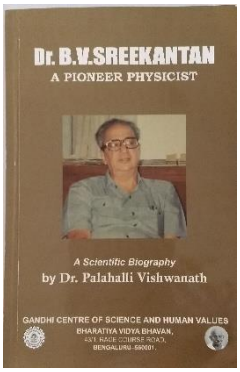
News & Events: Book Review

Dr. B.V. Sreekantan-A Pioneer Physicist



The book on Professor B.V. Sreekantan written by Professor P.R. Vishwanath, carries the prominent sub-title "A Pioneer Physicist", and elsewhere on the cover describes the text as A Scientific Biography. The book certainly succeeds in conveying the pioneering aspect of Professor Sreekantan's early work at TIFR, on various aspects of Cosmic Ray Physics and X-ray and Gamma-ray Astronomy. On the other hand, it is more than the biography of a single individual, becoming also a biography of other individuals and an institution.

The book begins (as all good things must), before the beginning, taking the reader into the small town of Nanjanagudu, to the south of Mysore city, in the early 1900s. It was here that Badanaval Venkatasubba Sreekantan was born in 1925. His father, Shri B.V. Pundit, was a self-made man – a well-known ayurvedic physician, and a very successful entrepreneur, with a best-selling tooth powder formulation that brought substantial wealth for the family. The young Sreekantan thus grew up in that happiest of settings – freedom from want, together with an early exposure to the highest levels of intellectualism through books, discussions and discourses, within the family and with visiting scholars hosted by the family. Professor Vishwanath, with roots in similar settings, empathetically evokes the atmosphere of the Pundit household, and the idealism of the India that was rising to Independence. The formative years of the young Sreekantan, while rooted in Hindu tradition, Hindu scripture and Hindu philosophy, yet created the self-confidence (and thirst) in him to look beyond, and assimilate wider streams of human thought. Foremost among these was the desire to pursue a career in science, something he did with remarkable success.

Sreekantan joined TIFR as a PhD student with Bhabha in 1948, after a post-M.Sc. year spent learning high-speed electronics in the Communications Engineering Department of IISc. Bhabha must have gauged his abilities very quickly, for he put him up to performing a state-of-the-art experiment to measure the lifetime of the muon, with everything to be built by him. The 1951 paper by Sreekantan (sole author) would do credit to a graduate student even today; at the time, it was one of the most precise measurements of the muon lifetime, and did a lot to broadcast Sreekantan's capabilities – skill with electronics, careful design and building of experimental apparatus from scratch, and sophisticated data analysis. In Vishwanath's telling, Bhabha had found a young "pioneer", and BVS's next frontier was to address the problem of the "hard component" in Cosmic Rays, by studying the intensity of muons underground in the mines of KGF. As we read on, what emerges beyond Sreekantan's science of this phase, is the spirit of adventure, together with his can-do approach; and the hard work, always the hard work. He thus laid the foundations for the remarkable success of the TIFR-KGF group from the 1950s all the way until the mid-1990s, as they contributed to aspects as diverse as Fundamental Interactions at high energies, neutrino physics and baryon non-conservation. Through this period the KGF group attracted and retained international collaborators (from Osaka, Japan, and Durham, U.K.) – the physics was at the frontiers.

In the 1950s, soon after his Ph.D. (Bruno Rossi the external examiner), Sreekantan spent considerable time in Cosmic Ray Laboratories in Europe and the US. Besides building confidence in his own (and TIFR's) skills at the frontiers of the field, this sojourn also gave Sreekantan scientific comrades for life, impressed as they were with his abilities and work ethic. His next scientific frontier thus very naturally became the newly emerging fields of "high-energy astronomy" – in the early 1960's he worked with the MIT group of Rossi, Giacconi and others, including on the first rocket-based detection of a celestial X-ray source. Upon return to India, he started groups working on X-ray and Gamma-ray Astronomy, first through balloon-borne payloads flown from the TIFR Balloon Facility at Hyderabad, and subsequently through dedicated instruments on satellites. These efforts have been attended by success, in some cases quite spectacular.

The book dwells on yet another frontier that Sreekantan explored, and that was in his role as Director of TIFR – the builder of new facilities and new scientific horizons. Under his watch TIFR grew in many different directions, some of them unconnected with Cosmic Ray Physics, High Energy Interactions and High-energy Astronomy. Often, this was because of Sreekantan's providing a gentle prod at the right time, and at all times because of his ensuring that there was an enabling atmosphere. All his life, Sreekantan was a man with a gentle touch with humans, and this emerges vividly through a device extensively employed by Vishwanath through the book – to allow the story to be filled in by other people in their own words. Readers are thus acquainted with BVS's qualities of character, his remarkable equanimity even during scientific failures, his warmth, kindness and concern for all who worked with and for him. Professor Vishwanath speculates that much of this would have been seeded in BVS's early life, living, sharing and caring within a large family.

Are there flaws in the book? It is didactic, perhaps overly so. As the author reveals in his Foreword, he wanted to connect with young people of today with an interest in science, and therefore it was his intention to write in an accessible way. This does happen with flair in some of the "Boxes", but not all of the writing has this character. There are several instances of abbreviations being used much before their full forms are explained. There are long digressions into developments in

fields that Sreekantan had seeded in TIFR, but which he moved out of long ago too, the later developments therefore out of place in the "biography" of an individual. Better editorial oversight would have also lifted the overall quality – removal of typesetting inconsistencies, errors of spelling etc. Some errors of a scientific nature also exist – for instance accelerators of Cockcroft-Walton type are not linear accelerators. The description of Sreekantan's work of his last two decades – on consciousness and his speculations thereof – is inadequate. Two missing features, whose presence would have helped enormously for the mature scientific reader are an Index, and numbered citations to specific references that support specific points made in the text.

Yet, I would not dwell long on these flaws. There is a quality of warmth to the writing that arguably comes from the author's personal connect with (and respect for) his subject and his work, and this is uplifting. His unconventional device of inviting third party reminiscences adds further to the warm "family-feeling", something that Sreekantan did so much to engender within the scientific groups that he created, as also in the Institute that he led with distinction. The pages of the book are full of gems that a wide spectrum of people can learn from. And most especially, the book is the celebration of an eminent man of science, one who was dedicated to working at the frontiers of human activity but always with an eye on doing it all "the Indian way".

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August 7 - 8, 2020

To commemorate fifty years of IPA for serving and strengthening the physics activities in the country, a two day conference is being organized.

The conference aims to acquaint young students and researchers in the country with major developments in Physics in recent years and the major upcoming projects as well as topics of Contemporary Interest

Keynote talks will cover discovery of Higgs Boson, neutrino oscillations, physics of quantum computation and mega-science projects like FAIR LIGO, accelerators etc.

IMPORTANT DATES	
First announcement	March 25, 2020
Registration opening date	*April 15, 2020*
Accommodation Request closing date	July 1, 2020
Registration closing date	*July 15, 2020*
Conference date	August 7-8, 2020

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