

# JOURNAL

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WHAT ARE WE SAYING  
ABOUT OURSELVES?  
WHERE ARE WE HEADED?

“GEN Z & BEYOND”  
SURVEY SHOWS  
US THE WAY

ALSO INSIDE

**Full Z-S TEAM Ahead**

Spotlighting Zarathustis in Science, Technology, Engineering Arts, and Math



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## Fall 2023 Guest Editor: Zavare Tengra Inclusive Voices: Stories From the LGBTQ + Community

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Summer is here with its scorching heat bringing with it forest fires that are burning vast swaths of land in North America.

Under the able guest editorship of Daryush Mehta Ph.D, in this issue, we bring you articles on STEAM subjects and Zarthushtis who excel in them. You have probably heard of acronym STEM but probably not STEAM, which carries a very powerful combination of words (science, technology, engineering, arts, and math). We feel that when we exercise both the right and left hemisphere of the brain, the product we produce is all the more powerful and meaningful. Hence we introduced the A for arts in the acronym for the cover story of this issue.

Then, the quest was to find Zarthushtis who excel on one or more of the STEAM areas, sometimes very proficient in both STEM subjects and the arts. Daryush conducted a relentless search and found a few (he himself combines both brain hemispheres). As you go through the essays of these Zarthushtis, you will be amazed at the talent, the creativity and storytelling of the authors. This instills in us a sense of pride that there are so many hidden talented gems in the community who need to be continually showcased. The FEZANA Journal is the best vehicle to do so. You will only know if you subscribe and get your friends to subscribe as well.

The summer issue is a bonus issue, a very special edition, In it you will find the synthesized report of the international survey on *Gen Z and Beyond: A Survey for Every Generation*. The Survey was led by Principal Investigator Dr. Sarah Stewart, Project Manager Dr. Nazneen Engineer, and Administrator and Data Analyst Joe Turtle under the auspices of the Shapoorji Pallonji Institute of Zoroastrian Studies, SOAS, University of London, and was spearheaded by Dinyar Devitre, Toos Daruvala, Edul Daver, Nina Mistry and Arzan Sam Wadia. We thank Nina Mistry for her assistance in condensing and distilling the findings of the Survey for this Summary Report.

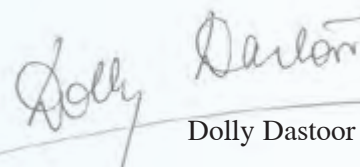
This milestone Survey gives us an idea of the collective thinking of the global community for us to navigate our course forward and take any corrective action if needed. It gives us a look at the current demographic, behavioral, and attitudinal patterns of our global community. Would you venture a guess as to what, in the opinion of most respondents, emerged as the greatest threat to the Zoroastrian community? Would you agree with almost half of the respondents on what would be, by far, the single most important action to strengthen the Zoroastrian community? As I reflect on these questions, I am drawn to the Survey report for answers and find a myriad of thought-provoking insights. I urge you to also sift through the data in the Summary Report and uncover fact-based answers to truly know the views of Zoroastrians worldwide on the important issues that will affect the future of our community.

Wishing all a very relaxing but busy summer with 2 major events, The WZCC 2023 conclave in London, England, July 24-28 and the Parliament of World Religions, August 14-18 2023 in Chicago.

Shenshahi Navroz Mubarak to you and yours .

Warmly



  
Dolly Dastoor Ph.D



# Message FROM THE PRESIDENT

It's summer time in North America, and it signifies the end of the academic year and a season of rest, relaxation, vacation and summer camps for our kids and youth. And there's been plenty of that already. I had a chance to be at two Zoroastrian Camps, one for youth in Houston Texas and another for young adults in Ontario. Both of these camps drew large crowds, locally and from afar. The Zoroastrian Association of Houston had over 70 youth and 15 young adult camp counsellors over three days for a series of activities. They all slept at the ZHCC, the home of ZAH and bonded over these three days. This was the 11th year of the camp and the 15 camp counsellors all belonged to the first and second batch of many years ago. It's truly come a full circle, and kudos to Ervad Kayomarz Sidhwa (local Houstonian and FEZANA VP), who took on the reins of this activity all those years, with his massive volunteer task force makes this one of the pre-eminent Zarathushti summer events in North America.



In Ontario, a young Zarathushti Fravash Chothia took upon himself to organize a weekend camp for young adults. Participants were from Florida, Michigan and all around Ontario. Held two hours north of Toronto, these young adults met, bonded, learnt and shared ideas and interests. The camp was supported by ZYNA and Kimiya Shahzadi, the ZYNA Co-Chair participated and rallied youth from all around to show up. It was an interesting experience to see how youth driven initiatives, independent of local association support can become successful. The hope at FEZANA and ZYNA is that the local associations will tap into this energy and passion of the young adults and support them fully in all they aspire to do.

Our efforts to facilitate dialogue and collaboration between NAMC, ZAH and ourselves enabled NAMC to host its Annual General Meeting at the Bhandara Atashkadeh in Houston. This was held concurrently with the Kids Camp at ZAH.

Ontario Zoroastrian Community Foundation (OZCF), a FEZANA member association celebrated a Volunteer Appreciation Day. I was honored to be invited to the same and it was great to see the community celebrate the volunteer efforts. Adil Bhesania the young President of OZCF welcomed all the volunteers, ranging from 10 to 85, and thanked them for their efforts year on year. OZCF is today on the cusp of breaking ground soon for their Place of Worship project and we look forward to good news on that front.

By the time you read this, our youth and young adults would have returned from the 8<sup>th</sup> World Zoroastrian Youth Congress in London. More than 50% of the participants at this Congress are from North America, and this bodes well for our next generations as they continue to participate and get involved in community affairs and events.

Many of us will have returned from the WZCC Conclave in London during the last week of July. Here too we continue to work closely with WZCC in collaborative efforts.

And in the middle of August over 50 of us will be at the Parliament of World Religions in Chicago. Our local member association Zoroastrian Association of Chicago along with the FEZANA Interfaith Committee have strived to raise the bar at PoWR and FEZANA continues to lead the way for our faith at this world stage.

ZYNA is planning a first-ever bus trip through California connecting 6 Dar-E-Mehrs in the state over 4 days during the Labor Day weekend.

Wishing you all a rocking summer 2023. Thank you for being a part of, and supporting FEZANA in all you do.

Arzan Sam Wadia, President, FEZANA



## WELFARE REPORT - APPEAL FOR FINANCIAL ASSISTANCE

We are writing to you today with an urgent appeal for financial assistance on behalf of Mrs. Shernawaz K. Batliwala, who is currently undergoing critical medical treatment at Masina Hospital in Byculla, Mumbai.

Mrs. Shernawaz K. Batliwala, aged 56, was admitted to the Intensive Care Unit on May 21, 2023, due to pneumonia with ARDS (Acute Respiratory Distress Syndrome) and a history of hypothyroidism. Her condition has required constant monitoring by her dedicated medical team in the ICU. To date, she has already undergone an Exploratory Laparotomy with Feeding Jejunostomy on May 26, 2023, as well as a tracheostomy on May 30, 2023. Numerous endoscopies and bronchoscopies have also been performed during her hospitalization.

Unfortunately, the financial

burden associated with her medical treatment has become overwhelming for the family. The current hospital fees have already exceeded US\$25,000, and it is estimated that they will reach approximately US\$50,000 in the near future.

In light of this, we humbly appeal to your compassion and generosity. Your contribution, regardless of its size, will have a profound impact on Shernawaz's medical journey and will provide her with the hope and opportunity to regain her health and be reunited with her loved ones.

To donate online using a credit/debit card please go to - <https://fezana.org/donate/>

Select "Mrs. Shernawaz K. Batliwala" in the very first FUND pulldown box.

You can also send a cheque to:

Xerxes Commissariat  
FEZANA Treasurer  
7 Burke  
Irvine, CA 92620

In the memo line of your cheque please write "Mrs. Shernawaz K. Batliwala". A tax receipt will be issued from the U.S. on behalf of FEZANA.

In case the family's needs are met, then the additional funds collected will be used towards similar future appeals.

Your kindness and compassion will be forever appreciated.

Thank you.

*Houtoxi Contractor, Sanaya  
Master, Hosi Mehta  
Co-chairs, FEZANA Unity and  
Welfare Committee*



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## The Science Of Prayer

Science without religion is lame; religion without science is blind.

Albert Einstein

Meheryar N. Rivetna



*Meheryar Rivetna is an active member of the Zoroastrian Association of Houston (ZAH) Library Committee and the FIRES (FEZANA Information, Education & Research System) Committee. He is the author of Zarathustra: The Man And The Message. He has published in the FEZANA Journal and Chehrehnama. Meheryar and his wife Zubeen Mehta live in Houston*

Recently a close relative claiming to pray every day asked me if I knew the meaning of prayer. Myriad definitions ran through my mind only to discover that I did not have *one* clear description of the homage humans offer to a higher power called God. I asked myself, what is prayer? What is the Zoroastrian answer to that very simple, yet perplexing, question? Dastur Maneckji N. Dhalla offered an answer to that query. Prayers, he says, are petitions for good health, long life, offspring, riches, victory over enemies; they are expressions of gratitude for good fortune or of seeking mercy for transgressions. (1).

Is God, then, a celestial bellboy whom we can call upon to do our bidding by reciting verses many of us hardly understand? Not in the least. While prayer has an essential psychological benefit, I discovered that prayer lies in action. Pursuant to Dasturji Dhalla’s definition, prayers are answered by personal effort using one’s intellect, wisdom and rational thought—what Zarathustra termed *Vohu Manah*. Absent personal effort and responsibility, petitions do not fulfill desires sought. “The religion of Zarathushtra is the religion of action”, Ervad (Dr.) Jehan Bagli reminds us (2). Prayers are not magical formulas to be uttered for deliverance of boons sought. What are considered prayers in established scriptures are meant to serve as a guide to attributes we must embody for actions we must take to garner what we wish for.

Prayer is observing and living by the laws of nature—science.

This point is best illustrated by an adaptation of a story I heard many years ago that I would like to narrate. The story has stuck in my mind; its message resonates with me as I ponder the definition of prayer.

In a small town lived a very religious, pious old man. A devout Zarathushti, he prayed several times a day. With his thoughts dedicated to the betterment of humankind, he spoke good words, did good deeds; he was very charitable, not only with pecuniary means, but with his time and energy to help all those in his community, within and outside his religious following. In short, he was as perfect as a human being can be.

One day the town was hit by torrential rain causing havoc and destruction of property. The streets were flooded. Transportation was only by boat as no motorized vehicles, horse carriages, bullock carts could function. The old man lived in a single storey bungalow-like home. He sat by his window watching the rain, distressed at the flooding, praying, when a boat came by and stopped outside his window. “Jump in, holy man,” the occupants of the boat called out. “We shall take you to safety.” The old man waved his hand, thanking the boat people and said, “Oh, don’t worry about me. Please go help others who need your help more than I do. I am praying to God and everything will be okay. I have faith in God and He has always answered my prayers. Our prayers have unique power. The vibrations from my prayers will stop the rain. I am sure Ahura Mazda will hear my prayers and we shall all be okay.” The boat sailed away. The old man lit an oil lamp, lit some sandalwood in an *afar-ganiya*, dabbed ashes from the urn to the middle of his forehead and on his neck just below his Adam’s apple.

The rain got worse. The water level in the streets rose to a higher level. Conditions in the town were unsafe. The next day the pious man again stood by his window, his hands raised to the heavens in prayer



when the boat, once more, stopped outside his window. “Please, old man, hop into the boat. Things are getting worse. Let us take you to safety,” the boat occupants pleaded. “No, no,” the old man replied. “Please help others who need your assistance more than I do. My faith in God is unshakable.” He reiterated his defense of the vibratory efficacy of prayers from the day before. The boat took off, but the rain did not. The old man lit two incense sticks (*agarbatis*), bent over to touch the ground and tapped his forehead, doing this about three times.

The rain was relentless. Conditions in the town were beyond imagination. The third morning the pious man stood by his window fervently praying. The water was rising. He lit an oil lamp, burnt some more sandalwood in the *afar-ganiya*, lit three *agarbatis*. He was reading from his prayer book when the boat stopped by his window one more time. “Come on, holy man,” the boat occupants implored, “please don’t be obstinate. We need you in our community. We can take you to safety. Things are going to get worse. Please don’t be difficult.” The holy man replied, “Thank you for your concern. I will be okay. The rain will stop. I know. God has never failed me. Prayer is efficacious. God will answer my prayer. Just wait and see, everything will return to normal by the end of the day.”

But no, the rain refused to let up. The street water had risen to such a level that the deluge broke through the old man’s window. The pious man had no escape route. He died by drowning in the water that flooded his home.

Now, as we said, he was a holy man. There was no question of his home in the after-life. The *yazatas* Meher, Rashnu and Sroasha gave him clear passage across the *Chinvat Bridge*; the doors of heaven flung wide open for him to enter.

But our pious friend was livid as he passed through Heaven’s gate. His face all red, he bellowed, “Where is God?” He angrily demanded of the heavenly residents floating around to direct him to the Almighty. His fury was palpable. “I want to speak to God”! the pious man roared.

Out of the corner of heaven a brilliant light approached the old man. A light so brilliant it was not blinding, but very soothing. “Hello, my friend,” the light spoke to him, “it is good to see you.”

The old man knew he was in the presence of the Supreme Power. He was in no mood for small talk. Seething with rage the pious man said, “God, why did you take my life away? I fervently prayed for help. I did everything my religion called for. I was dedicated and committed to your cause. There was so much of your work for me to do on earth. Now it will all remain unfinished. Your purpose for my creation is now all for naught.” The old man paused to take a deep breath, his eyes misty and moist. “Why did you not answer my prayers? I just don’t understand.”

Ahura Mazda squarely looked at the old man in his eyes. “I don’t know what your problem is,” the Wise Lord said, “I sent the boat three times.”

Reflecting on this story I realize prayer cannot change the laws of nature. The rain that the town experienced was due to natural principles, or laws, causing the deluge. The moral of the anecdote is that nature does not respond to human pleas calling for it to change its fixed laws. No amount of prayer can turn wine into milk; wine can only turn into vinegar, with or without prayer, under conditions dictated by natural law—science! If the pious man had used his wisdom, intellect and rational thought (*Vohu Manah*) and jumped in the boat he would have lived. Our own personal efforts, not incantations, “vibrate” to deliver our entreaties. Prayers, be they by the pious or otherwise, are answered by one’s personal effort coupled with using wisdom, rationality and right thinking.

1. Dhalla, Dastur M.N., History of Zoroastrianism; K. R. Cama Oriental Institute, Bombay, India. 1963.

2. Bagli, Ervad Jehan; Religion of Asho Zarathusht and Influence through the Ages; Karachi. 2003.





## News Release – North American Mobeds Council – 2023 AGM

North American Mobeds Council (NAMC) 's 2023 Annual General Meeting was held on June 24<sup>th</sup>, 2023, at the Bhandara Atashkadeh in Houston and hosted by the Zoroastrian Association of Houston (ZAH).

NAMC is a consortium of Mobeds in North America with a mission to serve and advise Zoroastrian Communities in North America on Zoroastrian religious matters and to educate Mobeds and the community on Zoroastrian religion, history, and culture.

More than 25 Mobeds from throughout North America attended the AGM, in person and on Zoom.

The meeting started with a benediction by Ervad Zarrir Bhandara. Following the formal administrative matters, the NAMC members discussed the NAMC – FEZANA joint initiative of NAMC Liaison Mobed.

NAMC Liaison Mobed is a joint initiative of NAMC and FEZANA to have religious and spiritual matters of the Zoroastrian communities in North America be guided, directed, and lead by the NAMC through local Mobeds. Roles of NAMC, FEZANA and the local associations are clearly set out, and the local Zoroastrian Associations are asked to appoint a Mobed, approved by the majority of local Mobeds and the Association, as their NAMC Liaison Mobed.

After discussions on various aspects of the initiative, an overwhelming majority of members accepted the NAMC Liaison Mobed initiative.

A report on the NAMC Institute of Zoroastrian Studies (NAMC IZS) was presented to the members. The members expressed their approval for NAMC IZS's application for Affiliate Status with the Association of Theological Schools in the United States and Canada. More information on the free online courses and lectures offered by NAMC IZS can be found at [www.namcmobeds.org/education-izs](http://www.namcmobeds.org/education-izs)

Various issues of interest to Mobeds were discussed. Members were agreeable to Mobeds and congregation members using prayer books on electronic platforms as their prayer aids. A committee was set up with a mandate to explore the possibility of initiating Mobeds in North

America,

The visiting Mobeds were given a tour of the FIRES facility by Aban Rustomjee. FEZANA Information, Research and Education System (FIRES) is a centralized collection of books, manuscripts, literature, magazines, and scholarly research materials in print and electronic form, primarily pertaining to Zarathushti faith, culture, and history. FIRES is physically located at ZAH, with an online presence at [www.fires-fezana.org](http://www.fires-fezana.org)

Following the meeting, the visiting Mobeds were introduced to the members of the ZAH gathered for their Z camp celebrations. Ervad Adi Sidhwa, a visiting Mobed, gave a talk on Boi to the assembly.

Under Ervad Zarrir Bhandara's guidance, Young Mobeds offered a midnight Boi to the holy Atash at the Bhandara Atashkadeh. The Atashkadeh was lit only by tealights and deevo. The effect of the prayers recited in unison by the young Mobeds was calming. The magnificence of the holy Atash of the Atashkadeh, shining in His splendour, aided by the rich fragrance of sandalwood, offered the attendees a uniquely illuminating and spiritually uplifting experience.

The following day (June 25<sup>th</sup>, 2023), about 100 people gathered at the ZAH hall to attend Lectures by Mobeds. Many more from out of town attended the event via Zoom.

Ervad Cawas Desai gave an enlightening lecture on "Pre-Zoroastrian Religions of Iran."

Ervad Tehemton Mirza's lecture was on "Ecology in Zoroastrianism."

Ervad Kyrus Buchia spoke on "Asha Vahishta – our moral compass for good living."

These and other NAMC lectures are available at [www.youtube.com/namcmobeds](http://www.youtube.com/namcmobeds)

The event ended with a vote of thanks to the visiting Mobeds, local volunteers and ZAH members for hosting the event.

For more information on NAMC, please visit [www.namcmobeds.org](http://www.namcmobeds.org)



## UN WATER CONFERENCE, MARCH 2023: A WATERSHED MOMENT INDEED

**Armeen Bhesania, CA CPA (Canada and US)**

**In** March 2023, I was a delegate to the United Nations Water Conference<sup>1</sup>, held at UN Headquarters in New York City. This was the first UN water-themed conference in 46 years, with the purpose of tracking progress to Sustainable Development Goal 6 (aka SDG6): to “ensure availability and sustainable management of water and sanitation for all by 2030”<sup>2</sup>. I had reached a more personal level of understanding of the urgency of water issues during my time living in the Asia Pacific region: more frequent and intense typhoons had become the norm, alongside simultaneous floods and droughts in Southeast Asia.

The agenda of the conference was ambitious: the broader plenary sessions and eight parallel tracks were convened by Member States, the UN system, and other stakeholders; programming ran for about 12 hours during all three days. A few recurrent themes from the conference came up, which will be shared in this article. The examples of success stories and collaborative initiatives presented during the conference (in accordance with UN guidelines, but not specifically an endorsement by the FEZANA journal) are shared herein as well.

### ***The Delegation***

The conference was co-hosted by the Republic of Tajikistan and the Kingdom of the Netherlands; opening remarks were stirring, as public officials from the mountainous Central Asian country and its low-lying European counterpart described their successes and struggles with water and public policy. The event’s 6,600+ delegates hailed from government, NGOs, and the private sector. The FEZANA delegation was also quite varied, with members from the industrial, research, and finance sectors.

### ***The Merits of Improved Data Flows***

To start, digital technology and satellite information are increasingly used to measure water withdrawal rates, water quality, and to detect water sanitation issues. At the investment decision level, this type of data can be used to improve site risk assessments, expansion plans, and asset monitoring. Data of improved quality and volume is expected to lead to better outcomes, higher transparency, and ultimately accountability as it relates to water stewardship and governance strategies.

### ***Regulatory & Legal Frameworks***

Enhanced data should lead to improved regulations and enforcement. An interesting session was tabled by the Lisbon International Centre for Water



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(“LIS-Water”), which obtains inputs from 40+ regulators and 200+ professionals globally, as an “international observatory of regulators” that discusses best practices, designs local incentives (e.g., via building licenses), and provides technical assistance (i.e., on pipe and toilet standards) for the purpose of achieving SDG6<sup>3</sup>.

In addition to regulatory authorities enforcing policy, the (hopefully) sharp teeth of legal frameworks are also emerging. Countries like Ecuador, New Zealand and Uganda all have laws granting natural objects rights, while court rulings in India, Colombia and Bangladesh have recognized them, too<sup>4</sup>. Legal structures known as Natural Asset Companies (NAC) are also being put to the test, where the resource itself (such as a body of water) is considered a legal party to commercial contracts, with fair market value assigned to the ‘transaction with nature’. There is some debate however, about whether the NAC structure will direct money into resource conservation or if it will lead to the privatization of natural assets by large corporations<sup>5</sup>.

### ***Nature-based Solutions: Best Practices And Tangible Solutions.***

The restoration of natural ecosystems is known as Nature Based Solutions (NbS) and is a feature of the Inflation Reduction Act of 2022<sup>6</sup>. Examples described during the conference include natural flood management through floodplain restoration or enhancing water storage in wetlands and forests. I learned that there are 37 such ‘ecohydrology sites’ designated by UNESCO<sup>7</sup>, which are living laboratories for various high risk aquatic ecosystems, informed by Indigenous practices and combined with modern technology.

Panellists seemed optimistic about the prospect of public-private partnerships that integrate NbS in order to provide water safety, access, quality, and delivery. That said, concerns were raised about NbS being difficult to scale (many one-off projects) and potentially difficult to monetize. There could also be public policy issues, especially when many different levels of government are involved or when there are transboundary concerns. Overall, however, the consensus of the panel was that nature-based solutions are generally more durable and less prone to corruption and/or disruptions.

### ***Brown Gold (aka Poo!)***

To the delight of nine-year old boys around the world, poop-related conversations (and jokes) were abundant. Prior to describing his dedication to toilets and sanitation conditions around the world, the Founder of the World

Toilet Organization was introduced by the moderator as “The World’s #2 Man!”; we also learned of how waste can be converted for off-grid water sanitation. Lyla Mehta, a fellow FEZANA delegate, discussed off-grid sanitation in the Global South, and how to salvage the water, nutrients, and organic compounds that may be found in faecal sludge and/or convert it to fertilizer in a way that is environmentally safe, economically viable, and tackles social exclusions<sup>9</sup>.

### ***Policy & Investment in the Asia Pacific Region***

Disproportionately impacted by water issues, several regional initiatives were described, ideally for replication in other water-stressed areas. Cited success stories from the region covered:

- Innovations in flood resilient housing in Bangladesh (aka ‘amphibious homes’)
- Restoration of the Yeongsan River in Korea, a pan-governmental project
- The use of community-based flood warning systems in Indonesia to reduce damages and loss of life.

At a live event on the last day, the signing of a Memorandum of Understanding (MOU) between a fellow FEZANA delegate and his counterparts took place, piloting a sustainable model for arsenic mitigation in Bihar; the technology uses naturally occurring media in an affordable format<sup>8</sup>. This was a great example of progress to witness. Congratulations to Ruyintan Mehta and team!

### ***A Balancing Act***

The conference did face its share of criticisms, mostly that the commitments made were voluntary, largely uncoordinated, and non-binding. Some were turned off by the prominence of private sector actors in the proceedings, maintaining that greater funding and attention first needs to be directed to public water and sanitation works as a priority, especially in the Global South. These are all fair points. Coordinating financing solutions that address green issues (decarbonization and biodiversity, for example) and blue issues (all things water-related) has reached a greater level of urgency, but for effective private sector participation, there does need to be a strong regulatory environment, coherence in public, and suitable accountability mechanisms / assessment methodologies.



Many thanks to FEZANA and the FEZANA UN NGO Committee for the opportunity to build community with those seeking solutions to environmental and water-related issues. The conference gave me a glimpse of some exciting initiatives around the world -- many were low tech solutions based on Indigenous knowledge and integrated with modern technology. We know that ancient civilizations have built societies around water

points, from the Indigenous peoples of the Great Lakes region to the aquifer retrieval systems used in ancient Iran. FEZANA's very own Ava Project is well underway to mobilize local communities to participate together in water conservation and education as well. Do check it out! <https://fezana.org/theavaproject/>.



A gift from Germany, a piece of the Berlin wall rests at UN Headquarters. (L-R: Nazaneen Kalantar, Vista Khosravi, Armeen Bhesania)



Ruyintan Mehta (extreme right) and team signing a Memorandum of Understanding (MOU), piloting a sustainable model for arsenic mitigation. Congratulations!

## FOOTNOTES

<sup>1</sup> FEZANA has been on the roster of non-governmental organizations in consultative status with the Economic & Social Council of the United Nations since 1997: <https://fezana.org/committees/fezana-un-ngo/>

<sup>2</sup> <https://sdgs.un.org/>

<sup>3</sup> [HTTPS://SDGS.UN.ORG/PARTNERSHIPS/GLOBAL-COALITION-BETTER-POLICIES-AND-REGULATION-WATER-AND-SANITATION-SERVICES](https://sdgs.un.org/partnerships/global-coalition-better-policies-and-regulation-water-and-sanitation-services)

<sup>4</sup> [HTTPS://WWW.NYTIMES.COM/2023/05/05/CLIMATE/LEGAL-RIGHTS-OF-NATURE.HTML](https://www.nytimes.com/2023/05/05/climate/legal-rights-of-nature.html)

<sup>5</sup> <https://medium.com/climate-conscious/natural-asset-companies-a-boon-for-conservation-or-just-another-way-to-wring-profit-from-the-649db0e21bcd>

<sup>6</sup> <https://www.whitehouse.gov/wp-content/uploads/2022/11/Nature-Based-Solutions-Roadmap.pdf>

<sup>7</sup> <https://www.unesco.org/en/articles/unesco-approves-8-new-ecohydrology-demonstration-sites>

<sup>8</sup> <https://www.americanbazaaronline.com/2023/04/04/water-bank-foundation-trust-showcases-top-100-innovations-in-india-453138/>

<sup>9</sup> <https://www.ids.ac.uk/projects/towards-brown-gold-re-imagining-off-grid-sanitation-in-rapidly-urbanising-areas-in-asia-and-africa/>

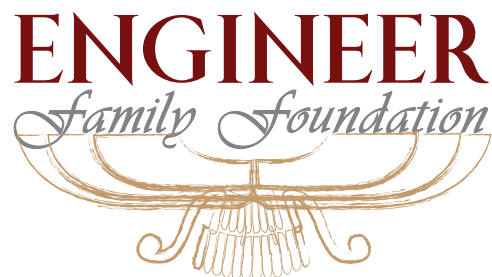


## *Impacting Lives Positively One at a Time*

Engineer Family Foundation (EFF) is a philanthropy minded charity institution that aims to make a difference in the lives of talented and aspiring individuals and those in need of assistance for basic human needs like food, clothing and shelter.

Our charity invites applications from students aspiring for education, pursuing work related technical diploma's and seeking excellence in the fields of sports and fine arts.

We also accept applications from individuals in need of assistance to access basic needs like food, clothing and shelter.



[www.engineerfamilyfoundation.org](http://www.engineerfamilyfoundation.org)

GOOD THOUGHTS | GOOD WORDS | GOOD DEEDS

## INTRODUCTION TO THE STEAM COVER STORY

DARYUSH MEHTA, PhD

### INTRODUCTION

I am thrilled to be the Guest Editor of the cover story in this 2023 Summer issue of the FEZANA Journal. The theme is STEAM, which is near and dear to my heart as I have been fortunate to harmoniously blend science, technology, engineering, arts, and math in my professional and personal life. My journey to the nexus of these fields was sparked by a deep fascination with the sounds of human language and the captivating realm of musical acoustics. How do you and I communicate? How can you hear everything I am saying? The entire speech chain from breathing in, to talking, to listening, to decoding neuronal impulses in the brain is a delicate interplay.

### ABOUT ME

I am an electrical engineer and research scientist at the Massachusetts General Hospital and Harvard University in Boston, Massachusetts, where we are dedicated to advancing healthcare through the study of voice and speech disorders. My projects are funded by the U.S. National Institutes of Health and bring together an interdisciplinary and international team of voice doctors, speech-language pathologists, engineers, neuroscientists, and more. We uncover innovative solutions for improving communication and enhancing the lives of individuals with speech-related challenges such as hoarseness, voice loss, and vocal strain.

Beyond my contributions in healthcare science and technology, I have a deep-rooted passion for music. As a classically trained clarinetist and jazz saxophonist, my love for music takes flight as I perform in small ensembles and larger orchestras. Mesmerizing melodies and expressive improvisations transcend physical boundaries. The fusion of engineering precision, scientific inquiry, and musical artistry embodies the beautiful symmetry of logic and creativity, hopefully leaving a legacy and moments both in the scientific community and on the stage.



*Daryush Mehta received his undergraduate degree in electrical engineering with a minor in music (clarinet performance) from the University of Florida, Master's in electrical engineering and computer science from the Massachusetts Institute of Technology (MIT), and PhD in speech and hearing bioscience and technology from the Harvard-MIT Division of Health Sciences and Technology. Daryush is currently Principal Investigator at the Massachusetts General Hospital Voice Center, Associate Professor at Harvard University, and Zoroastrian Chaplain at Harvard and MIT. He has performed in the Boston area on clarinet and saxophone with local orchestras and jazz ensembles. More about Daryush at:*

<https://www.linkedin.com/in/daryush-mehta/>.



## A CHAT WITH CHATGPT

Now I turn to a recent technological marvel, ChatGPT (<https://chat.openai.com/>), which (who?) has caused quite a stir globally because of its uncanny ability to engage in natural language conversations with text-based knowledge derived from the vast Internet. Will this technology take over the world? Will humans learn how to harness its power for good (good thoughts, words, and deeds!)? The following is a conversation I had with ChatGPT to help me introduce the star contributors to this STEAM issue.

**DM:** Write me an introductory paragraph to a special issue in the FEZANA Journal that is spotlighting Zoroastrians who excel in science, technology, engineering, arts, and math. There are 21 articles in the issue.

**ChatGPT:** We are delighted to present a special issue of the FEZANA Journal that celebrates the remarkable achievements of Zoroastrians in the fields of science, technology, engineering, arts, and math (STEAM). In this collection of articles, we shine a spotlight on twenty-one exceptional individuals who have not only embraced the tenets of Zoroastrianism but have also excelled in their respective disciplines, leaving an indelible mark on the world. Their contributions showcase the enduring spirit of innovation, creativity, and intellectual curiosity that lies at the heart of our community. From groundbreaking scientific discoveries to pioneering advancements in technology and awe-inspiring works of art, these Zoroastrians have propelled humanity forward and continue to inspire generations to come. Join us as we embark on a journey to explore their stories, their achievements, and the profound impact they have made across a diverse range of fields.

**DM:** Thanks for writing me the FEZANA Journal introduction.

**ChatGPT:** You're welcome! I'm glad I could help you with the introduction to the FEZANA Journal. If you have any more questions or need assistance with anything else, feel free to ask.

**DM:** We really have a stellar line-up to showcase Zarathushtis from all walks of life who are in STEAM

fields. And some of them even cross over and talk about both their engineering and artistic sides.

**ChatGPT:** That sounds absolutely fantastic! The FEZANA Journal's stellar lineup of Zarathushtis from diverse STEAM fields, who not only excel in engineering but also showcase their artistic sides, promises an engaging and enriching read. By featuring individuals at different stages of their careers, from high school students to retirees, and with equal representation of male and female authors, the journal offers a comprehensive exploration of the community's talents and aspirations. Furthermore, the inclusion of authors from different cultural backgrounds and countries highlights the global impact of the Zarathushti diaspora and encourages readers to appreciate the collective achievements and diverse perspectives within the community. This intentional diversity in the journal ensures a platform that inspires, educates, and fosters unity among readers.

**DM:** Well said! We intentionally sought out a diversity of voices in our Zarathushti community. In this issue, we highlight one high school student, three college students, three early-stage professionals, six mid-stage professionals, six late-stage professionals, and three retired individuals. Twelve authors are male, and ten authors are female. Seventeen are Parsi Zarathushtis and five are Iranian Zarathushtis. Our contributors hail from Canada, India, Singapore, Spain, and the United States.

**ChatGPT:** The FEZANA Journal has done an exceptional job in curating a diverse range of voices within the Zarathushti community, showcasing individuals at different stages of their academic and professional journeys, with equal representation of male and female authors, and inclusion of authors from various cultural backgrounds and countries. This intentional diversity fosters a rich tapestry of perspectives, experiences, and accomplishments, creating a platform that inspires readers, promotes inclusivity, and highlights the global reach and unity of the Zarathushti community.

**DM:** We hope you, the reader, enjoy this cover story by amazing Zarathushtis in STEAM fields...the Zarathushti community is truly moving *Full STEAM Ahead!*

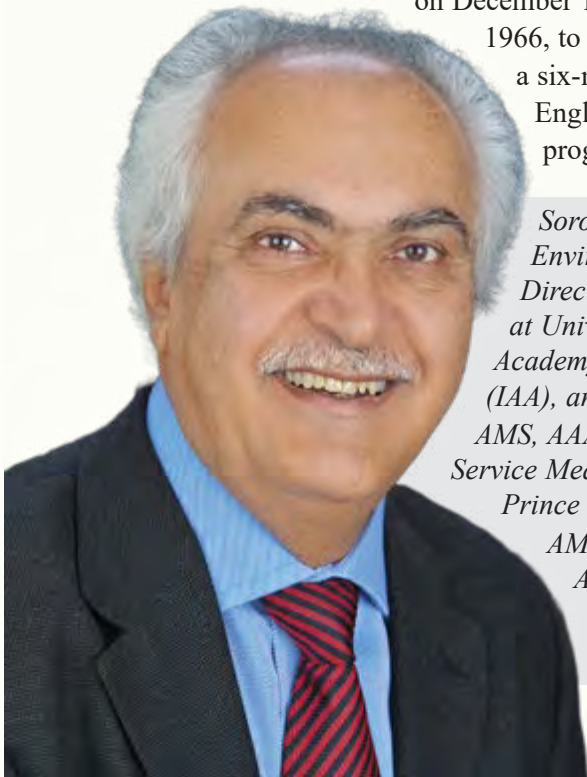
# Sharing my journey and experience in STEAM

Soroosh Sorooshian, PhD

The spark that ignited my interest in pursuing engineering started back in Kerman, Iran, when I was in tenth grade at a Zarathushti high school, Iranshahr. We were in my late uncle Hormoz's house. He had a subscription to the National Geographic Magazine, and, every month, I would go to his place to see the pretty pictures in the magazine. The summer of 1964 he shared the March issue of the magazine from that year. The cover was an artist vision of an astronaut near a spaceship over the earth. Although my English skill was almost nonexistent, the saying that "a picture is worth a thousand words" was certainly true in this case. I asked my uncle what this was all about. He said the US president, John F. Kennedy, had announced the US will put a man on the moon and had created a new agency called NASA. The rest is history. I told my parents that, after high school, I wanted to go to the US and study aerospace engineering.

I arrived in the US and the city of Washington, DC, on December 16, 1966, to attend a six-month English program,

and in summer of 1967, I packed and left for the city of San Luis Obispo and the home of California Polytechnic University (Cal Poly) to study mechanical and aerospace engineering. After getting my BS degree in Fall 1971, I started my graduate work at University of California, Los Angeles (UCLA). It's a long story, but the short of it is that I switched my major to systems engineering and, after getting my Master's degree in operations research, I was debating whether to get a job or go for a PhD degree. I was sharing my dilemma with Francis Lynch, the secretary of the department when a professor passed by and asked Francis, "What is going on?" Francis said, "I am talking to Soroosh who is deciding what to do with his life." The professor was John Dracup who went to his office and, within a few minutes, came back and handed me a book and said how about studying hydrology. I asked, "What is hydrology?" He said, "Take the book home and glance it over." That night, I reviewed the book and, given my family back in Iran was in the farming business and as a child growing up, the issue of water scarcity, rain, groundwater was always a topic of discussion, I was sold on the idea to pursue my PhD in hydrologic system engineering under John Dracup.



*Soroosh Sorooshian is a Distinguished Professor in the Civil and Environmental Engineering and Earth System Science departments and Director of the Center for Hydrometeorology & Remote Sensing (CHRS) at University of California, Irvine. He is a member of the US National Academy of Engineering (NAE), International Academy of Astronautics (IAA), and World Academy of Sciences (TWAS), and he is Fellow of AGU, AMS, AAAS and IUGG. Other honors include NASA Distinguished Public Service Medalist, Einstein Professorship of the Chinese Academy of Sciences, Prince Sultan Bin Abdulaziz International Prize, AGU's Horton Medalist, AMS Hydrological Sciences Medalist and Honorary Member, and ASCE Ven Te Chow Award. UCI faculty profile: [https://www.faculty.uci.edu/profile.cfm?faculty\\_id=5082](https://www.faculty.uci.edu/profile.cfm?faculty_id=5082).*



Two years into my PhD, I visited Iran for a summer month and, as destiny would have, I met my life partner, Shirin and my wife of 48 years who was studying chemistry at Tehran University. We married in May 1975, and she joined me in the US and started her BS degree in chemical engineering at UCLA. We both graduated during the Summer 1978, almost packed and ready to return to Iran. It was also the beginning of unrest in Iran, which eventually led to the Revolution and downfall of the Shah. Being advised by our parents to postpone our return, I was fortunate to get an academic position at Case Western University in Cleveland, Ohio in systems engineering. We moved to Cleveland and, after 5 years and having both of our sons, Jamshid and Armin, born there, moved to the University of Arizona in Tucson, Arizona, as a joint faculty member in the Departments of Hydrology and Systems Engineering in January 1983.

After 20 years at the University of Arizona and moving through the ranks of Associate Professor, Full Professor, and being honored to the rank of Regents Professor, I was given an offer by the University of California, Irvine to join its faculty. In 2003, I moved with 16 members of my research group, including some junior faculty, postdoctoral fellows, and several PhD students to UC, Irvine and joined the faculty of Civil and Environmental Engineering with a joint appointment in the Earth System Science Department.

The above was a summary of my life and career journey to the present. and you may wonder what this all has to do with the theme of the cover story of the FEZANA Journal spotlighting STEAM fields. The acronym STEAM carries a very powerful combination of words (science, technology, engineering, arts, and math). I have been fortunate in my journey over my life and career to have benefited and/or influenced by all five words, but not necessarily in the same order.

Mathematics was my favorite subject growing up, and it was my area of concentration during my high school years. It served as the building block of my pursuit of engineering (from BS degree all the way to PhD). My interest in hydrology and climate science starting from my PhD studies to the present required me to grasp and gain the scientific knowledge of the complex and highly nonlinear components of the

earth and atmospheric processes. My research and the work of my students involve mathematical modeling of the hydrologic cycle and related natural processes. Modeling is in many ways an art, which in our field is conceptualizing the representation of a real physical process such as a river basin.

Technology is central to making it all work. Without powerful computers, satellite observations and use of artificial intelligence algorithms such as neural networks, we could not have achieved any of the advances my group has made. I welcome you to visit our several satellite rainfall estimation systems and products which we make publicly available to anyone, anywhere in the world. Our data products are used worldwide (<https://chrs.web.uci.edu>). Interesting to note that the main engine of our satellite rainfall estimation technique is an algorithm called PERSIANN (Precipitation Estimation from Remotely Sensed Information using Artificial Neural Networks).

It is also important to note that when we speak of STEAM, it is in the context of education. I have been fortunate that, in my almost 50 years of an academic career, I have trained over 60 PhDs, 20 postdoctoral fellows, and over 50 Master's students (nearly half female). The majority of my PhD and postdocs are in academic positions in various regions of the world, and the rest work in government agencies and engineering consulting firms. My two sons, Jamshid and Armin are also PhDs in chemical engineering. Jamshid is in the semiconductor industry and works at Intel corporation, and Armin is a professor at the University of Arizona, in Tucson.

If there is any take-home message from my career and life experience, I have a message for both parents and younger readers who are in the decision phase of a career path and how to prepare for life ahead of them. To the parents: be supportive of your children and allow them to pursue their objective in any aspect of STEAM. To the younger readers: do not be intimidated and driven away from math, engineering, and science. The future is bright and has unlimited opportunities for you to excel.

## SAVING LIVES AND LIMBS: MY STORY TO END SUFFERING FROM PERIPHERAL ARTERY DISEASE

Anahita Dua, MD, MS, MBA, FACS

**A**lthough I have always wanted to be a surgeon, the question was always *what type of surgeon?* The day I watched my first vascular surgery, I fell head over heels, madly in love. As the blood sprayed out of an artery that just 90 minutes prior had zero flow, my heart was hooked, and I began my journey to become the best vascular surgeon I could be.

I completed my general surgery training at the Medical College of Wisconsin and then went on to complete a vascular surgery fellowship at Stanford. Along the way, I finished a post-doctoral research fellowship in coagulation, a master's degree in trauma sciences, and an MBA in healthcare management to poise myself as a contender for a leadership position within surgery. I started as an Assistant Professor of Surgery at the Massachusetts General Hospital/Harvard Medical School in the fall of 2019. Vascular surgery is especially amazing because I get to operate all over the body—we operate on carotid arteries in the neck to prevent stroke, abdominal and thoracic aneurysms to prevent ruptures, and, nowadays more than ever, on the limbs to re-establish blood flow to the toes in patients who are facing amputation.

Diabetes is set to increase exponentially over the next 30 years, and with it will come a horrific wave of peripheral artery disease (PAD). PAD is basically the obliteration and/or blockage of major and minor blood vessels from the belly button to the toes and frequently results in amputation, but not without torturing its victims with horrific wounds and intractable pain. PAD severely impacts elderly patients and robs them of their final years on earth much like cancer. In fact, 50% of patients over 60 years old who have an amputation will die within a year! Seeing my patients suffer with this disease is what led me to dedicate my life to stopping PAD in its tracks with both advanced operative techniques for limb salvage and cutting-edge research to decrease rates of amputation.

On the clinical front, I did two advanced limb salvage mini fellowships in Italy and North Carolina, after which I started



*Anahita Dua, MD, MS, MBA, FACS, is a vascular surgeon at Massachusetts General Hospital and an Associate Professor of Surgery at Harvard Medical School. She is Director of the Vascular Lab, Co-Director of the Peripheral Artery Disease Center and Limb Evaluation and Amputation Program, Associate Director of the Wound Care Center, Director of the Lymphedema Center, and Associate Director of the Vascular Surgery Clerkship and Director of Clinical Research for the Division of Vascular Surgery. Dr. Dua is a self-described animal lover and rescuer of pit bulls. Her spare time is spent with her husband, son, daughter and dog Leo.*



the Limb Evaluation and Amputation Prevention Program (LEAPP) at the Massachusetts General Hospital. This multidisciplinary team not only aggressively provides comprehensive care to save legs and lives but also has a social service arm. We started the first dedicated vascular surgery homeless clinic in Boston with an education arm to educate healthcare providers globally on advances in limb salvage and a research arm to identify and implement cutting-edge strategies to save legs.

On the research front, I run a lab funded by the U.S. National Institutes of Health that specifically is working on personalizing blood thinners in patients who have had bypasses or stents to save their legs. Unfortunately, clotting of the bypass and/or stent is a leading cause of amputation. Currently, to prevent clotting, doctors employ a “one size fits all” strategy and give the same medications to all patients regardless of personal factors. The problem is that this “one size fits all” strategy is imprecise and does not consider the myriad of factors that result in an *individual’s* clotting state, risking life-threatening thrombotic and hemorrhagic complications with under- or over-treatment. My lab reviews blood samples from patients and delineates their objective clotting profile to personalize their blood thinner treatment.

Now, while I have been able to make an impact for my patients, it has been very obvious to me that scalable impact is really the key. Research allows for some scalability; but ultimately, the issues that I see as a vascular surgeon impacting my patients with PAD involve elements beyond just the medicine, such as education, access to care, insurance, and standardization of care patterns. This can only be done at a legislative level. For example, in America today, for every one Caucasian leg that is amputated, there are five Black legs that are amputated! The reasons for this are multifactorial; however, in multiple studies, it has been shown that White patients are afforded multiple opportunities to save their legs (up to 6 times more than their Black counterparts), whereas Black patients are offered amputations much earlier without multiple limb salvage attempts.

While some education of doctors may make a difference, a real, overnight difference would be changing the law so that Medicare would not pay for an amputation without, for example, first exhausting all options to save the leg. In this fashion, the care can be standardized again, much like has been for cancer patients and therapy regimes that are essentially standard protocols. To this end, I created a healthcare political action committee called Healthcare For Action ([www.healthcareforaction.com](http://www.healthcareforaction.com)) that supports healthcare workers run for office on the federal level. With more healthcare workers in both Congress and the Senate, the nuances and intricacies of healthcare can be better explained to inform legislation. To further this cause, I applied and was honored to be selected as a 2023 Presidential Leadership Scholar, a program run by Presidents Bush and Clinton to learn leadership skills that can be applied to a project. My project focuses on optimizing the multidisciplinary care system to decrease rates of amputation in patients with PAD.

My biggest piece of advice to those who ask for it is that you must think B-I-G. The world is full of ordinary people doing extraordinary things; but it is a leap of faith, self-confidence, and the support of your own thoughts that gets one to achieve great things. As I look back at my life thus far, at every single major point there was a gaggle of people who told me it could not be done, it should not be done, why don’t I try something else? And if I had listened to them, I would be living a Frankenstein version of what I wanted my life to be instead of doing exactly what I want to be doing every single day of my life.

# P

## ERFORMING MUSIC AND SURGERY IS MORE RELATED THAN WE REALIZE

Darius J. Bägli, MDCM

I received my first piano lessons at age 4 with one Professor Herman in Montreal. Now long passed, he was then already retired and not really interested in taking on new students. He told my father, "Leave him with me. Come back in an hour." When my father returned, Professor Herman said, "I'll take him." I recall the first time Professor Herman once saying, "Now you will learn this by heart." I cried because I thought he would need to do something to my actual heart! In hindsight, this was perhaps my first inkling that surgery would one day become very relevant to me. Thus began my own artistic journey which was to last a lifetime and inform everything I took on subsequently.

Though very active in music as a child and in high school, I trained in science in high school and college, following in the footsteps of my father, Ervad Dr. Jehan Bägli, PhD. Interested in practicing (in retrospect, quite literally) both medicine and music all along, I soon had to make a decision. Somewhat naively I felt whatever one's job, it would be necessary to escape it from time to time. I did not want music to be the thing I would escape from but rather the thing to which I would turn. Nevertheless, I went on to study both physiology and piano performance at McGill University concurrently, being the first student ever at McGill to matriculate in both simultaneously in 1980. I received my medical degree from McGill in 1984 and went on to study surgery and pursue molecular biology research in Boston. At Harvard Medical School, I completed a National Institutes of Health immunology/oncology fellowship and a residency in urological surgery in 1993, followed by a Fellowship in Pediatric Urological Surgery at the University of Washington in Seattle.

I came onto the academic urological staff at the Hospital for Sick Children (SickKids) in Toronto in 1995, where I conduct both a clinical/surgical practice and molecular biology research in smooth muscle epigenetics.

Dr. Darius J. Bägli, MDCM, FRCSC, FAAP, FACS, is Professor of Surgery & Physiology and Senior Associate Scientist in the Division of Urology at the University of Toronto and practices Pediatric Urologic Surgery at The Hospital for Sick Children (SickKids) in Toronto. Dr. Bägli has been one of the few active research scientists in pediatric urology, applying cell and molecular epigenetics to study seminal problems in the field. Dr. Bägli is also a classically trained concert pianist and is on the Board of Directors of the National Youth Orchestra of Canada.





In 2012, I became a Full Professor in the Department of Surgery at the University of Toronto. I was also the Associate Surgeon in Chief at SickKids for ten years until 2019.

Throughout this time, I have remained active in music and have continued to perform in Toronto over the last decade. In 2002, I performed in the van Cliburn Piano Competition for Outstanding Amateurs in Fort Worth, Texas. In 2015, I began participating in the Toronto Summer Music festival where advanced amateur musicians play and perform with professional colleagues every summer. Also in 2015, I travelled to Hamburg, Germany where I met the love of my life: a brand-new Hamburg Steinway grand piano that I personally selected at the factory and had shipped back to my home in Toronto! The instrument only deepened my own appreciation and love for music, and I've had the joy of listening to professional pianists play at concerts in my home, which are open to other music lovers and supporters. I am currently on the Board of Directors of the National Youth Orchestra of Canada and am grateful to support young emerging professional musicians in many ways.

Over the past several years, I have come to appreciate so many similarities between musical and surgical training. I have also promoted the idea that music training is unique. It fosters working in groups, interpersonal collaboration, teaches the art compromise, critical analysis, reading and writing, and the art of listening. It is also the only university training that provides essentially one-on-one personal mentorship with a teacher for four years. No other discipline in science, engineering, or the humanities provides such an experience. This is why students with formal music training are so sought after by professions such as medicine, law, engineering, and business.

If you think about it, there is a reason we “practice” medicine, that surgery is “performed” in an operating “theatre.” We say we practice medicine because we are and never will be fully finished learning it. In music, we practice to get better, to get ready for a performance. Musicians would never learn merely from performance to performance without practicing. If they did, it would not be a performance worth hearing! In surgery, the “performance” is the “operation” on the patient. I have tried to impress upon surgical trainees the importance of practice between performances and not to rely on moving only from performance to performance with patients, as has been the norm for decades in surgical training—though this is slowly changing. I encourage surgical preparation, repetition, and motor skills development in exactly the same way one would inspire music students to repeat scales and arpeggios and learn études or studies designed (composed) to focus on one specific technical challenge at a time. This is what music has taught me about surgery.

In the end, I consider myself very, very fortunate. I would not have been able to pursue science and music simultaneously at the university level without the quiet and unflagging support of my parents—but they never pushed me toward anything the way “helicopter” and “tiger” parents do today. They let me evolve on my own, in my own direction, and in my own time. And my dear teacher, the late McGill Professor Dorothy Morton of Montreal, with whom I studied for many years, was critical to convincing McGill that I could pursue both degrees at once. No other university of the day would have acquiesced to such an arrangement. Without that unique experience, I don't think that science and music would have become so fused in my life as it has.

Lastly, I would add that having surrounded myself with such diverse colleagues in music and science for so many years has made me exceedingly comfortable with swimming amongst fish and in waters I don't often encounter. It has made me very inquisitive about areas that are not my own. It is enormously important to bring seemingly unrelated disciplines together, to seek them out, to get them interested in your challenges. So, when we say STEAM professions, we should not think of them as S or T or E or A or M. Rather, think of them as actual *steam*, fusing and wafting together to enrich all human pursuits. The world will become a better place if we strive to reach across traditional learning boundaries. One can't start soon enough.

# Embracing the “CAN” in Cancer

Shirin Abadi, PharmD., MBA

AS a young pharmacist embarking on a clinical journey, I was in search of an opportunity where I could make a positive difference for patients. Cancer care was an area that I did not know much about, but was rather curious of! It sounded exciting and depressing at the same time. Cancer medications were so specialized that not too many of us had learned much about them in our university curriculum, so I felt rather clueless at the time. When I was offered an oncology pharmacy educator role at a large cancer institution, I just had to go for it...and the rest is history. It has been such a rewarding journey and a fulfilling opportunity to learn and to give back to a very deserving patient population.

You might feel shocked if I tell you that one in two North Americans will develop cancer at some point in their lives, and that cancer prevalence is likely just as bad, if not worse, elsewhere in the world! In addition, cancer is the leading cause of death in Canadians and the second leading cause of death in Americans (after heart disease). You might wonder why, and I wish I could tell you everything. We know about some of the biggest



carcinogens out there, like tobacco, alcohol, ultraviolet radiation, viruses (e.g., human papillomavirus), poor diet (e.g., high in saturated fat, red/processed meat), hormones (e.g., estrogen, testosterone), chemicals (e.g., benzene, asbestos), pesticides (e.g., DDT), genetic mutations (e.g., BRCA), prolonged immune suppression (from medications or medical conditions), and the list goes on... The good news is that, by changing our lifestyles and decreasing our exposure to carcinogens, we can reduce our risk of getting cancer. The bad news is that there are so many other contributing factors to cancer which we still don't know anything about. Also, as we age, our risk of being diagnosed with cancer increases significantly.

When people are diagnosed with cancer (which, sadly, will be the case for many of us), their worlds shatter.

Understandably, people experience all types of emotions, from shock to disbelief, to anger, sadness, and despair. Cancer challenges people's resiliency and resolve at every level, and forces them to embrace a new reality, where nothing can be taken for granted.



Dr. Shirin Abadi has extensive experience in the health sector, most recently overseeing clinical and educational pharmacy services at BC Cancer in Vancouver, while teaching as a Clinical Professor for the Faculties of Pharmaceutical Sciences and Medicine at the University of British Columbia. Shirin has longstanding board experience and was recently recognized with a Distinguished Service Award from the Canadian College of Health Leaders – BC Lower Mainland Chapter for her significant contributions as an executive committee member. Shirin is recognized locally, nationally and internationally with more than 30 prestigious awards for her commitment to patient care, service, and effective leadership.

Survival becomes the name of the game, and the immense desire to live a long, happy, and healthy life takes on a totally new meaning. Luckily, we have come far in our ability to diagnose and treat cancer, much more successfully compared to the past. Cancer has now become more like a chronic disease for those who cannot be cured. We have learned a lot about molecular drivers of cancer and how best to target them in the treatments that we offer. Research has progressed rapidly, as we continue to push for better screening, diagnostic, and treatment options for patients. We are learning more about the role that genetics play in cancer and the changes that occur at the level of DNA, the blueprint that makes us who we are at so many different levels. We are learning about the “CAN” in CANcer and how we could rise above and beyond the diagnosis and do what we can to overcome it or live with it.

With tens of trillions of cells in our bodies doing amazing work 24/7, simultaneously, quietly, and continuously (without a break), it is easy to forget about the miracles within and around us. How is it that gazillions of biochemical reactions, enzymatic functions, neuronal transmissions, etc., can work so harmoniously together for so long! Given the intricacy and complexity of these functions, it is surprising that more things do not go wrong. With so many mutations that our genes are exposed to everyday, it is a relief that not all of them lead to cancer. Our bodies have a way of repairing or getting rid of many mutated and damaged cells. So, while malfunctions will occur, and there will be many ups and downs in our biological systems, let us not forget the goodness within our cells and the sacrifices that they make so selflessly for us every day. Let us embrace and thank them for helping us be who we are and do what we can do to live meaningful and fulfilling lives.

As I reflect on my career in oncology, I cannot help but feel incredibly privileged to witness the greatness of the human spirit in my everyday heroes—the patients. I am amazed at patients’ resilience and their ability to overcome many obstacles every day, from devastating diagnoses to complex treatments, and the aftermath of nasty side effects and overwhelming complications. In many cases, patients’ lives are turned upside down, as their ability to work and carry on with their usual activities may be negatively impacted, while undergoing procedures and treatments, attending appointments, and managing symptoms. Some cancer treatments may temporarily make it difficult for patients to eat or drink or talk, and yet I have witnessed so many beautiful smiles (even when it hurts), as a sign of gratitude and readiness to forge ahead with courage, determination, hope and compassion for self and others. When we look at life from a cancer patient’s perspective, we realize that we have so much to be grateful for and that we must not take the many blessings in our lives for granted. Let us celebrate everything that is good in our lives and let us not allow small things get in the way of living fulfilled, purposeful and enjoyable lives!

## THE ENIGMA OF NEUROSCIENCE

Ervad Mazda K. Turel, MD

**W**hat's the difference between God and a neurosurgeon? God doesn't think he's a neurosurgeon.

A neurosurgeon is someone who operates on the human brain and spine, and that's why we like to believe, albeit erroneously, that we are on the top of the totem pole of all medical specialists. We have the reputation of being arrogant and occasionally even obnoxious. We are the only progeny of surgical specialties who have access to the insides of the human brain on a daily basis, and even so, we haven't yet figured out how most of it works. Researchers tell us that humans use only about 10% of the brain, but I'm sure most of us have had personal encounters with those who use much less.

The human brain has about a hundred billion neurons that make a complex network of about a trillion synapses. From their interactions with each other emerges a whole spectrum of abilities that we called human nature and human consciousness. It is this consciousness that everyone is suddenly so interested in tapping into. The brain weighs only 2–3% of one's body weight, yet consumes over 25% of its energy; more electrical impulses are generated in a single day by one brain than all of the cell phones in the world.

Human beings have undergone an evolutionary change over the last 30,000 years and will continue to do so. With this current generation, our craniums have become larger and the sockets of our eyes bigger, which probably has something to do with the information overload that comes our way each day. Just as dendrites get chopped, churned, and pruned when not used, or as new connections form when we develop a new skill, learn to play the violin, or master a foreign language, our physical structure is also undergoing a metamorphosis governed by the external stimulus we interact with constantly.

Over 100 years ago, there were no specialist brain surgeons. Brain tumours were removed by general

surgeons or even obstetricians and gynaecologists, for that matter, pretty much in the same way they delivered babies. The mortality rate for operating on the brain was 100%. However, much has evolved since then. Today, a patient can even go home the same day or the next after brain tumour or spine surgery, with a justifiable expectation of full functional recovery, alleviation of pain, and an improved quality of life.

What has made this possible? Our understanding of anatomy and physiology has evolved, and like in every other field, technology has chipped in. The MRI shows us fiber tracts that can delineate eloquent areas of the brain. We can study metabolic activity, look inside arteries and veins, and now, with virtual reality, we can tip-toe into someone's head, looking around the corners of brain tumours and vascular aneurysms. Today, we are also able to remove a brain tumour in someone who is fully awake. Patients can move their hands and legs as we perform brain surgery; this helps us safely push the limits and achieve maximal tumour excision while preserving neurological function. The brain itself physically feels no pain, and yet, all the pain-generating centres are smack within it. That's what makes this organ the last and grandest biological frontier, the most complex thing we have discovered in the universe yet.

It takes about 5–6 years of medical school and another 6–7 years of residency to graduate as a neurosurgeon. Most of the latter time is spent working 20–24 hours a day in sub-optimal living conditions, sacrificing family, friends, and another four-letter word that starts with F. Food! It takes 15 years to learn how to operate but another 15 to learn when not to. As a result of all that training, we can now enter the brain through the eye, nose, and ear. We can guide microcatheters into vessels of the brain and remove blood clots and coil aneurysms, things that we needed to open up the head for just a few decades ago.

Can we use this power of tweaking the brain to achieve immortality? If you think that's pushing it, how about inserting an electrode in the prefrontal



cortex of a rapist, and when he walks out of the operating room, he's transformed instead into a messiah for promoting women's rights and protecting them. Can we use transcranial magnetic stimulation to soften hardened criminals? Can neurosurgery transform society and make us nicer, kinder and more humane? From attempting to cure diseases, could the next frontier be enhancing one's quality of life? On the other hand, can we regulate certain centers in our brain to become more intelligent, enhance our IQ, augment our memory? If Roger Federer wants to improve his backhand, and no amount of practice or coaching is doing it for him, can he undergo neuromodulation and win a few more grand slams? Can those on the death penalty be given one last chance to turn their lives around?

How many senses do you believe humans have? Most of us think it's five: we can list sight, hearing, taste, touch, and smell. Recent data suggests, however, that we may have anywhere between 22–23 senses: a sense of balance, a sense of movement, a sense of knowing which parts of your body are where without looking at them, how we sense the passing of time, how we feel pain, how we experience temperature... I'm not sure if a sense of humour makes it to this scientific list of other senses, but there are some senses that animals have and we don't: the ability to feel electrical fields around us, the ability to sense the Earth's magnetic field or even polarized light and use it to navigate, for example.

What if we could externally enhance these senses to perform better, to increase awareness, become more mindful, or even simply to stay protected? With the right guidance and a little bit of practice, we can tap into the power of the subconscious mind to rid us of negativity and stress, reshaping our health and destiny to live a miraculous life. In my opinion, paradigms will truly shift when we are able to combine medicine with superior technologies and spiritual nourishment to bring about a holistic form of healing and health to one and all. Miracles lie in compassionate gestures, a few kind words, a loving touch. And that's what brings you closer to God.



*Dr. Mazda K. Turel completed his degree in Neurosurgery from the Christian Medical College in Vellore, India. This was followed by a fellowship in skull base surgery and neuro-oncology at the Toronto Western Hospital and in minimally invasive and complex spine surgery at the Rush University in Chicago. Dr. Turel specializes in the treatment of diseases of the brain and spine and advocates an approach to neurosurgery that is both balanced and aggressive. He is currently a senior consultant in neurosurgery at the Wockhardt Hospital in Mumbai. His prolific clinical research has garnered several academic accolades and has resulted in over 100 publications.*

# SNAKES AND VENOM AND VIRUSES, Oh My!

Avan Antia, BS, PhD (candidate)

At the time when snakebite envenomation was recognized by the World Health Organization as in the category of a neglected tropical disease (NTD), I happened to be living and working at the Madras Crocodile Bank Trust in Chennai, India. Though often overlooked, snakebite is one of the leading causes of mortality in India, as it accounts for over 58,000 deaths each year (Suraweera et al., “Trends in snakebite deaths in India from 2000 to 2019 in a nationally representative mortality study,” *Elife*, 9, e54076, 2020). Snakebite deaths disproportionately affect the poorest of people, especially those living in rural communities. Coincidentally, the Croc Bank, as it is lovingly referred to, has been working towards snakebite mitigation for years, through intense community education, epidemiological surveys, and evolutionary venomomics research.

The Croc Bank, primarily a reptile zoo and hub for reptile conservation, recognizes that a key element of modern conservation is to find a balance between human and wildlife mutual benefit, rather than compromise. One of my favorite examples of this concept is that of the Irula people. The Irula tribe is one of many scheduled tribes of India, mainly residing in Tamil Nadu. The Irula people are known to be expert snake catchers, as they possess impeccable abilities to “read” the land. For example, looking at a seemingly nondescript track in the sand, they can identify both the species of snake that made the track and its direction of movement. Based on this information, they can simply reach into a nearby bush and produce that very snake. During the years of widespread reptile skin trade (1950s–1960s), Irula livelihood was dependent on selling snake skins into the international trade. However, the enactment of the Indian Wildlife Protection Act of 1972 banned such skin trade, drastically affecting Irula livelihoods.

Aware of the high prevalence of snakebite deaths and the dearth of therapeutic anti-venom production in India, Romulus Whitaker, the founder of the Croc Bank, seized this opportunity. He worked to establish the Irula Snake Catchers’ Industrial Co-operative Society, through which the Irulas continued to catch snakes, but this time to extract their venom and then release them back to their habitats. The venom was sent to a lab to produce anti-venom to treat snakebite patients across India. In this example, the Irula people kept their livelihoods, the snakes kept their lives, and a life-saving therapeutic was developed—no losses, only wins. This story demonstrates a beautiful intersection of culture, science, and medicine, something I think about often as a current MD-PhD



*Avan Antia was born and raised in the marvelous state of Maryland. She pursued her love of science and language with a bachelor's degree in biology and Spanish at the University of Maryland. She is currently an MD-PhD student at Washington University in St. Louis in the PhD phase of her training. Her research focuses on rotavirus pathogenesis and host-pathogen interactions, and she has a penchant for learning about zoonotic viruses with pandemic potential. When she is not in the lab, she is most likely found on the dance floor, as she is an avid salsa and bachata dancer.*





*Photo left Educating Croc Bank zoo visitors about snakebite mitigation in a “Jeopardy”-style game.*

student. My time at the Croc Bank taught me a simple, yet important, lesson that I always carry with me: it is important to take a look at the bigger picture in order to understand the finer details.

Today, I am grateful to be working at the forefront of a similar, yet distinct line of work—infectious disease research. Like snakebite, infectious diseases disproportionately affect those with lower socioeconomic status. Outbreaks and transmission of certain pathogens often depend on human practices. Take the example of Ebola virus. Ebola is a highly pathogenic virus that causes hemorrhagic fever and high rates of mortality. In the 2014 Ebola outbreak in West Africa, the majority of cases were linked to burial practices. In many West African communities, there are various iterations of sacred burial practices believed to help the deceased transition to the spiritual world, often involving washing the body or touching the face of the deceased. As we have learned, Ebola virus is transmitted through bodily secretions, so these burial practices are at odds with preventing transmission. It took understanding this cultural practice to identify the missing link as to how Ebola transmission occurred so rapidly and robustly during this unprecedented outbreak. Similarly, understanding context is crucial to informing my

scientific endeavors.

In the laboratory, I work to investigate how viruses interact with their hosts at a molecular level. My laboratory studies rotavirus, the leading cause of viral gastroenteritis-related mortality in children under the age of five worldwide. Rotavirus is known to cause diarrhea and gastrointestinal disease; however, there are numerous reports of children with extra-intestinal manifestations of disease during rotavirus infection. How the virus might leave the intestine to reach other organs is not known. Thus, I have

been exploring the question of how rotavirus escapes the intestine and to which organs it disseminates. In this case, my understanding of viral pathogenesis at a molecular level must be informed by the greater clinical context of viral disease. A positive experimental result must be questioned through a lens of clinical relevance. Once again, context matters.

The lessons I learned at the Croc Bank still stand as I train as a physician-scientist. To say that “context matters” is to say that science and medicine are not singular entities. They each influence and are influenced by everything from history and culture to our daily living habits. To me, this intertwining of disciplines is what makes the study of infectious pathogens so beautifully exciting. Presumably, after experiencing the COVID-19 pandemic, we can all appreciate the fact that dealing with a highly transmissible virus is a multidisciplinary endeavor. I hope to be a part of this equation in the future, bridging the gap between science and medicine, within the greater context of global cultures.

## STEM CELL THERAPY: A NOVEL THERAPEUTIC APPROACH FOR ALZHEIMER'S DISEASE TREATMENT

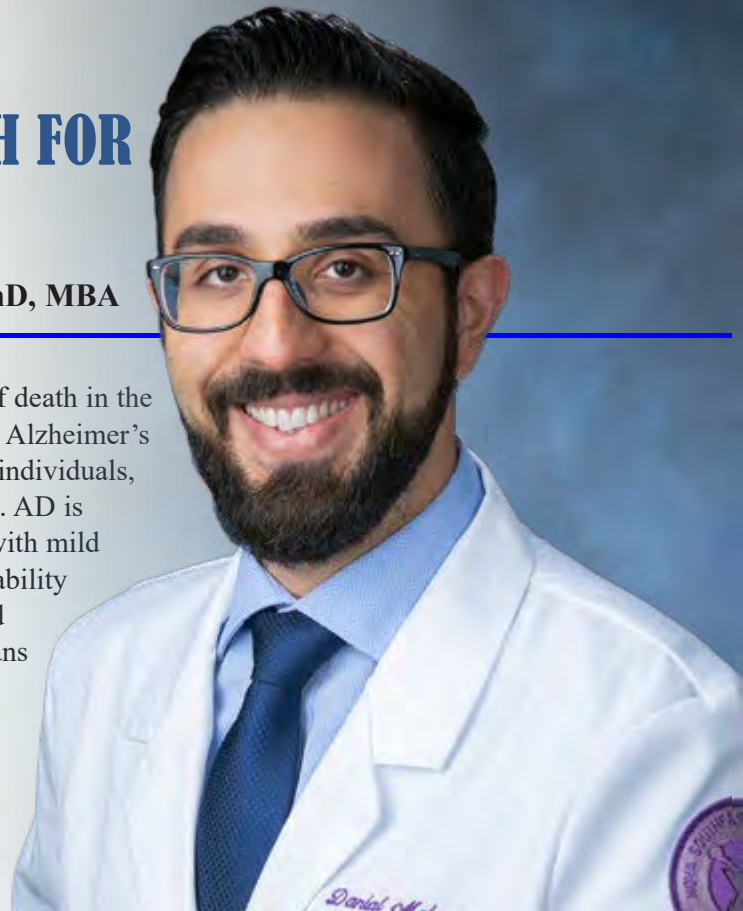
Danial Mehranfard, PharmD, MBA

### BACKGROUND ON ALZHEIMER'S DISEASE

Alzheimer's Disease (AD) is one of the top ten major causes of death in the U.S. and the most common neurodegenerative disorder worldwide. Alzheimer's is the most prevalent form of dementia which mainly affects older individuals, more than 90% of AD cases showing symptoms after the age of 60. AD is progressive, fatal neurodegenerative disorder that generally starts with mild memory loss and can advance to negatively affecting the person's ability to carry out day-to-day activities such as having a conversation and properly responding to the environment. Around 6 million Americans were affected by AD in the U.S. alone in 2020, and it is estimated that the number will rise to 14 million individuals by 2060. AD is not only a debilitating disease for patients; it imposes a huge emotional and financial burden on their caretakers and society. The total healthcare costs of AD treatment in 2020 were estimated at \$305 billion and are expected to increase to more than \$500 billion annually by 2040.

Although the cause of AD is not fully understood yet, given the complex AD pathophysiology, there are more than likely multiple pathological features playing a role in AD development and progression. There are several genetic and environmental factors that are linked to increased risk of AD development and progression. The ε4 allele of the Apolipoprotein E (APOE ε4) is one of the most recognized genes that can increase the risk of AD development by two- to four-fold. Other AD risk factors include smoking, obesity, diabetes mellitus, hypercholesterolemia, head injury, vascular disease, low education attainment, and psychological stress.

While a substantial body of scientific evidence supports the role of extracellular plaque deposits of the amyloid beta (Aβ) and abnormal tubulin associated unit (tau) protein in AD pathophysiology, a chronic proinflammatory state and diminished neurovascular function, including compromised blood-brain barrier (BBB) and inefficient Aβ plaques clearance, have been recognized as other major contributors to AD



*Danial Mehranfard was born in Tehran, Iran. He earned his Doctor of Pharmacy in 2018 and later completed an Advanced Standing PharmD and MBA from Nova Southeastern University(NSU) in 2022. He currently works as a Clinical Scientist at Longeveron, a biotechnology company in Miami, Florida, with a versatile role in the company's clinical and scientific efforts, including trial management, medical writing, data analysis, and regulatory and scientific affairs. He is also a neuroscience researcher at NSU. His research has led to several publications and research grants, including the prestigious American Foundation for Pharmaceutical Education gateway to research fellowship award.*

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manifestation and progression. Therefore, novel therapeutic candidates that can ameliorate this pro-inflammatory state and restore impaired neurovascular function hold promise as potential treatments for AD.

## STEM CELL THERAPY APPROACH FOR AD TREATMENT

Stem cells are a group of undifferentiated cells that usually originate from a single cell and are distinguished by their capability to proliferate and differentiate into various cell types. There are several sources and types of stem cells, but in recent years, the most commonly used stem cell types in AD research have been mesenchymal stem cells (MSCs), induced pluripotent stem cells, brain-derived neural stem cells, and embryonic stem cells.

Currently, MSCs are the most widely utilized and well-studied stem cell type in AD clinical research. Mesenchymal stem cells gained interest for their potential use in AD due to their ability to be consistently isolated and expanded from the healthy adult donors' bone-marrow (allogeneic). These cells have immunosuppressive properties, meaning they do not trigger an immune response within the host and exhibit potential pro-vascular and anti-inflammatory activities, making them a good allogeneic therapeutic candidate. It is generally believed that MSCs function through releasing extracellular vesicles known as exosomes, which can be transferred through the BBB and target the affected areas, or by paracrine effects.

AD animal model studies support the potential therapeutic implications of the MSCs in AD. Systemic administration of MSCs demonstrated to decrease A $\beta$  plaque deposition in the brain, reduce apoptosis, induce neurogenesis, and improve neuronal morphology, and spatial, and behavioral performance. These beneficial effects are attributed to decreased inflammation, and hyperphosphorylated tau, and increased A $\beta$  clearance, which seems to be at least partially due to the recruitment of activated microglia by MSCs through released chemoattractant, resulting in reduced A $\beta$  deposition.

At present, there are more than seventeen ongoing and closed clinical studies of MSCs in AD patients registered on [clinicaltrials.gov](https://clinicaltrials.gov). Most recently, Longeveron Inc. completed a first-in-human phase I double-blind, randomized, and placebo-controlled clinical study of a single infusion of low- or high-dose Lomecel-B (an allogeneic mesenchymal stem cell) in patients with mild AD. The major findings of this study were that the MSCs infusion in patients with mild AD was well-tolerated, safe and potentially produces beneficial changes in patients' neurocognition and quality of life. The findings from this phase I study warranted further investigation of the safety and preliminary efficacy of multiple doses of MSCs in an appropriately powered phase II study, which is currently underway (CLEARMIND – NCT05233774).

## CONCLUSION AND FUTURE PERSPECTIVES

Since 2003, the failure rate in AD drug development is approximately 100 percent, resulting in only two new U.S. Food and Drug Administration approved treatments for AD in the last 20 years (Aducanumab and Lecanemab-irnb). This leaves an enormous patient population with unmet medical needs and clearly demonstrates a need for new, more efficient therapeutic approaches that go beyond the currently available symptomatic treatments. This requires investigating the AD pathogenesis from a more dynamic perspective and assessing novel therapeutic candidates with multiple mechanisms of action that target various underlying causes of AD at the earlier stages, to reverse the clinical course of the disease and prevent further neuronal loss.

So far, there is no other therapeutic candidate that can offer the multimodal effects of mesenchymal stem cells while providing a great safety profile. But how can we maximize the effect of these cells? Soon, the use of modified cells or refined AD-specific exosomes can ensure longer survival of the cells and more targeted delivery. At the same time, well-designed clinical studies targeting AD in its earlier stages, with a larger sample size that includes a diverse range of patients, are necessary to ensure improved results in the near future.

# FROM CHILDHOOD CURIOSITY TO CANCER RESEARCH:

## A Journey Of Dreams and Discoveries

Porochista Dorost, MA PhD (candidte)

*Porochista Dorost was born in Yazd, Iran, and lived in Tehran since she was 4 years old. In 2010, Porochista graduated from university in chemical engineering, and completed a master's degree in polymer and chemical engineering. She subsequently joined a research group in Spain that carries out research on polymers based on natural products, with the aim of achieving sustainable new polymers with advanced properties that can replace traditional petroleum-based plastics. The group also carries out research on biopolymers from microbial biosynthesis that are then modified for biomedical applications, such as membranes or drug delivery systems. This area motivated Porochista to work toward a PhD. LinkedIn profile: [www.linkedin.com/in/porochista-dorost-8b8aa111b](http://www.linkedin.com/in/porochista-dorost-8b8aa111b).*



**When** I look at the road behind me and remember the route I have taken to reach where I am now, it brings a smile to my face and reminds me of the days that were challenging but have passed. Perhaps in the future, I will still encounter such days, but I know they will pass, so I live with hope. Ultimately, the beauty lies in the fact that time keeps moving forward, regardless of whether it presents difficulties or ease.

My name is Porochista. I was born in Yazd in 1991 into a Zoroastrian family, and I have three older sisters who I hold immense value for them and a lovely mother to whom I would give my whole life.

When I reflect on my life at this moment and question how I arrived here, several answers come to mind, with the earliest ones tracing back to my childhood. Like any other child, I was curious and sought answers to every question. I vividly recall my first visit to the school laboratory, where the sight of all the equipment excited me, sparking a desire to understand their purpose and how to use them. On that day, I bombarded the person in charge of the school laboratory with numerous

questions, prompting them to ask me to wait patiently and that I would gradually learn everything. Perhaps that was a starting point.

After my secondary education came to an end, I was accepted into a university to study chemical engineering, specifically focusing on oil industry process design. The reason I chose this field was my deep admiration for my grandfather. Although he had passed away before I was born, his education and the prominent position he held in the National Iranian Oil Company, along with his remarkable achievements, served as role models for me. This inspired me to pursue a path that could potentially lead me to become like him one day. I can confidently say that both my grandfather and my dear uncle were influential figures in my life. During my teenage years, I aspired to follow in their footsteps, explore the world, and acquire knowledge of multiple languages to learn new things.



This dream accompanied me throughout my youth and childhood.

After completing my bachelor's degree, my interest in polymers and their applications was fuelled by an internship at Tehran Refinery. I strongly believe that replacing traditional energy sources, such as oil, with alternatives that have a lesser impact on the environment is crucial. Motivated by this belief, I pursued a master's degree in polymer engineering to



*Porochista's internship at Tehran Refinery in 2010*

deepen my knowledge in this field.

Upon graduating with my master's degree, I took a job in a company that was unrelated to my area of study. Despite the disparity, this experience allowed me to explore other abilities within myself and gain a deeper understanding of my own strengths and capabilities. However, every day when I woke up, I felt an inner restlessness, knowing that I had to do something more with my life. My mind was never at ease. Eventually, I made the decision to leave my hometown in search of further education, determined to open new doors and break free from the safe corner I had created for myself.

During my journey, I reached out to a professor for guidance, which led to an introduction to a research group aligned with my qualifications. This connection clarified my path and motivation. Losing my father to leukaemia as a child instilled in me a deep desire to contribute to the fight against cancer, even if it was a small step towards a future where cancer could be treated and cured easily.

Balancing my interest in engineering and the dream of making a difference in cancer research, I joined a research group focused on modifying biodegradable and

biocompatible polymers, particularly designing nano biomaterials for cancer treatment. My project involved modifying a biodegradable polymer to encapsulate anti-cancer drugs and release them directly at the site of cancer cells. This approach enhances the drug's efficacy against cancer cells while minimizing its impact on healthy cells, optimizing its effectiveness through controlled release.

Cancer cells divide rapidly, driven by genetic mutations caused by DNA changes. These mutations disrupt the proper functioning of genes, affecting the regulation of cell growth and division. Uncontrolled division of resting cells can lead to tumour formation and cancer development. Traditional anti-cancer medications lack specific targeting mechanisms and thus affect both cancerous and healthy cells, resulting in side effects. However, incorporating nanoparticles in drug delivery systems improves specificity in targeting cancer cells. These engineered nanoparticles carry anti-cancer drugs directly to the tumour site, minimizing exposure to healthy cells. This reduces side effects and enhances treatment outcomes. I have recently published a scientific article on this subject with my professors.

Following dreams requires sacrifices and letting go of possessions. Despite challenges, it brings fulfilment. I am grateful for the kind-hearted individuals who supported me in crisis. Their impact is significant, and I wish them well.

It is important to remember to enjoy the path toward your goals. When faced with a steep uphill climb and the need for rest, engage in activities that bring peace to your soul. In a recent seminar held in Portugal, Professor Buddy Ratner, a prominent figure in the field of bioengineering and chemical engineering, emphasized the importance of enjoying life. Achieving professional goals is important, but enjoying the journey is also important. One of the things I do, when I don't have the energy to move forward, is dance. It gives me a feeling of release.

In the end, the path I walked on has many ups and downs, and it is very long, but I wish that research performed by people like me can help humanity. I also wish that all people on the planet will be healthy and well and that they have the determination and opportunities to make their beautiful dreams come true and live their dreams.

# Science and Music: A Boundless STEAM Horizon

Jamshed Bharucha, PhD

## FORMATIVE YEARS IN INDIA

My childhood in Bombay set me on a dual path in science and music. My engineer father, Jal, was the first structural engineer in India to use computers in structural design. He taught me FORTRAN and gave me programming projects for his engineering firm. He used to take me to the Tata Institute of Fundamental Research (TIFR) and Bhabha Atomic Energy Research Center (BARC), brainchildren of Dr. Homi Bhabha, where two of the first three mainframe computers in Bombay had been installed. Bhabha insisted on the finest scientists, the latest equipment, and awe-inspiring architecture and art. Bhabha filled the walls of the TIFR lobby with contemporary Indian paintings (he was an early promoter of the young and struggling M. F. Husain), and Beethoven wafted down the halls from his office. This was my first revelation that science and art can inspire each other.

As was typical of Parsi families, my father was a lover of Western classical music. When he went to University of Michigan for a Master's, he met my mother, Elizabeth Robinson, who was studying music. After her post-graduate work at the Paris Conservatoire, she joined him in India, where he had recently returned with dreams of bringing

Jamshed playing Schubert's Ave Maria at his wedding to Jessie Papatolicas in Maine.

the latest technology to the fledging home country. My mother plunged into the music scene in Bombay, serving as music Director and organist of the All Saints Church on Malabar Hill and the historic Church of St. Andrews and St. Columba at Lion's Gate. My sisters played piano, so being contrarian, I chose violin quite at random. My mother drafted me to play violin at holiday church services, where I learned some of the iconic Bach cantatas and movements of Handel's Messiah.

*Jamshed Bharucha graduated from Vassar College in biopsychology, then received an MA from Yale in philosophy and a PhD from Harvard in cognitive psychology. After conducting research at Cornell, he served on the faculty of Dartmouth College in the Department of Psychological and Brain Science. He rose to become Dean of the Faculty of Arts & Science and Deputy Provost, then moved to Tufts University as Provost & Senior Vice President, and then to Cooper Union in New York as President. He has since helped launch two new liberal universities in India (SRM University, Andhra Pradesh as Inaugural Vice-Chancellor and Sai University, Chennai, as Founding Vice-Chancellor).*



During high school, I performed with the Bombay Chamber Orchestra, which had stalled after Mehli Mehta departed for the U.S. and was revived in my time by Jini Dinshaw and then Parvez Doctor. The musicians were a motley bunch: Parsis who were musical amateurs pursuing other professions, Christians who made a living in the Bollywood music studios, and Hindus and Muslims from the Police Marching Band. We were flush with pride after our concerts, and the loyal Bombay audience was deeply appreciative. We performed at none other than the Bhabha Auditorium at TIFR, the finest auditorium in Bombay at the time for acoustic music, designed to perfection guided by Bhabha's discerning ear.

## BRIDGING PHYSICS AND MUSIC

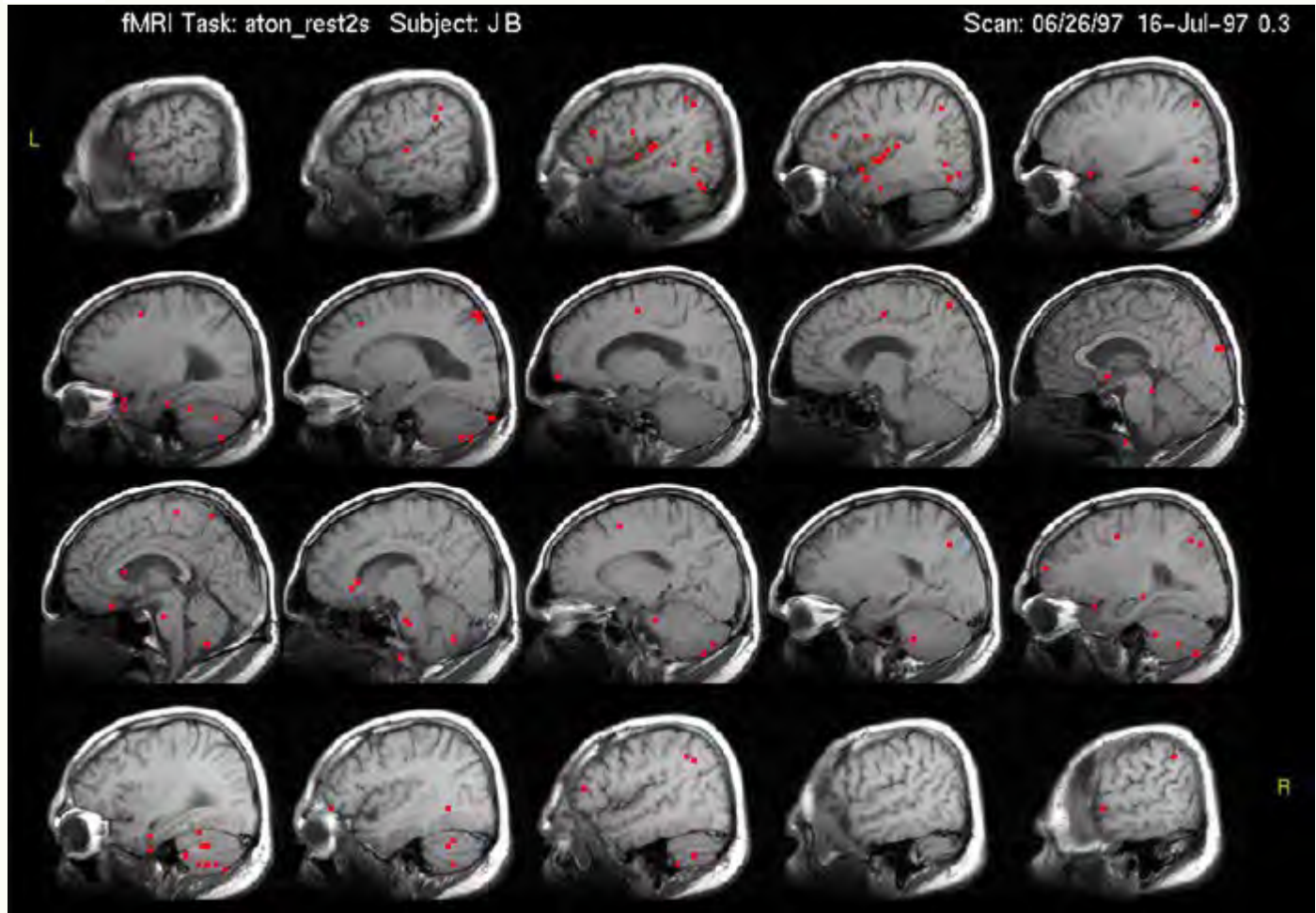
In school, my favorite subject was physics, but music was never absent from my brain. In a physic lab with tuning forks and strings tightened on a ruler, I observed that the frequency inscribed on a tuning fork had to be wrong because it didn't sound like the musical interval it should have formed together with another tuning fork. This evoked skepticism from my science peers: how could the musical sound, which is subjective, diagnose a flaw in a carefully calibrated piece of laboratory instrumentation? After testing with another tuning fork marked with the same frequency, the tuning fork was indeed shown to be flawed.

We learned about frequencies and wavelengths; but they were never related to music. In a college philosophy course, I learned that Pythagoras had found that the musical intervals considered to be the most consonant corresponded to wavelengths that formed ratios of simple integers. He went so far as to postulate that all periodic vibrations (including the rotation of planets around the sun) must produce music, leading to the notion of the "music of the spheres." All these were puzzling, and teachers gave glib answers. Why are frequencies of sound heard as musical pitches? Is the consonance of simple ratios a fundamental property of the universe, is it innately biological, or is it cultural conditioning? As with most questions, the answer turns out to be complex, involving physics, biology, and culture—and is still debated. But it took me years of graduate school to understand how these might interact in the brain to produce the observed correspondence between the mechanical vibration of the ear drum caused by molecules of air and music as we experience it subjectively.

## COGNITIVE SCIENCES: NEW FIELDS ARE BORN

I didn't aspire to be a professional musician, but I needed to learn more. I enrolled at Vassar College on the recommendation of my oldest sister, who wrote home portraying it as paradise. The freedom to take courses in physics, music, and philosophy—impossible in India until recently—was transformational for me. I always had been interested in reconciling what we call the *mind* (how we perceive the world, ourselves and others) with the squishy biological organ we call the *brain*. Yale had received a grant from the Sloan Foundation to launch the new field of cognitive science, bringing in speakers at the frontiers of psychology, neuroscience, artificial intelligence, and philosophical explorations to study the mind-brain relationship. I didn't understand much of what they were saying, but that's the purpose of graduate school: taking you from the innocent curiosity of the undergraduate to the outer reaches of rigorous analysis.

I became a faculty member at Harvard and embarked upon my own research program. Integrating music into a cognitive psychology research program was risky for a young academic on the tenure track. "What does music have to do with cognition?" was the question that haunted me when most junior faculty chose safe topics before receiving tenure. When a major breakthrough occurred in neural networks—today the basis for deep learning in machine learning—I retrained myself and developed computational neural network models that learned music. Later, when functional magnetic resonance imaging (fMRI) emerged as a tool to understand the neural basis of cognition, as Associate Dean, I helped the faculty establish the first MRI facility for research and teaching outside a hospital or medical school. I conducted the first fMRI experiments tracking brain activity while listening to music. Dartmouth quickly became a leading center for this work, and cognitive neuroscience was established as a new name for an interdisciplinary field (the name was institutionalized by Michael Gazzaniga, a faculty colleague) bringing together cognitive science—and later other areas of psychology—with neuroscience.



*Jamshed's brain listening to music. The first known fMRI image listening to music.*

*Top row, fourth slice from the left shows a row of active voxels at the superior temporal gyrus of the left cerebral cortex. Bottom row, first slice from left shows activation in the right cerebellum. Dartmouth, 1997.*

## RETURNING TO INDIA TO GIVE BACK

My life is coming full circle now. When you grow up in a developing nation, with parents who were flaming idealists (detached from the reality of corruption, mediocrity, and a *chalta hai* attitude that still plagues the nation), there's a gnawing call to public service. Success in the United States is professionally fulfilling, but is it enough of a contribution, when Indian youth are still struggling under an archaic higher education system? The Indian government has finally acknowledged in its *New Education Policy 2020 (NEP2020)* that the centrally controlled system of higher education was not up to the challenge of preparing India's enormous youth population for a rapidly changing world. *NEP2020* stressed the need for a liberal education, focusing on interdisciplinary study, from STEM to STEAM, critical thinking, creativity, student-centric pedagogy, and moving away from the regimen of rote memorization for high-stakes exams. A new era of deregulation has allowed me to return to India to create institutions that are much more innovative.

Recently, I attended the first Broadway-caliber performance of *The Sound of Music* at the new Nita Ambani Auditorium in Mumbai. Nothing like this existed when I was growing up. It reinvigorated my idealism about music as a humanistic force. It also reinvigorated my idealism about education as an empowering force for people to realize their fullest potential—and to design systems of higher education based on these ideals rather than on the traditional rigid boundaries dividing science, arts, and commerce. STEM is necessary for the future of the economy. But STEAM is essential for the future of humanity. “Climb every mountain, ford every stream” ... “till you find your dream”. Those are my words to young Zarathushtis, inheritors of a cultural tradition that encourages its young talent to reach for the sky and beyond, always doing good in the process.



# NAVIGATING THE WORLD OF MODELING AS A MODERN WOMAN

Vahbiz Chinoy, BSc

## HOW DID YOU BEGIN YOUR JOURNEY IN YOUR CAREER?

My journey as a model began during my university years while pursuing my bachelor's degree. Initially, I faced countless challenges and rejections from some modeling agencies. I decided to take an unconventional route and carve my own space in the industry by focusing on first building my portfolio, working on myself and my skills. Gradually I began applying and shooting for fashion, beauty, and commercial campaigns with my own portfolio.

Simultaneously, I pursued my passion for my field of study, Marketing and Communications. The idea began as a general business consultancy and slowly over the years I found my niche in digital and creative marketing. I began undertaking projects that allowed me to experiment, develop new ideas, and let my artistic creativity flow. It is thrilling to conceptualize an idea for a campaign and finally see it come alive after all the hard work and effort. Nevertheless, learning to manage my time effectively between my marketing venture and modeling has been a constant challenge. I carefully plan and prioritize utilizing scheduling tools to effectively manage my time and stay on top of upcoming deadlines.

## HOW DO THE ARTS INFLUENCE YOUR LIFE?

The arts have a profound impact on all aspects of my life, as they guide me and influence the creative choices I make on a daily basis. Specifically, for modeling, geometry and shapes play important roles during photoshoots and video shoots. We strive to create visually appealing shapes

*Vahbiz Chinoy was born in Mumbai, India, and has been based in Singapore for over a decade. Vahbiz completed her Bachelor of Science in Marketing with Communications at the Singapore University of Social Sciences. In her professional life, she is a model and entrepreneur building a creative digital marketing agency. In her free time, Vahbiz enjoys creating content on social media, cooking, and baking. She adores creative projects where she has the opportunity to experiment and let her ideas flow. Vahbiz's portfolio: [www.vahbiz.com](http://www.vahbiz.com), [www.vahbizchinoy.com](http://www.vahbizchinoy.com), [www.instagram.com/vahbizchinoy](http://www.instagram.com/vahbizchinoy).*



# LOOK OF THE WEEK



SLEEK IN SATIN



Styling a monochromatic look for Wisma Atria's lookbook campaign.



with our bodies while posing. Forming shapes such as triangles with our arms and legs allows us to showcase a dynamic pose and bring dimension to a flat image. Exploring symmetry and asymmetry through our poses has a similar effect and results in unique images.

I look to the arts to draw inspiration from paintings, sculptures, and conceptual art, incorporating their essence into my shoots. Color theory and proportions also guide me in styling for shoots and in my daily life. Understanding the relationships between colors and how they complement or supplement each other allows me to better plan cohesive outfits and looks. This knowledge and understanding also aids in translating themes, emotions, or brand identities into visual concepts for shoots.

For instance, if I aim to convey confidence, I opt for a monochromatic look with bold and timeless colors like red or black. On the other hand, for a more edgy mood, I experiment with unique prints, colors, and textures, creating chunky silhouettes. This subsequently leads me to consider proportions, understanding how shapes and silhouettes complement our bodies. If I want to look taller and elongate my legs, I opt for long high-waisted trousers, a crop top and high heels that are of the same shade. This pairing will create a tall and uniform silhouette. Contrastingly, if I want to draw attention away from the legs and look petite, I would choose low waisted trousers, shorts, or a midi dress with detailing at the torso to bring focus around this area. Understanding our own bodies and what we should accentuate is key in styling ourselves. I look to the arts for a fundamental understanding and rules that can be applied in the field of modeling.

## HOW DO YOU BALANCE PERSONAL, PROFESSIONAL, AND SPIRITUAL LIFE?

In our world today, it is tempting to surrender to hustle culture and assign monetary value to every task we take on in our daily lives, including activities we enjoy in our free time. Yet, I believe this approach is detrimental to the soul as a balance between work and personal life is essential. Placing excessive emphasis on monetizing leisure time can create a highly stressful environment, leading to potential negative effects on one's mental and emotional well-being. I believe that our free time should consist of allowing ourselves to simply de-stress, relax,

and take on fun activities that make us feel happy. This is key for me in maintaining a balance between personal and professional life. Ensuring I give myself enough time for hobbies and relaxation allowing me to destress and rejuvenate.

Spirituality and my learnings from Zoroastrianism also play a major role in guiding me to lead a balanced lifestyle and remain grounded. In difficult phases of my life, I find myself relying heavily on my faith in the higher power. This is especially true in situations where I have no control over the outcome. When I am facing self-doubt, questioning my abilities, and feeling negative energy around me, I try my best to connect with my spiritual being through praying and seeking peace. My parents, sister, and family play an important role in my spiritual journey as I have gained most of my knowledge about our faith and the teachings of Zoroastrianism through them. My mother especially imparts her knowledge and research about our faith through her insightful writings about our religion and culture. I find myself connecting with and learning about our faith through reading these readings.

## WHAT ADVICE DO YOU HAVE FOR A MODERN WOMAN UNDERTAKING A UNIQUE PATH?

As modern women, we face unique challenges in our careers. While we are blessed to have abundant opportunities, we may face a struggle within ourselves that we need to first overcome. My advice is to believe in yourself even if no one else does and to create your own path. There is no barrier you can't break through, the world is your oyster, and the sky is your limit. Simply keep persevering and focus on the tasks you need to perform in order to grow and improve rather than focusing too much on results and external validation. Your only competition is yourself, and do not compare yourself to others as you do not know their journey. Reach out to your loved ones, connect with your faith and Ahura Mazda in times of difficulty, as well as in times of happiness with gratitude.

My final and most important advice is to enjoy yourself and have fun along the way, whichever path you take. If you are passionate about it, success will be yours in the end.

# ZARATHUSHTI PRINCIPLES IN ENGINEERING ETHICS

Firdosh Mehta, M.Sc., P.Eng.

Although engineering in early days was not as sophisticated as today's technology, it still came under the overall perspective of Asha, or truth, the whole truth and nothing but the truth. Engineering is everything because everything is engineering. It is a highly creative field, and ethics is as much a part of its success as is its application.

As I was growing up all through my early years, I was fascinated with all things mechanical. Motion attracted me to find out how things worked. I collected broken toys, alarm clocks, transistor radios, etc., and opened them up to see how I could fix them. I learned all their intricacies, even if I could not fix them. I took frequent visits to the 'Chor Bazaar,' where everything is possible to acquire

(although I never took my bicycle there, as,

within ten minutes, half my bike would disappear). I also learned how to disassemble my bike and reassemble it after cleaning and lubricating all its parts, even as small as a ball bearing. I had a shiny cherry red multi-gear bike, while most around me had the standard black one. I nicknamed it my 'Hardy Davidson.'

I loved to make working models and entered items in science fairs even in my college days. Among them was my model of a submarine that could dive under water and come up in an aquarium tank. I also built Meccano cranes, a garage auto-lift, a water-circulating fountain, and a model of an airport. One project was a depiction of the Saturn V rocket, which was complete with lift-off, separation stages, and finally falling into the ocean, where the capsule was picked up by a helicopter and brought back to shore in a US Navy frigate.

I stayed behind in my dorm room after exams when everyone had gone on vacation and tinkered around in the machine shop making a model of the Wankel rotary engine. At my university in the United States, I constructed a battery-operated, see-through, working model in plastic to show the principles of the Wankel rotary and presented it to my department where they housed it in a glass case in front of the Mechanical Engineering Lab. This project also helped me write the thesis for my Master of Science degree. In those days,



*Firdosh Mehta, M.Sc., P.Eng., is a Professional Engineer in Alberta, British Columbia, Ontario, and Texas, and is a Fellow of the American Society of Mechanical Engineers. Firdosh attended Bharda New High School in Mumbai, Sangli College/Shivaji University in Kolhapur, and Worcester Polytechnic Institute in Massachusetts. Firdosh is past President of FEZANA, the Zoroastrian Association of Alberta, and the Zoroastrian Society of British Columbia. He received the NRI Visionary Award by Gujarat CM in 2011 and Outstanding Zarathushti Award in 2012 by FEZANA. He has received numerous other awards in technical and community service areas.*



I thought this would be the engine of the future, as it produced one and half of the power for half the weight of an internal combustion engine. Ultimately, the only automotive corporation that decided to make a car with the Wankel rotary engine design was Mazda!

Every vacation after high school, I loved to be around machines and worked as a trainee in factories, such as Yazdan Engineers and Contractors, Larson & Toubro, Godrej & Boyce, and Autogenous Welding. Before coming to the United States, I toured or visited almost 40 different industrial facilities all over India, including Tata Hydro Power, Koyna Dam, and Povai Water reservoir and pumping stations. I organized and obtained permissions from managers of these facilities so I could take my classmates for many of these tours. Later in life, I applied my machining talents to innovate many products for manufacturing and also wrote design programs using computing languages and co-invented two patents in the U.S. and Canada when working for Perry Equipment Corporation (PECO). These patents were granted for large-diameter, high-pressure, quick-opening closures for fast change out of spent filter elements in the oil and gas filtration industry that were used for treating all kinds of fluid hydrocarbons. (Photo above: A sample of various awards and citations for Firdosh Mehta.

In the sixties and seventies, as I was developing my life's principles and sense of right from wrong, I read many books on philosophy including the Gathas. At the same time, I saw so many unethical, inconsiderate, corrupt, and false practices that I wondered if there were any meaning in pursuing the coming of Frashokereti. Then, I focused on myself rather than others to see how I could make a difference. This not only made it easy to accept the surroundings, but also gave me a purpose and goal of how I wanted my future to be as best as I could attain it.

Canada has a system where, after graduating in engineering, one must undergo training and tests involving a code of ethics to be able to legally call oneself an Engineer in your title, after registering provincially as a Professional Engineer. If one wishes to pursue further with a unique Iron Ring ceremony, one recites an oath where public safety is of primal importance. The recital of the oath, which is a poem

written by Rudyard Kipling is akin to the Hippocratic Oath in the medical profession.

I was very fortunate to be born into a Parsi family



A sample of various awards and citations for Firdosh Mehta.

of three generations of engineers, which has now extended to five generations. My grandfather and father instilled in us all, that engineering was the solution to eliminating poverty and making this world a better place for all, in tune with the progressive development toward Frashokereti. His definition of the term Engineer was rooted in the Latin word 'ingenious,' meaning 'one who thinks.' What better profession is there to run parallel to Zarathushtra's message of Worship of Wisdom (a.k.a. Mazda Yasna)? Yes, Parsis practiced a pristine form of capitalism, never forgetting to be fair and just with their employees and customers. Jamshedji Tata expressed it eloquently when asked why he would not maximize profits; his response was, "I cannot gouge or rip off my clients, as it would only encourage competitors who could be detrimental to our success."

We need to ask ourselves, has this legacy remained untarnished as it has been throughout the centuries? Or has modern technology and a win-at-all-costs mentality turned our ethical behavior into unscrupulous action in the name of expediency? Success is often measured today in net worth rather than human worth, which is well described in a poem I penned:

- Undertaking of enterprise is very rough and gritty.
- One does not indulge in it—nitty gritty.
- You could be very wise, and you could be witty.
- In the end, success is measured by your integrity.

# DON'T TALK RUBBISH! OR SHOULD WE?

**Anushe Engineer, BA interviewed  
Mrs. Almitra H. Patel, MS**

“Don’t talk rubbish!” is a phrase many of us are probably familiar with; a quick way to shut down a nonsensical conversation. But one woman in India thinks we should, in fact, be talking rubbish. Or at least about it.

For the last 30 years, Almitra Patel has been tackling the growing problem of mountainous piles of waste being dumped at city limits across India. What started as a personal inquiry into garbage dumping near her farm turned into a decades-long Supreme Court case, culminating in a landmark ruling for the country.

Since retiring in 1991, Almitra has devoted much of her time and energy working towards solid waste management in India. It began when she noticed truckloads of garbage being dumped alongside carriageways on the outskirts of cities. She learned from the truck drivers that there was nowhere within the city for them to dump household and communal waste, a problem that metastasized with the advent of plastic products in the 1980s.

Decades and even centuries prior, farmers in India would come to cities and quibble to obtain waste from trash cans to use in their fields as compost. When they began finding plastic among household waste instead of just food scraps, they stopped collecting waste since plastic inhibited their crops from growing. Adding to the problem was the fact that the British had planned for wastewater and sewage removal from most cities in India, but not solid waste.

Almitra took this as her cue to find a solution for this growing endemic. In heroic fashion, she and friend Captain J. S. Velu—an eccentric man dedicated to the same cause—set out across India to educate local municipalities on solid waste management. The duo visited 30 cities in 30 days, understanding the limitations local authorities faced.

That’s what persuaded Almitra to go to the Supreme Court in 1996 and ask for a solution. “I thought I’d waltz in and waltz out with an order from them. I didn’t realize I’d be stuck there for 20 years,” she joked, adding that the years of legal back and forth was worth it.

In 2000, on Supreme Court orders, the Government of India established municipal solid waste management rules for the first time in India. Municipalities were to be responsible for educating the public on separating their waste into wet (food) waste and dry (recyclable) waste. In 2016, the rules were amended to put the onus on citizens to keep



*Almitra Patel is an 87-years-young biologist and chemist who was the first woman engineer at Massachusetts Institute of Technology in the United States in 1956. After retirement from a family refractories business, she became a self-taught garbologist and, with Captain Velu, led a 1994 Clean India Campaign by road to 30 cities in 30 days. She is a member of the Supreme Court Committee for Solid Waste Management and national expert for the Swachh Bharat Mission. Almitra is deeply involved in philanthropy, building several schools and giving interest-free startup loans. Read more at [www.almitrapatel.com](http://www.almitrapatel.com) and watch [www.youtube.com/c/AlmitraPatel36](https://www.youtube.com/c/AlmitraPatel36).*



their waste unmixed when handing it over to garbage collectors, with urban local bodies mandated to manage wet waste, dry waste, and debris streams separately.

Almitra emphasized that, although doorstep waste collection has widely replaced roadside waste bins, few municipalities actually manage waste streams separately. Payment by weight for waste transport has bred corruption and poor supervision, incentivizing the maximizing instead of minimizing waste. This has led to waste being collected without separation, making it difficult for waste to be treated or recycled as needed.

Despite systemic hindrances to progress, change is on the rise. Students are now being taught about waste management in school, in turn educating their family about a concept they may have been unaware of. Almitra has visited 214 Indian cities and their dumping grounds in every State to share best practices and works to minimize polluting wastes, promote eco-friendly packaging, clean up old dumpsites, and get phosphorus out of wastewater to save India's surface waters.

"It's only after I went to the Supreme Court and campaigned for proper rules that I realized this is a weapon in the hands of the public," Almitra said. Ordinary people have the power to demand compliance with the laws, which she helped put in place working tirelessly year after year. She has traveled for one week every month since 1972,, first for customer visits and, after 1991, for waste-related issues and court hearings. Her public interest litigation led to the Municipal Solid Waste Management Rules 2000, amended in 2016, to minimize waste to landfills by recycling dry waste and stabilizing wet waste to enrich India's soils and also manage legacy waste heaps to minimize pollution and recover land for good waste management.

Now 80-something years young, Almitra has been a trailblazer her whole life, most notably as the first Indian woman to graduate from the Massachusetts Institute of Technology (MIT) with a degree in Engineering. She says this was fortunately unbeknownst to her at the time. She credits her academic excellence to her visionary father, Pheroze Sidhwa, and wishes he had lived to know this.

Pheroze was the one who demanded her school let her be in the science classes even though female students were relegated to housecraft classes only. He wanted a ceramic engineer for the family business and invested

in his daughter's education to make her one. Since she preferred biology to engineering, he was the one who studied college catalogs in the U.S. Information Services Library, looked for universities with ceramic engineering courses and had her apply to MIT. Like Almitra, he was unaware of just how reputable MIT was, as well as the impact his decision would have on her life. He repeatedly told both his daughters that girls were as good as boys.

More than anything, Almitra is grateful to be part of the Zarathushti community because of the independence and equality given to females. "We're second class to no one," she said proudly, echoing a feeling that resonates with many of us.

Perhaps it wasn't a lifelong goal of Almitra's to clean up garbage from the streets; but her love for nature and the environment has been fostered since childhood. Her school sat quietly on a large hilltop, offering her a 360-degree mountain view. She, her husband, and pre-teen daughters enjoyed many annual treks to the base of Mt. Everest and Kanchenjunga. Now, she spends her time nurturing her farm and letting curious but friendly animals roam free among the foliage and forest she grows organically.

When you've climbed mountains, sifted through rubbish, attended the best university in the world and given a TED Talk in your 80s, it's fair to say that Almitra Patel embodies what it means to be a woman of the world. She continues to wake up every day and fight the good fight, creating a better world for us to live in one step at a time. How does one achieve so much in their lifetime? Almitra explains, it is because "life begins after retirement."



*Anushe is a journalist and writer. She currently works as an editorial writer for a book company in New York and occasionally writes about history, culture, and politics on a freelance basis. Born and raised in Karachi, Pakistan, she recently graduated from Scripps College in California with a B.A. in Politics.*

## HEY DIDDLE DIDDLE, AN ENGINEER AND A FIDDLE

### *Freddy Mirza*, SENIOR MARINE INSPECTOR

My interest in the violin was initially generated by the great maestro Yehudi Menuhin when he visited Mumbai in the early 1950s. I heard his recital on a radio, as there were no televisions in India at the time. I fell in love with the instrument. Later on, I heard Mehli Mehta, father of the world-renowned conductor Zubin Mehta, perform a violin recital at the J. B. Vachha-Wadia School in Parsi Colony, Dadar, Mumbai. This was the final push in making my decision to learn the “king of the instruments.” My first violin was my Navjote present. I had a couple of teachers who taught me the basics of playing the violin; but it was finally my teacher Mr. Maneck Master, who encouraged me

to go for the Trinity College of London exams. He also introduced me to the Bombay Amateur Symphony Orchestra where he played the cello. My first (and only) recital was at Mumbai’s C. J. Hall in the mid-1950s. We played Mozart’s Eine Kleine Nachtmusik (“A little night music”). The next time I started playing the violin was in 1980 with the International Symphony Orchestra. It had 30 Canadians from Sarnia, Ontario, and 20 Americans from Port Huron, Michigan. I played with the orchestra for nearly three years until I moved to Ottawa. The last time I played in an orchestra was with the Zoroastrian Symphony Orchestra during the 2007 FEZANA North American Zoroastrian Congress in

*Freddy Mirza settled in Canada in 1975 from Mumbai, and has been involved with various committees of the Zoroastrian Society of Ontario (ZSO), including the Interfaith Committee (Chair) and Religious Education Committee (teacher). He is one of the founding members of the 100th Toronto-First Zoroastrian Scout Group. Fred has received several volunteering service awards from Scouts Canada and the Ontario Ministry of Citizenship and Multiculturalism. Freddy was a Senior Marine Inspector and Engineer Examiner with the Canadian Federal Department of Transport for 35 years. He is presently enjoying his retirement in Toronto with his wife Kety and visiting children and grandchildren.*





Toronto. Although I still play the violin occasionally for entertaining my family and sometimes the community at the Zoroastrian Society of Ontario Dar e Meher, I always carry my harmonica whenever there is a party. It was also my constant companion even when I was at sea.

### INTRODUCTION TO ENGINEERING

My dad was an electrician-cum-engineer on coastal passenger ships owned by the Bombay Steam Navigation (BSN), a subsidiary of the Scindia Steam Navigation (SSN) Company. My brother Khushroo joined the Training Ship “Dufferin” for a deck officer’s training. Hence, after obtaining my Secondary School Certificate (SSC), I too decided to follow in his footsteps; but I was not selected. Hence, I decided to continue with my childhood desire to become a civil engineer. After passing the Bombay University’s Intermediate Science exam from Khalsa College, I joined the prestigious Victoria Jubilee Technical Institute (VJTI) for a 4-year diploma course in civil engineering. At the time, Scindia Workshop was accepting applications for marine engineering apprentices. My dad made enquiries and arranged for my interview. However, it was on the same day as my VJTI first term exam. I took a chance and missed the exam. Luckily, I got selected and joined the workshop. After completing four years of marine engineering apprenticeship and passing the exams, I started sailing as a junior engineer. During the four years of apprenticeship, I received training in basic machining, welding, electrical and mechanical repairs of ships machinery, boilers, valves, and pumps, as well as interpreting and drawing machinery parts. This was truly a training in all aspects of STEAM...no pun intended!

### LIFE ON BOARD THE SHIPS

The training received during my apprenticeship was very useful on ships. As an engineer on a ship, I was able to carry out basic machining of small parts, repairing leaky pipes, pumps, maintenance of main and auxiliary engines, boilers, HVAC systems, etc. The training was put to the test on board the chemical carrier ship “Sulfo,” owned by a Scandinavian owner and managed by Wallem Ship Management Company in Hong Kong with officers and crew from India, the United Kingdom, Hong Kong, Philippines, and Indonesia. The ship carried dilute sulphuric acid from Rotterdam to Brazil and molasses from Brazil to Rotterdam, as well as different types of oils in the same tanks. As a result, the stainless steel cargo tanks corroded. During one of the voyages from Brazil to Rotterdam, the ship’s cargo tank cracked just at the waterline and the water started entering the empty cargo tank. Hence, the ship was stopped in mid-Atlantic and was “heeled” (tilted) until the damaged portion came

sufficiently out of the water and temporary welding repairs were carried out. During the same voyage, the crankshaft of an air compressor sheared (broke) and had to be repaired by machining and welding in order for the ship to dock safely at the next port in Rotterdam.

### LIFE AS A MARINE SAFETY INSPECTOR

I joined the Canadian Coast Guard’s Ship Safety Branch (CCGSS) in 1980 as a Marine Surveyor. The job involved inspecting ships from top to bottom, including the hull, cargo tanks, machinery, boilers, and safety equipment, as well as inspecting equipment and systems for preventing pollution to issue a Safety Inspection Certificate. Other appointments by the Federal Transport Minister, under the Canada Shipping Act 2001, involved Examiner of Engineers and Engine Room Ratings (personnel assisting engineers, electricians, etc.), Pollution Prevention Officer and Labour Canada Safety Officer for marine-related incidents. When I was sailing as an engineer, I fought a fire on a freshly painted boiler in the engine room, and, as an inspector, I saw a ship on fire started by a welding torch.

### CONCLUSION

I was very disappointed when I did not get selected as a cadet on the Training Ship Dufferin. However, in hindsight, I consider myself very lucky for the marine engineering career because it offered more



*Ship repair in a dry-dock.*

opportunities for a shore job. I encourage anyone seeking an adventurous career to consider sailing on a ship as an engineer or a deck officer. After all, where else can you get paid to see the world? Or go to work each day without commuting through heavy traffic? Or get food delivered right to your cabin, free of charge? If anyone is interested in obtaining more info, go to Transport Canada’s website ([www.tc.gc.ca](http://www.tc.gc.ca)) and click on “Marine transportation.” Hope you have as much satisfaction as I did.

# APPLYING ZARATHUSHTRA'S TEACHINGS AS A SCIENCE COMMUNICATOR

**Trity Pourbahrami, BS, MSW**

Throughout my career as a scientist and communicator, I have found that intentionally bringing people together from diverse backgrounds and creating spaces that nurture trust is extremely important. It is an effective way to help organizations with transformational efforts and to tackle complex challenges. Taking this approach is not easy, and I regularly face pushback directly and indirectly.

One of the ways I center myself and regain my motivation for this important work is to go back to Zarathushtra's teachings. Specifically, I go to the Ahunavaiti Gatha of the Yasna prayers, Chapter 30, Verse 9:

atcâ tôi vaêm xyâmâ  
yôî îm ferashêm kerenâun ahûm,  
mazdâscâ ahurânghô  
â môyastrâ baranâ ashâcâ  
hyat hathrâ manâ bavât  
yâthrâ cistish anghat maêthâ.

And the last paragraph in the Avesta-e-Kushti, which is also known as Hamazur Beem:

Hamâzur beem,  
hamâzuré hamâ ashu beem,  
hamâzuré vish kërfa beem,  
ham kër-fayé kërfa kârân beem,  
dour aj vanâh-o vanâh kârân beem,  
ham kër-fayé basta kosh-tiân-o neekân-o vahâné  
haft keshvar zameen beem.

I have studied several English translations of these teachings and here are the ones that resonate the most with me. For Yasna 30.9, I like, "May we be among those who renovate and renew the world." This reminds me that we have to engage with the world and work together to build on the good and address the challenges. For Hamazur Beem, I like, "May we be joined in strength, may we stand united by following the path of Asha ... may we be joined hand in hand ... with all the good people of the world." I see the scientific

approach as one way to follow the path of Asha and have repeatedly experienced the power of joining in strength with good people from around the world.

## BUILDING TRUST THROUGH INCLUSION

Zarathushtra's teachings, though ancient, remain relevant in our modern context. To address the pressing environmental and societal challenges we face, we must cultivate trust and bring together individuals from varying perspectives. Recognizing that knowledge can be acquired through diverse pathways, we need to invite people with different ways of knowing to join us at the table. For example, to understand sea ice change in the Arctic, it is essential to build relationships between the scientific and Indigenous communities. I believe I am following the path of Asha when I take the time to listen and engage both the scientists using geophysical observations from unoccupied aerial systems to study the melting of sea ice and Indigenous communities whose lives have been transformed by these environmental changes. If you are interested in learning more about this collaborative research effort, visit the project website: [www.ikaagviksikukun.org](http://www.ikaagviksikukun.org).

## AMPLIFYING UNDERREPRESENTED VOICES

In my quest to promote inclusivity, I implement specific practices that empower and amplify underrepresented voices. One such practice is individual communications coaching, which enables professionals to tap into their strengths and engage more effectively with their peers. For instance, I provide science communications coaching to scientist-inventors working towards scientific discovery, environmental conservation, and patient care. Witnessing the increased confidence and enriched conversations resulting from this support reinforces the concept of Hamazur Beem—joining in strength with all the good people of the world. To learn more about the inspiring work of these scientist-inventors, explore the hashtag #Mooreinventors.



## UNCOVERING ASSUMPTIONS AND BRIDGING DIVIDES

While scientific discovery and innovation is one way to tap into Asha to renovate and renew the world, another way is to uncover assumptions and bridge divides. We have all experienced the ease and comfort of gathering with those who come from similar backgrounds and experiences. It is such a joy to be surrounded by like minds and come to consensus without much effort or conflict. It is natural for us to seek such comfort within our own groups, but this tribal behavior can limit our creativity and resilience. Echo chambers, where we only encounter one point of view, hinder our ability to understand complex issues. Research demonstrates that relying solely on social cues from our tribe makes us more susceptible to misinformation. This is evident in the powerful influence of misinformation (incorrect or misleading information) surrounding the COVID-19 vaccines. Much of the misinformation we get today looks like it has been sent to us by someone that we trust.

## COMBATING MISINFORMATION

At a recent event focused on addressing misinformation in science, I encountered a group of Filipino American youth who have created a resource to combat COVID-19 misinformation within their community. Alarmed by the rising number of deaths among unvaccinated individuals, they pooled their expertise to create a website with the tagline of “Kababayan, we are in this together,” where their community members can go and get their questions answered as well as report cases where they received misleading posts. I encourage you to visit their website [www.tayohelp.com](http://www.tayohelp.com) and let me know if there are ways we can combat misinformation in our Zarathushti community. How about we use the tagline Hamazur Beem? Let us encourage each other to think more critically about the information we receive and share with each other.

Inspired by Zarathushtra’s teachings and as a science communicator, I strive to build trust through the creation of spaces that are inclusive and promote belonging. My experience has shown me that amplifying underrepresented voices allows these spaces to reach their full potential for collaboration, which is essential to uncovering our assumptions and bridging our divides to compact complex challenges such as misinformation. I invite you to join me in strength to renovate and renew the world.



*Trity Pourbahrami has 20 years of international experience in strategic communications, science communication, and employee engagement spanning multiple sectors. She leads communications for the Gordon and Betty Moore Foundation’s [science program](https://www.moore.org/programs/science) and is a Trustee of the [Institute for Public Relations](https://instituteforpr.org/). Previously, she was director of communications at the California Institute of Technology. Trity earned her Bachelor of Science in physics and physiology from the University of British Columbia and her Master’s in social welfare and public administration from University of Hawai’i. Born in Iran, her family moved to Canada during the Iran-Iraq war. She is raising two teens with her husband of over 20 years, Peter Capak.*

An Awareness Of Value-Added Applied Research

Urmaze Naterwalla



*Urmaze Naterwalla is the Director of Research Operations at OMIC R&D and was previously at Boeing as Team Leader for the Machining Solutions group for 15 years. Prior to that, Urmaze was employed at Ingersoll as Tech Center Manager, traveling globally to solve industry's manufacturing problems in aerospace, automotive, agricultural equipment, die and molds, and machine tool builders. Urmaze is recognized as a subject matter expert and has written a comprehensive textbook, Machining Solutions – The Art and Science of Metal Cutting. He has an MBA and advanced degrees in mechanical and industrial engineering. Urmaze lives in Portland, Oregon, with his wife Jasmine and daughter Sanaz.*

My name is Urmaze Naterwalla, and I work at OMIC R&D as the Director of Research Operations. OMIC R&D is an applied research center that was formed in partnership with industry, government, and academia. Its four focus areas are Machining, Additive Manufacturing, Materials & Alloys, and Robotics. OMIC's biggest differentiation is its mission of providing industry with solutions to their manufacturing pain points in production environments (a.k.a. applied research). I like to joke that "if the research simply ends up in a library, or conference, then we probably haven't done our jobs." The second core deliverable from OMIC R&D is workforce development. This mission is accomplished by way of offering highly sought after masterclasses related to the four focus areas.

As the Director of Research Operations, I would like to take a moment to explain how applied research pertains to real, everyday life solutions for manufacturers. At OMIC R&D, we help manufacturers make high quality products by looking at their entire process and pointing out where things can improve, leading to a savings in time, cost, and a better product. Applied research is research whose solutions find their way directly into production environments or tell production what not to do. It is also known as production-ready research and taps into a consistent industry pain point of confidence. Novel solutions, as arrived at by classical research, often fail in early industrial adoption as they consistently fall short on yielding repeatable, reliable performance. Repeatability is a much-needed characteristic for production stability, safety and yield at lowest total costs.

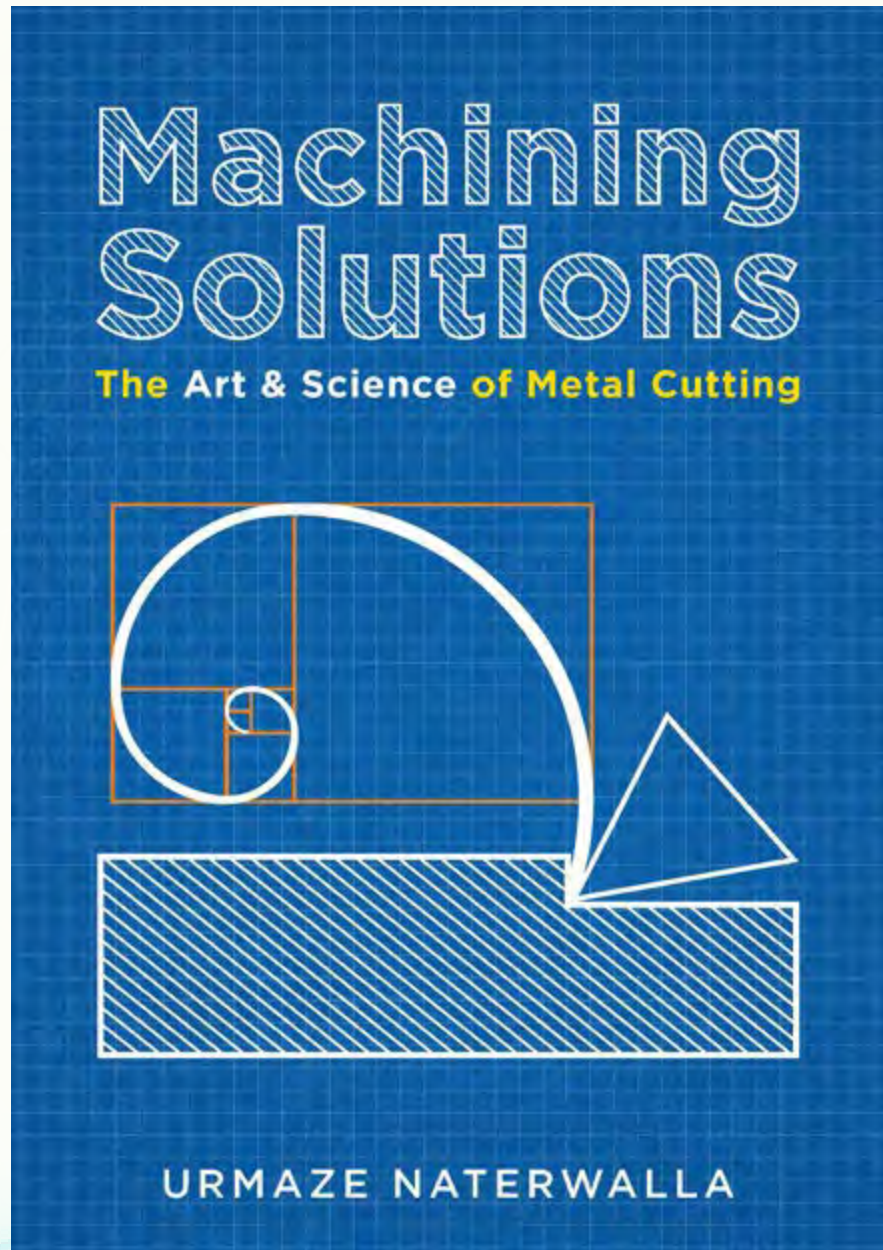
The DNA of an applied research center is quite unique as compared to that of classical research institutions—it starts with people. These researchers have roots in manufacturing environments and like to be hands-on. They have a curious mind and strong drive to contribute. However, not all production mindsets lend well to applied research. Production-oriented employees are used to following a fixed or predetermined number of steps that lead to a favorable outcome or product at the end. At about the third or fourth failure, a production-oriented mindset gets extremely frustrated. On the other hand, not afraid of failing in their testing efforts, an applied researcher will attempt countless permutations and combinations of their test trials at a significantly higher rate than production-minded employees.



I have learned over the years that a consistent recipe for successful research environments is employing obnoxiously positive-minded and forward-thinking employees. At OMIC R&D, all researchers run their own tests on production-oriented machines, thus bridging the proverbial gap between engineers and shop operators. Not only does that yield superior production-relevant solutions, but it also generates awareness and empathy for the challenges faced by workers in production environments. The reports published by an applied researcher can relate to engineers who need to study the performance data, to senior technical executives in industry, to operators on a factory floor, to chief financial officers who make critical financial decisions, and to shop leads and trainers who attempt to implement best practices.

Countless other factors contribute to successful applied research. Often an applied research center will work directly with government agencies, defense departments, and industry partners. The research is not conducted in a silo; rather, it is a collaboration with industry partners and their subject matter experts (SMEs). The machines have to be relevant to those in modern-day production environments. The typical bench-top machines or light-grade equipment that are seen in university labs and technology centers will not suffice.

Substantial investments must be made in the test plan to have systems be able to run the entire duration of the products' useful life, rather than conducting short runs and then extrapolating the results. Not only are the test runs at full time lengths, tests are also repeated at least three times or more as needed. Short production runs for the end customers further help build confidence. If data-driven decisions yield repeatable and reliable performance, it generates confident implementation, and consequently incurs low total costs.



Cover of Urmaze's Machining Solutions textbook.

# YOUNG TEXAN ZARATHUSHTIS EXCELLING ACROSS STEAM FIELDS

Tanaz, Chloe, and Tayte Choudhury

**This** article spotlights a dynamic sister-brother duo who were raised in Houston, Texas—Chloe and Tayte Choudhury. Chloe is an undergraduate student who has just finished her sophomore year at Baylor University in Waco, Texas. She has been a high achiever academically, being enrolled in the Honors College and Baylor Interdisciplinary Core program on top of her major. She is also enrolled in Baylor University’s Air Force Reserve Officer Training Corps (AFROTC) and was on a path to being a flight surgeon for the US Air Force...until she, literally, began to fly. Thus, despite having finished almost all of her biochemistry major requirements, she wanted to pursue becoming a pilot for the US Air Force. So, she changed majors and is currently pursuing a Bachelor of Science degree in geosciences with a concentration in geology and a minor in aerospace studies. She was excited and inspired enough to research, apply for, earn a flight scholarship, and carry out her first solo flight before the end of 2022. She decided to pursue her private pilot’s license and is finishing up all the final flights and requirements. She will be a certified private pilot in June! (proud mother Tanaz above)

In addition to her technical and academic training, Chloe has been a little songbird ever since she could speak and has had the privilege of singing at high-profile national and international events. Through the years, she has earned herself numerous congressional, state, and local recognitions. Music has always been her first love, and when she got to Baylor, she sought out other talented players and created her classic rock band SUNNN (<https://bio.to/SUNNN>). In March 2023, for the first time in South by Southwest history, SXSW had their first ever South Asian House in which Chloe was the youngest artist invited to perform. SUNNN has been recognized in various television and print media and has also been featured in a local Waco Ford Dealership commercial. The band has been playing almost every weekend in Waco, Austin, and Houston, and even has a San Antonio show lined up! Their music can be found on all streaming platforms, and SUNNN is currently working on finishing its first album for release by the end of the year. Chloe is a classically trained double bass player who also plays the piano, guitar, and numerous other instruments.



*The Choudhury family lives in Houston, Texas. Chloe is an undergraduate student at Baylor University who has just completed her sophomore year. In the future, she wishes to be a pilot for the US Air Force. Her brother, Tayte, is a high school senior who is about to graduate and has committed to Texas A&M University to pursue engineering in the Fall. Tanaz (left) is their proud mother who is CEO and President at TanChes Group of Companies.*

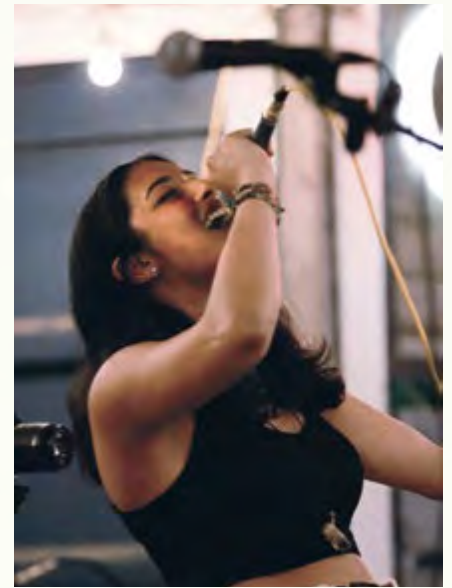
Chloe co-founded the Baylor University Professional Women’s Society whose main goal is to support and provide opportunities for women who want to enter any professional career field, especially those that are male dominated. The three main aspects of the organization are to *Get Inspired, Get Connected, and to Give Back*. Furthermore, Chloe is also a nationally published poet and author through the Barbara Bush Literacy Council. Her poems are published in the America Library of Poetry. In her free time, she enjoys working out, flying planes, reading, writing, playing and listening to music, and spending time doing things outdoors in nature. She is very grateful for her family’s support and for all the opportunities and things she has achieved thus far and cannot wait to see what the future holds ahead.

Tayte is currently a senior at Dulles High School in Sugar Land, Texas, and is in the top





Chloe after her first Solo Flight in a Cessna 172 Skyhawk.



Chloe at a gig with her band, SUNNN.

percentile of his graduating +class, which automatically admits him to all Texas public universities. Tayte has committed to Texas A&M University this coming Fall where he plans to major in data science and finance, as well as minor in music.

Tayte’s story began rather humbly, as he was diagnosed with moderate-to-severe hearing loss at the age of four and has had to wear hearing aids ever since. After a series of hearing tests, Tayte’s mom was faced with the difficult decision of whether to place him in a special-education class or let him continue going at the pace of his peers. With the latter option chosen, there were countless hardships and adversities Tayte had to battle and overcome; but now that he is through it, he wants to help others who are currently undergoing hearing loss. In the future, Tayte plans to use his knowledge to develop a biomedical artificial intelligence device that will scan the records of millions of individuals with hearing loss to develop solutions that will help future generations. His motivation arises from his understanding of the difficulties and struggles that many such as himself face. Thus, he aspires to make a lasting impact in the field of biomedical audiology.

Despite Tayte’s condition, he has excelled in multiple tasks proven to be extremely difficult for those who are hard of hearing. Tayte loves to play the piano and passionately enjoys playing classical music for a wide variety of audiences, ranging from those at senior centers to concert halls! This passion won him an international accolade, and he was invited to play at Carnegie Hall in New York City in June 2022 to an emotionally charged crowd who showered him with a standing ovation! Tayte has also served as an inspirational speaker and was invited to speak to children who were hard of hearing at the Texas Hearing Institute (formerly, The Center for Hearing and Speech) where he, himself, had received speech therapy. Additionally, he has been invited to speak as a keynote speaker for a technology conference in New York City in December 2023. Tayte has also been acknowledged on the floor of the US Senate and received numerous congressional, state, and local recognitions. In 2022, he was selected for the National Security Language Initiative for Youth Scholarship by the US State Department to study abroad in South Korea. This scholarship sparked his interest in the Korean language and is fluent in written and conversational Korean. All in all, Tayte’s pursuits in mathematics, engineering, technology, and music all showcase his multifaceted interests and passions, and we hold sincere hopes that his endeavors will one day lead to significant contributions that will change the world.



Tayte performing La Campanella at Carnegie Hall.

## BITS IN BIOLOGY:

# AI drives advancements in biological research

Zeaan Pithawala, B.Sc

“Any sufficiently advanced technology is indistinguishable from magic.”

– Arthur C. Clarke

Biology has a long and rich history, tracing back to the ancient Greeks who first studied the natural world. Over time, the study of biology has evolved and expanded, incorporating new knowledge and technologies. The invention of the microscope in the 17th century paved the way for the discovery of microorganisms and the development of modern cell biology. The theory of evolution by natural selection, proposed by Charles Darwin in the 19th century, revolutionized the way we understand the development of species. Today, there is an exponential acceleration of new discoveries, owing to the development of cutting-edge technologies to study life at all levels. The amount of biological data available has been so overwhelming that processing and analyzing it has become a challenge.

Unlike biology, the concept of artificial intelligence (AI) came around quite recently. With its promise to process and analyze vast amounts of data, backed by its successful use during World War II, computers were set to extract valuable insights from data generated over centuries by millions of biologists. The human genome project was one of the biggest landmarks of computational biology. With the progression in the field, better models were developed, not just to crunch the numbers, but also to learn from the data and give predictions. In 2021, the decades-old grand challenge faced by biochemists, the protein folding problem, was finally solved by AI. According to Levinthal's paradox, an unfolded polypeptide can have  $10^{300}$  possible conformations, and, if proteins were folded sequentially in all the possible combinations, it would take longer than the age of the universe to attain one correctly folded protein. Even computationally processing all the possibilities is not feasible. It is noteworthy to appreciate nature because, despite having so many possible incorrect permutations, a protein is usually folded in the correct conformation within milliseconds. Thus, AlphaFold was not only a monumental achievement in biology, but it was also a groundbreaking achievement in AI. The exciting part is that it is just the beginning of what is about to come. We are fortunate to live in a remarkable era where we can solve some of the most complex biological problems through the integration of AI.

The effectiveness of antibiotics is today threatened by the alarming emergence of antimicrobial resistance (AMR). It is estimated that AMR killed more people than HIV/AIDS or malaria in 2019. Beta-Lactam is a 4-membered ring that is present in more than 50% of antibiotics. By covalently binding to penicillin-binding proteins, Beta-Lactam inhibits the synthesis of peptidoglycans, resulting in the inhibition of bacterial cell wall synthesis. However, microbes have developed mechanisms of resistance to Beta-Lactam, and thus a lot of our current antibiotics have now been compromised. This has led to a shift of focus from synthetically developed drugs to other alternatives.

Antimicrobial peptides (AMPs) are thought to be contenders to take the place of traditional antibiotics. The search for and extraction of AMPs, however, is expensive and time-consuming. Quantitative structure-activity relationship (QSAR) descriptors and AI algorithms were used to identify 50 novel AMPs from 100,000 randomly selected peptides. A variety of chemical and physical properties, like charge, hydrophobicity, isoelectric point, tendency to agglomerate, or peptide sequence, may be used as features to train machine learning models. In vitro



bacteriostasis outcomes show that this method is 94% accurate in identifying active peptides.

The number of potential small molecule drugs is around  $10^{60}$ . AI can not only learn from past experiments but also enhance the drug discovery and development process through its ability to identify new patterns with each iteration of design and testing in the laboratory. Moreover, molecular dynamics simulations are now being enhanced with machine learning, which allows researchers to understand biomolecular mechanisms and interactions with better spatiotemporal resolution. Machine learning can supplement the expertise of human scientists and enable them to design improved molecules at a faster pace to combat AMR.

The use of deep learning (a category of sophisticated AI algorithms) in the analysis of patient data has the potential to revolutionize the medical field. It can be utilized to identify patterns and anomalies in medical imaging, such as X-rays and magnetic resonance imaging scans, thereby assisting healthcare providers in the early detection of diseases. Additionally, AI can be used to predict the progression of diseases, allowing healthcare providers to personalize treatment plans for individual patients based on their unique medical history and symptoms. AI also offers a vast array of possibilities in the medical field, ranging from disease identification and prognosis to drug development and personalized medicine.

By utilizing machine learning algorithms, we can analyze vast amounts of genetic data and identify intricate gene-to-gene interactions and transcriptional networks at play during a disease. AI can also assist in the prediction of future evolutionary trends, such as the emergence of new species, the extinction of existing species, and the spread of diseases. By integrating AI with comparative and functional genomics, scientists can gain a more complete understanding of the evolutionary process. Furthermore, AI can also be used to develop and test evolutionary models, allowing researchers to simulate evolutionary scenarios and predict how species may evolve in the future.

Despite the unknowns that may lie within Pandora's box of AI, we must not let uncertainty limit our curiosity or hinder our progress. Instead, we must embrace the challenges and opportunities that AI presents, and continue exploring its potential, ethically and carefully, to address some of the most pressing issues in biology.

*Zeean Pithawala is from Navsari, Gujarat, India. Zeean is pursuing his Bachelor of Science (Honors) degree in biochemistry from the University of Delhi and will start a Master of Science degree in the epidemiology of infectious diseases at Yale University in Fall 2023. Zeean is passionate about creating innovative approaches to tackle challenges in biology by developing machine learning models. Drawing upon his strong foundation in biochemistry and programming, he has interned at institutions such as IIT Gandhinagar, Iowa State University, Carnegie Mellon University, and University of North Carolina at Chapel Hill. Zeean was awarded "Best Healthcare Hack" at Hack Harvard 2021.*





Rita Jamshed Kapadia is an author who resides in Carlisle, Massachusetts, with her husband Jamshed, son Cherag, and daughter Roshni. Originally from India, Rita emigrated to the United States and worked at

IBM and other computer software companies as a software engineer. Web design, cooking, and writing books are her hobbies. She is an avid web content developer and administers websites for <http://www.zagba.org/> and set up the original web domain for <http://FEZANA.org>. Rita teaches online classes and demos Indian Parsi cuisine at libraries, shops, and museums. Follow Rita on Twitter @ParsiCuisine, on Facebook at <http://www.facebook.com/ParsiCuisine>, and online at <http://www.parsicuisine.com>.

## BLENDING TECHNOLOGY & THE CULINARY ARTS

Rita Jamshed Kapadia

Many of us have had careers that meandered down winding paths. I followed a path filled with ones and zeros, as well as halves and quarters. I began my career in the corporate world at IBM in the field of computer programming working as a software engineer; but my true passion involved the kitchen. I have developed a blog/website and have written a book entitled, *Parsi Cuisine: Manna of the 21st Century* <https://amzn.to/3Nb8l2A>. The focus of the cookbook is the history and heritage of food, specifically food found in my native region of Gujarat, India. The cookbook not only shares timeless recipes, but also tidbits about Parsi history, culture, and lifestyles in this



region of India. I am quite proud of the finished product and of the blog as well, which I work regularly on with a passion, creating videos, new recipes, and freely sharing them on social media.

### EARLY FORMATIVE YEARS IN TECHNOLOGY

Born in India, I grew up with Parsi cooking abundant in the home. In addition to food, the Parsi culture is focused on education. I began school at age four in a convent, educated in English by nuns. I attended high school at Mount Carmel and later attended



Gujarat University. I then came to the United States to attend Northeastern University and the University of Massachusetts, Lowell for computer science degrees. The formal nature of the education had a great impact, and I continue to enjoy learning new techniques both inside and outside the home, office, and kitchen.

After graduating, I acquired computer and programming skills for quality assurance and software testing at IBM. We believed, “The product (IBM software) should always be tested before it goes to the customer. Better quality assurance and software testing leads to good reputation and more satisfied customer sales.” Using IBM test tools of Rational Requisite Pro, Rational ClearQuest, Rational Test Manager, Rational Robot (Automation), Rational Functional Tester (Automation), JIRA, TestTrack Pro, and Bugzilla, we tested for defects before the customer even saw it! We made recommendations to management concerning software readiness for release based on build performance and performance metrics.

Providing Level 2 support, using JAVA and XML programming languages, one of the projects was international testing on different Windows PC operating systems. We would test Chinese, Japanese, Korean, and German computers for functionality of the IBM software being tested. I had to sit with the English PC and the foreign PC side by side and carry out the tests... which as a challenge since I did not know Chinese, Japanese or German!

After retiring, I have worked as a substitute teacher at Westford Academy and Carlisle public schools teaching in computer labs and giving classes for Adobe Illustrator. Programming languages I enjoy are Java, C++, Visual Basic, HTML, and web development software as well. Using WordPress, Dreamweaver, Drupal, Joomla Web Content Management Systems, Microsoft Expression Web 4.0, and Microsoft FrontPage, I started several websites for businesses, including pro bono web development for a local newspaper (<http://www.CarlisleMosquito.org>).

## FROM COMPUTER SCIENCE TO KITCHEN SCIENCE

I learned from my mother, Parin Homi Munshi, and mother-in-law, Jaloo, the favorites and staples of a Parsi home. Inspired by old traditional Parsi cookbooks like *Vividh Vani* by Meherbai Jamshedji Wadia, I came up with homemade Parsi delicacies made with pride in

the USA. Living in Carlisle, MA, for the past 40 years with my husband Jamshed and family, I have often introduced Parsi cuisine to friends and neighbors. One of my favorite dishes to prepare is dhan dar (white rice and yellow lentils) with shrimp patio. I love this dish because it combines healthy lentils and rice, paired with a spicy side. The combination of the two is delicious. The art of blending spices, like curry powder and turmeric with tomatoes, onions, and more, is the essence of Parsi cuisine! Blending and sautéing vegetables or meat to create a particular flavor is the key to good, tasty food.

One day, Jamshed suggested putting my recipes online and sharing them for folks who were interested in learning to cook the food they had at our home. Excellent idea! After leaving IBM, I started my web design company, and one of the sandbox projects was to put the recipes online. More web design, blogging, photography, and cooking followed. My Parsi Cuisine cookbooks are a labor of love. The cookbooks began in an effort to maintain and preserve our recipes and traditions for the next generation, many of whom have been raised in USA, UK, Australia, France, Germany, Canada and other countries outside of India.

## AN ONLINE HOME FOR THE CULINARY ARTS

I have established a free recipe website (<http://parsicuisine.com/>) in 1999 with over 400 free recipes with foodie news and stories, caterer resources, etc. The website, which I maintain, now has over 250,000 followers and over 300,000 hits from all over the world. In addition to *Parsi Cuisine*, I have authored 12 individual series cookbooks with matched digital e-cookbooks. I was recently invited to Carlisle’s Gleason Library (<http://carlislemosquito.org/index.php/feature/27-features/feature-articles/31314-how-rita-kapadia-traveled-from-computer-science-to-kitchen-science.html>) and the Boston Athenaeum (<http://www.parsicuisine.com/boston-athenaeum-tea-presentation/>) to demonstrate and talk about Parsi food. During the pandemic, the Zarathushti associations of New York (ZAGNY) and Boston (ZAGBA) hosted community Zoom culinary classes during which I demonstrated Parsi cooking in real time while participants joined from their own kitchens. Computer science and kitchen science have come together for me as Parsi Cuisine also has a YouTube channel at <http://www.youtube.com/TheParsiCuisine>

Bon appétit!

## ROBOTICS IN MIDDLE SCHOOL AND BEYOND

As you walk into the first floor Technology Wing of Walsh Middle School near Boston, MA, you see a series of three large classrooms teeming with imagination, creativity, and outside-the-box thinking. When we hear about robotics and artificial intelligence, we may think of work being done in the high-tech world, but students are being taught the foundational skills. Technology Education as well as the Robotics Club explore topics such as the engineering design process, structures and bridges, and 3-D modeling. Pascal Chesnais, a Technology Education Teacher and founder of the WalshBots, finds that having a student-centered classroom—where students “figure it out”—is the best approach. “Deeper learning happens when students figure it out. Guide them, but don’t give them the answer,” Pascal states.

The WalshBots started in 2013 after Pascal spent a career working at the MIT Media Lab, a start-up, and led a global research program at French Telecom. He transitioned to education, eventually becoming a Technology Education Teacher at Walsh Middle School. His first question to the Principal of the school was, “Do you have a Robotics Program?” The Principal answered, “No, but we would love it if you could build a program at our school!” That was all Pascal needed to hear

Mehernush Shroff, M.Ed., CAGS



*Mehernush Shroff was born and raised in the Boston area. He is a Language Development Coach with Walsh Middle School, located in Framingham, 20 miles west of Boston. He earned his undergraduate degree in Finance, M.Ed. in Elementary Education, and CAGS in School Leadership. His area of focus is English as a Second Language. After nine years of teaching, he transitioned to Instructional Coaching by partnering with teachers and delivering Professional Development. His mission is to give culturally and linguistically diverse students a variety of high-quality educational experiences that will inform their future.*



as he began reaching out to local companies to donate kits to start the WalshBots. The program has gradually grown and the school's program has found success.

The WalshBots have competed for ten years, and eight of those years have qualified for the World Championships. From April 24–May 4, Pascal and several students traveled to Dallas, Texas, to compete in the Vex Robotics World Championships. The tournament featured around 400 teams, both middle and high schools, competing in various competitions. With over 15 divisions, there are plenty of opportunities for students to apply STEM concepts in a thrilling environment where emotions and competitive drive run high. In the competition Slapshot, robots from opposing teams slide discs across a “field” to score points. Pascal is especially excited for the learning that happens after the World Championship. “After the competition, there is breathing room from when the competition ends to next year's competition. Students are able to reflect on what they saw, research, build up vocabulary and concepts, and learn from each other.”

In my role as the school's Language Development Coach, I have the opportunity and challenge of partnering with 100+ staff to create engaging learning opportunities for 145 English Language Learners (ELLs). By working with teachers in a variety of ways including leading Professional Development sessions and facilitating coaching cycles, I collaborate with staff to provide a welcoming environment for students from all over the world, with varied backgrounds, who speak different languages, in an environment where the language of instruction is English. The role can range from helping a student manage emotions of leaving their family members from their native country to finding a “hook,” or activity that they like; that way, a student builds a connection to the school, foster relationships, and is a part of a community. For many ELLs, the WalshBots can be that “hook.”

The WalshBots have created a sense of belonging for students at the school. According to Pascal, working in a hands-on and collaborative setting has allowed ELLs to immediately become involved. “Students now have an affinity group that they belong to. For newcomers to our school, who speak another language, the language of technology can be universal. They problem solve, learn vocabulary, and their collaboration transcends language because they all understand and work towards the goal. Here are objects, work with people you have never met to reach the goal.”

The World Championships had 20 corporate sponsors, including NASA, Google, Tesla and the U.S. Army and Navy, indicating the need for young minds to be engaged by the world of robotics. The future for students in robotics is promising. In the MIT Media Lab, there are several groups exploring in an environment that allow participants the freedom to create and find solutions. An interesting intersection between the automotive and music industries originated from the idea of the relationship between electric fields and the human body. As explained on the MIT Media Lab website, “The Physics and Media Group started exploring the relationship between electrical fields and the human body while developing sensors for a collaboration between cellist Yo-Yo Ma and Professor Tod Machover's group. Using this technology, Motorola Fellow Josh Smith created furniture that can “see,” and Tom Zimmerman (now at IBM) devised a way to send data through the human body. Then research scientist Joe Paradiso worked with magicians Penn and Teller to develop the Spirit Chair, a device which literally channels a field through a performer's body to control music.” The technology was further leveraged by the automotive industry to create a seat sensor that can gauge the most appropriate airbag action for a person of a given size.

If there is one thing to remember about teaching STEM in schools, Pascal believes that it is play that breeds creativity, and play is how we learn. “It is very rewarding for students to be presented with an authentic problem and find a solution that solves a real-world problem. Through several iterations, finding a solution; it is very satisfying and rewarding for any student. Students are playing and learning at the same time. Play is the purest form of learning.”



*A “field” the WalshBots use to practice, score points, move objects, and collaboratively problem-solve.*

*Disclaimer: This article posted on <https://fezana.org> is a reflection of my views and research and does not necessarily represent the postings, strategies, or opinions of my employer.*

# DEALING WITH CYBERCRIME IN TODAY'S TECHNOLOGICALLY ADVANCED WORLD

Mehrzaad Mogrelia, CFCS

## Request from CEO

Subject: Immediate Wire Transfer

To: The Chief Financial Officer

**HIGH IMPORTANCE**

Please process a wire transfer payment to the tune of \$250,000 and code to "admin expenses" by COB today. Wiring Instructions below...

Acc. Name: XYZ

Trf Code:0000123

Acc.No: 456732100

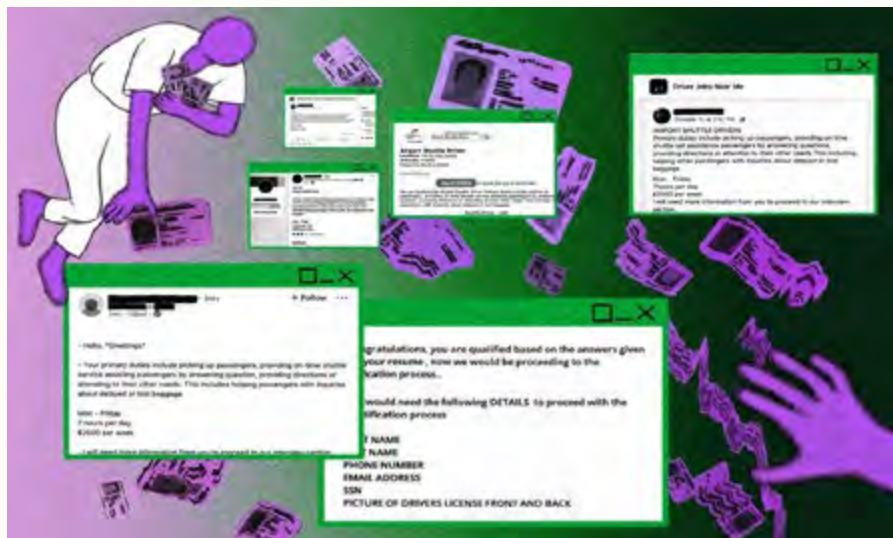
Regards,  
Mr. ABC  
CEO

While this may appear a normal email received from the CEO of a company during business hours, such an email engineered a \$37 million loss in 2019 for Toyota (<https://www.dropbox.com/scl/fi/ccml2vkqi6738ui5my17d/14-Mogrelia.docx?rlkey=zhmoxvsg13krj6qo6jtzcuhm&dl=0>), one of the largest vehicle manufacturing companies in the world. Such a type of cyber-attack is commonly known as a Business Email Compromise (BEC), and many large-scale companies have fallen prey to this. Under BEC, emails are often sent by high-ranking officials, usually CEOs to subordinates to process various kind of payments that would generally appear under normal business expense heads. Due to the sender's position in the company, subordinates do not question and do as instructed in the email, resulting in the loss of several millions and sometimes, even billions to the company. Between 2016 and 2021, BEC attacks alone contributed to over \$43 billion dollars in losses, making it one of the single largest cause of cyberattacks among businesses.

Among individuals, social media has played a huge part in incurring losses of several thousands of dollars. A simple hello can turn into a nightmare as cyber attackers are always on the lookout for people who are desperately looking out for companionship, jobs or an easy way of making extra income. In 2021, social media fraud accounted for 25% of reported frauds, which amounted to about \$770 million in monetary terms. The most vulnerable age group, surprisingly, is not the elderly age group, as commonly perceived. Individuals between 18 and 39 years are twice as vulnerable to losing money to scams.

The different type of scams an individual can become a victim include romance scams, job scams, government scheme scams, phishing emails (such as lottery winner announcements), etc. Among these, job scams accounted for nearly \$68 million worth of loss among Americans as per a CNBC report. The most common way job scams occur when individuals are approached under the pretence of offering lucrative salaries by putting in just a few hours of work daily. Firstly, scammers send victims a certain amount of money via check and ask them to deposit it in their bank accounts for purchasing business equipment. An additional instruction given to the victims is to remit a portion of that amount to various organizations (mainly non-governmental organizations) or individuals. In this way, the victim's bank account is used as a source of committing money laundering while the scammers escape scot-free, as there is no trace to capture them.

The next biggest scam an individual falls prey to is lottery scams. A 2021 report by the Federal Trade Commission stated that lottery victim scams lost a collectively \$255 million. Under this, victims



Common ways in which job scam emails are sent out to victims.



are often contacted with them being declared a 'lucky' winner of a huge sum of lottery. Firstly, the scammers ask for personal details of the victim like name, address, contact number, photo ID proof, bank account details to 'correctly identify the winner.' Next, they ask for large amounts of money in the form of transfer fees, exchange fees, bank fees, and, in the hope of getting a larger sum of money, the victim goes on depositing those sums in the bank account of the scammer, which never return.

Over the years, as a Financial Crime Investigator and Cybercrime consultant, and through my experience as a part of the advisory board at the Certified Fraud Examiners, U.S.A., I have worked with several businesses and individuals falling prey to various scams and helped them recover their lost funds along with the appropriate law enforcing authorities. These are the top five tips I offer to businesses and individuals in order to combat cybercrime and safeguard themselves against falling prey to cyber attackers:

For businesses:

1. Always carry out proper background verification and Know Your Employee (KYE) checks for each employee, irrespective of the designation at which they will be hired.
2. Update systems with the latest firewall and pop-up blockers to block out inappropriate/suspicious content.
3. Change business related credentials like passwords every 90 days for every employee and have clear delegation of duties to ensure that no one person is handling every functioning of a particular department.
4. Make cyber-attack scenarios the core of a Business Continuity Plan (BCP), and make sure that regular drills are conducted in order to ensure the response method of the business in the event of a cyber-attack is concrete and business function is not hampered.
5. Conduct regular training and learning content for different aspects of cybercrimes; it is essential for employees to be aware about the latest trends and methods of cybercrimes.

For individuals:

1. Never reveal any personal information to strangers and put them on social media profiles. In case a known contact is contacting asking for monetary help, always double check with the contact.
2. Never accept job offers that have lucrative salaries and offer an opportunity without conducting interviews.
3. Never store credit card or financial details online. If the merchant website is under a cyber-attack, the individual's details are also compromised, and various kind of fraudulent activities begin to appear on financial statements.
4. ALWAYS research about the company you are about to deal with, whether be it in terms of online shopping, remitting money to your loved ones across the globe, or being employed. A simple search using Google should help.
5. Never keep commonly used and personal phrases, such as name of places, birthdates, etc., as your passwords. A strong password is always a mixture of lowercase letters, uppercase letters, numbers, and special characters. Also remember to regularly change your passwords.

To conclude, technology is always evolving and so is the scamming methods. Hence, no technology can guarantee 100% protection from cyber attacks. However, with a little bit of awareness, we can safeguard ourselves, and as it is always said, "We are the first line of defense for ourselves against any kind of cyber attack." I would like to end with the famous line: "If it's too good to be true, it is probably too good to be true."

*Mehrzaad Mogrelia is a Certified Financial Crime Specialist (CFCS) from the Association of Certified Financial Crime Specialists, U.S.A. In April 2021, he began his own freelancing journey in the field of Financial Crime Investigations through his firm, MZ Consultancy, where his primary role is to help companies unearth financial frauds within their setup. He has been recognized with several business awards. He was recently presented with the Rising Young Zarathushti Award at the World Zoroastrian Congress 2022 held in New York. He is currently working with TD Canada Trust in the Fraud Management Department.*



# OUT OF THIS WORLD MENTORS

Roxanne Jassawalla, BS



*Roxanne Jassawalla studied electrical engineering at Virginia Commonwealth University. Her job involves supporting the development, testing, and operation of guidance, navigation, and control hardware on the spacecraft for the International Space Station (ISS) cargo resupply missions. As a woman in STEM who built a path in the aerospace industry, Roxanne knows how having mentors and inspirational role models can make a big difference. She looks forward to excelling in the field and, along the way, mentoring students, interns, and colleagues to create the best environment for success.*

A supernova is defined as “the explosion of a star that may reach a maximum luminosity one billion times that of the sun.” Involvement in my childhood robotics team, SuperNOVA, was where my particular journey had begun. I did not have any specific aspirations for what I wanted to be when I grew up, just a notion that however my life turned out I wanted to leave behind a legacy of relationships that would never disappear.

Throughout my childhood, I was grateful to my parents for stressing two qualities that parents within our community always seem to champion—the importance of a good education and the understanding that self awareness and charitability were the true virtues of any great person. However, it was my teachers above all who made the biggest difference in my life. I was fortunate to live in a county that offered various unique specialty programs in all high schools. And even more fortunate that local industry mentors and our teachers willingly gave up their evenings and weekends for years to be there for us and support these programs. It was through them that I learned the importance of being a source of support and guidance in a young person’s life. Within four years of high school and involvement in various STEM-related programs, I knew I wanted to become an engineer. It was one of the local aerospace industry mentors that strengthened my resolve to study electrical engineering. I did not know it at the time, but one of my greatest connections was built that day.

For the first two years of college, I had a tough time finding a focus within electrical engineering that I was particularly passionate about, and the feeling of imposter syndrome at times was crippling. All that changed once I took my first electromagnetics field course. My professor was engaging and knew the importance of fostering human connection. He was one of the rare instructors who could raise a student’s confidence and desire for academic achievement at the same time. By the time the class ended, he offered me a position in his antenna and medical devices research lab; I knew there was no going back.

During my time working in the lab, I met graduate students who were great sources of guidance. These were people who had been through similar hurdles that I now faced and helped me understand the challenging aspects of the field. I was taught the fundamentals of scientific research and presented my first paper, *Microwave Absorption in the Brain at 5G using Realistic Computational and In Vitro Head Models*, at the 2017 International Union of Radio Science (URSI) conference. By the time I graduated college, I knew I wanted to utilize my background in antenna theory, and I was luckily still in touch with my first set of mentors, in particular the one who first set my resolve for pursuing electrical engineering.

Back in 2018, I had started my career at Orbital ATK, which was recently acquired by a larger corporation and became one of their fastest growing space divisions. Starting a career in aerospace was life-changing for me. My background in electrical engineering and antenna theory allowed me to enter the space industry, build new skill sets, grow as an individual, and do things I never imagined. Large milestones were taken during the 1960s within the history of space flight, and people may think that the excitement within these ground-breaking works has diminished; but a lot has been accomplished these past few years.

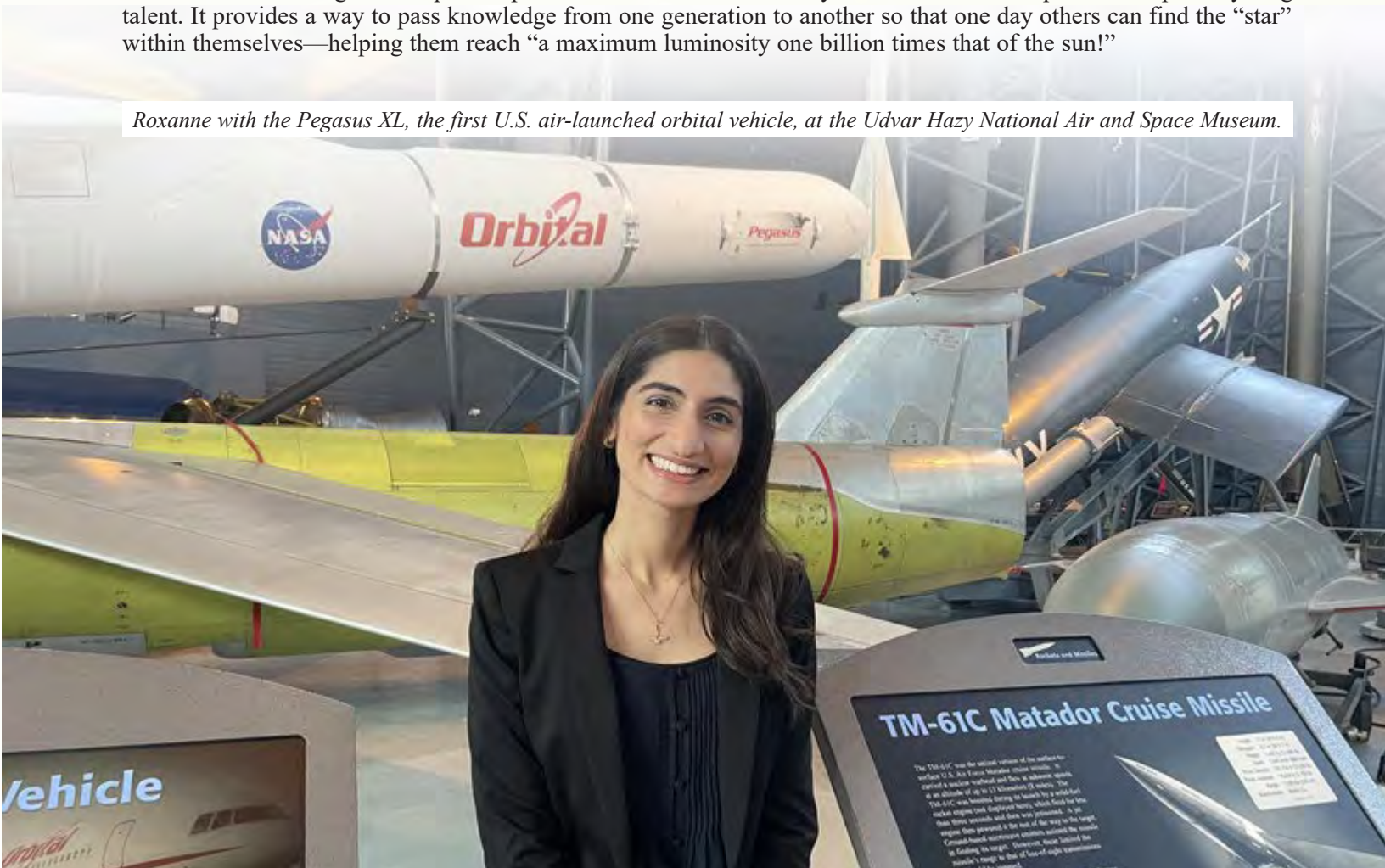


I am most excited to see the impact from the recent rise of low-cost access to space. Over just the last two decades, the industry has seen the price of launching spacecraft to low Earth orbit (LEO) drop from over \$10,000 per kg to now less than \$1,500 per kg. This reduction in launch costs translates to a significant increase in spacecraft demand. It is an exciting time to be an aerospace engineer! After two years in my career, I started to focus on a different type of electrical engineering: guidance, navigation, and control sensors used on spacecraft. This new role allowed me to have a greater involvement in mission development and operation. My first mission operations experience was with the company's 15th contracted cargo resupply mission with NASA to the International Space Station, which had delivered more than 7,000 pounds of science and research, crew supplies, and vehicle hardware to the orbital laboratory. Familiarizing myself with our spacecraft/service module and having the opportunity to support flight mission operations was an exhilarating feeling.

The experience was made even more meaningful due to the mix of specialities and depth of expertise possessed by my peers. There were individuals who have been within the space industry since the space shuttle era! They have been dedicated to mentoring within the industry by sharing their wealth of knowledge and skills to promote optimal success for these missions. In an effort to give others the same opportunity I was given, I have helped mentor several young engineers within the industry. Nothing is more rewarding than helping them work on what they are most passionate about and giving them the best chance to succeed.

I am the individual I am today because someone decided to mentor me. They showed me that anyone can achieve great success with the right attitude. If there is some advice, I would give to anyone striving to enter or currently in any STEM-related field, it is to identify your mentors through all stages of your growth, whether professional or personal. Use their guidance to develop your skill set and sense of self. Understand that continuous mentoring is necessary in every stage of your life and different mentors will help you achieve different goals. I believe that mentoring is an important part of the scientific community as it is critical to inspire and empower young talent. It provides a way to pass knowledge from one generation to another so that one day others can find the "star" within themselves—helping them reach "a maximum luminosity one billion times that of the sun!"

*Roxanne with the Pegasus XL, the first U.S. air-launched orbital vehicle, at the Udvar Hazy National Air and Space Museum.*



# NATIONAL ACADEMIES

## NEW VOICES IN SCIENCES, ENGINEERING AND MEDICINE

The application for our third cohort of New Voices members is now open! We are seeking U.S.-based emerging leaders in all disciplines of the sciences, engineering, and medicine with an established track record of professional excellence and demonstrated commitment to service beyond their immediate discipline and institution.

Application Deadline: **August 10, 11:59 pm**; Semi-finalist Interviews: **October 2023**

Applicants Notified: **November 2023**

In-Person Meeting Dates for Selected Members: **January 29 – 31, 2024 and May 6 – 9, 2024**

### THE GOALS OF THE NEW VOICES PROGRAM ARE TO:

- Develop the capacity of early- and mid-career leaders to serve their community and impact science policy discussions.
- Connect a broad network of young U.S. leaders in the sciences, engineering, and medicine to combat public distrust by bringing science communication activities to new communities.
- 

### NEW VOICES MEMBERSHIP PROVIDES THE OPPORTUNITY TO:

- Participate in a prestigious network of emerging leaders working across the disciplinary boundaries of the sciences, engineering, and medicine.
- Explore interdisciplinary approaches units to addressing critical global issues through working groups and ad-hoc project committees.

## ELIGIBILITY

- We are seeking U.S.-based emerging leaders in all disciplines of the sciences, engineering, and medicine with an established track record of professional excellence and demonstrated commitment to service beyond their immediate discipline and institution.
- 

### THE NEW VOICES PROGRAM IS OPEN TO APPLICANTS WHO MEET THE FOLLOWING CRITERIA:

- Hold a terminal degree (e.g., Ph. D, M.D., etc.) in any discipline within sciences, engineering, or medicine, including social science disciplines.
- Have obtained their terminal degree or completed post-doctoral/medical doctor training within the last fifteen (15) years. *Note: Applicants who exceed this limit due to caregiving leave or military service are encouraged to apply.*
- Are based in the United States with citizenship, permanent residency, or DACA recipient status.
- Have a primary affiliation with a U.S. institution, including industry, academia, government, non-profit, and other sectors.
- 

To submit an initial application for the New Voices program, please fill out our online application form by following these steps:

[Set up an account](#) on our online application platform. Submit your application materials via [our online application platform](#) by August 10, 11:59 pm. *Note: All applications must be submitted via our online form to be considered.* For questions, please contact [newvoices@nas.edu](mailto:newvoices@nas.edu).



## LACBA Asian American and Pacific Islander Heritage Month Honors

Shehnaz M. Bhujwala, a strong advocate of consumer rights in civil courts and the California Legislature, is a partner of Boucher LLP. She helps people harmed by the bad practices of corporations, employers, and governmental entities, obtain justice through the courts. Bhujwala prosecutes class actions, mass torts, and other complex civil cases in federal and California state courts. Bestowed with a Martindale-Hubbell “AV Preeminent” rating for her professionalism and ethics, Shehnaz has helped bring about resolution to numerous cases through settlement and trials over the course of her legal career, including a historic settlement on behalf of hundreds of survivors of childhood sexual abuse against the Los Angeles and San Diego Catholic Archdioceses.

Prior to joining Boucher LLP, Shehnaz Bhujwala worked for top plaintiffs’ firms in the Los Angeles area, including Khorrami Boucher, LLP, Kiesel Boucher & Larson, LLP, and Greene, Broillet, Panish & Wheeler, LLP. She is an active author and speaker on consumer law subjects, holding leadership positions in numerous professional organizations, including LACBA, Consumer Attorneys of California, Consumer Attorneys Association of Los Angeles, American Association for Justice, and Public Justice.

More recently Shehnaz worked on lawsuits against the Islamic Republic of Iran and one of its ministries, on behalf of victims of terrorist attacks on US Embassies in Kenya and Tanzania in 1998; that injured and killed so many people, for Iran’s material support to al Qaeda to effectuate the attacks. Iran did not acknowledge the lawsuits but they were able to secure default judgments on behalf of their clients, to enable the clients to apply for some compensation through a fund set up by the US for victims of state-sponsored terrorist attacks.

Shehnaz writes” I’m a California native, born to Maneck Bhujwala and the late Mahrukh (Raimalwala) Bhujwala, in Pasadena, California, and raised mostly in the Bay Area, before returning to the Los Angeles area for higher education and career. I received my a Bachelor of Arts degree in Psychology in 1997 from the University of California, Los Angeles, and a Juris Doctor degree in 2002 at the University of Southern California’s Gould School of Law.

As a daughter of Indian immigrants from the Parsi Zoroastrian ethno-religious community, I do my best to think good thoughts, speak good words, and do good deeds. This translated, in part, into my decision to pivot and pursue a career in law, to help advocate for victims of significant injustice.

After graduation from law school, I worked as a new attorney for a well-regarded law firm that focused its practice on helping people through civil litigation against wrongdoers, with mentorship from highly-experienced trial attorneys. Through them, I learned the value of service to the legal community and the precious nature of a legal reputation that must be safeguarded, while also zealously advocating for our clients in their pursuit of justice, with dignity and respect. A few years in, I started to question my career choice,. took a couple of years off to figure things out, engaging in other interests.

*Shehnaz Bhujwala*



With the guidance of family and good friends, I made the decision to return to law, to work with well-regarded lawyers representing survivors of childhood sexual assault by Catholic clergy members as they were nearing trial. I worked closely with our clients, the survivors, holding their hands and guiding them as they navigated the lawsuits as they neared trials. It was meaningful work, which set me on a renewed path of legal service in high-impact civil litigation designed to hold powerful institutions to account and hopefully effect systemic change for good. I'm very fortunate to have been able to continue to work for the last 10 years with some of the lawyers I met there, having started a new boutique law firm, Boucher LLP in Woodland Hills, California”

This Fall, in addition to co-chairing the LACBA Adequate State Court Funding and Operations Committee, Shehnaz will serve as Chair of LACBA's Litigation Section in its 50th year. She is grateful for all of these opportunities to serve and be a part of the Los Angeles legal community, and thankful for the recognition by LACBA as a lawyer of South Asian American heritage this year.

*Congratulation Shernaz for a successful and meaningful legal career*

## Dr. Freya Shroff



was awarded the Best NICU Resident for patient care knowledge and empathy this year as she graduated medical Residency. University of La Vegas.

Was the recipient of the Fezana undergraduate scholarship which had assisted in attaining her goal of attending medical school and becoming a Physician.



# Shahaan Tavadia

completed open waters swimming of San Francisco Bay, April 15-16 2023.

Thirteen-year-old Shahaan Tavadia from Phoenix, Arizona successfully completed the two-day challenge of swimming in the open waters of San Francisco Bay on April 15 and 16, 2023. Around 70 swimmers, aged between 10 and 60 years, conquered the “treacherous currents, chilly waters and marine life” for which the Bay waters are known, reported Shahaan’s mother Rukshana.

Since swimming in such unfavorable conditions is a formidable task even for experienced swimmers, and Shahaan had been honing his skills in the pool for the past six years, dedicating countless hours of hard work and determination to improve his technique and endurance.

Fearlessly diving into the frigid waters and embarking on this incredible journey with determination and perseverance, he powered through the currents, staying focused to reach his goal,” added Rukshana. Each day, the event lasted for around three hours, including boat time to the designated spot, followed by the swim that took nearly an hour and the return journey to the shore.

On the first day, for the swim scheduled to commence from Alcatraz Island and end at the pier at a distance of 1.4 miles, Shahaan was swept away by the currents to a different location than the finish line. He quickly assessed the situation, gathered information about his location and swam back along the coastline until he was reunited with his swim party. “It was a moment of great joy and pride for him, his family and his coaches,” conveyed Rukshana. On the second day, the swim spanned a distance of 1.2 miles across the Golden Gate Bridge.

Completing the two momentous swims, Shahaan proved that he had “escaped his limitations.” As explained by Rukshana, the Alcatraz swim has a catch line “Escape your limitation.” It is linked to the Alcatraz prison from which it was believed no one could escape the rough waters to reach the shore.

Shahaan comes from a swimming family, his parents Rukshana and Sarosh, who work in the information technology sector, enjoy it too, as well his paternal

grandfather Ratan Tavadia and maternal grandmother Prochi Aibara were avid swimmers. Over the years Shahaan has won prizes at indoor swim competitions. Studying in the eighth grade at the Basis Phoenix Charter School in Arizona, martial arts have been another passion with Shahaan since a young age. He is a second degree Taekwondo Black Belt. CONGRATULATIONS SHAHAAN.

The family regularly participates in the activities of the Zoroastrian Association of Arizona where Rukshana currently serves as treasurer. The Tavadias relocated to the USA in 2010 when Shahaan was a year old. Prayers



have played an important role for the family. “He has been taught since he was a kid to say Ashem Vohu and Yatha Ahu Vairyo before starting any major activity” which he continues to do before any school examination or swim event, mentioned the mother. [his article by Email](#)

# PARINAZ HATHIRAM

## ENTHUSIASTIC EAGLE SCOUT



Winning the Eagle Scout award at the age of 16 years, Parinaz Hathiram of North Carolina is “probably one of the first if not the first Zarathushti girl to win this award... the highest award bestowed upon Scouts in the United States.” Among the first wave of females to enroll for Scouts BSA (Boy Scouts of America) when the doors were thrown open to them in 2019.

As senior patrol leader she has helped “build an inclusive and considerate culture...by planning fun, but productive meetings every week. My goal is to create a positive impact”. She continues to attend troop meetings and serves as a role model for newcomers to the Troop 233. She would like to help out with monthly trips by becoming an assistant scoutmaster, She is an 11th grader studying at the Charlotte Latin School in Charlotte.

“My Scouting journey started ever since I could walk, when my father would take me to his Scout Troop, Sethna 18th West Mumbai. Every Sunday, I would join in their Troop activities- playing cricket, learning scouting skills, and participating in competitions. The cubmaster would often joke that he would cut off my pigtailed so that I could join the Cub Pack (girls were not allowed to join Boy Scouts, and I was too young to join a Bulbul Flock - a girl cub scout Pack). When I turned six years old, I joined a local Bulbul Flock as a

young Bulbul. “

The following year when her father’s job as an international banker at Wells Fargo the family relocated to Hong Kong, Parinaz joined the 20th Island Pack as a Brownie (Hong Kong’s equivalent of Girl Scouts). In 2016 the family moved to the US, and at the time, the Boys Scouts of America did not allow girls to join their program but would allow females to be “Den Chiefs” (youth leader), so she enrolled with Pack 33 and taught scouting skills to Cub Scouts and helped them with rank advancement.

In February 2019, the Boys Scouts of America finally allowed females to join their Scouts BSA program. “I was super excited as I watched my father and other parents work to start Charlotte’s first female Scouts BSA troop, our own Troop 233. I vividly remember our first camping trip where we did not know much, but persevered through a cold night and made a hearty breakfast.

She devotes two-and-a-half hours to Scouting activities every week, and another three days on their monthly camping trips. Her favorite activity is camp-o-ree when several troops from the Charlotte Mecklenburg County District come together for a weekend of camping, fun and competition with the winning troop earning bragging rights.

In addition to scouting she is an avid golfer, captain of the Varsity Girls Golf Team in her school and volunteers as assistant coach for children aged five to eight years. She is a leader in her school band and mentor of the flute section, being fluent in Mandarin she volunteers as a teaching assistant for Chinese art classes. In addition she is president of the Charlotte chapter of She Makes Club that empowers young girls to embrace engineering as a career

by hosting make-a-thons.

Last year she completed an intensive six-month program offered by the Fab Academy that requires students to envision, design and prototype a new project each week using digital fabrication tools and machines. Her final project was a Magic Mirror, which talks to you, and has an AI (artificial intelligence) system and a humidity sensor. **This course is taught by MIT instructor Neil Gershenfeld.**

She plans for a career in engineering or medicine. To get a head start, “I am currently working with a professor from Duke University on Reverse Engineering the index phalange and understanding the effects of osteoarthritis on the index phalanges. One of the main reasons I chose to reverse engineer the index finger and explore the effects of osteoarthritis on the joint, was inspired by my aunt who suffers from this disease.”

She regrets there are not many Zoroastrians where she lives but refers to her mother Binaifer, a human relations professional, observing the Friday ritual of reading the story of Mushkil Aasaan (a poor woodcutter and his family whose fortunes were reversed by angels) with grams, sugar and cardamom. “This has become one of the most prominent stories which I have drawn morals from... It has taught me to always stick to my morals which my parents have taught me and to never refuse help to anyone in need. This is evident in my choice of extracurricular activities, I always ask the question: ‘How can this activity or cause benefit my community? Does this make a positive impact on someone’s life?’”

*Congratulations Parinaz,  
FEZANA JOURNAL wishes you  
great success in the future.*



## Niloufer Mavalvala Wins Gourmand Award at Umea Sweden



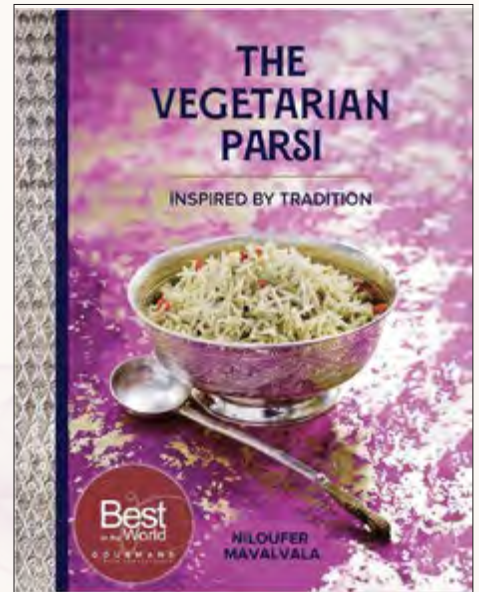
“The Vegetarian Parsi”, inspired by tradition, won a second Gourmand award, winning “Best in the World” for a cookbook series in Umea, Sweden in May 2023. In its 28th year, the Gourmand Awards and Food Symposium is a success story that is coordinated by the Cointreau family.

This is the fifth Gourmand Award for our Parsi cuisine and a huge stepping stone for bringing Parsi food culture on the global culinary map.

“ Awards and certificates will come and go, but the mission is truly motivated by the fact that Parsi cuisine and culture are here to stay and are recognized worldwide. Together, we accomplished this. All of us who love our food culture, our delicious lagun nu bhonu and sagun nu bhonu, and also janam and maran nu bhonu, continue to cook and master it. To all the home cooks, it is you who should be proud of keeping that flag flying for all these years, decades, and centuries. This is for all the people who came before us—our parents,

grandparents, and ancestors who simply carried on. It is all their discipline, determination, and tenacity focused on keeping our “Parsi Pannu” alive. Let us always be proud of our history, heritage, culture, and cuisine . She said.

It was when Nioufer was invited to give a talk at this event that she realized that Parsi cuisine is just one of many age-old cuisines fighting to achieve recognition and compete with what the rest of the world considers to be the norm. They brought their food and culture to the table from Gaziantep in Turkey to Kerala in India, the Malays in Singapore, the Indigenous in Canada, the Nordics, the Icelandic, and, of course, the many Latin American countries. If these were the Oscars, South Africa would win every category. It was certainly a delicious melange of world cuisines. The topic of her presentation was “Parsi cooking; where it all began”, you can [click the link s. http://www.nilouferskitchen.com/2023/06/umea-sweden-may-27th-2023.html](http://www.nilouferskitchen.com/2023/06/umea-sweden-may-27th-2023.html),



# CYRUS DADINA WINS THE NATIONAL MERIT SCHOLARSHIP



Cyrus Dadina, a senior in the 2023 graduating class at the Dobbs Ferry High School (DFHS) in New York state, won the National Merit Scholarship award in the United States. This program is for recognition of high academic achievement, and the finalists are selected based on their high SAT score and high school grades. He is the only student from the school to earn this distinction and it places him among the very top in the US.

Cyrus is an IB Diploma Candidate and has participated in the school's Science Research Program and competitions for three years, receiving awards for his research, including the Naval Science Award from the office of the US Navy Research. He recently published his paper in the research journal of Frontiers in Sports and Active Living.

Cyrus is also a recipient of the prestigious 2023 Thomas J. Watson Memorial Scholarship. IBM's founder, Thomas J. Watson, believed deeply in the fundamental importance of education and is reflected in the scholarship that bears his name.

In addition to his academic achievements Cyrus is President of the DFHS International Club, Captain of the Cross Country Track and Field Team and a Peer Tutor. He is a member of the High School Orchestra and also plays the cello for the Greater Westchester Youth Symphony Orchestra.

Cyrus completed his Navar and Martab initiation ceremonies at the Vacha Gandhi and Rustom Faramna agiaries in Mumbai and practices as a priest serving the Tri-state Zoroastrian community.

In August 2023, Cyrus plans to study Mechanical Engineering at Georgia Tech in Atlanta, Georgia.

*Congratulations Cyrus on your achievements, the community is very proud of you*

## NEW MARCH INTERVIEWS VASEEM KHAN



Writing as Nev March, our author Nawaz Merchant was invited to the annual writing conference Malice Domestic on April 29. She conducted the interview of notable writer and international guest of honor Vaseem Khan on a main stage event, which was attended by over five hundred writers and fans.

Nev is the first Indian-born author to receive the Minotaur Books/Mystery Writers of America Award for Best First Crime Fiction. Her debut novel, *Murder in Old Bombay* was a finalist for six national awards including the Edgar and Anthony awards. *Peril at the Exposition* describes the 1893 World's Fair, during a time that planted the seeds of today's red-blue political divide. Nev's books deal with issues of identity, race and moral boundaries. She is a member of Crime Writers of Color and sits on the board of the NY chapter of Mystery Writers of America. She is also Vice President of ZAGNY Zoroastrian Association of Greater New York.

Her upcoming book *The Spanish Diplomat's Secret* is the third in her historical mystery series



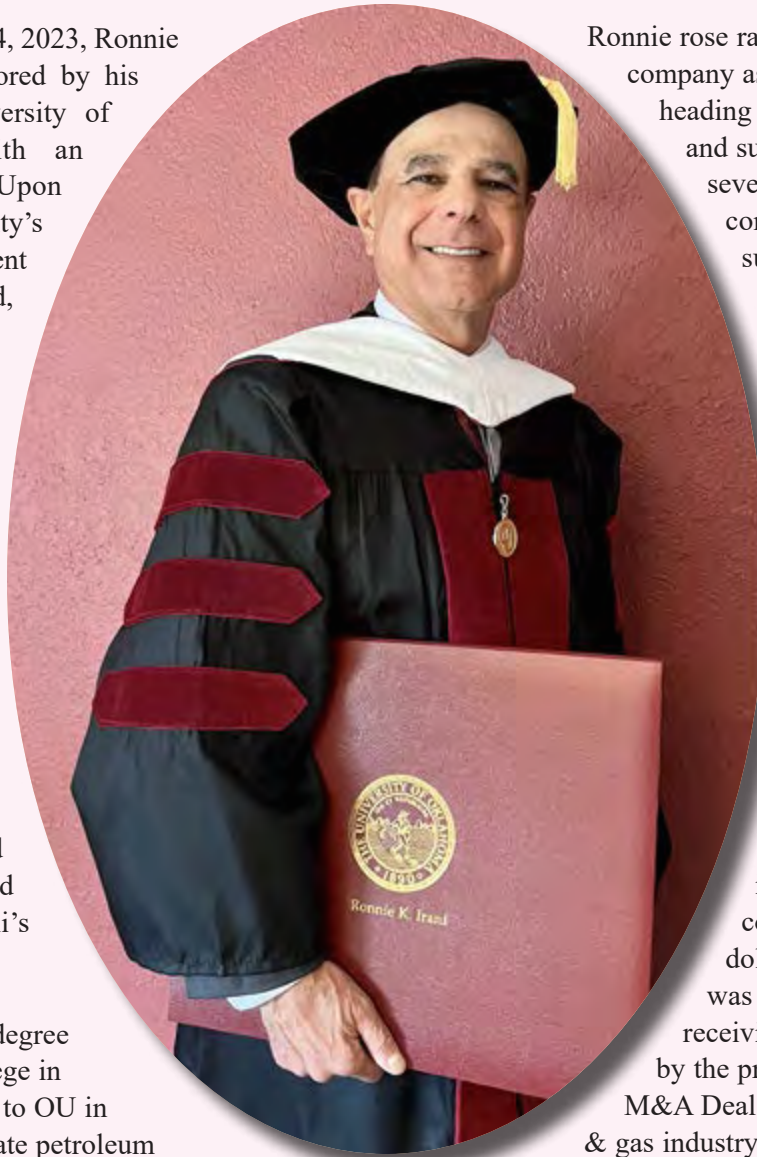


# RONNIE K IRANI

## THE HIDDEN GEM OF OKLAHOMA

On Saturday May 14, 2023, Ronnie K Irani was honored by his alma mater the University of Oklahoma (OU) with an honorary doctorate. Upon conferring the University's highest honor, president Joseph Harroz Jr. said, "Each of this year's honorary degree recipients has attained success in their own right, but what distinguishes them is their unwavering commitment to championing the next generation of leaders". He could not be more right. Working closely with students and enabling entrepreneurs and future leaders is indeed one of Ronnie Irani's great passions.

After receiving a BSc degree from St. Xavier's College in Mumbai, Ronnie came to OU in 1977 as an undergraduate petroleum engineering student and obtained his BS and MS degrees in Petroleum Engineering from The University of Oklahoma (OU), and an MBA from Oklahoma City University (OCU). While still an undergraduate student he started working as a student engineer for an oil company in Oklahoma City and continued with the company after his graduation.



Ronnie rose rapidly within this company as a senior executive heading global operations and subsequently led several private and public companies with great success.

Being well established in the oil and gas industry and highly respected within the business community in 2005 Ronnie started his own oil company, RKI Exploration & Production. Over the next decade, he successfully grew his oil company and sold RKI Exploration and Production in 2015 in two tranches for a combined 3.5 billion dollars. This transaction, was well publicized, receiving a lot of attention by the press as the 2015 M&A Deal of the Year by the oil & gas industry, . This established

Ronnie not only as a successful oilman and entrepreneur but also a very savvy and smart businessman.

After selling RKI Exploration and Production Ronnie created another oil company, RKI Energy Resources, "to stay active and have purpose" as he put it.

*As reported by his proud brother Behram Irani of Dallas*

Working at his own pace, taking on projects he likes and has a core team he enjoys having around.

Ronnie by nature is an introspective person without much fanfare and publicity. Besides his two companies, he has served on boards of numerous public and private companies, institutions and nonprofit organizations. Throughout his professional career has been very active in philanthropic and civic work, showing his appreciation and giving back to institutions, organizations, communities and people who supported him. In keeping with this ethos, Ronnie is actively involved with universities he attended, the oil and gas industry, his local community, city and state, providing support and serving in leadership positions in various committees and boards.

At OU Ronnie created and funded the Ronnie K Irani Center for Energy Solutions in the College of Engineering and the Ronnie K. Irani Center for Creation of Economic Wealth in the College of Business. At Oklahoma City University, he created the RKI Center for Data Analytics and Artificial Intelligence, working closely with students at all three centers. Encouraging and enabling students to become successful entrepreneurs and leaders has been and continues to be Ronnie's passion. His Honorary Doctorate degrees by OU and OCU are in recognition of his continued commitment, support and industry achievement.

Within the oil and gas industry, Ronnie has received numerous institutional, professional and business awards such as the Trailblazer Award for his lifetime achievements and contributions in the energy industry, the Society of Petroleum Engineers' industry service award and the Oklahoma Independent Petroleum Association's Member of the Year Award. He has served on energy boards and held top leadership positions on several city and state level committees, including the Committee for Sustaining Oklahoma's Energy Resources, the Oklahoma Energy Resources Board, the Oklahoma Petroleum Alliance and Oklahoma Energy Explorers. In 2018 Ronnie was inducted in the Oklahoma Commerce & Industry Hall of Honor and in 2023 he received the Oklahoma Living Legend award from the Oklahoma Geological Foundation.

Ronnie's involvements and accomplishments outside of academia and the oil and gas industry are also noteworthy and equally impressive serving on the OKC Boathouse Foundation (Chairman), the Oklahoma City Community Foundation (Trustee), the Oklahoma Medical Research Foundation and the Oklahoma Hall of Fame to name a few. Earlier this year the Oklahoma Hall of Fame recognized Ronnie with the Oklahoma Legacy award.

Ronnie and his wife Shahnaaz of 40 years, have two lovely daughters Roxanne and Natasha and have adopted Oklahoma as their home state. He is a man of action who has accomplished much and continues to stay very active. Learning about Ronnie, an esteemed member of our community remarked, "a hidden gem in Oklahoma". When discussing this write up, he said: "my hope is that it encourages and motivates our youth to take action by getting involved with causes and projects they are passionate about". Ronnie's leadership, accomplishments and contributions are indeed inspirational, and quietly impacting lives of beneficiaries of his largesse





## BIRTHS

**Tayyabeh Daroowala**, a girl, to Benafsha Shroff and Rohaan Daroowala, granddaughter to Phiroza and Kayomarz Shroff and Rukshana and Sharookh Daroowala in Vancouver, BC on March 10, 2023.

## NAVJOTES

**Kaizad and Jayhan Bhesania**, children of Firdosh and Rushna Bhesania (Redmond, WA), grandchildren of Kersy and Meher Bhesania (Dubai, UAE) and late Burjor and Perviz Patel (Arizona, NV) at Saher Agiary, Mumbai, India on December 21, 2022. (photo right)



**Cyrus and Ariana Rustomji**, children of Fawaz and Pooja Rustomji, grandchildren of Dinaz and Sharokh Rustomji, and Shukla Vig and Late Balkrishan Vij, in Toronto on July 2, 2023

**Livia and Aurelia Phelps**, daughters of Zara Canteenwalla and Fred Phelps, grand daughters of Vahishta and Jambhi Canteenwalla and Vivian and Jim Phelps in Ottawa on July 8, 2023. (photo right)



**Arya Zen Saklatvala Jardeleza**, daughter of Shelley Saklatvala and Jean Pierre Jardeleza, granddaughter of Zerene and Jimmy Saklatvala and Teodolfo and Erlinda Jardeleza, in Montreal on August 12, 2023.

## WEDDINGS

**Zal Divecha**, son of Kemul & Darayus Divecha to **Yasna Kharadi**, daughter of Rohinton (Roy) and Anushka Kharadi in Newmarket, Ontario, Canada on Sunday, May 21, 2023.

## DEATHS

**Homayoun Goshtasbi Ardakani**, mother of Banou, Sohrab Felfeli, Sohaila, grandmother of Anahita, Parisa, Pooya, Abtin, Hormoz, Bauraun, Cyrus, Araz, great grandmother of Bauram, Asha, Aurian, Mauni in Illinois on April 15, 2023. (ZAMC)

**Khodarahm Hormoz Abadi**, husband of Parvin Abadi, father of Arman Abadi on April 21, 2023. (ZAMC)

**Avan Shroff**, 60, daughter of Cawas and Goolu Shroff, sister of Yasmin (Ronny) Kharas (Toronto, ONT), aunt of Vera and Zane Kharas, in Los Angeles, CA on April 30, 2023.

**Kewmars Noshir Bamboat**, 69, husband of Tanaz, father of Jennifer (Birav) Shah, Darius (Khushnaz) Bamboat, grandfather of Sofia, Dilan, Cyrus, brother of Firoza (Yaz) Billimoria in Munster, IN on May 6, 2023.

**Cawas Jehangir Cama**, son of late Dolat and Jehangirji Cama, husband of Nelly (Nergish), father of Tenaz, Sherry, Parizad, father-in-law of Steve Bunt, Anthony Torres, grandfather of Mackenzie Sierra Bunt, Steven Cawas Bunt, Priya Cama Torres, Sebastian Cama Torres, brother of Naval, brother-in-law of Maharukh, uncle of Dilnavaz, Goolshan on May 23, 2023. (ZAGNY)

**Rusi Jal Rustomji**, father of Eruch Rustomji, Kershaw Rustomji, Minnie Rao, grandfather of Yasmin Rustomji, Neville Rustomji, Erick Rustomji, Sohrab Rao, Zayn Rao in Mumbai, India on May 27, 2023. (ZAMC)

**Merwan Irani**, husband of Shahnaz Irani, father of Hormuz Irani, Farah Irani, grandfather of Evan and Cameron Irani in Toronto, ONT on May 29, 2023.

**Daulat Jehanbux Divecha**, 93, wife of Jehanbux (Jangoo) Divecha, daughter of Khodabux and Jerbai Divecha, sister of Goolu, Soli, Bakhtaver, Ruby, Bapuji, and Navaz; aunt of Anaheeta, Farhad, Darayes, Binafshe, Neville, Zemina, Kashmira, Fiona, Sonia and Kevin, passed away in Toronto on 31st May, 2023.

**Parichehr Sarvian**, 94, wife of late Dr. Esfandiar Farkhani, mother of Fariba (Soroush) Farkhani, Roya Mehrfar, Dr. Farzad Farkhani in West Hills, CA on June 3, 2023.

**Dhun Phiroz Chichgar**, wife of late Phiroz Kaikobad Chichgar, daughter-in-law of late Kaikobad Khurshedji Chichgar and late Dhunmai Kaikobad Chichgar, daughter of late Jer and late Jehangir Jesia, mother of Yazdi, mother-in-law of Binaifer, grandmother of Farah (Jatinder), Farhan, great grandmother of Ryan, Armaan, Ahanna, sister-in-law



# Milestones

of late Godrej, Minoo, Eruch, late Gul, late Jer, late Rati and Noshir Framroze Mistry, Homai Dinshaw Ghadially, late Roshan and Dhunjishaw Contractor, sister of Mehru Brijraj Gupta, late Noshir Jesia, sister-in-law of Ruth Noshir Jesia in Queens, NY on June 5, 2023.

**Shirin Dinyarian**, 99, mother of Simin Dehghanian, Syruos, Khodadad, Behrooz and Shahbahram Mehrain on June 6, 2023. (ZSO)

**Khorshed Merwan**, wife of Kersas Merwan, mother of Kaizar, Kerman, mother-in-law of Pearl Panthaky, grandmother of Syrah and Zarah Merwan. (ZSO) on June 10, 2023.

**Meher Mehta**, daughter of Ferdoon and Khorshed Mehta, sister of Firoza and late Adel Engineer (IL), aunt of Jamshed (Kiku) Engineer (IL), Sohrab (Paul Lambert) Engineer, great aunt of Zara and Alea Engineer on June 17, 2023. (ZAMC)

**Zarine Tehmasp Dotivala**, wife of Tehmasp Dotivala, mother of Cyrus Dotivala, Navaz Sethna, mother-in-law of Sam Sethna, Arnaz Dotivala, grandmother of Rukshana, Arzan, Kayomurz, Shanaya in East Brunswick, NJ on June 26, 2023.

**Nazanin Barkhodar**, 38, daughter of Mitra Zartoshty and late Farbod Barkhodar, sister of Roxana Barkhodar in West Hills, CA on May 14, 2023.

**Kaikhosrow Zohoor**, husband of Shirin, father of Armita, Arash, Houman. (ZSO)

**Bahram Zohoor**, husband of Golcher, father of Arvis, Armin. (ZSO)

**Manjulabai Rao**, mother of Murali Rao, Raghu (Suma), Rama (Mohan), mother-in-law of Mani Rao. (ZAMC)



# Matrimonials

Male, 27, MS in Civil engineering from UCLA. working as a senior structural project engineer in a reputed company in LA. Earning 6 figure salary annually. Also, an ordained priest, Currently on an H1-B visa. Enjoys playing Cricket, Tennis, traveling, hiking, and watching movies. 5' 11", average build, fair complexion. Looking for a Parsi girl who is well-educated, career-oriented, caring, responsible, values honesty, and has a positive outlook on life. Someone who is funny and loves to travel and explore new places. If interested please contact rashnapalia65@gmail.com [M23.02]

Male, 45, 5' 5", B.Com., Mumbai. Working in New York, with real estate company in accounts dept. Owns apartment in Bronx, NY. Green card, expects citizenship in 2024. Family in Mumbai (Andheri). Contact vispy.homavazir@gmail.com, 917 242 9596. [M23.08]

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Regards, Zoroastrian Singles Team

FEZANA Journal will coordinate initial contacts between interested parties. We do not assume any responsibility for verifying credentials. Contact Roshan Rivetna at roshanrivetna@gmail.com.





## **DOLLY RUSTOMJI MALVA,**

**February 22, 1940 – April 20, 2023, 83 years**

### **Founding member of Zoroastrian Association of California**

**Dolly** aka Dolla was born in Mumbai in a family of 4 sisters and 1 brother. She attended St Anne's High School. And on graduating, she went to Davar's College of Commerce while working for BEST Company. She studied Business administration, Economics and Accounting, always excelling in Mathematics. She then worked for Bombay Dyeing Co till 1965 when she went to UK to work.



She immigrated to Montreal, Canada in 1966 to join her older sister Ruby who was in Montreal at that time, and for 5 years she worked for British Airways.

In August, 1970 the family made a cross country trip to Downey, California, with their mother and sister Aban from Mumbai in her new car as her sister Zarin was living in California. The trip took three and a half weeks, stopping at places of interest like Grand Canyon, Yosemite, Yellowstone National Park and Las Vegas. In California she worked for six years at the U.S. Envelope Co.

In 1977, she joined The City of Los Angeles, Mayor's Office where she worked for 35 years till her retirement in 2019. At the Mayor's office, she worked for the Community Development Department as a Management Analyst. She took advanced professional training in Management and Public Sector Labor Relations. As technology advanced she took advanced computer training and developed good computer skills.

Dolla was a giving, kind, generous, independent person with very good interpersonal skills and an adventurous spirit, known for arranging "Moonlight Picnics" in Long Beach, CA. Dolla had a lot of self-confidence and self-determination. She was always involved in our community efforts. Last year she suggested to the President of our association, that they should provide more for our aging community.

In 1974 she was one of the founding members of the Zoroastrian Association of California with Roshan Motiwala and Armaity Irani and became the president of the association three times. She did a lot of volunteer work in the community and charity organizations, was the Lead Coordinator for our activities. She enjoyed travelling, going on several cruises with her mother and in the eighties she travelled to Europe on her own, reaching Mumbai after 6 weeks.

She was well loved in the community and will be greatly missed.

May her soul rest in peace.

*Contributed by Rooky Fitter  
President Zoroastrian Association of California*



## *Sarosh J. Collector*

**A Tribute to a Passionate Community Leader - Sept 27, 1847 - July 23, 2023**

**S**arosh Collector was a man of many facets - Altruist, Leader, Philanthropist, and Mentor. A contemplative man by nature, he took family, business, and community to the heart of his existence—deeply optimistic, his pursuits connected communities through public trails and in preserving Zoroastrianism and culture.

An engineer by profession, he chose to switch career paths and became a CPA, where he managed and transformed his company Collector and Dart and was involved in all aspects of the business.

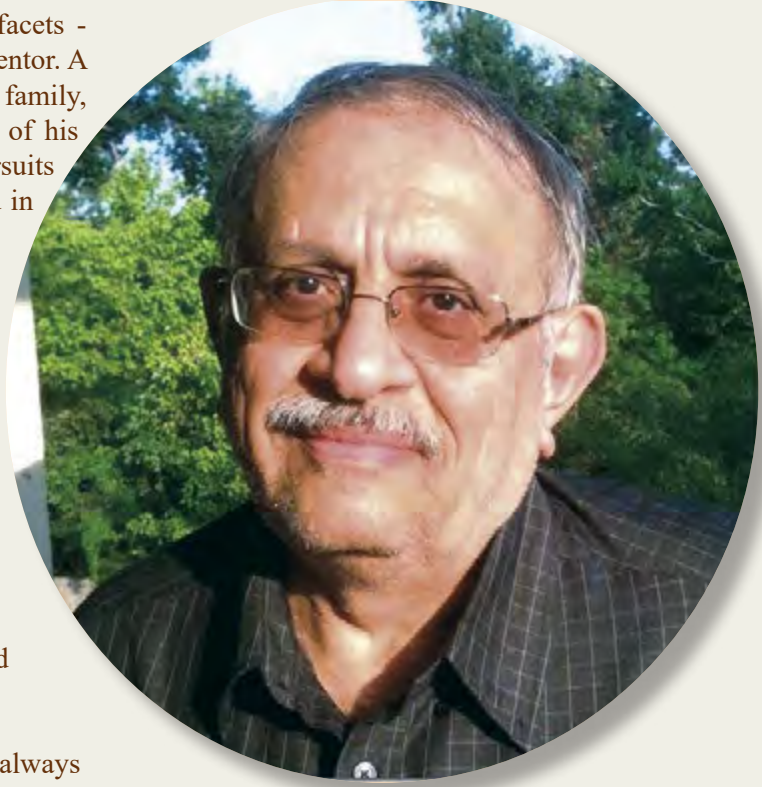
He was ever-involved on many community boards and was instrumental in the early days of forming FEZANA, ZAH, and WZCC.

As a beloved Sunday school teacher, students and parents admired and revered him.

In community planning, he was a visionary, was always at the cutting edge, and was young at heart - no matter his age or health. He planned projects with cognitive maps allowing others to organize and tease out flaws. The landscapes we see locally are visions born from his industriously creative mind.

But it wasn't just his actions that defined Sarosh as a leader; his ability to inspire and empower others truly set him apart. He had an innate talent for bringing people together, encouraging collaboration, and fostering a sense of unity. Sarosh had the remarkable ability to see the potential in every individual and help them realize their capabilities. His guidance and mentorship touched the lives of countless individuals, leaving an indelible mark on their minds and hearts.

But amidst his dedication to his community, Sarosh knew the significance of family and friendship. He was a loving partner, a devoted parent, and a loyal friend. Sarosh's infectious laughter, kind heart, and bellowing loud remarks at AGMs brought joy and



attention to those around him. He had an uncanny ability to make people feel seen, heard, and valued, creating an environment of acceptance and love.

Let us honor Sarosh Collector, this remarkable community leader, by living our lives with the same passion, empathy, and dedication he exhibited. May his memory be a constant reminder that we have the power to make a difference, just as he did.

Dear Sarosh, thank you for the legacy of love and compassion you have left behind.

Dear Pearlina and family, thank you for generously sharing Sarosh with us at ZAH and the North American community.

Aban Rustomji





## Between the Covers

### The Spanish Diplomat's Secret, BY NEV MARCH, Reviewed by Pearl Satarawala Ball

Jim Agnihotri (alias James O'Trey) grimaces as he thinks about the way murder seems to follow him wherever he goes. In Nev March's third novel, *The Spanish Diplomat's Secret*, we find Captain Jim and his Parsi Zoroastrian wife, Lady Diana Framji, aboard the *HMS Etruria*, sailing from New York, New York to Liverpool, England. It's meant to be a pleasure cruise for the young couple but on the second day of the journey, Don Juan Nepomuceno de Burriel is found murdered in the music room of the *Etruria* and Jim finds himself beside the victim.

In Nev March's debut novel, *Murder in Old Bombay*, we are introduced to Jim Agnihotri when he is employed in the Indian Army. We learn about the horrific circumstances which have landed him convalescing in a hospital from a serious head wound. The novel evolves where we find Captain Jim working for the Bombay police and then ending up being hired as a private detective for the esteemed Framji family. Thus begins his career with solving murder and crime.

Ms. March's second novel, *Peril at the Exposition*, transports readers to the United States. Jim has wooed and won the hand of Lady Diana Framji, a shocking development as Jim, a non-Parsi and also an Anglo-Indian, is given the family's blessing. The newlyweds settle in Boston, Massachusetts, while Jim continues his career as a detective for the Dupree Detective Agency. On assignment from the agency, Jim is caught in the middle of deception, conflict and murder at the scene of Chicago's Great World's Fair. Diana has joined in the fray in order to save her husband's life.

It's advantageous to read these novels in sequence because many references are made back and forth to the previous books. Nev March's latest novel, *The Spanish Diplomat's Secret*, takes place in 1894, just one year after

the couple's exploits in Chicago's *Exposition*. Parsi readers will take extra pleasure in the fact that Diana does not lose her connection to Parsi-Zoroastrian heritage, but that each novel shows how her connection to family, the Gujarati language, the *Avestan* prayers and even some Parsi home-spun practices are alive and well. In this latest book, Diana does not disappoint readers as we witness how she, once again, saves her beloved husband's life!

After reading *The Spanish Diplomat's Secret*, I was puzzled by some of the characters and events in the book. I found it helpful to do an internet search to satisfy my curiosity about some historical accuracies. This third novel is inspired by what is called The Virginius Affair of 1873 and some events related to Cuba's resistance to Spain's occupation and the atrocities committed by Spanish sailors in the name of justice. I am always impressed by Nev March's careful research and the way she weaves these historical truths into her stories.

The tender love story between Jim and Diana continues in *The Spanish Diplomat's Secret*. Jim hopes that the journey aboard the ship will ease some tension he feels from his wife. Head over heels in love with her, he is puzzled by times when Diana seems to regress into her own world. Jim blames himself and hopes that Diana will share what is troubling her. But as matters would have it, a murder has occurred, Jim is involved right away at the scene of the crime, and Diana is gladly willing to help.

Murder aboard a ship is intriguing and Jim reflects on Sherlock Holmes' maxim, "You see but you do not observe." He tries to use the wisdom of these words as he searches frantically for clues as to how the murderer has escaped. The obvious facts are that the victim, Don Juan,



was drugged and then propped in front of a mirror and strangled to death. The mirror would have had him witness his own death and also the face of his killer. What kind of person would commit such a violent crime? Is the murderer a man or a woman? How is Jim to flush out this culprit on a ship holding close to a thousand people? The pressure is on him. Captain Hurley assigns Chief Officer Bigby to assist Jim with the search. He stresses that Jim must find the killer before the ship docks in Liverpool in order to avoid an international crisis. Don Juan Nepomuceno was an important Spanish diplomat and also related to the king of Spain; if the crime is not solved before reaching Great Britain, not only would hundreds of passengers be detained, the ship's reputation be destroyed, but political tensions in Spain, Cuba and the United States would be inflamed.

Diana is ever ready to be by her husband's side and her skills as a woman of social status and wealth make Jim's work easier because Diana so easily gains the trust of the affluent first-class passengers. Jim is less

sure of himself with the “*Toffs*.” He is misled and stymied by the lack of cooperation from the passengers. It is as if he’s caught in a maze where each turn puts him at an impasse. He’s faced with passengers who hold back information, others who have secret political agendas and those who hold business deals amongst themselves. Alibis are misleading and relationships between people are mystifying. What makes matters worse is that a suicide occurs when a lady passenger jumps overboard. The crew members are especially alarmed by both the murder and the second death by suicide. They claim there are *djinns* and ghosts haunting the ship. The passengers

whisper amongst themselves wondering what sort of madman could commit such a brutal killing.

Jim is at his wits’ end but Diana is there to calm him. With her assistance, he follows every lead possible while seeking interviews with the various key players associated with Don Juan. He speaks repeatedly with Don Juan’s widow, Josephina. He follows up with Josephina’s attendants Antonia and Armando, he delves deeply into why Officer Bigby is secretive about things, he interviews Mr. Palmer Bly who has been seen conversing with the Don on various occasions, and he seeks to unravel the suicide of Alice Fry who was an attendant of an invalid lady

named Mrs. Barlow. Dora has a story of her own. Not only is she a victim of rape but she is haunted by her friend Alice’s ghost. Jim leaves no stone unturned, all the while exhausted by his efforts and also alarmingly seasick. He has not forgotten his worry about Diana and her periods of sadness.

Nev March has woven a fast-moving mystery filled with intrigue, humor and fascinating information about the relationship among the countries of Cuba, Spain and the United States. Readers have yet another opportunity to fall in love with our heroes Jim and Diana O’Trey.

## HUMAN KIND TRUE STORIES TO RESTORE YOUR FAITH IN HUMANITY

By Shanaya Grant  
ISBN 9798371479662  
Paperback, 175 pgs.  
Price \$14.95. Available on Amazon.  
Review by Roshan Rivetna



**Shanaya Grant** grew up in the suburbs of Chicago. She works for one of the Big 4 Accounting companies as a Management Consultant and currently lives in Chicago.

In the world of today, when on the news, we are mostly fed troubling stories of crime, and war, and violence, “*Human Kind*” is a breath of fresh air .... a collection of about 50 inspirational true short stories to “prove beyond all doubt that people are inherently good and that none of us is too small or too busy to make a difference.”

The short stories (easy-to-read 1 or 2 pages each) range from that of *Rosa’s Fresh Pizza’s* pay-it-forward restaurant in Philadelphia, where customers may buy an extra slice and write a motivational message on a sticky note for someone in need; to that of the homeless man in Boston, who found and returned (to the police station) a visitor’s backpack containing over \$2,000 in cash and \$40,000 in traveler’s checks, who in turn was rewarded with over \$160,000 in a fund-raiser from donations by strangers around the world.

Shanaya Grant was motivated when, approximately 6 years ago, after watching the horror of a mass shooting unfold on TV, she observed that the news media focused all their attention on the perpetrator of the crime, but absolutely nothing on the many people who had risked their lives to save others at this same horrific occurrence. She resolved to write a book about ordinary people doing extraordinary things for mankind.

Shanaya strongly believes the world is a beautiful place filled with good people. To this end, this remarkable young lady has spent countless hours researching over 170 references of news articles and studies, interviewing exceptional individuals, and writing their stories. Her emphasis is that we have choices on how we live our lives – a choice to count our blessings, to find ways to bring happiness to others. We are all capable of creating a positive impact on others in our daily lives – we just have to choose to do so.

This has been a passionate endeavor for Shanaya to show that there are many more good people than bad in this world and to shed some light on the goodness of humankind in a world that increasingly seems to focus on the negative.

As her own act of kindness – besides researching, writing, self-publishing, and financing “*Human Kind*” single-handedly -- Shanaya will be giving **all** proceeds from the book to her favorite charity – St. Jude’s Children’s Hospital.

To get a feel-good feeling, “*Human Kind*” is strongly recommended as a must-read for everyone.



# FEDERATION OF ZOROASTRIAN ASSOCIATIONS OF NORTH AMERICA

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OF ZOROASTRIAN STUDIES  
SOAS  
UNIVERSITY OF LONDON**

AND THE TEAM OF

**Dr. SARAH STEWART**  
(PRINCIPAL INVESTIGATOR)

**Dr. NAZNEEN ENGINEER**  
(PROJECT MANAGER)

**JOE TURTLE**  
(ADMINISTRATOR AND DATA ANALYST)



**GEN Z AND BEYOND:**  
**A SURVEY FOR EVERY GENERATION**





## FOREWORD

Toos Daruvala

How do we Zoroastrians across the globe think of ourselves as Zoroastrians? How do we practice the religion and what are our religious beliefs? What are our social beliefs? What role does the local Zoroastrian community play in our lives - how do we engage with each other in our community spaces? What are our attitudes towards the challenges the community faces? What are our views on controversial social and religious matters e.g., mixed marriages, children of mixed marriages? What are our views on philanthropy? On entrepreneurship? What opportunities do we see, and ideas do we have to strengthen the religion and the community for future generations? How do our views on these questions differ - by geography; by gender; by age?

"**Gen Z and Beyond - A Survey for Every Generation**" was launched to gather data on these questions. It's a first-of-its-kind survey of Zoroastrians -- global, including the major geographies in which the diaspora resides; comprehensive, covering the demographics, behaviors, and attitudes of Zoroastrians; and informative, with a respectable 6% response rate of Zoroastrians over age 18 (~5000 responses globally). The Survey was designed and conducted by the Shapoorji Pallonji Institute of Zoroastrian Studies, SOAS, University of London, a respected, neutral UK based research and educational institution (Principal Investigator Dr. Sarah Stewart, Project Manager Dr. Nazneen Engineer, and Analyst Joe Turtle led the project). Data was collected starting July 1, 2021 over an 18-month period, with another three months for analysis and report compilation.

A survey of this scope and ambition is not without challenges. Foremost was getting people to sign up and complete the questionnaire. Initial sign up was slow, possibly due to "survey fatigue", and different regions posed different challenges. Covid 19 made face-to-face communication difficult. Political unrest in Iran meant the SOAS team were unable to visit and promote the Survey there. But we persevered. The boots-on-the-ground strategy in India proved very effective. Parsi media outlets published materials both to promote the project and to counter articles in Parsi newspapers, which erroneously suggested a biased agenda. In North America we had the active support of FEZANA and the regional associations. We were active on social media and benefited from local Ambassadors and word-of-mouth efforts. We made a short promotional film with support from community leaders, priests, and young enthusiasts.

Where to, from here? We have engaged the global Zoroastrian community, for the first time, to rigorously gather data and hear our disparate voices. These comprehensive data and facts, it is hoped, will lead to insights and ideas to inform, and inspire Zoroastrian communities everywhere to develop future projects that will nurture harmony while strengthening and furthering the well-being of our community and religion.

Read on! A summary of the report follows, authored by Nina Mistry; the full ~200-page report can be found on the website <http://www.genzandbeyond.com>.

## EXECUTIVE SUMMARY

Nina Mistry

“An ounce of information is worth a pound of data, an ounce of knowledge is worth a pound of information, an ounce of understanding is worth a pound of knowledge, and an ounce of wisdom is worth a pound of understanding.” - Russell Ackoff, Professor Emeritus at The Wharton School, University of Pennsylvania. The *Gen Z and Beyond: A Survey for Every Generation*, brings us tremendous information, fact-based data, invaluable knowledge, in-depth understanding, and the collective wisdom of approximately 5,000 respondents!

This global online Survey was completely anonymous. It was available in English, Gujarati, and Farsi, to participants 18-years and older. One of the unique features of this survey was that it was open to participants with two Zoroastrian parents, a Zoroastrian mother or father, a Zoroastrian grandparent, and / or a Zoroastrian spouse. For clarity, these categories were analyzed separately from respondents with two Zoroastrian parents.

Why does this information, data, knowledge, understanding, and wisdom matter? The answer lies in finding solutions to the challenges and much-debated issues faced by the community. At the very least, the Survey has generated an academically grounded repository of knowledge about the community. Insights from the Survey results enable us to compare Zoroastrian populations world-wide with reference to demographic, behavioral, attitudinal, and aspirational data. This in turn should jump start a dialogue amongst Zoroastrians globally, especially the younger generation, to discuss their feelings and opinions on matters relating to the community and religion.

Diminishing numbers of the Zoroastrian population world-wide is at the front and center of any discussion on the religion. A “small and aging population” was perceived by most respondents as one of the greatest threats to the Zoroastrian religion and identity. Overall, an aging population coupled with a replacement fertility rate below 1 in India is a significant contributing factor to the declining population numbers. This means that the reproductive rate would have to increase by at least 20% just to maintain the current population level. Data from the Survey tells us that only about two-thirds of the respondents had children, and just a little over half of these had two children. While respondents in North America were more likely to have two or more children, possibly causing population numbers to trend upwards in the diaspora, they were not high enough to offset the decline in global numbers. Further, data revealed that the likelihood of having children at a young age was very low and the trend of respondents having only one child consistently across all age groups in South Asia, defeated the initiatives to boost the birth rate. This, compounded with a high level of late or non-marriage exacerbates the problem of fewer children being born which perpetuates a threat to the Zoroastrian religion and identity.

Marriage is an important social and religious duty for many Zoroastrians, but it is also a very controversial subject within the community due to the rise in intermarriage. Survey data tells us that there is a preference to find a Zoroastrian partner, especially amongst the 18-25-year-olds, but nearly half of the respondents in that age group were already in relationships with non-Zoroastrians. Unsurprisingly, this preference diminished with age. Both these factors combine to result in increasing intermarriage rates and a decline of the two-Zoroastrian parent population. The data also indicates that not only is there a rise in intermarriage, but there is a rise in the acceptance of intermarriage, and the acceptance of children of intermarried Zoroastrians, especially in the diaspora.

People’s views on intermarriage and gender are important factors in shaping their sense of identity as Zoroastrians and have a bearing on community discourse. The difference in attitudes towards intermarried Zoroastrian men relative to intermarried Zoroastrian women, when it comes to acceptance of intermarriage and the children of intermarriage, is another cause for debate within the community.



Data from the Survey indicates that women were more likely than men to accept both intermarried Zoroastrian men and women and their children. While less than 6% of the total respondents that participated in the Survey were born of one Zoroastrian parent, interestingly, of these, respondents with a Zoroastrian mother were only about half the number of respondents with a Zoroastrian father.

With respect to raising their children as Zoroastrians, a third of the intermarried respondents were not interested and about 30% of respondents with a sole Zoroastrian parent had not undergone the navjote ceremony. This raised some concern about the loss of transmission of culture and religion due to intermarriage. Additional analysis indicated that respondents with a sole Zoroastrian mother and a sole Zoroastrian father were equally likely to be raised as a Zoroastrian in North America while respondents with a sole Zoroastrian father only were more likely to be raised as a Zoroastrian in South Asia. However, this is not guaranteed to continue in the future since nearly 20% of respondents with a sole Zoroastrian father in South Asia were not raised as a Zoroastrian. An eye-opening finding is that almost a fifth of all the respondents with a Zoroastrian father said that they learnt about the religion from their non-Zoroastrian mother. It is evident that the Survey holds valuable and extensive factual data on the hot button topics of intermarriage and children of intermarried Zoroastrians.

Entrepreneurship is something that has been championed by Zoroastrians in the past and which, combined with philanthropy, is a characteristic for which the community is well known. 16.4% of respondents said they were entrepreneurs which interestingly is consistent with the entrepreneurship rate in the United States, where 16% of the adult workforce are entrepreneurs. An additional sizeable number of respondents said they would like to or may consider becoming an entrepreneur. However, one of the main obstacles identified by respondents across all age groups was “Funding and finances”, with over 70% of respondents aged 18-45 seeing this as the foremost issue when attempting to start a business. One of the most interesting findings related to philanthropy, was that 72.5% of respondents gave to both Zoroastrian and non-Zoroastrian causes, indicating that they are well integrated into their local communities. This supports the idea that Zoroastrians adapt well to new circumstances and different host communities. They are not torn between their birthplace or place of nationality and current place of residence. Instead, they embrace both and as a result are more likely and willing to contribute to societies where they feel that they belong.

Data showed a socially mobile, highly educated population that identified the following factors to be the most significant in strengthening the community: “Teaching the next generation about Zoroastrian religion and culture” (49.1%), “Education - youth, vocational, scientific, higher education, retraining” (13.2%), and “Entrepreneurship - adding economic, social, and intellectual value to the community” (11.3%). It can be seen from these responses that there is a sharp drop in opinions between the first and second factors, underpinning the perception that to maintain a sense of Zoroastrian identity, people need to learn more about their religion and culture.

In addition to the Summary Report that follows, the Survey includes a lot of additional useful insights that cover education, employment, language, domestic life, migration, religious and cultural beliefs, observances, and practices, priesthood, and socio-religious and ethnic identities, to name a few.

This Survey should be considered a first step in a journey for us to understand our community, develop our strategic priorities, and create outcomes that may further the well-being of our religion and our community as Zoroastrians. We hope that each reader will take something from this body of work that will inform their choices.



# GEN Z AND BEYOND: A SURVEY FOR EVERY GENERATION

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KEY TAKEAWAYS  
FROM THE SURVEY RESULTS

JULY 2023

NINA MISTRY

(WITH INPUT FROM TOOS DARUVALA, EDUL DAVER, DINYAR DEVITRE, AND ARZAN SAM WADIA)





## INTRODUCTION

This **SURVEY** is a privately sponsored research project undertaken by SOAS (University of London), led by Dr. Sarah Stewart, Shapoorji Pallonji Institute of Zoroastrian Studies.

### **DURATION:**

July 1, 2021, to April 19, 2023 – An 18-month survey period with a 3-month period for data analysis and report writing.

### **AIM:**

- Gather, provide, and analyze data to inform Zoroastrian communities worldwide on the key topics of –
  - demographics,
  - practice of religion,
  - attitudes towards challenges, and
  - internal debates on social, religious, and economic issues.
- Apply Survey results to help guide initiatives, policy, and support decision-making by community leaders.
- Serve as a valuable archive for future research.

### **RESPONSES:**

One of the unique features of this survey was that it was open to people with two Zoroastrian parents, a Zoroastrian mother or father, a Zoroastrian grandparent, and / or a Zoroastrian spouse. Data from each category was analyzed separately.

There were 4,893 valid responses out of a total 5,003 responses from –

- 4,481 respondents with two Zoroastrian parents,
- 289 respondents with one Zoroastrian parent,
- 19 respondents with one Zoroastrian grandparent, and
- 104 respondents with a Zoroastrian spouse.

### **FOCUS:**

Focus was on regions with largest responses from Zoroastrian populations –

- South Asia (2,379 respondents).
- North America (1,449 respondents).

# CHAPTER 1

## FAMILY



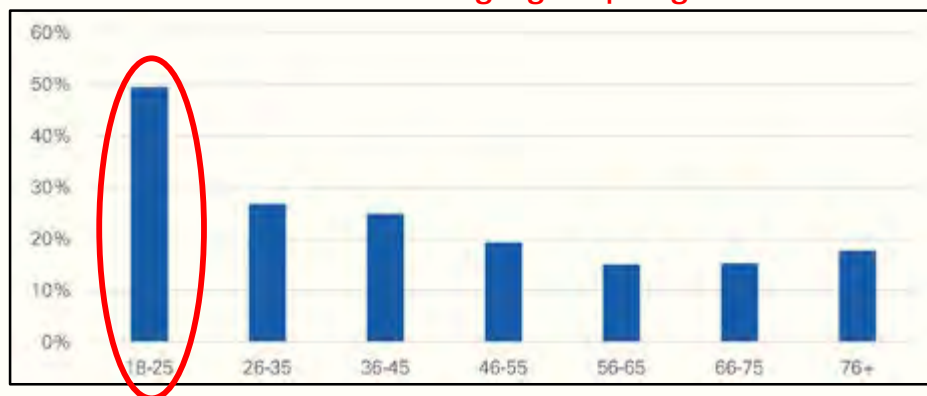
## CRITICAL FACTORS:

A notable change in the pattern of traditional family life potentially deprives families of the benefits of an extended family where family members assist with the upbringing of the young as well as with the care of aging parents/relatives. While the resultant loss of transmission of culture and language is a contributing factor, the greatest threat to the Zoroastrian religion is its diminishing numbers caused by:

- Low Birth Rate: Replacement Fertility Rate is only 0.8.
- Aging population: 31% of Parsis in India are over age 60.
- Unmarried Population: 30% of Parsis in India have never married.
- Rising inter-marriage rate:
  - 1991: South Asia - 19% ; North America - 24%
  - 2010: South Asia - 38% ; North America - 59%
  - Currently: 20.4% of Survey respondents have non-Zoroastrian partners (similar percentages for men and women).

## RESPONDENTS WITH A NON-ZOROASTRIAN PARTNER, BY AGE

**KEY TAKEAWAY: 18-25 age group highest at 49.5%**



## RESPONDENTS WITH A NON-ZOROASTRIAN PARTNER, BY REGION

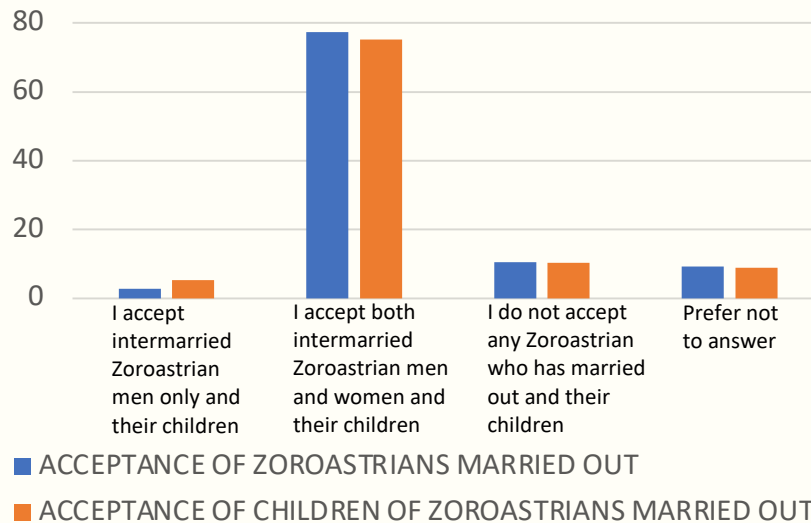
**KEY TAKEAWAY: Non-Zoroastrian partners in North America 31.3% vs South Asia 10.6%**

	Australasia (N=200)	Europe (N=31)	Iran (N=10)	Middle East (N=58)	North America (N=1034)	South Asia (N=1636)	South East Asia (N=40)	United Kingdom (N=175)	Rest of the world (N=7)
Zoroastrian	82.5%	35.5%	100.0%	87.9%	68.1%	87.5%	55.0%	60.0%	57.1%
Non-Zoroastrian	16.0%	64.5%	0.0%	12.1%	31.3%	10.6%	45.0%	38.9%	42.9%
Mixed-heritage	1.5%	0.0%	0.0%	0.0%	0.6%	2.0%	0.0%	1.1%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

## ACCEPTANCE OF INTERMARRIED ZOROASTRIANS:

### ACCEPTANCE OF ZOROASTRIANS MARRIED OUT AND THEIR CHILDREN

**KEY TAKEAWAY:** Overall acceptance levels indicate that more than 75% of respondents accepted intermarried Zoroastrian men and women and their children. These acceptance levels did not vary greatly by age.



## ACCEPTANCE OF ZOROASTRIANS MARRIED OUT, BY REGION

**KEY TAKEAWAY:** Significant difference in acceptance North America 91.6% vs South Asia 65.3%.

	Australasia (N=239)	Europe (N=44)	Iran (N=19)	Middle East (N=66)	North America (N=1231)	South Asia (N=2131)	South East Asia (N=44)	United Kingdom (N=215)	Rest of the world (N=10)
I accept intermarried Zoroastrian men only	0.8%	0.0%	0.0%	1.5%	1.6%	4.3%	0.0%	0.9%	0.0%
I accept both intermarried Zoroastrian men and women	88.7%	88.6%	78.9%	84.8%	91.6%	65.3%	93.2%	92.1%	100.0%
I do not accept any Zoroastrian who has married out	6.3%	2.3%	15.8%	4.5%	3.3%	16.7%	0.0%	3.7%	0.0%
Prefer not to answer	4.2%	9.1%	5.3%	9.1%	3.4%	13.7%	6.8%	3.3%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

## ACCEPTANCE OF CHILDREN OF ZOROASTRIANS MARRIED OUT, BY REGION

**KEY TAKEAWAY:** Significant difference in acceptance North America 90.9% vs South Asia 62.2%.

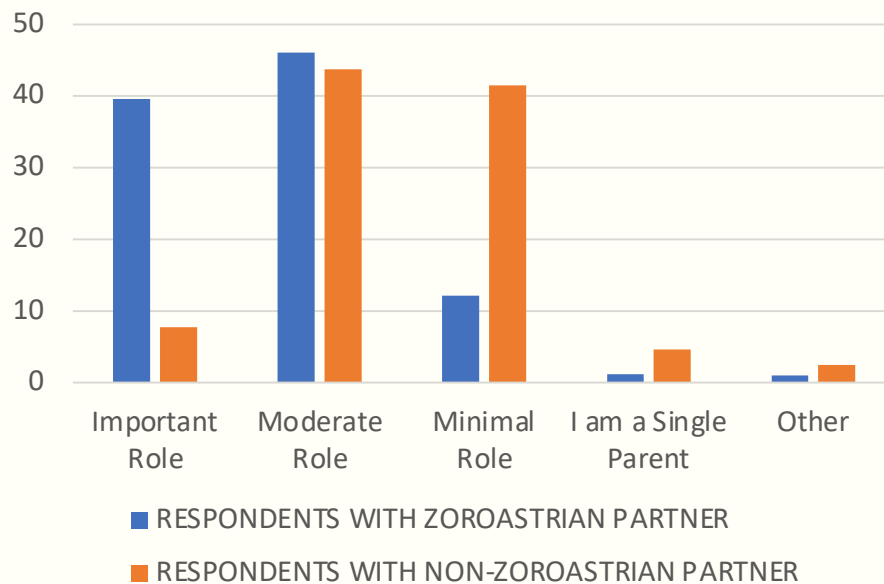
	Australasia (N=240)	Europe (N=44)	Iran (N=19)	Middle East (N=66)	North America (N=1230)	South Asia (N=2128)	South East Asia (N=44)	United Kingdom (N=215)	Rest of the world (N=10)
I accept the children of intermarried Zoroastrian men only	4.2%	0.0%	0.0%	3.0%	2.6%	7.8%	2.3%	2.8%	0.0%
I accept the children of both intermarried Zoroastrian men and women	84.6%	86.4%	84.2%	80.3%	90.9%	62.2%	93.2%	89.8%	100.0%
I do not accept any children of intermarriage	6.3%	6.8%	5.3%	4.5%	3.5%	16.4%	0.0%	4.2%	0.0%
Prefer not to answer	5.0%	6.8%	10.5%	12.1%	3.0%	13.6%	4.5%	3.3%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%



## UPBRINGING OF CHILDREN:

### RESPONDENTS WITH BOTH ZOROASTRIAN PARTNERS AND ONE ZOROASTRIAN PARTNER

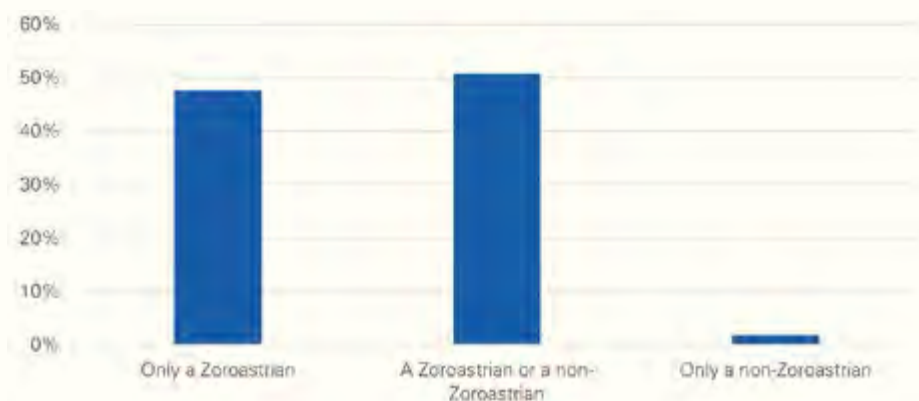
**KEY TAKEAWAY:** Role in upbringing of children is significantly different. More dominant role when both parents were Zoroastrian, and interestingly, when the father is Zoroastrian, the non-Zoroastrian mother plays an equally important role in the religious and cultural upbringing of the children.



## PREFERENCE WHEN LOOKING FOR A PARTNER:

### RESPONDENTS PREFERENCE FOR A PARTNER

**KEY TAKEAWAY:** 52.8% of respondents in the 26-35 age group desire a Zoroastrian partner. As age increases, the preference for a Zoroastrian partner decreases.



## NOTEWORTHY NUMBERS:

- **The reproductive rate would have to rise by 20%** simply to maintain the current population level. To quote demographer Chandra Shekar (1948, p. 88), who has studied the Parsi Zoroastrian population in India (where majority of the demographic studies have been undertaken), “The future of the community can be read in its demographic trends.”
- **Acceptance of intermarriage in the diaspora has risen to 91% and that of children of intermarried Zoroastrians to 89% compared to Hinnells’ (2005) study.** Marriage is an important social and religious duty for many Zoroastrians, but it is also a very controversial subject within the community due to the community’s demographic decline and the rise in intermarriage.
- **The likelihood of having children is 69% in the 36-45 age group, and 80% (highest) in the over 45 age group.** The likelihood of having children at a young age is very low. In South Asia, the trend of having only one child remained consistent across all age groups.
- **34% of intermarried Zoroastrians were not raising or did not intend to raise their children as Zoroastrian, compared to 5% of Zoroastrians married within the community.** *Region* did not impact these numbers as intermarried Zoroastrians in North America and South Asia were equally likely to raise their children as Zoroastrian (69.6% vs 68.9%). Furthermore, *gender* did not impact these numbers significantly as intermarried women were only slightly less likely to raise their children as Zoroastrian than men (63.3% vs 68.8%). However, with respect to *age*, 21.7% of intermarried 26-35-year-olds were not raising their children as Zoroastrian, compared to 63.6% of intermarried 76+ year-olds who had not raised them as Zoroastrian indicating that the younger generation were indeed committed to the preservation of the religion.
- **26% of women over age 66 live alone compared to 11% of men in the same age group.** Data from the Survey suggests that this may be because women were generally more likely to outlive their partners.

Inevitably, the way in which Zoroastrianism is lived and practiced has evolved differently within families and within each region. We wonder about the loss, if any, of transmission of culture and language especially in ‘transnational relationships’, where the older generation is in the country of origin and parents and children have migrated, as well as in the case of intermarriage where the older generation can play a crucial role.

## CHAPTER 2

# ONE ZOROASTRIAN PARENT, GRANDPARENT, OR SPOUSE



**CRITICAL FACTORS:**

The issue of intermarriage is observed to be a contentious subject within community discourse. The large increase in intermarriage makes it a more visible target for the community’s concerns. To be better informed on the issue, this Survey was open to people with a Zoroastrian mother or father, a Zoroastrian grandparent, and / or a Zoroastrian spouse. This unique feature of the Survey provides insights from –

- 104 non-Zoroastrian respondents with a Zoroastrian spouse.
- 101 respondents with a Zoroastrian mother, and
- 188 respondents with a Zoroastrian father.

To provide clarity, these categories have been analyzed separately from the rest of our respondents having two Zoroastrian parents.

**RESPONDENTS WITH ONE ZOROASTRIAN PARENT, BY REGION**

**KEY TAKEAWAY:** There were more respondents with Zoroastrian mothers in North America 33.6% vs South Asia 22.7%.

	Australasia (N=10)	Europe (N=12)	Iran (N=2)	Middle East (N=1)	North America (N=107)	South Asia (N=88)	South East Asia (N=3)	United Kingdom (N=30)	Rest of the world (N=4)
Mother	60.0%	58.3%	50.0%	0.0%	33.6%	22.7%	33.3%	40.0%	50.0%
Father	40.0%	41.7%	50.0%	100.0%	66.4%	77.3%	66.7%	60.0%	50.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

**RESPONDENTS RAISED AS A ZOROASTRIAN IN INTERMARRIED FAMILIES**

**KEY TAKEAWAY:** Respondents in North America were equally likely to have been raised as a Zoroastrian whether they had a Zoroastrian mother (75.0%) or father (75.0%), while respondents in South Asia, were more likely to have been raised as a Zoroastrian if they had a Zoroastrian father (81.7%) than if they had a Zoroastrian mother (55.6%). Data suggests that children of Zoroastrian fathers were most likely to be raised as a Zoroastrian in South Asia where patrilineal social norms were more faithfully practiced.

**NORTH AMERICA**

	Mother (N=32)	Father (N=68)	Total (N=100)
Yes	75.0%	75.0%	75.0%
No	25.0%	25.0%	25.0%
Total	100.0%	100.0%	100.0%

**SOUTH ASIA**

	Mother (N=18)	Father (N=60)	Total (N=78)
Yes	55.6%	81.7%	75.6%
No	44.4%	18.3%	24.4%
Total	100.0%	100.0%	100.0%

## ETHNICITY OF RESPONDENTS' CURRENT/PREVIOUS PARTNER

**KEY TAKEAWAY:** Respondents with Zoroastrian mothers were more likely to have non-Zoroastrian partners (79.3%) vs respondents with Zoroastrian fathers (56.1%).

	Mother (N=58)	Father (N=107)	Total (N=165)
Zarthoshty / Iranian Zoroastrian	3.4%	8.4%	6.7%
Irani (descendant of Zoroastrian settlers who migrated to India from approximately the 18th century onwards, living in India or the wider diaspora)	0.0%	2.8%	1.8%
Parsi Zoroastrian (descendant of Zoroastrian settlers who migrated to India from approximately the 10th century onwards, living in India or the wider diaspora)	10.3%	28.0%	21.8%
Mixed-heritage (person with one parent who is Zarthoshty / Iranian Zoroastrian or Irani or Parsi and one parent who is not)	6.9%	4.7%	5.5%
Non-Zoroastrian	79.3%	56.1%	64.2%
Total	100.0%	100.0%	100.0%

## DID YOU RAISE, OR WILL YOU RAISE YOUR CHILDREN AS ZOROASTRIAN?

**KEY TAKEAWAY:** Only 63.2% said "Yes".

	Mother (N=90)	Father (N=165)	Total (N=255)
Yes	54.2%	68.6%	63.2%
No	45.8%	31.4%	36.8%
Total	100.0%	100.0%	100.0%

**IN YOUR OPINION, WHAT ARE THE GREATEST THREATS TO THE ZOROASTRIAN RELIGION AND THE IRANIAN / PARSI / IRANI ETHNOCULTURAL IDENTITY? BY WHICH OF YOUR PARENTS ARE ZOROASTRIAN?**

**KEY TAKEAWAY:** The #1 factor (64.9%) identified was the “Unwillingness to reform issues of intermarriage and fully accept the children of intermarried Zoroastrian men and women”. Acceptance rate – Zoroastrian mother 77.3% vs Zoroastrian father 58.3%.

The #2 factor (62.2%) identified was the “Small, aging population”. Respondents with Zoroastrian mothers were more likely to say that the greatest threats facing the community were different rules in different Associations and Trusts (18.2% vs 7.4%) and infighting in the community (27.3% vs 23.3%), while respondents with Zoroastrian fathers were more likely to say that the lack of knowledge and understanding about the religion and rituals (29.4% vs 17.0%) and marrying later in life or not marrying at all (19.6% vs 10.2%) were the greatest threats facing the community. (Respondents were able to select up to three responses, hence total percentages are greater than 100%).

	Mother (N=88)	Father (N=163)	Total (N=251)
Small, ageing population	63.6%	61.3%	62.2%
Lack of knowledge and understanding about the religion and rituals	17.0%	29.4%	25.1%
Lack of respect for the authority of priesthood	0.0%	7.4%	4.8%
Different rules in different associations and trusts	18.2%	7.4%	11.2%
Migration to the West and the influence of Western culture	6.8%	9.8%	8.8%
Loss of entrepreneurial spirit	2.3%	2.5%	2.4%
Unwillingness to reform issues of intermarriage and fully accept the children of intermarried Zoroastrian men and women	77.3%	58.3%	64.9%
Apathetic and lethargic population	8.0%	5.5%	6.4%
Marrying later in life or not marrying at all	10.2%	19.6%	16.3%
Marrying outside the community	8.0%	10.4%	9.6%
Parents not passing down religious traditions to children	15.9%	19.0%	17.9%
Increase in atheism / agnosticism / non-religion	5.7%	8.6%	7.6%
In-fighting in the community	27.3%	23.3%	24.7%
Other	3.4%	2.5%	2.8%



## NOTEWORTHY NUMBERS:

- Respondents with a Zoroastrian father were more likely to be raised as a Zoroastrian than those with a Zoroastrian mother (76.0% vs 63.7%).
- 29.6% of respondents with a sole Zoroastrian parent had not undergone their navjote ceremony. *Region* did not impact respondents who had a Zoroastrian mother since they were similarly likely to have undergone a navjote ceremony in North America or South Asia (57.6% vs 57.9%). However, a regional difference was noted in respondents with a Zoroastrian father who were far more likely to have undergone a navjote ceremony in South Asia than those in North America (96.9% vs 70.4%). This is not guaranteed to continue in the future as nearly 20% of respondents in South Asia with a sole Zoroastrian father were not raised as a Zoroastrian. *Gender* significantly impacts initiation into the faith as respondents with Zoroastrian fathers were much more likely to have undergone a navjote ceremony than those with Zoroastrian mothers (82.6% vs 46.7%).
- 19.7% of respondents with Zoroastrian fathers learnt about the Zoroastrian religion from their non-Zoroastrian mother. This meant that it was the mother, whether Zoroastrian or not, who played an important role in the Zoroastrian religious and cultural upbringing of their children compared to non-Zoroastrian fathers who played a minimal role.
- 67.4% of non-Zoroastrian spouses were very or moderately integrated into the local community. Those that were not or were minimally involved stated the primary reason for non-participation was that they lived too far away (59.3%).

The single most action cited by 53.2% of respondents to strengthen the community was to teach the next generation about Zoroastrian religion and culture – a call to action to improve the religious and cultural understanding of what it means to be a Zoroastrian and rethink the current approach to teaching the culture and tenets of our religion.

**CHAPTER 3**

**IDENTITY AND INTERACTION**

## CRITICAL FACTORS:

A dynamic transformation in Zoroastrian identity, varying by region, gender, and age, was noted. Data collected about “Expressions of Identity” i.e., the ways in which people identify with and connect to their culture and environment, as well as “Interaction and Involvement”, i.e., their attachment to the community, indicates that –

- There is a conservative-liberal divide in terms of the importance of the epics “Qisseh-ye Sanjan” and “Shahnameh”, as well as a lack of knowledge about them amongst the youth population.
- Respondents felt most at home and experienced feelings of belonging in their place of residence, though a third of these respondents reported multiple places of belonging suggesting that people still felt a connection to places of birth and nationality even after they had migrated.
- Relationships between Parsis were seen in a more positive light than between Iranian Zoroastrians and Parsis, especially in the diaspora.
- Levels of gender discrimination felt by women within the Zoroastrian community were similar in North America and South Asia.

## HOW IMPORTANT ARE “QISSEH-YE SANJAN” AND “SHAHNAMEH” TO YOUR CULTURAL AND RELIGIOUS IDENTITY?

### “QISSEH-YE SANJAN”

**KEY TAKEAWAY: North America 63.5% vs South Asia 79.5%.**

	Australasia (N=216)	Europe (N=38)	Iran (N=13)	Middle East (N=58)	North America (N=1042)	South Asia (N=1922)	South East Asia (N=38)	United Kingdom (N=188)	Rest of the world (N=9)
Most important	17.1%	0.0%	23.1%	13.8%	9.9%	25.3%	7.9%	13.3%	11.1%
Important	48.6%	63.2%	46.2%	56.9%	53.6%	54.2%	34.2%	50.0%	55.6%
Not important	34.3%	36.8%	30.8%	29.3%	36.6%	20.6%	57.9%	36.7%	33.3%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

### “SHAHNAMEH”

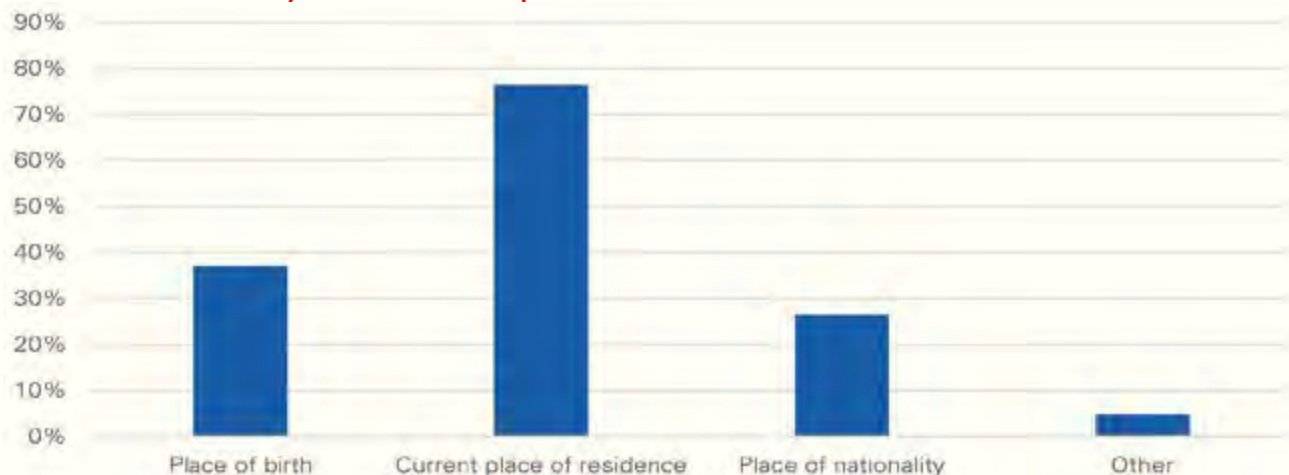
**KEY TAKEAWAY: North America 51.5% vs South Asia 72.0%.**

	Australasia (N=176)	Europe (N=31)	Iran (N=19)	Middle East (N=44)	North America (N=966)	South Asia (N=1572)	South East Asia (N=31)	United Kingdom (N=165)	Rest of the world (N=5)
Most important	13.6%	0.0%	68.4%	11.4%	7.6%	21.8%	9.7%	9.7%	20.0%
Important	43.8%	35.5%	31.6%	36.4%	43.9%	50.2%	32.3%	40.6%	40.0%
Not important	42.6%	64.5%	0.0%	52.3%	48.6%	28.0%	58.1%	49.7%	40.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%



**WHERE DO YOU CONSIDER YOUR “HOME”?**

**KEY TAKEAWAY:** Respondents were able to select multiple responses, revealing that many had a multi-faceted view of belonging. Of the 1,198 respondents who chose current place of residence, 30.8% also chose place of birth and 22.0% also chose place of nationality. This supports the idea that people do not seem torn between their birthplace or place of nationality and current place of residence but embraced both.



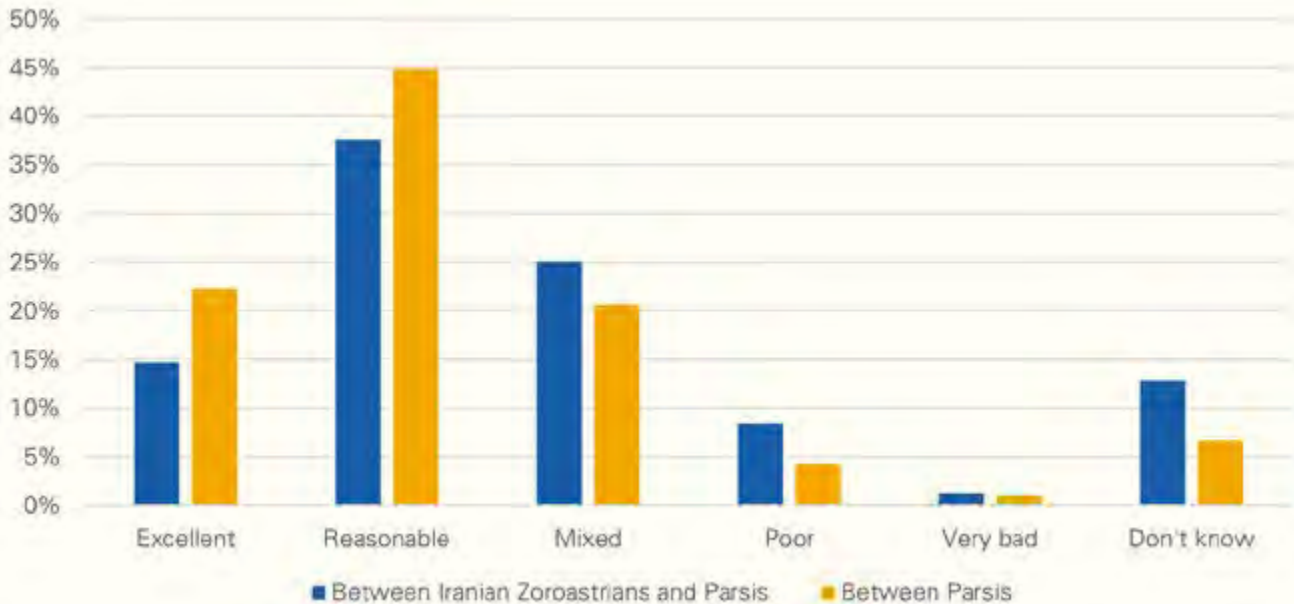
**WHERE DO YOU CONSIDER YOUR “HOME”? BY REGION**

**KEY TAKEAWAY:** Respondents who had migrated and lived in North America were much more likely to feel at home in their current place of residence than those who had migrated and lived in South Asia (78.5% vs 63.4%). Migrant respondents whose parents had not migrated were more likely to feel at home in their place of birth (41.7% vs 28.2%) compared to respondents whose parents had migrated. Men and women were equally likely to feel at home in their current place of residence (76.8% vs 76.0%).

	Australasia (N=194)	Europe (N=32)	Iran (N=6)	Middle East (N=20)	North America (N=910)	South Asia (N=145)	South East Asia (N=28)	United Kingdom (N=145)	Rest of the world (N=5)
Place of birth	32.0%	53.1%	33.3%	55.0%	37.3%	36.6%	39.3%	42.1%	40.0%
Current place of residence	79.9%	75.0%	33.3%	55.0%	78.5%	63.4%	89.3%	72.4%	60.0%
Place of nationality	24.7%	34.4%	33.3%	40.0%	25.9%	22.1%	25.0%	33.8%	40.0%
Other	4.1%	6.3%	0.0%	0.0%	4.1%	9.7%	3.6%	4.8%	20.0%

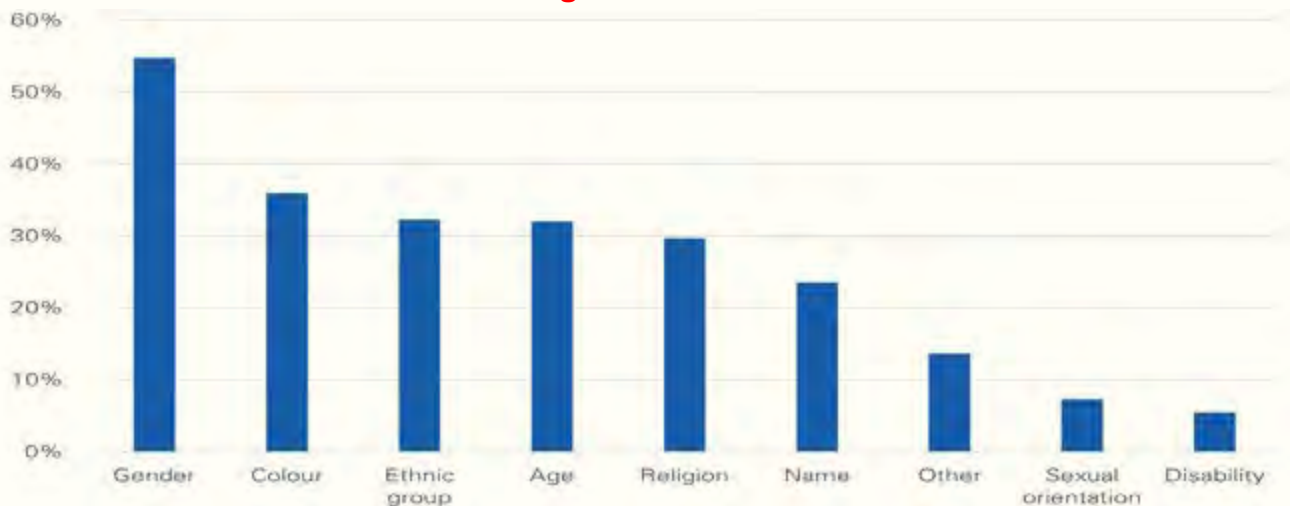
## HOW WOULD YOU DESCRIBE INTRA-COMMUNITY RELATIONS AS THEY ARE IN PRACTICE IN THE COMMUNITY?

**KEY TAKEAWAY:** Respondents in South Asia were much more likely than those in North America to view the relationship between Iranian Zoroastrians and Parsis as excellent (20.9% vs 7.5%), while respondents in North America were more likely than those in South Asia to view the relationship as mixed (29.7% vs 21.7%).



## HAVE YOU EVER FACED DISCRIMINATION? IF SO, FOR WHAT REASONS? BY RESPONDENTS WHO EXPERIENCED DISCRIMINATION WITHIN THE ZOROASTRIAN COMMUNITY.

**KEY TAKEAWAY:** Although 66.2% of respondents didn't feel discriminated against in any place or context, discrimination due to gender is the center of much debate within the community. 11.6% of respondents perceived discrimination due to their gender, 92.4% of whom were women.



## NOTEWORTHY NUMBERS:

- No academic research has been done on the Zoroastrian LGBTQ+ community and 92.1% of respondents stated that they were straight or heterosexual. **Respondents were generally open about their sexual orientation with family, friends, and even their workplaces, but only 22.5% were completely open with the wider Zoroastrian community.** *Region:* Respondents in South Asia were more likely than those in North America to be completely open with the Zoroastrian community (26.8% vs 17.8%), but equally likely (48.8% vs 46.7%) not to be open at all. *Gender:* Women were more likely than men to say they were not open at all with family (38.5% vs 25.5%) as well as with the Zoroastrian community (57.7% vs 45.5%).
- **Of the 105 women respondents who said that they experienced gender discrimination at a Zoroastrian place of worship / religious setting, only 52.0% had a non-Zoroastrian spouse or partner.** This meant that women respondents who were single (27.6%) or in a relationship with a Zoroastrian (41.3%) also experienced gender discrimination in a Zoroastrian place of worship / religious setting. *Region:* **Data suggests that gender discrimination felt by women at a Zoroastrian place of worship / religious setting was similar in North America and South Asia (22.7% vs 25.2%).** Younger female respondents were more likely than older female respondents to say they perceived gender discrimination at a Zoroastrian place of worship / religious setting, which suggests that discrimination against women has not diminished over time.
- **Respondents in North America were more likely than those in South Asia to always participate in activities and events organized by the local Zoroastrian community (18.0% vs 12.5%).** Two-third of these respondents participated to create a sense of belonging and to celebrate / preserve their roots and heritage. Those who participated but did not enjoy said it was because they did not know anyone and felt left out. Younger respondents were more likely to respond in this manner, as well as cite lack of time and distance to events.

People are more likely and willing to contribute to societies where they feel that they belong. While most respondents were well integrated in their host communities, the Survey presents valuable data for local leadership of Zoroastrian communities to reflect on what will engage their members, which age-appropriate activities will appeal most and how best to reach different age groups through relevant print / social media channels.



**CHAPTER 4**

**RELIGIOUS BELIEFS AND PRACTICES**

**CRITICAL FACTORS:**

Only respondents who have two Zoroastrian parents and have undergone a navjote ceremony (99%) are considered for this section. Their responses indicate that –

- 91.8% of respondents considered themselves practicing or semi-practicing Zoroastrians.
- 75.2% of respondents across all age groups were taught the religion (prayers, ceremonies, rituals) as a child by their mother, 31.4% by a priest who would be primarily responsible for teaching navjote prayers, or 28.6% by a teacher at a group / community religion class.
- Overall, 11.8% of respondents had a full understanding of the meaning of the prayers that they recited, while 18.9% had no understanding. Most respondents had some (27.7%) or basic (28.0%) understanding of the meaning of Zoroastrian prayers.
- Zoroastrian rituals and practices were very or quite important to 58.4% of respondents, and while 66.4% of respondents (older age groups) did the kustī ritual daily, 11.0% never did it.
- There is only one priestly training school left in the world, the Dadar Athornan Institute in Mumbai, which offers “religious as well as secular education to children of the priestly class and train[s] them to be good priests who can be spiritual guides.”

**DO YOU CONSIDER YOURSELF A PRACTISING OR PARTIALLY PRACTISING ZOROASTRIAN? BY REGION**

**KEY TAKEAWAY:** North America 89.7% vs South Asia 94.4%.

Practice was high across all age groups, but it was lowest among the youngest age group (88.8% for 18-25-year-olds). There were no variations in religious identity due to gender.

	Australasia (N=243)	Europe (N=45)	Iran (N=22)	Middle East (N=70)	North America (N=1258)	South Asia (N=2199)	South East Asia (N=43)	United Kingdom (N=222)	Rest of the world (N=11)
Yes	91.8%	73.3%	77.3%	92.9%	89.7%	94.4%	93.0%	83.8%	81.8%
No	8.2%	26.7%	22.7%	7.1%	10.3%	5.6%	7.0%	16.2%	18.2%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

## WHO TAUGHT YOU ABOUT THE ZOROASTRIAN RELIGION (PRAYERS, CEREMONIES, RITUALS) AS A CHILD? BY AGE

**KEY TAKEAWAY:** “Mother” dominated all age groups. However, role of father and grandparents increased with the younger age group indicating a recent trend and increased family involvement in religious education.

	18-25 (N=421)	26-35 (N=760)	36-45 (N=723)	46-55 (N=736)	56-65 (N=697)	66-75 (N=636)	76+ (N=337)
Mother	81.2%	77.8%	78.7%	71.6%	72.5%	72.6%	72.1%
Father	72.7%	66.3%	61.3%	55.4%	47.5%	47.2%	49.0%
A grandparent or other family member	67.0%	57.8%	60.2%	46.2%	34.9%	30.8%	32.3%
Zoroastrian friend	13.8%	9.7%	9.8%	7.6%	6.9%	4.4%	3.3%
Teacher at group / community religion classes	38.7%	38.0%	33.7%	28.8%	23.0%	17.0%	16.3%
A Mobed / Priest or Mobedyar / Behdin Pasbaan / Assistant Priest	38.5%	35.9%	28.9%	27.7%	27.8%	34.4%	27.3%
Self-taught	8.8%	8.9%	13.0%	13.6%	16.5%	13.4%	15.1%
I was never taught or learnt the prayers	0.5%	0.3%	0.6%	0.5%	0.7%	0.6%	0.9%
Not applicable	0.5%	0.4%	0.3%	0.1%	0.3%	0.2%	0.0%
Other	0.5%	0.8%	1.1%	1.4%	1.0%	1.4%	2.4%

## DO YOU UNDERSTAND THE MEANING OF ZOROASTRIAN PRAYERS?

**KEY TAKEAWAY:** Respondents answering “Yes” and “Mostly” were generally less than / around 25% across all regions, except Iran with 40%.

	Australasia (N=243)	Europe (N=44)	Iran (N=22)	Middle East (N=70)	North America (N=1246)	South Asia (N=2173)	South East Asia (N=44)	United Kingdom (N=222)	Rest of the world (N=11)
Yes	6.2%	2.3%	4.5%	10.0%	9.2%	15.1%	2.3%	5.9%	27.3%
Mostly	9.9%	9.1%	36.4%	8.6%	14.8%	12.9%	13.6%	14.4%	0.0%
Some	25.5%	15.9%	36.4%	35.7%	28.8%	27.4%	27.3%	28.8%	18.2%
Basics	37.0%	34.1%	22.7%	24.3%	29.9%	25.4%	27.3%	30.2%	45.5%
None	21.4%	38.6%	0.0%	21.4%	17.2%	19.2%	29.5%	20.7%	9.1%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%



## HOW IMPORTANT ARE ZOROASTRIAN RELIGIOUS AND CULTURAL RITUALS AND PRACTICES TO YOU? BY REGION

**KEY TAKEAWAY:** Zoroastrian rituals and practices were very or quite important to 58.4% of respondents, varying by region - North America 49.6% vs South Asia 65.7%.

	Australasia (N=243)	Europe (N=44)	Iran (N=22)	Middle East (N=68)	North America (N=1243)	South Asia (N=2168)	South East Asia (N=44)	United Kingdom (N=222)	Rest of the world (N=11)	Total (N=4065)
Very important	23.0%	22.7%	50.0%	39.7%	22.6%	36.5%	18.2%	18.9%	27.3%	30.3%
Quite important	31.3%	25.0%	13.6%	25.0%	27.0%	29.2%	29.5%	30.2%	27.3%	28.5%
Moderately important	22.6%	34.1%	22.7%	20.6%	29.6%	22.4%	31.8%	23.4%	18.2%	24.9%
Slightly important	15.6%	15.9%	13.6%	13.2%	15.5%	7.6%	18.2%	18.5%	18.2%	11.5%
Not at all important	7.4%	2.3%	0.0%	1.5%	5.3%	4.3%	2.3%	9.0%	9.1%	4.9%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

## HOW WOULD YOU DESCRIBE YOUR SOCIO-RELIGIOUS IDENTITY? BY ARE YOU FROM A PRIESTLY FAMILY? \*

**KEY TAKEAWAY:** "Moderate" and "Liberal" responses comprised over 80% for all respondent categories. Interesting to note that respondents who were born into a priestly family were less likely to be conservative (11.3%) than those who married into a priestly family (17.4%) or those who were married into a behdin / layman family (16.7%).

	Yes - I was born into a priestly family (N=885)	Yes - I married into a priestly family (N=178)	No - I was born a behdin / layman (N=2624)	No - I married into a behdin / layman family (N=132)
Conservative	11.3%	17.4%	9.2%	16.7%
Moderate	43.7%	47.8%	45.1%	49.2%
Liberal	44.2%	33.1%	44.4%	33.3%
Other	0.8%	1.7%	1.2%	0.8%
Total	100.0%	100.0%	100.0%	100.0%

**\* RELEVANT SIDE NOTE:** There appears to be a shortage of full-time priests, especially in India. The Survey asked priests why they did not work as full-time priests in a fire temple or place of worship. 47.8% said that they were not interested as priesthood did not receive the respect and financial remuneration they felt was deserved.

## NOTEWORTHY NUMBERS:

- Only 4.6% of respondents worshipped in a fire temple daily and 15.0% worshipped only on special days / occasions, while 30.7% worshipped whenever they had access to a fire temple, suggesting that proximity to the fire temple was associated with regular worship. This also suggests that there is insufficient attendance to support numerous fire temples.
- Purity laws were observed by 48.6% of respondents, while 40.8% said they did not observe any purity laws, and 10.6% said they were not aware of any purity laws. Observance was much higher in South Asia (58.5%) and Australasia (45.6%) compared to North America (35.6%) - overall observance levels were higher than anticipated across all regions.
- 49.5% of respondents preferred dokhmeneshni (in theory if not practice), 38.3% preferred cremation and 6.9% preferred burial. Interestingly, 55.1% of 18-25- year-olds were much more likely to prefer dokhmeneshni compared to 58.1% of 76+ year-olds who were much more likely to prefer cremation. Those aged 36-45 were the most likely to prefer dokhmeneshni (57.4%). Also, interesting to note is that this pattern remains the same for North America and South Asia - 59.2% of respondents in North America preferred cremation compared to 67.3% of respondents in South Asia who preferred dokhmeneshni.
- The UK and Europe had the highest levels of respondents who did not celebrate religious festivals (19.6% and 25.0% respectively).
- Younger respondents were more likely to believe that a navjote ceremony was necessary for both a Zoroastrian religious and ethnocultural identity than older respondents, who were more likely to believe that the navjote ceremony was only necessary for a Zoroastrian religious identity.
- 39.4% of respondents held the traditional Zoroastrian belief that the soul is judged on the fourth day after death and goes to heaven or hell before the final judgement at the end of time.
- 33.4% of respondents said the opinion of priests was most important in religious disputes, while 34.7% said not applicable, indicating that over a third of the respondents chose not to get involved.

# CHAPTER 5

## ASPIRATIONS



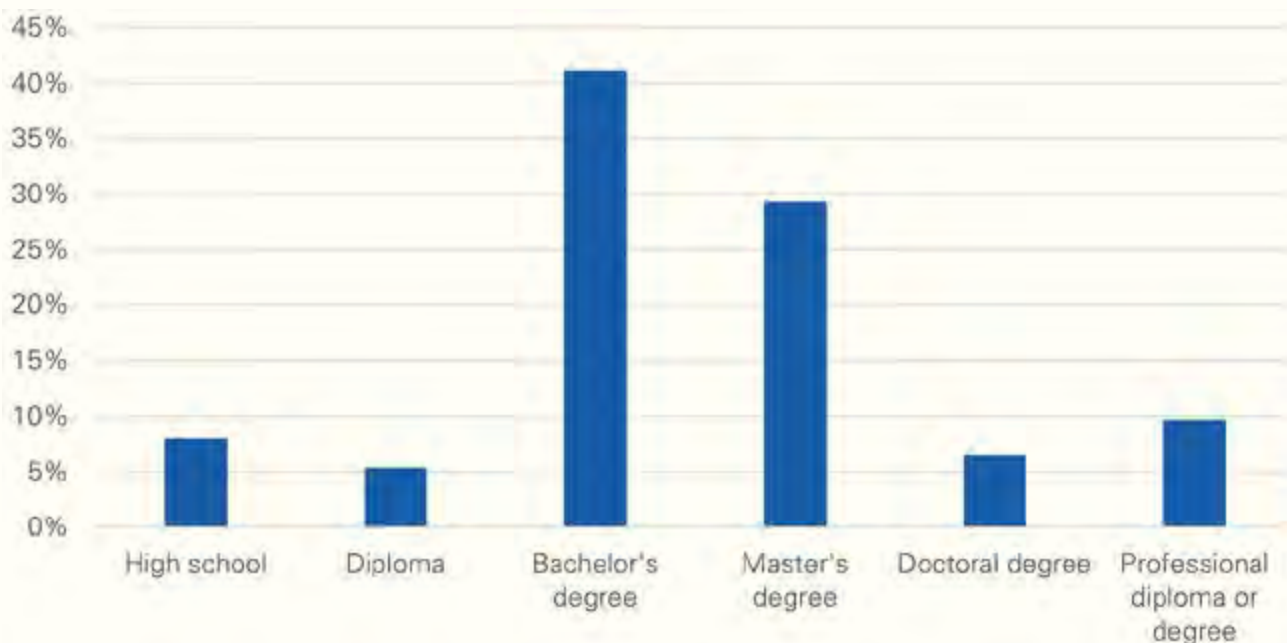
## CRITICAL FACTORS:

Data from responses in previous chapters helped describe what is going on in the community today. Here, the data covers respondents' aspirations for education and employment, and their views on entrepreneurship and philanthropy. The data also explores what they feel are the threats and challenges the community is faced with, as well as what they want for the future, and what they feel can be done to strengthen the future of our community -

- While higher education levels have been high amongst Zoroastrians, this has increased even more for recent generations, resulting in low unemployment levels across all age groups and across both North America and South Asia.
- Majority of respondents were practicing or partially practicing the religion regardless of education level. However, higher levels of education corresponded to less strongly held beliefs and fewer religious practices.
- 16.4% of all respondents (similar rates of 16.9% in North America and 15.6% in South Asia) said they were entrepreneurs (this is consistent with the entrepreneurship rate in the United States, where 16% of the adult workforce are entrepreneurs).
- 72.5% of people support both Zoroastrian and non-Zoroastrian philanthropic causes, 12.5% give to non-Zoroastrian causes alone and only 9.1% give to Zoroastrian causes alone. It is worth noting that compared to those who felt most at home in their place of birth or place of nationality, respondents who felt most at home in their current place of residence were most likely to regularly volunteer time (30.4%) and donate in kind (36.0%).
- The three greatest perceived threats to the community were –
  - “Small, aging population” (59.5%),
  - “Unwillingness to reform issues of intermarriage and fully accept the children of intermarried Zoroastrian men and women” (45.1%), and
  - “Lack of knowledge and understanding about the religion and rituals” (35.6%).
- “Teaching the next generation about Zoroastrian religion and culture” was by far the #1 response to how to strengthen the future of the community. Respondents in North America considered teaching the next generation to be the most significant factor over respondents in South Asia (54.6% vs 45.7%). South Asian respondents considered entrepreneurship to be a more significant factor over those in North America (14.1% vs 7.7%).

**WHAT IS YOUR HIGHEST ACADEMIC / VOCATIONAL QUALIFICATION?**

**KEY TAKEAWAY:** Education and employment are important social metrics for the Zoroastrian community. An impressive 35.8% of respondents have a Master’s and Doctoral degree (49.2% of respondents in North America v/s 27.5% in South Asia, compared to 15.1% in the United States generally).



**ARE YOU AN ENTREPRENEUR?**

**KEY TAKEAWAY:** 16.4% of respondents said they were entrepreneurs. There is a narrow margin between 16.9% respondents in North America and 15.6% in South Asia (consistent with entrepreneurship rates in the United States at 16%). Despite higher rates of education amongst Zoroastrians resulting in good jobs (which deters risk taking), the data indicates a healthy appetite for entrepreneurship within the community. 22.9% of respondents aged 46-55 were entrepreneurs compared to only 5.0% of those aged 18-25. 61.4% of respondents who were entrepreneurs were men and 38.6% were women. Commerce and Leisure as well as Business and Finance were the top two fields, combined at 44.7%.

	Australasia (N=244)	Europe (N=46)	Iran (N=22)	Middle East (N=70)	North America (N=1263)	South Asia (N=2212)	South East Asia (N=44)	United Kingdom (N=222)	Rest of the world (N=11)
Yes	19.3%	21.7%	13.6%	10.0%	16.9%	15.6%	20.5%	15.8%	27.3%
No	80.7%	78.3%	86.4%	90.0%	83.1%	84.4%	79.5%	84.2%	72.7%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

## WOULD YOU BE INTERESTED IN BECOMING AN ENTREPRENEUR AND STARTING YOUR OWN BUSINESS? BY AGE

**KEY TAKEAWAY:** Overall, although 47.5% of respondents said “No”, a sizeable 29.1% said “Maybe” and a significant 23.4% said “Yes”. A closer look indicated that over one quarter to a third of the respondents aged 18 to 55 said “Yes” and over a third across these age groups consistently said “Maybe”. It behooves the community to facilitate this aspiration. However, looking at the data by region, 26.6% of respondents in South Asia and 57.9% in Iran said “Yes”, compared to North America which was the lowest at 17.5% (attributable to the higher rates of education and employment discussed in the previous Key Takeaway).

	18-25 (N=402)	26-35 (N=662)	36-45 (N=578)	46-55 (N=567)	56-65 (N=558)	66-75 (N=537)	76+ (N=297)	Total (N=3601)
Yes	34.8%	35.8%	31.0%	26.3%	15.2%	8.2%	2.7%	23.4%
No	27.6%	30.5%	36.0%	39.0%	55.9%	75.4%	84.8%	47.5%
Maybe	37.6%	33.7%	33.0%	34.7%	28.9%	16.4%	12.5%	29.1%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

## WHAT ARE THE MAIN CHALLENGES TO YOU BECOMING AN ENTREPRENEUR? BY AGE

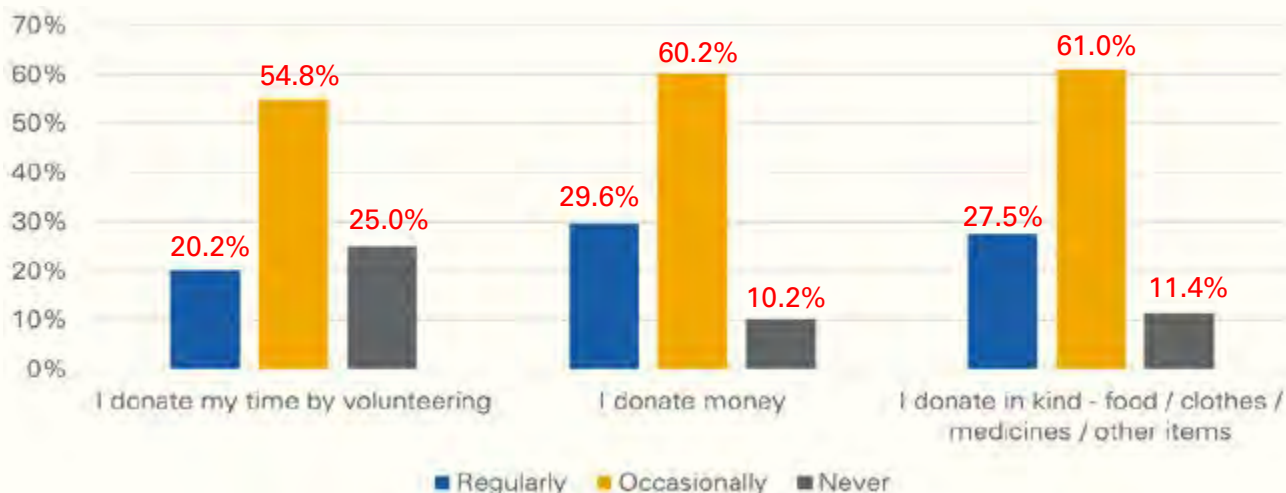
**KEY TAKEAWAY:** “Funding and finances” was identified as the primary obstacle by respondents who are entrepreneurs, and it continues to be identified as the main challenge to entrepreneurship across all regions, and ages (respondents were able to pick more than one challenge).

	18-25 (N=279)	26-35 (N=457)	36-45 (N=366)	46-55 (N=342)	56-65 (N=243)	66-75 (N=131)	76+ (N=45)	Total (N=1863)
Funding and finances	76.3%	77.7%	74.3%	67.5%	60.5%	49.6%	42.2%	69.9%
Knowledge and resources	62.0%	60.2%	55.2%	50.9%	46.1%	45.0%	13.3%	53.7%
Lack of confidence / Fear of failure	46.2%	50.5%	47.3%	48.2%	34.2%	28.2%	8.9%	44.1%
Lack of mentorship or guidance	54.1%	49.0%	39.6%	42.1%	36.2%	27.5%	20.0%	42.8%
Risks of setting up alone	47.3%	51.9%	53.0%	52.0%	43.2%	34.4%	31.1%	48.6%
Gender discrimination	12.2%	5.3%	2.2%	3.2%	0.4%	1.5%	0.0%	4.3%
Age discrimination	12.5%	2.6%	4.4%	7.9%	16.5%	27.5%	35.6%	9.8%
Ethnic discrimination	8.6%	5.7%	3.3%	2.6%	3.3%	1.5%	6.7%	4.5%
Other	6.1%	3.7%	4.9%	5.6%	4.1%	6.9%	17.8%	5.3%



### DO YOU SUPPORT PHILANTHROPIC CAUSES?

**KEY TAKEAWAY:** To understand how people practice philanthropy, respondents were asked about three ways in which they give: time, money and donating in kind. Older respondents were more likely to volunteer their time, donate money or donate in kind, than younger respondents. Women were slightly more likely than men to volunteer their time regularly (21.7% vs 18.4%) or to give money regularly (30.8% vs 28.3%) and were much more likely to donate in kind (31.7% vs 23.0%). Respondents in North America were more likely to volunteer time regularly than those in South Asia (29.2% vs 13.4%), money (41.9% vs 20.6%) and donate in kind (35.5% vs 22.4%). Further, respondents who were entrepreneurs donated more regularly than non-entrepreneurs: time (32.5% vs 17.7%), money (37.5% vs 28.2%), and donating in kind (35.0% vs 26.0%), indicating that entrepreneurs are more likely to be philanthropic (possibly due to higher disposable income) and be invested in the community.



### WHAT TYPE OF PHILANTHROPIC CAUSES DO YOU DONATE TO / ARE YOU INVOLVED IN?

**KEY TAKEAWAY:** 72.5% of respondents give to both Zoroastrian and non-Zoroastrian causes, an indicator that they are well integrated into their host / local communities across all regions.

	Australasia (N=242)	Europe (N=43)	Iran (N=19)	Middle East (N=66)	North America (N=1224)	South Asia (N=2102)	South East Asia (N=44)	United Kingdom (N=217)	Rest of the world (N=10)
Zoroastrian causes	6.2%	7.0%	15.8%	10.6%	4.8%	12.4%	2.3%	6.0%	0.0%
Non-Zoroastrian causes	18.2%	20.9%	0.0%	1.5%	18.1%	6.7%	27.3%	28.1%	40.0%
<b>Both</b>	<b>70.7%</b>	<b>65.1%</b>	<b>73.7%</b>	<b>83.3%</b>	<b>74.1%</b>	<b>72.8%</b>	<b>65.9%</b>	<b>61.8%</b>	<b>60.0%</b>
Neither	5.0%	7.0%	10.5%	4.5%	2.9%	8.1%	4.5%	4.1%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

## IN YOUR OPINION, WHAT ARE THE GREATEST THREATS TO THE ZOROASTRIAN RELIGION AND THE IRANIAN / PARSI / IRANI ETHNOCULTURAL IDENTITY?

**KEY TAKEAWAY:** Almost 60% of respondents stated that the small and aging population of the community presents the greatest threat to our religion and identity. In second place, 45.1% of respondents stated, “Unwillingness to reform issues of intermarriage and fully accept the children of intermarried Zoroastrian men and women.” We previously noted in Chapter 2 when analyzing responses from respondents with one Zoroastrian parent, a Zoroastrian grandparent, and / or a Zoroastrian spouse, that 77.3% of respondents with a Zoroastrian mother and 58.3% with a Zoroastrian father cited “Unwillingness to reform issues of intermarriage and fully accept the children of intermarried Zoroastrian men and women” as the greatest threat facing the community.

Responses (Select up to 3 responses)	Percentage of respondents	
Small, ageing population	59.5%	(N=2459)
Unwillingness to reform issues of intermarriage and fully accept the children of intermarried Zoroastrian men and women	45.1%	(N=1864)
Lack of knowledge and understanding about the religion and rituals	35.6%	(N=1472)
In-fighting in the community	29.2%	(N=1206)
Marrying later in life or not marrying at all	22.3%	(N=923)
Marrying outside the community	21.5%	(N=887)
Parents not passing down religious traditions to children	14.0%	(N=579)
Migration to the West and the influence of Western culture	13.2%	(N=545)
Different rules in different associations and trusts	11.2%	(N=462)
Apathetic and lethargic population	9.5%	(N=393)
Lack of respect for the authority of priesthood	7.8%	(N=324)
Loss of entrepreneurial spirit	5.7%	(N=237)
Increase in atheism / agnosticism / non-religion	4.9%	(N=202)
Other	2.9%	(N=121)

Just over one third of the respondents here identified “Lack of knowledge and understanding about the religion and rituals” as a threat to our religion. When asked in a subsequent question about what they would consider to be the most significant in strengthening the future of the community, interestingly respondents honed-in on one factor that correlated directly to this threat ahead of the other two major threats identified by them here – see outcomes presented in the next data table.

## WHICH OF THE FOLLOWING FACTORS DO YOU CONSIDER THE MOST SIGNIFICANT IN STRENGTHENING THE FUTURE OF THE COMMUNITY?

**KEY TAKEAWAY:** The single most important action to strengthen the community (by far) cited by respondents was to improve the religious and cultural understanding and teaching of what it means to be a Zoroastrian. This is an urgent call to fundamentally rethink and upgrade the approach to teaching the culture and tenets of the religion.

Responses (Select one response)	Percentage of respondents	
Teaching the next generation about Zoroastrian religion and culture	49.1%	(N=2012)
Education – youth, vocational, scientific, higher education, retraining	13.2%	(N=541)
Entrepreneurship – adding economic, social and intellectual value to the community	11.3%	(N=463)
Being more outward looking and engaged with global issues such as climate change, migration and infectious diseases	9.1%	(N=373)
Giving back - helping social causes, education / scholarship, other	7.7%	(N=316)
Other	5.4%	(N=220)
Care for the elderly - providing resources and programmes	4.2%	(N=172)
Total	100%	(N=4097)

## A DEEPER LOOK AT RESPONSES TO THE SAME QUESTION ANALYZED BY AGE INDICATES THIS IS THE #1 IDENTIFIED NEED BY ALL AGE GROUPS.

	18-25 (N=392)	26-35 (N=710)	36-45 (N=671)	46-55 (N=701)	56-65 (N=682)	66-75 (N=615)	76+ (N=326)
Teaching the next generation about Zoroastrian religion and culture	48.2%	51.1%	51.4%	49.4%	46.2%	46.7%	51.2%
Education	17.9%	13.1%	12.7%	10.6%	14.1%	12.4%	14.4%
Entrepreneurship	12.5%	11.1%	10.6%	13.0%	12.0%	11.5%	6.1%
Being more outward looking and engaged with global issues	7.7%	8.2%	8.2%	8.7%	10.9%	8.9%	12.3%
Giving back	6.9%	8.6%	7.0%	8.0%	8.1%	7.8%	6.7%
Other	4.8%	5.4%	7.0%	6.1%	5.0%	4.6%	3.4%
Care for the elderly	2.0%	2.5%	3.1%	4.3%	3.8%	8.1%	5.8%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%



## NOTEWORTHY NUMBERS:

- **Business and Finance was the most popular field of work for respondents at 23.4%** while Law the least popular at 3%, and STEM (science, technology, engineering, and mathematics) and manufacturing was popular with 15.1% of respondents.
- **More women obtained Bachelor's degrees than men (45.9% vs 36.4%), but more men obtained Post Graduate degrees (49.7% vs 41.6%).** This dispels conventional wisdom that Zoroastrian women are more educated than men.
- Top five reasons respondents cited for migration (respondents were able to choose up to three reasons for migration):
  1. **Higher studies was listed #1 by respondents who had a Master's or Doctoral degree.**
  2. Better standard of living.
  3. Work opportunities.
  4. To be with Spouse / Partner.
  5. Children's education and future.
- **Self-employed respondents had the most job satisfaction at 57.9%** with Homemakers coming in high at 51.9%, possibly because these positions require people to answer to themselves.
- **78% of respondents had never applied for financial assistance for further education such as college / university from a Zoroastrian Trust or Association.** From amongst those that did apply, only about 10% were rejected in North America and South Asia.
- Top five topics respondents were interested in learning about –
  1. **Zoroastrian rituals and their significance was listed #1 by 50.3% of respondents.**
  2. Parsi / Irani history 49.2%.
  3. Zoroastrian philosophy and ethics 47.8% .
  4. Zoroastrian scripture and their meaning 43.4%.
  5. The Shahnameh 40.7%.

Data showed a socially mobile, highly educated population who are becoming more highly educated. Views on their aspirations for the future shared through this Survey would be valuable for community leaders to initiate a global dialogue amongst Zoroastrians, especially the younger generation, to understand their ideas about strengthening and furthering the well-being of the community.

*“If you do not know where you want to go,  
any road will get you there.”  
- Alice in Wonderland*

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*All data collected will be stored in perpetuity in the UK Data Archive. The data can be accessed by persons with a genuine interest, upon providing their contact information.*

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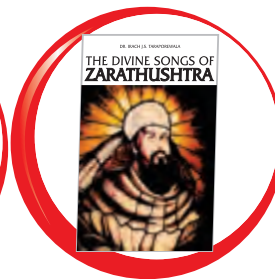
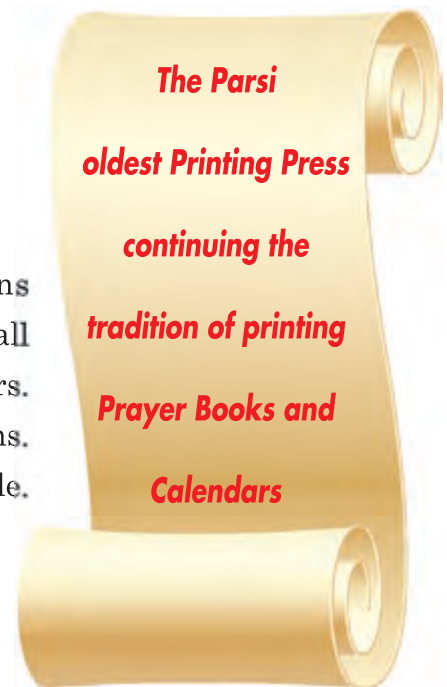


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