

Hema Ramachandran (1962–2020)

Professor Hema Ramachandran – Hema to all who knew her, passed away during the early hours of 24 November 2020, after a long illness. The light and matter physics (LAMP) group of the Raman Research Institute (RRI) lost a fine scientist and one of its founding members.

After a Master's degree in physics from IIT Bombay, Hema joined the training school of the Bhabha Atomic Research Centre (BARC), Mumbai. She then worked in high pressure physics and uncovered a novel phenomenon, viz. a material becoming amorphous when subjected to pressure. Her contributions and promise were recognized by an INSA Young Scientist Award. Hema moved to Bangalore after marriage and was posted

at the BARC's seismological station at Gauribidanur. This meant taking up a new area of science.



RRI had a close linkage with the BARC seismology group, which had provided support for a radio telescope

facility at Gauribidanur. Hema used an office on the RRI campus when needed. In 1995, she was offered a faculty position by the then director, Prof. N. Kumar, who was keen to start activity in the emerging area of light matter interactions. Hema took up the challenge of entering yet another field. In this venture, she had strong support from R. Srinivasan, an outstanding and versatile physicist, just retired from the Inter University Centre in Indore, and Kumar himself. Looking back it now seems that she had found her true calling.

One of us (A.N.) had just finished a theoretical Ph.D. thesis at RRI and recalls the experience of working hands-on, doing experiments with Hema who

combined ambition and determination with personal warmth. One of the earliest experiments on imaging through a turbid medium resulted in a well-cited paper. The optics laboratory as it was then known attracted talented and motivated students and gained recognition for light scattering-related experiments. The end of 1999 brought a paradigm shift – Kumar laid out an ambitious path, opened up by the winners of the 1997 Nobel Prize in Physics – trapping and cooling of alkali atoms. Hema's character, thriving on challenges, Kumar's indomitable spirit and the strong guiding light of Srinivasan helped a team of relative novices in the field to achieve Magneto-Optically Trapped (MOT) cold Rb atoms in October 2001 – only the second group in the country to do so.

With new additions to the faculty, the research group expanded to include non-linear optics. Later, talented younger physicists trained in cold atoms joined and started new activities. Hema continued her own journey, with experiments on light scattering, cold atoms and later on the brain computer interface. Those close to her know the enormous satisfaction each and every new result gave her.

Her talents and experience were put to use across the institute when she was made the head of all research facilities at RRI, a position she held for nearly half a decade.

The LAMP group of RRI is known today as a place not just for cold atom research but potentially, an important player in the new emerging area of quantum and quantum enabled technologies. Hema grew into a significant enabling role in developing a community in these new areas at the national level. Serving on the relevant Programme Advisory Committee of the Department of Science and Technology (PAC of DST) meant reviewing proposals for funding, in this and related areas, and often interacting with the proposers. This led later to her serving on the more co-ordinated QUEST (quantum enabled science and technology) programme. She then joined a small group playing an advisory role to the larger, younger group drafting the ambitious Quantum Mission. The funding of this mission – 8000 crores over 5 years announced in the budget for 2020, is widely known. Less visible is the spadework which went into producing a comprehensive proposal of this scale.

Hema's role in the process leading to the formulation of this mission was critical. This is particularly poignant considering that she attended meetings, made presentations, and prepared documents, all to tight deadlines, while fighting what proved to be her final battle.

Hema had a fine sense of aesthetics and carried herself with grace and dignity. She was a strong feminist without ever being very obvious about it. In recent years, even when besieged by illness, she maintained her endearing sense of wry humour in the face of life's absurdities. The genuine affection her students have for her is a testimony to the camaraderie she had with them. This extended to the technical staff who play such a vital role in experimental science – she cared for them and they looked up to her.

Hema is survived by her spouse, brother and parents.

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