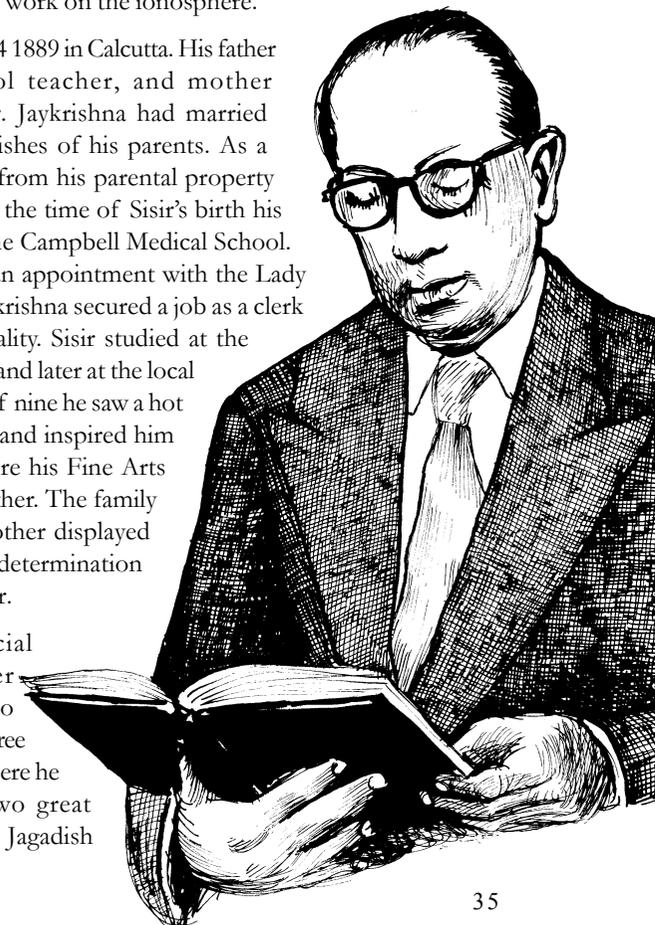




Prof. Sisir Kumar Mitra was the doyen of radio science in India. He was also well known for his seminal work on the ionosphere.

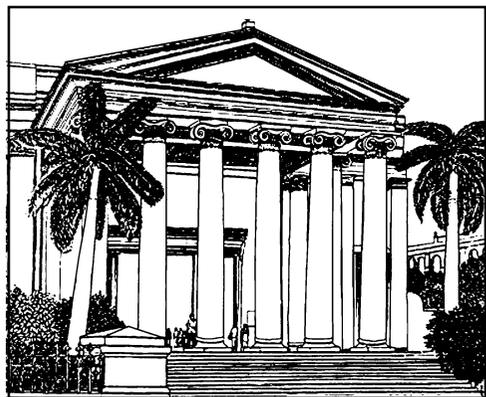
Sisir was born on October 24 1889 in Calcutta. His father Jaykrishna was a school teacher, and mother Saratkumari was a doctor. Jaykrishna had married Saratkumari against the wishes of his parents. As a result he was disinherited from his parental property and had to leave home. At the time of Sisir's birth his mother was a student of the Campbell Medical School. In 1889, Saratkumari got an appointment with the Lady Dufferin Hospital, and Jaykrishna secured a job as a clerk in the Bhagalpur Municipality. Sisir studied at the Bhagalpur District School, and later at the local T. N. J. College. At the age of nine he saw a hot air balloon. This intrigued and inspired him to study science. Just before his Fine Arts (FA) exam, Sisir lost his father. The family was devastated but his mother displayed indomitable courage and determination and brought up young Sisir.

Despite pressing financial problems Sisir's mother encouraged him to go to Calcutta to pursue a BSc Degree at the Presidency College. Here he was fortunate to have two great scientists as his teachers – Jagadish



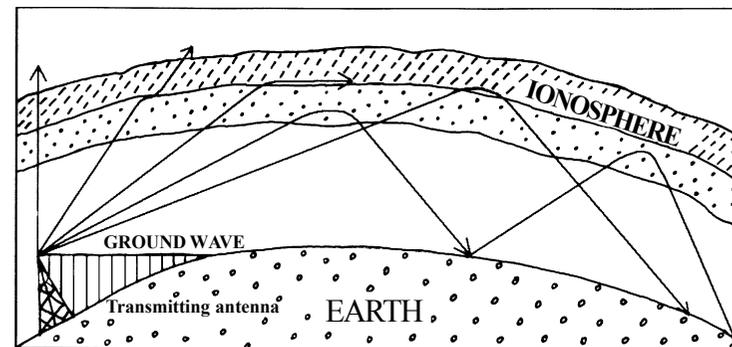
Chandra Bose and Prafulla Chandra Ray. He was fascinated by the sundry low-cost devices invented by Bose and decided to pursue teaching and research as a career. He finished MSc physics in 1912 topping the merit list. For a short period he joined Bose as a researcher but he urgently needed a job to support his family. So he taught for a few years first at the T. N. J. College, Bhagalpur, and later at the Bankura Christian College. In 1914 he married Lilavati Devi.

Sir Asutosh Mookherjee the then Vice Chancellor of Calcutta University was trying to initiate post-graduate teaching and research in science. In 1916, he managed to set up the University Science College, and invited Mitra, along with other highly talented scholars to join the physics department. This included luminaries like C. V. Raman, S. N. Bose and M. N. Saha. Mitra worked under Raman's guidance on interference and diffraction of light. In just three years he completed his thesis and obtained a DSc from Calcutta University in 1919.



Soon thereafter he proceeded abroad for advanced research. He first worked under Charles Fabry at the Sorbonne University in Paris. In 1923 he obtained a second DSc degree. Later, he joined Madame Curie at the Institute of Radium. For a while he worked at the Institute of Physics, University of Nancy under Gutton. Here Mitra got deeply interested in radio valves and their applications. He decided that his future lay in advancing the new field of radio research. As this subject was not taught anywhere in India he requested Sir Asutosh to include *wireless* in the MSc curriculum and to set up a laboratory for experimental work.

Sir Asutosh supported his proposal and asked Mitra to prepare the necessary details and return to India. Mitra returned in 1923 and was appointed the Khaira Professor of Physics. This marked the beginning of radio electronics in India - teaching, research, setting up an experimental lab began in earnest. Soon the Calcutta University had a world class school of *radio research* now known as the Institute of Radio Physics and Electronics.



The real science of *radio* began with the discovery of the ionosphere. Mitra investigated the ionosphere - vital for long distance radio communication. It's a region in the upper atmosphere that reflects short radio waves enabling transmission around the curved surface of the earth. Using the medium wave transmitter used by the Calcutta station of the Indian Space Broadcasting Service, Mitra produced the first experimental evidence of the E-region of the ionosphere. He proposed that the luminescence in the night sky was caused by ions in the F-layer of the ionosphere. Because of this luminescence the sky was not pitch black and looked dusty. He wrote a series of papers relating to the ionosphere layers over Calcutta. He did excellent mapping of the ionosphere using very simple equipment. Though ionospheric chemistry was then, still in its infancy but even here Mitra made a beginning through detailed discussions of the formation and destruction of ozone.

Mitra wrote a masterpiece on the ionosphere - *The Upper Atmosphere*. Foreign publishers were reluctant to publish the book as they thought it would compete with established foreign books! And yet when the book was published in 1947 by the Asiatic Society, 2000 copies were sold out within three years. Generations of students in radio communication, ionosphere and upper atmospheric physics, geomagnetism and space science have used this book as a major reference document. Mitra broke new ground by considering the ionosphere to be part of a vast panorama that interlinked the sun, the earth and the atmosphere.

In 1955 his book was translated in Russian. At the time of launching *Sputnik-I* in 1957, the Russian space scientists found that the only reasonable atmospheric models they could use for predicting the lifetime of satellites were those given in *The Upper Atmosphere*.

After retiring from the University in November 1955, Mitra continued as an Emeritus Professor. At the request of Bidhan Chandra Roy, the then Chief Minister of West Bengal, he restructured the ailing West Bengal Secondary Education Board into an efficient and disciplined organization. Despite his heavy schedule of work at the Board, Mitra continued his research and supervision at the Institute. Mitra trained scores of experimental scientists who later did pioneering work. Notable amongst his students were Prof. A. P. Mitra (FRS), M. K. Das Gupta (Radio Astronomer) credited with the discovery of the double radio galaxy CYGNUS-A, and Prof. J. N. Bhar.

Mitra's family life was not very happy because of the premature death of his wife and elder son Dr. Ashok Mitra. The latter tragedy dealt a grievous blow on him. Soon after this however he was elected to the Fellowship of the Royal Society and also selected as a National Professor. He spent most of his spare time at home reading and writing. Every evening he used to visit the nearby Club for recreation and sometimes played a game or two of chess.

Mitra received many awards and honours, notable amongst them being the FRS (1958), he was the President of the Indian National Science Academy (1959-60), National Professor (1962), and was awarded the Padma Bhushan (1962). He breathed his last, after a brief spell of illness, on August 13, 1963. A crater on the moon has been named "*Mitra*" to immortalise the memory of this great scientist.

