

## Anna Mani

---

Anna Mani, the distinguished Indian meteorologist, was the former Deputy Director General of the Indian Meteorological Department. She made significant contributions in the field of meteorological instrumentation and pioneered research in the areas of solar radiation, ozone and wind energy measurements. This article is in fond remembrance of her life and science.

Anna Mani grew up in a prosperous family in the state of Travancore, a former princely state in the southern part of India, now part of the state of Kerala. Born in 1918, she was the seventh of eight siblings. Anna Mani's father was a civil engineer with large cardamom estates to his name. The family belonged to an ancient Syrian Christian community; however, her father remained an agnostic throughout his life. The Mani family was a typical upper class professional household, where from childhood the male children were groomed for high level careers, whereas the daughters were primed for marriage. But Anna Mani would have none of it. Her formative years were spent engrossed in books. By the age of eight, she had read almost all the books in Malayalam and, by the time she was twelve, all the books in English at her public library. On her eighth birthday she declined to accept her family's customary gift of a set of diamond earrings, opting instead for a set of *Encyclopedia Britannica*. The world of books opened her mind to new ideas and imbued in her a deep sense of social justice.

In 1925, at the height of the Vaikom Satyagraha where people of all castes and religions across Travancore protested the decision by the priests of a temple in the town of Vaikom to bar dalits from using the road adjacent to the temple, Mahatma Gandhi came to Viakom to lend his support to the civil disobedience. The motto of the satyagraha, 'one caste, one religion, and one god for men [sic]' became the rallying cry of the progressives who demanded that all Hindus irrespective of their caste be allowed entry into the temples of the state. The satyagraha, and especially, Gandhi's visit in its support, made a deep impression on the young and idealistic Anna. In the following years, as the nationalist movement gained momentum and the Indian National Congress adopted complete independence as its goal, Anna Mani became increasingly drawn to nationalist politics. Although she did not join any particular movement, she took to wearing only khadi as a symbol of her nationalist sympathies. A strong sense of nationalism also instilled in her a fierce desire for personal freedom for which she was willing to fight. Thus when she insisted upon pursuing higher studies instead of following the footsteps of her sisters (who got married in their late teens), there was neither active opposition nor encouragement from her family.



Anna Mani had wanted to study medicine but when that was not possible she decided in favor of physics because she happened to be good in the subject. She enrolled in the honors program in physics at the Presidency College in Madras (now Chennai). In 1940, a year after finishing college, Anna Mani obtained a scholarship to do research in physics at the Indian Institute of Science. She was accepted in C V Raman's laboratory as a graduate student and worked on the spectroscopy of diamonds and rubies. During this period, Raman's laboratory was immersed in the study of diamonds because of Raman's ongoing controversies with Max Born on crystal dynamics and with Kathleen Lonsdale on the structure of diamond. He had a collection of 300 diamonds from India and Africa; practically all his students worked on one aspect or the other of diamonds. Anna Mani recorded and analyzed fluorescence, absorption, and Raman spectra of 32 diamonds. She studied temperature dependence and polarization effects in these spectra. The experiments were long and painstaking: the crystals were held at liquid air temperatures and the weak luminescence of some of the diamonds required fifteen to twenty hours of exposure time to record the spectrum on photographic plates. Anna Mani spent long hours in the laboratory, sometimes working through the night. Between 1942 and 1945, she published five single-authored papers on luminescence of diamonds and ruby. In August 1945 she submitted her PhD dissertation to Madras University and was awarded a government scholarship for an internship in England.

Anna Mani, however, was never awarded the PhD degree she so rightly deserved. Madras University, which at that time formally granted degrees for work done at the Indian Institute of Science, claimed that Anna Mani did not have an MSc degree and therefore she could not possibly be granted a PhD. They chose to overlook that Anna Mani had graduated with honors in physics and chemistry, and had won a scholarship for graduate studies at the Indian Institute of Science on the basis of her undergraduate degree. To this day her completed PhD dissertation remains in the library of Raman Research Institute, indistinguishable from other bound dissertations with not a trace to suggest that Anna Mani's did not result in a degree for her. Anna Mani, however, brooked no grudge against this miscarriage of justice and insisted that the lack of a PhD degree made little difference in her life. She left for England soon after finishing her research work in Raman's laboratory. Although her preference had been to pursue research in physics she ended up specializing in meteorological instrumentation as it was the only scholarship available to her at that time.

Anna Mani returned to Independent India in 1948, and she joined the Indian Meteorological Department at Pune. At the department, she was in charge of construction of radiation instrumentation. She published a number of papers ranging from atmospheric ozone to the need for international instrument comparisons and national standardization of meteorological



instrumentation. Anna Mani retired as the Deputy Director General of the Indian Meteorological Department in 1976. She subsequently returned to the Raman Research Institute as a visiting professor for three years. She published two books, *The Handbook for Solar Radiation Data for India* (1980) and *Solar Radiation over India* (1981), and worked on several projects for harnessing wind energy in India. Later, in the industrial suburbs of Bangalore, Anna Mani started a small company that manufactured instruments for measuring wind speed and solar energy. Anna Mani believed that the development of wind and solar energy in India required detailed knowledge of solar fluxes and wind patterns in different regions of India and it was her hope that the instruments produced in her factory would have wide utility in procuring this information. However, despite her interest in and involvement with issues of environment, Anna Mani never saw herself as an environmentalist (“carpet baggers” as she called them) who seemed to be “always in orbit.” She preferred to stay in one place.

Anna Mani had a very matter of fact view of her life and achievements. She saw nothing unusual in her pursuing physics in an era where it was possible to count all women physicists in India on one’s fingertips. She made light of the difficulties and discriminations she encountered as a woman scientist and was disdainful of victim politics. She actively resisted coercive gender identities which limited women’s potential as well as posited different intellectual capabilities in men and women. It is no surprise that Anna Mani is a success story to which few women (or men) could aspire. She transcended the delimited cultural spaces available to her. She not only created her own laboratory but a whole workshop, a mini factory of her own.

*Abha Sur*  
*Program In Women’s and Gender Studies*  
*14E-316, MIT, 77 Massachusetts Avenue*  
*Cambridge, MA 02139, USA*  
*Email: asur@mit.edu*

