Biographical Encyclopedia of Astronomers

Störmer, Fredrik Carl Mülertz

Born Skien, (Norway), 3 September 1874

Died Blindern, Norway, 13 August 1957

Carl Störmer made substantial contributions to the understanding of polar auroral displays, from both theoretical and empirical viewpoints. His findings also had wider application to the study of cosmic rays.

Störmer was the son of Georg Ludvig Störmer, a pharmacist, and Henriette Mülertz. He attended the national university at Christiania (now Oslo) from 1892 to 1897. Störmer was awarded a candidatus realium (graduate) degree the following year, and then offered a five-year research fellowship, which allowed him to conduct advanced studies at the Sorbonne (Paris) and Göttingen University. In 1900, he married Ada Clauson; the couple had five children

Störmer was appointed professor of pure mathematics at the University of Oslo in 1903; he occupied this post for forty-three years, until his retirement in 1946. There, his colleague, physicist Kristian Birkeland, introduced him to the nature of cathode rays and their behavior in the presence of magnetic fields. Through experiments in which a magnetized sphere was bombarded with cathode rays under vacuum conditions, Birkeland and Störmer were able to simulate a number of phenomena relating to auroral displays. Störmer then undertook detailed analyses of the paths of charged particles in magnetic fields, including numerical integration of differential equations (long before the advent of electronic computation). In 1907, he described one such pathway in which a charged particle becomes entrapped within a dipole converging magnetic field. Although little recognized at the time, Störmer's mathematical solution received dramatic confirmation 50 years later, with James Van Allen's discovery of radiation belts surrounding Earth. These were identified by the United States Explorer I satellite, launched in 1958 during the International Geophysical Year (IGY).

In 1909, Störmer began intensive photographic studies of the aurorae, using parallactic photography along baselines as large as 27 km. By these means, he established the altitudes in Earth's atmosphere over which auroral displays occur. His photographic archives eventually encompassed more than 40,000 images. Störmer published a *Photographic Atlas of Auroral Forms* (1930). Results from his career-long research were brought together in his textbook, *The Polar Aurora* (1955).

Störmer was a research associate at Mount Wilson Observatory in 1912. He was appointed chairman of the auroral committee of the International Association of Terrestrial Magnetism and Electricity within the International Union of Geodesy and Geophysics [IUGG], and also elected president of the auroral committee of the Second International Polar Year (1932/1933). For his auroral research, Störmer was awarded the Janssen Medal of the Paris Académie des sciences (1922). He also received honorary doctorates from Oxford University (which invited

him to deliver its 1947 Halley Lecture), the University of Copenhagen, and the Sorbonne. A co-editor of the journal Acta Mathematica beginning in 1906, Störmer was elected president of the International Congress of Mathematicians (1936).

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Selected References

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