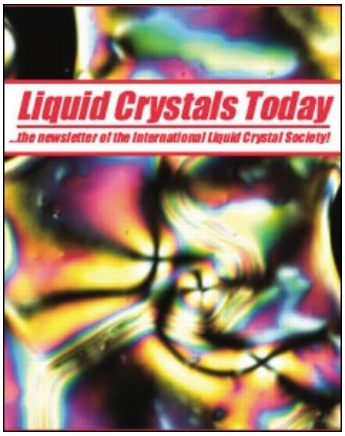

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MIT SYMPOSIUM to honour Professor S Chandrasekhar, June 1991

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MIT SYMPOSIUM
to honour Professor S Chandrasekhar, June 1991
— *a report from S Krishna Prasad and V N Raja*

An international symposium was held at the Massachusetts Institute of Technology, Cambridge, USA on 14 and 15 July 1991 to felicitate Prof S Chandrasekhar on reaching 60 years of age. As observed by the organisers "Professor Chandrasekhar has made pioneering contibutions to the understanding of liquid crystals and has been associated with the field from the days when liquid crystals were mere curiosities to the present when liquid crystal research is an important area of condensed matter physics".

S Chandrasekhar initiated studies on liquid crystals 30 years ago when he joined the University of Mysore as Professor of Physics to start a new post-graduate department. To quote his own words from his article in *"The Legacy of Sir Lawrence Bragg"* published recently [1]: "When I was setting up the new department in Mysore, I made up my mind to change my field from solid crystals to liquid crystals. My knowledge of these intermediate phases at that time was limited to the brief accounts that I had come across as a student more than ten years earlier in books published in the 1930s, but I was determined to make the change. With some trepidation, I mentioned this to Bragg, hoping that he would not be too disappointed that I was wandering off into an unfashionable and long-forgotten field. His response was. in fact, just the opposite, for which I was truly grateful. He started a serious discussion on the subject and I felt jubilant".

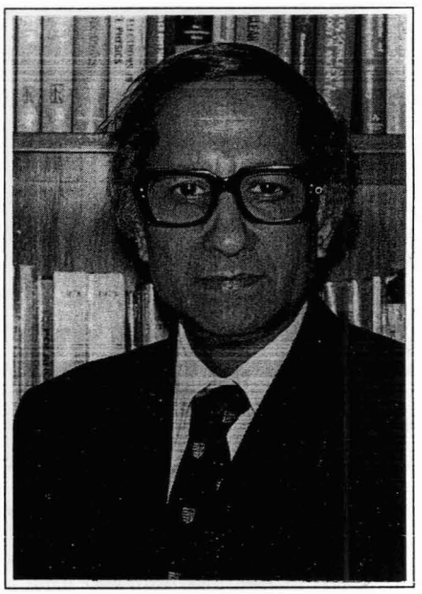
In 1971, Chandrasekhar moved to the Raman Research Institute, Bangalore, and established a Centre which is acknowledged as one of the leading schools of research in the field. With his versatile interests, his contributions have covered diverse aspects of this interdisciplinary area, but probably his best-known work was his prediction of, and (along with his students B K Sadashiva and K A Suresh), the discovery of discotic liquid crystals.

In this symposium eminent scientists in the field of liquid crystals delivered 15 outstanding lectures. About seventy participants from different parts of the globe "who share with Professor Chandrasekhar the quest to understand the mysteries of liquid crystals" took part in the proceedings. The scientific session started with a talk by R Pindak (AT&T Bell Labs), who presented results of structural and optical measurements on the recently discovered Twist Grain Boundary (TGB) phase. The existence of such a phase was envisaged by Renn & Lubensky in analogy with the Abrikosov flux lattice which occurs in a Type II superconductor in the presence of a magnetic field. The experimental results show that the helical smectic A phase, with the helical axis parallel to the layers, identified by Goodby and co-workers, does indeed correspond to the phase predicted by Renn & Lubensky.

J Toner (IBM Research Labs, NY), who spoke on the "Elastic Theory of Hydrodynamics of the TGB phase", pointed out certain important consequences of commensurate and incommensurate types of TGB phases, *viz*: number of Goldstone modes, Landau-Peierls instability in all three directions, anisotropic second sound behaviour etc. P S Pershan (Harvard University) presented some beautiful results on X-ray scattering from liquid surfaces. Smectic layering at the surface and smectic fluctuations in the bulk were studied by high resolution X-ray specular reflectivity and scattering techniques.

Continuing the theme of structural studies, J D Litster (MIT) gave a very interesting talk on the physics of fluids with bond orientational order. He presented extensive data obtained by synchrotron X-ray scattering from freestanding thin films. These high resolution data show several important features, namely, dimensional (3D-2D) crossover, multicritical scaling behaviour, etc.

Other interesting talks included those from R B Meyer (Brandeis University, Mass) on X-ray scattering from polymer nematics; A Saupe (Kent State University) on biaxial nematics; J Thoen (Katholeik University of Leuven, Belgium) on high resolution calorimetric studies of different liquid crystalline phase transitions; R J Birgeneau (MIT) on meta-stability, random fields and phase transitions. Properties of membranes were covered in lectures by T C Lubensky (University of Pennsylvania); by J Prost (École Superieure de Physique et de Chimie, Paris); and by C Safinya (Exxon Research and Engineering Company, NJ). N A Clark (University of Colorado) described some unusual properties of liquid crystals in aerogel — a highly porous material, and G Heppke (Technical University of Berlin) described recent results on ferroelectrics and discotic nematics. The concluding talk was by H Ringsdorf (University of Mainz, Germany), who gave a fascinating account of molecular engineering and phase induction in discotic liquid crystals.



Professor S Chandrasekhar

Altogether it was an excellent conference and one came away with a feeling that there are still numerous problems of fundamental interest to be solved in this exciting field.

[1] S Chandrasekhar, "It's a Black Ibis" in *The Legacy of Sir Lawrence Bragg*, eds. Sir John Thomas and Sir David Phillips, Science Reviews Ltd., UK, 1990

[A shortened form of this report is to appear in Condensed Matter News.]