

## Daniel Guggenheim Medal

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MEDALIST FOR 1930

*For pioneer and creative work in the theory of dynamics.*



LUDWIG PRANDTL

Every successful mechanical art must rest soundly upon knowledge of nature, and it was Ludwig Prandtl who first demonstrated in a substantial way the importance of scientific research to human flight. He was the creator of modern concepts of wing theory, boundary layer mechanics, and turbulence, and was thus one of the principal progenitors of the science of aerodynamics.

Prandtl was born February 4, 1875, at Freising, Bavaria. He studied mechanical engineering at the Munich Technical High School, and in 1900 was granted the degree of Doctor of Philosophy from the University of Munich. In the same year he entered the Nuremberg works of the Maschinenfabrik Augsburg-Nürnberg as an engineer, his first assignment being to redesign an installation for removing shavings by suction. By studying the aerodynamical principles involved, he was able to improve the equipment to such an extent that the company thereafter introduced it as a new product.

In the fall of 1901 Prandtl became Professor of Mechanics in the Hanover Technical High School, where he continued his research on the laws of air currents, particularly the behavior of the boundary layers of fluid as affected by wall friction. In 1904 he moved to the University of Göttingen, where he accepted the direction of the Institute for Technical Physics.

Two years later, in 1906, the Motorluftschiff-Studien-Gesellschaft was formed to develop the Parsifal airship. Prandtl, while continuing his university work, was chosen a member of the engineering committee of the company. In this capacity he suggested the construction of a wind tunnel, which was put into operation in 1909.

Beginning in 1910 Prandtl occupied himself with research on the aerodynamic behavior of airplane wings, and found laws showing the dependence of lift on the angle of attack and the aspect ratio. The first World War further stimulated his scientific work. With the aid of the German military establishment, a new and considerably larger wind tunnel was built, which long supplied the chief data for the aerodynamic calculations of the German aviation industry.

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In 1937 he became President of the Board of Directors of the Aerodynamic Research Laboratory at Göttingen, where most of his later researches were conducted. Among the important subjects treated by him were the theory of frictional layers, the wing theory, contributions to the understanding of flow in compressible fluids and the motions of gases, the theory of plastic deformation, and the theory of turbulent flow of fluids.

Prandtl visited the United States in 1929, when an invitation to participate in the World Engineering Congress in Tokyo gave him an opportunity for a trip around the world. He died at Göttingen, Germany, on August 15, 1953.