

Biographical Encyclopedia of Astronomers

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Bjerknes, Vilhelm Frimann Koren

Born Christiana (Oslo, Norway), 14 March 1862

Died Oslo, Norway, 9 April 1951

Norwegian mathematical physicist and geophysicist Vilhelm Bjerknes is best remembered for his work in meteorology, which, however, had considerable impact on planetary astronomy and the study of the atmospheres of other planets

Bjerknes' father was Carl Bjerknes, the noted hydrodynamicist who studied under Dirichlet in Paris. His mother was Aletta Koren. Vilhelm was born in what is now Oslo, but was then Christiana. (It was renamed Kristiana in 1877 and then Oslo in 1925.) He began undergraduate studies in 1880 at the University of Kristiana and was awarded a Master's degree from there in 1888. Throughout this period, he had collaborated with his father on hydrodynamical research, but, as his father became more reclusive in his later years, Vilhelm ended the collaboration after receiving his Master's degree. He was awarded a state scholarship that allowed him to travel to Paris in 1889, where he attended lectures by Jules Poincaré on electrodynamics

From 1890 to 1892, Bjerknes worked as an assistant to Heinrich Hertz in Bonn. Later in 1892, he returned to Norway to complete his doctoral thesis based on the work he had performed with Hertz in Bonn on electrical resistance in narrow frequency bands (something that would later become useful in the development of radio). With his degree in hand, Bjerknes was given a lectureship at the Höögskola (School of Engineering) in Stockholm in 1893. Two years later he became professor of applied mechanics and mathematical physics at the University of Stockholm.

On November 2, 1897, Bjerknes' wife gave birth to their son Jacob, who would later become famous for discovering the mechanism that controls cyclones. A trip to the United States in 1905 began 36 continuous years of funding from the Carnegie Foundation

In 1907, Bjerknes returned to Kristiana to take up the post of chair of applied mechanics and mathematical physics. He was not to stay there long, however. Just five years later, the University of Leipzig offered him the chair of geophysics. He accepted this offer and took several of his Kristiana collaborators with him, including his son Jacob, then aged 15. This post was followed in 1917 by an appointment as chair at the University of Bergen, where he founded the Bergen Geophysical Institute. Nine years later, he made his final move, returning once again to his *alma mater*, then known as the University of Oslo, to take up the chair he had left in 1912. Bjerknes retired in 1932.

Most of Bjerknes' career was based on hydrodynamics in one form or another. He was also the first person to suggest that sunspots were the erupting ends of magnetic vortices caused by the Sun's differential rotation. His work in meteorology produced a number of commonly known terms such as "cold front," "warm front," and "stationary front." He is considered to be the father of modern numerical weather prediction. Bjerknes' equations (and those produced by his assistants at Bergen) for vortices, which he originally derived from the vortex work of William Thomson (Lord Kelvin) and Hermann von Helmholtz, are so rigorous that modern computers still have difficulty solving them in reasonable timescales.

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