K. S. Viswanathan (1929–2009)

It is my sad duty to write the obituary of Kalakad Sundaram Viswanathan (KSV) who passed away on 5 July 2009.

My friendship with KSV dates back to the latter half of 1950. We were fellow research scholars in the Raman Research Institute (RRI). C. V. Raman had shifted to RRI when he reached the age of retirement at the Indian Institute of Science in 1948. S. Chandrasekhar, T. K. Srinivasan, M. R. Bhat, KSV, D. Krishnamurti and I constituted the student body in 1950. S. Pancharatnam joined us in 1953. A. Jayaraman and J. Padmanabhan were already at the RRI a year earlier as Raman's Research Assistant and Technical Assistant, respectively. All of us benefitted from Raman's inspiring example and insightful guidance.

KSV's academic training (BA and MA) being in mathematics, Raman singled him out for research on theoretical problems, e.g. lattice dynamics and atomistic theory of elasticity. His discovery that the group velocities of the normal modes of crystals vanish at the zone centre and the zone boundary (*Proc. Indian Acad. Sci.*, 1953, **36**, 308) as well as his deduction that crystals are characterized by 45 independent elastic constants in general if the stress and strain tensors are not symmetric (*Proc. Indian Acad. Sci.*, 1954, **39**, 196) are scientific results noteworthy for their originality from the earliest phase of his scientific career at RRI. They formed the basis of his 1955 Ph D degree, awarded for his thesis submitted to Madras University. KSV remained at RRI from 1955 to 1961 as Assistant Professor. He broadened and deepened his research interests, as documented in his papers, dealing with anharmonicity of molecular vibrations, the relativistic theory of chemical binding and the Dirac equation for many electron systems.

In 1960, Viswanathan joined the National Aeronautical Laboratory, Bangalore as Head of the Mathematical Sciences Division (1960–1970). In 1970, he accepted the Physics Professorship of Kerala University, Trivandrum. He also spent short periods as a Visiting Scientist

From left to right: M. V. Bhatt (Indian Institute of Science), S. Chandrasekhar (Mysore University), S. Ramaseshan (National Aeronautical Laboratory), K. S. Viswanathan (National Aeronautical Laboratory) and S. Pancharatnam (Mysore University). Photograph taken by A.K.R. in August 1962.

at the Dublin Institute for Advanced Studies, Ireland (1965–1966); Plasma Physics Laboratory, Princeton University, Princeton (1966–1967); and the International Centre for Theoretical Physics, Trieste, Italy (1977–1979). His publications reveal an impressive sweep of topics to which he made comprehensive contributions: 'Close equatorial satellites of the Moon' (*Proc. Indian Acad. Sci.*, 1962, **56**, 291); 'Artificial satellites and the earth's gravitational field' (*J. Indian Geophys. Union*, 1964, **1**, 77); 'Anharmonicity of vibrations and inner displacements in crystals' (with Watanabe, K., *Phys. Rev.*, 1966, **149**, 614); 'The internal conical refraction of elastic waves in solids' (*Indian J. Pure Appl. Phys.*, 1970); 'Helicon–phonon interaction in metals' (*J. Phys.*, 1975, **5**, L107) and 'Phonon magnification in cubic crystals' (*Phys. Rev. B.*, 1978, **17**, 4969). This selected list of publications illustrates Viswanathan's deep and extended scientific interests into which he brought his mathematical expertise, physical insights and an impeccable taste in the selection of novel research areas.

Viswanathan became a Fellow of the Indian Academy of Sciences (IASc) in 1956. He was the Secretary of the IASc and Editor of the *Proceedings of the Indian Academy of Sciences* from 1957 to 1961.

In reviewing Viswanathan's scientific achievements, I recalled how much the intellectual lives of my contemporaries and myself were profoundly enriched by our scientific interactions and informal discussions on science, scientific personalities, politics, literature and music. Indeed, our world view evolved due to our time together.

Viswanathan is survived by his wife Ponnammal, his son Suresh (Architectural Engineer), and his daughter Sujatha (Professor of Applied Mechanics, IIT, Chennai).

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