

## Obituary

### Prof. Sivaramakrishna Chandrasekhar



Prof. Sivaramakrishna Chandrasekhar, former Director of the Centre for Liquid Crystal Research, Bangalore, passed away on 8 March 2004 at Bangalore. He was well known internationally for his significant contributions to the field of

Liquid Crystals. Born on 6 August 1930 in Calcutta, Prof. Chandrasekhar obtained his M.Sc. degree from Nagpur University in 1951 and a D.Sc. degree from the same University in 1954. His D.Sc. thesis work was on crystalline optical activity carried out under the supervision of his uncle, the Nobel Laureate Prof. C.V. Raman, at the newly established Raman Research Institute. He also got a Ph.D. degree from the Cambridge University in the year 1957 and subsequently spent a few years at the University College, London and the Royal Institution, London, working in the field of X-ray diffraction.

In the year 1961, he joined the University of Mysore, Mysore, as Professor and Head of the Department of Physics where he got interested in the area of liquid crystals. Liquid crystals which possess a degree of ordering between that of a crystal and a liquid were just a curiosity in the sixties. The realization that these materials have potential applications in display devices due to their unique responses to electric fields spurred the research activity in liquid crystals, world wide in the seventies.

Prof. Chandrasekhar moved over to the Raman Research Institute in 1971 and established a Liquid Crystal Laboratory. This turned out to be one of the outstanding laboratories for liquid crystal research in the world. Prof. Chandrasekhar and his co-workers made many important

contributions to the area of liquid crystals. A study on the propagation of light through cholesteric liquid crystals led to the discovery of a remarkable effect, viz., the optical analogue of the Borrmann effect. The Borrmann effect in X-rays is associated with an anomalous increase in the transmitted intensity in an absorbing crystal set at Bragg reflection. A similar effect was discovered in an absorbing cholesteric liquid crystal in the vicinity of its optical reflection band. The study on the effect of high pressures on liquid crystal systems led to important discoveries concerning phase transitions, induced phases, triple points and so on. The most significant contribution was the discovery of discotic liquid crystals in 1977. Since the discovery of liquid crystals in 1888, all the materials known to exhibit liquid crystalline phases were made up of rod-like molecules. Prof. Chandrasekhar and his associates discovered that disc shaped molecules form a class of liquid crystals possessing an entirely new type of structure. Though the molecules studied by them had been synthesized in the 1930s, their liquid crystalline state was not realized till the group at the Raman Research Institute carried out X-ray studies to elucidate their structure. They established that the disc shaped molecules exhibited a columnar phase. Here, the molecules are arranged in liquid-like order in columns which are themselves organized in a two dimensional lattice. This discovery opened up a new area of research and the activity across the world resulted in about 2000 publications on discotic systems.

Prof. Chandrasekhar was instrumental in promoting research in liquid crystals by organizing several conferences and meetings in India, the prominent being the Ninth International Liquid Crystal Conference in 1982 at Bangalore. He was responsible for initiating the International Liquid Crystal Society of which he became the first President in the year 1990. He also wrote a

book on liquid crystals in 1977 (revised in 1992), that has become very popular with students and researchers active in the field of liquid crystals.

Prof. Chandrasekhar retired from the Raman Research Institute in the year 1990 and founded the Centre for Liquid Crystal Research, Jalahalli, Bangalore.

Prof. Chandrasekhar was honoured with many prestigious awards and Fellowships: Bhatnagar Prize in 1972, Elected Fellow of all the three Science Academies in India, Fellow of the Third World Academy of Sciences, Elected Fellow of the Royal Society, London, in 1983, Royal Medal of the Royal Society in 1994, Niels Bohr Gold

Medal of UNESCO in 1998, the French Government award of Chevalier dans L'Order des Palmes Academiques in 1999, the Freedericksz Medal of the Russian Liquid Crystal Society in 2000 and the Government of India award of Padma Bhushan in 1998.

Prof. Chandrasekhar is survived by his wife Mrs. Ila Chandrasekhar and two children. In his passing away, the Indian scientific community has lost an enthusiastic leader and a promoter of science.

**Kattera A. Suresh**  
Professor  
Raman Research Institute, Bangalore