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A heroic struggle of a scientist with cancer

B Vijayalakshmi
(by T R Govindarajan)

Viji joined the Department of Theoretical Physics in 1974 after obtaining her Masters from Seethalakshmi Ramaswami College, Tiruchirapalli. Hers was a conservative background, and it was remarkable that she could overcome conventional gender restrictions and consider research an option.

Our advisor was Professor P. M. Mathews, who was the head of department at that time. Always smiling and friendly, Viji discussed the graduate courses with me like any other student. Once, while we were discussing our work, she expressed some discomfort and I enquired about it. Looking straight at me as if to gauge my reaction, she replied that she had been diagnosed with widespread cancer of the stomach and the abdominal region. I was shocked and speechless for a few moments. Later she told me that her major aim was to make some substantial research contribution and be recognised as a physicist and that her immediate goal was to finish her research degree before anything happened to her.

Both of us were involved in the studies of relativistic equations of higher spin in external electromagnetic and gravitational fields. Our attempts were to look for suitable ways in which

interacting higher spin theories could be constructed. It was a very lively period in the life of the department. There was always much discussion, not only about theoretical physics but also about issues in politics, history, economics and university education. That was also the turbulent period of the Emergency and we came to know of the arrest of many political and trade union leaders.

It was also the time when the Association of Research Scholars of the Madras University was formed. Viji, while concentrating on her research, contributed actively to the Association. Graduate students in the University had to face enormous difficulties, even in routine matters like regular monthly fellowships and the ability to use their contingency or travel grants for their research. Laboratory facilities were poor and students' contingency grants were often used to augment the collections of departmental libraries. Worse still, they had to suffer many unacceptable restrictions from a feudal administrative and academic setup. Viji's involvement in the Association was not liked by some in the University and in the department.

Viji's life and world-view changed after she met T. Jayaraman, who was certainly the most important person in her life. She began to learn about the political scene in the country and to follow political events and happenings closely. She associated herself with the activities of the communist Left as much as her health would allow, an association that grew deeper as the years passed. She also moved on to an atheism that was not always immediately noticeable, but was nevertheless firmly held. Jayaraman and Viji married in 1978; Jayaraman sustained her professional work, gave her courage and inspired her to new achievements, and their marriage and relationship were an inspiration and example to all who knew them. Jayaraman introduced Viji to a circle of friends who became very close to her, and who cared deeply for both of them. With the marriage Viji also acquired concerned parents-in-law who were to assist her diligently in the years of difficult health that were to follow.

All this happened in the midst of many chemotherapy and radiation sessions, which often completely immobilized her. Eventually, as the cancer spread to the bones in her hip and legs,

she had to use a wheel chair for her travel as she could not walk more than very short distances. None of this, however, seemed to affect her good cheer and humour or make a dent on her fighting spirit.

In 1978 she started her work on characterizing a spinning particle in non-relativistic quantum mechanics. This was a novel idea of the interplay of geometry and topology. This also produced an interesting dual relation between massless particles and the monopoles of electromagnetic theory. This work was published and this particular contribution laid the foundation for many interesting developments later.

Her talk at the biannual High Energy Physics Symposium of the Department of Atomic Energy held at the University in Kochi in 1980 was well received. This was a great experience for her. The community of Indian high energy physicists was also very encouraging, treating her with due regard as an upcoming professional. Many of our fellow students, both visitors and those of the University, even took turns to take her around in her wheel chair.

By that time her health began to deteriorate further. Viji was always aware of the race with time. Continuing research for the next couple of years she wrote five publications on the relativistic wave equations in external fields and completed her requirements for Ph.D.. The study of higher spin wave equations and their interactions were important issues which had engaged the minds of physicists and mathematicians. In her thesis work she identified large classes of relativistic equations which were not equivalent to already known equations describing single mass and spin. This study in which she obtained interesting new results involved many conceptually difficult issues in group theory, which she mastered successfully.

This was also the period when supersymmetry was becoming an active area of research among high energy physicists and Viji started actively studying it. She visited IIT Kanpur (IITK) for a couple of months with the active support of her mother-in-law. The physics group at IITK who were watching this wheelchair-bound researcher were impressed and offered all support for her work. She also met Captain Laxmi Saigal of Kanpur, who was

moved by her courage and arranged support for her health and continued research. Following this she visited the Centre for Theoretical Studies at the Indian Institute of Science, Bangalore (now the Centre for High Energy Physics). She wrote two papers on issues in supersymmetric field theories.

Having accomplished her immediate aim, she continued to be active for two more years, studying relativistic equations from different angles. She even made plans to visit ICTP in Trieste with Jayaraman, but her health deteriorated sharply and she died on May 12, 1985. A socially conscious scientist, she will remain an inspiring figure in the minds of all her friends and associates. An inspiring one-hour documentary of her battle and her spirit, titled "*Vijayalakshmi: The Story of a Young Woman with Cancer*," which also included accounts of her years in school and college, was telecast by Doordarshan in the early 1980s.

Her death was an irreparable loss for all those who knew her. To me she was always truly one of the "*Daughters of Lilavati*."

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