Dr. Bimla Buti

(19.9.1933 – 24.2.2024)

The first woman fellow of INSA in physical sciences

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A highly acclaimed plasma physicist of international repute, who was invited by Dr. Vikram Sarabhai himself to join as faculty at PRL went on to establish strong theoretical and experimental research group in plasma physics. Later, this great scientist established the Institute for Plasma Research under the Department of Atomic Energy. She is none other than Bimla Buti!

During partition in 1947, little Bimla's family had to move to India. She was 13 or 14. "The first thing my father wanted to do was get me and my two nieces admission to some school. The one that we could get into was the government-run school for children who had migrated from Pakistan. Unfortunately, that school had no science, though mathematics was my favourite subject." recalled Prof. Bimla about her schooling.

Her father was a gold medallist in mathematics from Punjab University. He mentored and nurtured the interests of his daughter who had lost her mother earlier. After schooling, she was eager to take up science and mathematics when she entered college.

"At this stage I opted for the physics, chemistry, mathematics combination rather than biology for the simple reason that I was scared of cutting open frogs, maybe because I am a vegetarian. My sister's husband, a medical doctor, tried hard to persuade me to study medicine, but my father encouraged me to pursue the career of my choice. I did not enjoy chemistry but did like physics, probably because of my interest in applied mathematics. I considered going into engineering but for that I would have had to go out of Delhi. Neither my family nor I liked this idea. This, probably, was the reason I chose Physics (Hons.) at Delhi University."

After finishing her M.Sc., she received a fellowship from the government of India to go abroad for PhD at University of Chicago. Bimla had the privilege of working with Nobel Laureate Prof S.Chandrasekhar, whom she revered

as her guru! "Besides my father who moulded me during my early years, it was my Guru Chandra whose training had an indelible effect on my professional life later on. The virtues instilled in me in childhood, like self-reliance, the confidence to face all kinds of situations and the courage not to bow to unjust pressure, were strengthened by my association with Chandra. I always spoke my mind fearlessly, and most of my seniors did not like this."

Prof. Chandrasekhar had worked in many diverse fields. He would work in one field and after doing a thorough job in it, he would write a book and then move on to a different field. At the time when Bimla joined his research team, his field of interest was magneto-hydrodynamics and plasma physics. So she chose to specialise in plasma physics and worked on relativistic plasmas for her thesis.

She developed many models and then applied them to problems in the astrophysical realm as well as laboratory plasmas. Using the techniques of nonlinear dynamics, she interpreted many observed phenomena in terms of nonlinear, turbulent and chaotic plasma processes. After obtaining Ph.D. in 1962, she returned to India and started teaching at Delhi University for two years. At this stage, Buti's academic career took her back and forth between India and the US. Again, she decided to work as a resident research associate of the National Academy of Sciences, at the Goddard Space Flight Centre, NASA. There she was associated with the theoretical division headed by plasma physicist T. G. Northrop. For the sake of doing full justice to work and to focus on her professional commitments, she decided not to marry.

She returned to India and joined as a senior scientific officer at the Department of Physics, Indian Institute of Technology Delhi (IITD). It is during this period that Prof. Chandra was invited by the then Prime Minister Indira Gandhi to deliver the Nehru Memorial Lecture. As his student, Bimla Buti was also invited to the banquet dinner that followed, where she got a chance to meet many dignitaries.

"I met Prof. Sarabhai for the first time. Right then and there, he invited me to work at the Physical Research Laboratory (PRL) of which he was the Director. This is how I joined PRL, and spent twenty-three years of my professional life. The research atmosphere at PRL was quite different from that at IIT and Delhi University. Sarabhai did not believe in vertical hierarchy, and he gave full freedom and responsibilities to the scientists. We managed to establish a very strong group in plasma physics at PRL".

She initiated and founded the Plasma Science Society of India. While at PRL, she had opportunities to visit and work at other NASA centres, like the Ames Research Centre and the Jet Propulsion Laboratory (JPL), California, for longer durations. Besides visiting NASA Centres, she also worked at the University of California, Los Angeles, from 1986 to 1987.

She was the Director of the plasma physics division at the International Centre for Theoretical Physics (ICTP), Italy, for nearly two decades from 1985. She provided platforms for a large number of scientists from many developing and developed countries to interact and exchange ideas.

Prof.Bimla Buti was the first Indian woman Physicist Fellow of INSA in 1981 and The Academy of

Sciences of the Developing World (TWAS) in 1990, when it had only a handful of Indian Fellows. She was also elected as fellow of the National Academy of Sciences (NAS), the American Physical Society (APS).

At the same time, it was not an easy path that Dr.Bimala traversed as a woman scientist in a man-dominated field. Even to get nominated for fellowships and awards was very challenging. "Differential gender treatment was apparent when the Director of PRL was to be chosen in the mid-1980s. Invariably, I had to face the jealousy of my male colleagues.

Awards

- 1977 Vikram Sarabhai Award for Planetary Sciences
- 1993 Jawaharlal Nehru Birth Centenary Lectureship award
- 1994 Vainu Bappu International Award in Astrophysics
- 1996 Lifetime Achievement award of the University of Chicago

Career highlights

- **1992-93** - Founder President the Plasma Science Society of India
- **1977-83** - Associate Editor of IEEE Transactions on Plasma Science, USA
- **1988-91** as its Vice President
- **1991-94** President, Commission 49, International Astronomical Union

"We have to work hard to bring about some changes in society, namely to convince people that family responsibilities should be shared by men and women. And in my opinion, women themselves have to take strong initiative to convince their families and themselves that they can and should be able to pursue careers in science" said Buti about her thoughts on shrinking the gender gap.

After retirement, she started the **Buti Foundation to reduce the gender bias in STEM, to promote education, advancement of knowledge and computer literacy and strives to help the public connect with science**. The purpose is to increase interactions between natural and social scientists, and between scientists and non-scientists.

"Am trying to use the foundation and its four centres to talk to the administrators and policymakers and tell them we have got to do things to encourage women scientists," she said.

Her father's life was her motivation. "Professionally he was a lawyer, but he was also a social worker and a freedom fighter—he worked tirelessly for India to be liberated from British rule. So I must have got the feeling from him that I should give back to society. So far, the funds for the foundation have been my personal funds," she stated.

She will be a guiding beacon of many scientists across the globe.