

Honorary OSA Members of the 1920s and 1930s

>> Profiles of four
optical pioneers

John N. Howard

At the first meeting of the Optical Society of America in December 1916, the 30 charter members had already designated three honorary members: George Hale, Charles Hastings and Edward Nichols. They added two more in 1922 and another two in 1933.

Albert Michelson

The best known of the early honorary members is Albert Michelson, who in 1907 had been awarded the Nobel Prize in physics for his optical studies.

He was born in Strelno, Pomerania (then located in Prussia) in 1852. His parents took him to the United States at age two. The family settled in the West (in what is today Nevada), and his father opened a hardware store to sell picks and shovels to prospectors seeking gold.

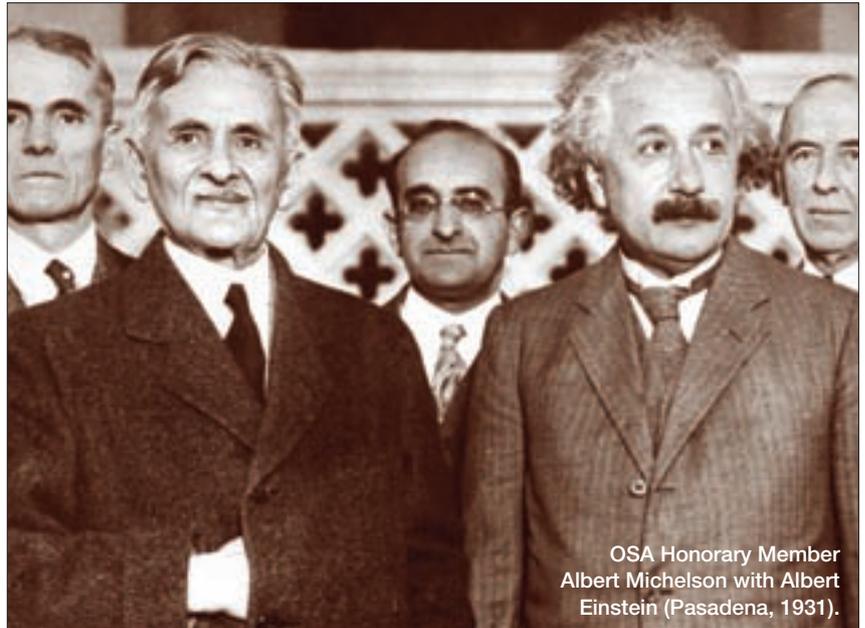
After Nevada became a state, young Albert persuaded his Congressman to nominate him to the U.S. Naval Academy in Annapolis. He graduated in 1873, and remained there for six years as a physics instructor. His lucky break came in 1877, when he gave a demonstration lecture on a measurement of the speed of light that Leon Foucault had published in 1862. Foucault, using a rotating mirror

technique, had determined that the speed of light was 185,200 miles per second.

In repeating Foucault's study, Michelson found that the beam returned by the rotating mirror was displaced less than a millimeter from the incident beam, which was very difficult to measure accurately. He made some simple modifications to Foucault's arrangement, replacing a concave mirror with a plane mirror,

Michelson invented the Michelson interferometer and devised the Michelson-Morley experiment, which helped bolster acceptance of relativity.

and increasing the light path from 66 feet to more than 500. He even spent \$10 of his own money to buy a small mirror mounted on two needle points that could be spun by a blast of air from a bellows to rotate at about 130 turns per second.



OSA Honorary Member
Albert Michelson with Albert
Einstein (Pasadena, 1931).

William Kellogg/AIP Emilio Segre Visual Archives

In the late spring of 1878, Michelson assembled his apparatus. Taking the mean value of ten final observations, he obtained a value of 186,508 miles per second in air—an improvement in accuracy over Foucault by a factor of 200. He published this finding in the *American Journal of Science and Arts* in 1878. The Navy was sufficiently impressed to send him to study at Berlin in 1880, at Heidelberg in 1881 and at the Ecole Polytech in 1882. He left the Navy in 1883 to join the physics department at the Case School of Applied Science. In 1889, he went to join Clark University, where he remained until 1892. After that, he moved to the University of Chicago.

Michelson also invented the Michelson interferometer (1882) and devised the Michelson-Morley experiment (1881-87), which helped destroy the concept of ether (and thus bolster acceptance of relativity). He designed an echelon grating spectroscope (1907); built a grating ruling engine (1915); did important work on spectral lines; measured the standard meter in terms of a cadmium line (1893); assessed the angular diameters of the satellites of Jupiter (1891); and made the first measurements of a star's diameter (1920).

OSA dedicated its 1928 spring meeting to Michelson in honor of the semi-centennial of his first communication on the velocity of light. Michelson presented the results of his 1927 careful repeat of his ether-drift measurement at Mount Wilson. At that time, the debate over relativity had captured the interest of not only scientists but the press and public. The lecture hall was packed. Michelson again found no detectable ether drift. He continued to work in stellar interferometry until his death in 1931.

Samuel Stratton

Samuel Wesley Stratton was born in Litchfield, Ill., in 1861. He obtained a B.S. at the University of Illinois in 1884, a D.Eng. in 1903, and a D.Sc. in 1903 from the Western University of Pennsylvania (now Pittsburgh). He taught math and physics at the University of Illinois from 1885 to 1892, and then joined Michelson's physics department at the University of Chicago, where he was Michelson's principal assistant. He became director of the newly formed National Bureau of Standards at an annual salary of \$4,000.

At NBS, Stratton also served as head of the optics department from 1901 until 1903, when he appointed Perley G. Nutting, a young Ph.D. from Cornell, to head optics. (Nutting remained until 1912, when he joined Eastman Kodak in Rochester.) Stratton published several optics reports at NBS.

Charles Fabry and Edward Bausch

Charles Fabry, founder and director of the Institut d'Optique in Paris, was born in Marseilles in 1867. He studied at the Ecole Polytechnique, Paris, from 1885 to 1887, and received a D.Sc. in 1892. He taught physics at the University of Marseilles from 1895 to 1921 and at the University of Paris from 1921 to 1937. In 1897, he developed (with Perot) the Fabry-Perot interferometer for spectral studies.

In 1913, he demonstrated by spectroscopy the presence of ozone in the upper atmosphere. He made the first direct verification of the Doppler-Fizeau principle in optics. He was very much the scientific diplomat, and he represented France on scientific commissions and unions in physics and geophysics. He helped establish an international system of wavelengths of spectral lines. He died in Paris in 1945.

Edward Bausch's father, John Jacob Bausch, had come to the United States from Germany in 1849 and opened a small optical store in Rochester in 1853 with Henry Lomb. Bausch's eldest son Edward was born in 1854.

Edward built his first microscope at 14. In 1871, he won a scholarship to Cornell, where he studied engineering. He returned to Bausch and Lomb in 1874, and he and his brothers Henry and William did all the optical work for the B&L display at the 1876 Centennial Exposition in Philadelphia. B&L started production of photographic lenses in 1883.

After B&L's development of the iris diaphragm shutter, he conducted some research jointly with Eastman Kodak Co. In 1885, he published *Manipulation of the Microscope*, a standard text. He became a fellow of the Royal Microscopical Society.

During World War I, B&L set up the only plant outside Europe for making optical glass. In 1931, Bausch received an honorary LLD from the University of Rochester, where he had been active in establishing the Institute of Optics as part of the physics department. He also donated the B&L building, which housed the Institute. In 1940, he donated his house and grounds to the Rochester Museum of Arts and Science. He was a charter member, serial number 2H, of the Optical Society. At the time of his death in 1944 (at age 89), he was chairman of the board of at Bausch and Lomb. ▲

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