

PREFACE

Science at High Altitude: Facilities in India

The idea of this volume originated quite some time ago. On the occasion of the Platinum Jubilee of the Indian National Science Academy (INSA), Prof. Alok Gupta invited me to coordinate the preparation of a volume, on a topic of my choice. Considering the great occasion, I readily and gratefully accepted. The enormity of the task dawned on me only a little later, but by then it was too late to back out. In any case, the task could not be completed in time to meet the deadline at that time. Nevertheless, a number of the colleagues whom I had approached for contributions put in considerable efforts and kept updating their manuscripts. Finally, the then Editor-in-Chief of the Proceedings of INSA, Prof. TP Singh, and now Prof. S. C. Lakhotia, agreed with the suggestion that it be published as a special issue of the *Proceedings of the Indian National Science Academy*.

The choice of the general theme of the present issue, **Science at High Altitude: Facilities in India**, was dictated primarily by the decade-long efforts of our small group at Bose Institute as well as detailed discussions with colleagues from all over India (and also some from other countries) whose research activities not only concentrate on high altitude environments but invariably necessitate the high altitude settings. The facets of scientific research utilising the high altitude environment are indeed many-fold. The global impact of the high altitude environment on all aspects of human civilisation is only beginning to be appreciated. In our own country, efforts in this direction are nascent. Even though the Indian National Science Congress of 1985 designated High Altitude Research as the focal theme, not much attention seems to have been paid. In the context of global change, the importance of such studies is now fast increasing.

Historically, physics research in India at high mountain altitude was well ahead of its times. Soon

after the discovery of cosmic rays by Viktor Hess in a balloon-borne flight in 1912, it was realised that ground-based experiments on cosmic rays were absolutely essential, in the context of long term exposures and that the mountain altitudes were ideally suitable for many of these studies. Such activities began quite early in India, under the leadership of D. M. Bose in Calcutta. This was truly the beginning of high energy physics research in India. In spite of severe hardships, compounded by the difficulty in obtaining the necessary equipment during the Second World War, Bose and his collaborator Biva Chowdhury made seminal discoveries in the area of meson detection in cosmic rays. Later, research in this area was taken to great heights by Homi Bhabha and the TIFR group. Further astronomy research involving high altitude facilities already began in earnest in the second half of last century in India.

The topic covered in this volume also has an international significance. Very recently, an effort has been mounted by our Russian colleagues to create a network of all high altitude installations in the world, initially in the discipline of physics research. They have approached us to be an integral part of this endeavour and attempts are currently on to make this proposal an integral part of the scientific collaboration within the BRICS framework.

This volume addresses only a small fraction of what we, ideally, should have included. The entire areas of the biology of high altitude, high altitude physiology, high altitude (namely Himalayan) geology and glaciology have not been touched upon; hopefully, they can form the contents of another collection. The focus here has been primarily on the existing (and functioning) high altitude research facilities, where major scientific activities in physical sciences are carried out round the year and which cater to the national and international communities

of scientists. The term “high altitude” refers, in the present context, to places above 2000 masl. The difficulty of running an internationally competitive research facility at such sites can only be appreciated by those who are directly involved in managing them.

I am most grateful to my colleagues who readily agreed to contribute to this volume. On behalf of all of them, it is my fond hope that the reader will have at least a bird’s eye view of the science that this small

and dedicated group has been pursuing over the past many years and the enormous prospect for excellent and novel science that can be explored here.

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