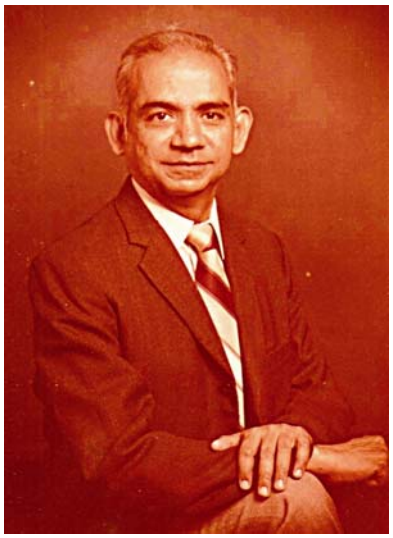
S. L. N. G. Krishnamachari (1928–2012)

Samaveda Laxmi Narasimha Gopala Krishnamachari, known as 'Chari' to his friends and colleagues, was born at Visakhapatnam on 20 September 1928. After a scientific career spanning more than 50 years, he passed away at Bangalore on 5 February 2012. Krishnamachari was a gentle and sensitive person, whose loss is felt deeply by all who knew him, and especially by those who came into contact with him during his professional life.

After completing his high school education from Kandupuri Veeresalingam Pantulu High School, Rajamundry, Chari continued his graduate and postgraduate studies at Andhra University, Waltair, from where he obtained in 1956 a D Sc degree for his research on spectroscopic studies of substituted benzenes. During this time he carried out extensive studies on the ultraviolet, infrared and Raman spectra of many mono- and di-substituted benzenes, providing considerable amount of spectroscopic data on the ground and excited states of these molecular species, some of which have since been used by many groups for correct interpretations of related molecular species.

In 1958, the Atomic Energy Establishment, Trombay (AEET) of the Government of India (now the Bhabha Atomic Research Centre) was planning to set up a group, under the guidance of R. K. Asundi, for research in spectroscopic applications in nuclear energy programmes. Chari joined this group as a Scientific Officer and Head of the Molecular Electronic Spectroscopy group. Soon thereafter, he was deputed to the National Bureau of Standards (present NIST), where he worked with Broida on the spectroscopy of free radicals and other transient species at very low temperatures, down to 4 K.

On returning to AEET, Chari continued his studies on transient species in discharges, in areas relevant to nuclear programmes. A method was developed for analysis of isotopic composition of boron using the spectrum of BO molecule produced in an electrical discharge. This was useful for quality control of BF3 used in neutron counters. One of the most important results obtained by Chari and his colleagues in the course of these studies on molecular species in discharges, was the discovery of the xenon and krypton fluoride excimer molecules, interpreting their spectra as bound-free state transitions. As is well known, these transitions form the basis for the present-day high-power, UV, rare gas excimer lasers. During this time, he also set up the *first* flash photolysis unit in the country, to study the spectra of free radicals



and other transient species. In the next few years he carried out extensive studies in several media and the spectra of several new free-radical species like HCCO, HCCS, HCCSe, HNC, etc. were studied. The above researches were further augmented by Chari by the setting up of a pulsed laser flash photolysis system. Time-resolved spectroscopic studies on energy transfer processes in excited electronic states, excited state-reactions of pollutants with atmospheric molecular species, excited state reactions of hydrocarbon pollutants, etc. were some of the areas studied by Chari with the two flash photolysis units.

Around 1967–68, Chari went as a visiting scientist to the prestigious National Research Council of Canada (NRC), Ottawa, where he continued his studies on excited states of polyatomic molecules in the Physics Division with D. A. Ramsay and others. This was followed by a fairly long period in BARC, when substantial contributions were made by his group on excited state interactions, mercury-sensitized photochemical reactions, reactions of singlet oxygen, etc.

In 1980, he again went to NRC, this time as visiting scientist at the Herzberg Institute of Astrophysics, where he continued his studies on time-resolved spectroscopy of polyatomic molecules. This was followed back home, with studies on new free radicals, time-resolved studies on photo-dissociation and photo-association of excited molecular species, spectra of free radicals with isotopic substitution, etc. Along with these studies, he also started what is today called laser-induced breakdown spectroscopy, for analytical applications.

Chari showed that a true scientist never retires from his passion for research, by continuing his research activities even after his retirement from BARC in 1988. He started the investigation of spectra of molecular species of astrophysical importance, in collaboration with scientists at the Indian Institute of Astrophysics, Bangalore. With his experience in the area of energy-transfer processes in molecular systems, during the last 2–3 years he also got involved in the processes that may improve the efficiency of existing solar-energy converters. He thought of investigating methods which can lead to conversion of the shorter wavelength UV and visible radiation to near infrared closer to the band gaps of the semiconductor materials used in solar cells. He started to investigate these possibilities in collaboration with scientists from BARC and suggested several configurations for this purpose. We hope that these ideas of Krishnamachari will be probed in detail by some of his younger colleagues, leading to the design of highly efficient solar-energy converters.

Chari was loved by all those who came into contact with him, for his gentle nature and the ever-pleasant attitude that he displayed and respected by the spectroscopists of this country for the deep understanding he showed in the field of spectroscopy of polyatomic molecules. He will be truly missed by all his colleagues and students. He is survived by his wife, a son and a daughter.

V. B. KARTHA

Res. 21, Udayagiri,
Opp. Telecom Factory,
Sion–Trombay Road, Deonar,
Mumbai 400 088, India
e-mail: bhasikartha@gmail.com