

## Ashesh Prosad Mitra (1927–2007)

Ashesh Prosad Mitra, Padma Bhushan, former Director General of CSIR, and ex-director of the National Physical Laboratory (NPL), New Delhi, passed away in the early hours of 3 September 2007, after a month's illness. Only a few months earlier, his eightieth birthday had been celebrated at NPL, the institution with which his name had been inseparably associated for the last half a century. He is survived by his wife, two daughters and their respective families.

A. P. Mitra was born on 21 February 1927 in Calcutta (now Kolkata), where he received his early education. Son of a schoolteacher, he had inculcated the high standards of academics and discipline from his father, which he nurtured and actively practised till the very end. A brilliant student all through his educational career, Mitra stood first in all his examinations. His biggest decision after passing M Sc in Physics from Calcutta University was perhaps in joining the laboratory of S. K. Mitra, the pioneer of ionospheric research in India. His D Phil degree from Calcutta University on this subject at a time that was considered the golden era of Indian ionospheric science, thanks to the leadership of S. K. Mitra, marked the first step of a brilliant scientific career.

The next landmark in his scientific career occurred in 1954, when Mitra joined the NPL and soon afterwards set up the

Radio Science Division there, marking the beginning of an association that was to last till the very end. A short digression on the subject of ionospheric research may be relevant here. Since interactions of



the components of these upper atmospheric layers with particles or radiation, primarily from the sun or from other sources like meteorites largely determine their composition, this is an extremely rich science with regard to applications. On the other hand, before the birth of rocket technology, such information could only be accessed indirectly by limited means, such as spectroscopy, with mostly earth-based instruments. So, by its very nature, this type of research is bound to be strongly dependent on the state-of-the-art techno-

logy of the country of origin, unlike a common global standard that characterizes theoretical research. In India, the field of ionospheric research was pioneered by S. K. Mitra, with a huge global impact. It fell on his long-term associate and successor A. P. Mitra, to carry the programme forward at NPL in the company with several other Indian groups operating from other laboratories.

A. P. Mitra's researches involved the earth's near-space environment, first with ground-based and later with space techniques. As Secretary of the Indian Committee of the International Geophysical Year (IGY), he steered the Indian programme for IGY as well as the International Quiet Solar Year during 1957–58, which pushed Indian efforts into international limelight and ushered its scientists to a new era of ionospheric chemistry. His pioneering research in cosmic radio noise for studying the upper atmosphere led to a series of discoveries in the ionosphere and solar physics.

The sixties saw the beginning of high-level atmospheric probing with rocket-borne payloads. The seventies saw the introduction of the ADGES programme signifying scientific capability in radar and troposcatter systems. The SITE experiment (with radio beacons) led to an India-wide effort on the studies of the upper ionosphere. The Indian Middle Atmosphere Programme of the eighties saw extensive

### A requiem to an environmental scientist

In December 2005 when I met A. P. Mitra, he shared his insights on a number of issues.

*Ozone:* Mitra was of the opinion that the problem of stratospheric ozone depletion has been taken care of by the Montreal Protocol. The real problem now is the ground-level ozone which has direct impact on agriculture (10% drop in output) and health.

*Atmospheric Brown Cloud:* As I had read the debates in various issues of *Current Science* on the then Asian Brown Cloud now called Atmospheric Brown Cloud (ABC), I did mention that I was aware of the differences in opinion of his joint article<sup>1</sup> with that of other authors<sup>2</sup>. As I was uncomfortable to rake up an issue that was unresolved, I did not ask him to give his views. Not being an atmospheric scientist by training, I still await the final scientific truth. Some insights have been well understood through the editorials, correspondence and meeting reports in *Current Science*<sup>3</sup>. Now in 2007, the debate is still unresolved. Each year the print media does show on the front page, a photograph (mostly from NASA, USA) indicating the ABC and its greater contribution to the perils of global warming and its negative impact on even the retreat of Himalayan glaciers.

*Generation of our own database:* Mitra's contribution on climate change research in challenging the Western projections of methane emission from India is regarded as a watershed event. In the 1990s, Mitra proved that calculations as done by the West on methane emission from rice fields was much lower than what was being projected (the data was then revised by the United Nations body as it related to India). Mitra mentioned that 'methane from paddy field is now no more an issue. Enteric fermentation from cattle is also not a serious issue as it