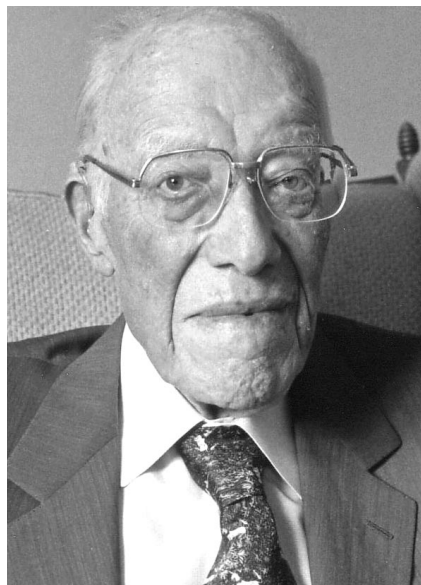




HEINZ MAIER-LEIBNITZ

by the US government's Atoms for Peace Program. To make it competitive with other reactors, he decided to concentrate on simple yet innovative methods not used elsewhere to make precision experiments with his inexperienced students. He focused on neutron-capture spectroscopy, fission studies, and especially neutron optics. With a deep understanding of the index of refraction of neutrons in a medium, he invented neutron guide tubes, an interferometer, a refractometer, and a neutron turbine for the production of, and a neutron bottle for the storage of, ultracold neutrons. A novel high-resolution back-scattering spectrometer revolutionized inelastic neutron scattering.

Maier-Leibnitz was also one of the first to realize that the neutron flux of his reactor was too low for some interesting projects, so he urged the construction of a high-flux neutron source. In 1967, he finally succeeded with a French-German project and became the first director of the Institute Max von Laue-Paul Langevin (ILL) in Grenoble, France. The ILL reactor was tailored by Robert Dautray, a young French engineer and later the high commissioner of the CEA (French Atomic Energy Commission), to the requirements of the novel instrumentation developed by Maier-Leibnitz and his students in Munich. The reactor had the first source of cold neutrons and a large hall filled with many neutron guides for thermal and cold neutrons in a background-free environment.

Later, a neutron turbine for slowing down cold neutrons was added,

providing ultracold neutrons for storage in totally reflecting material bottles and in a magnetic storage ring. This unique facility allows precision measurements of the neutron lifetime and a constantly decreasing limit for the electric dipole moment of the neutron. The reactor also has special beam tubes with internal targets for precision neutron-capture gamma-ray and conversion-electron spectroscopy, and for studies of the dynamics of the fission process. The ILL still is an El Dorado for high-resolution inelastic neutron scattering, diffracting small-angle scattering, and many other studies with polarized and unpolarized neutrons. Thanks to Maier-Leibnitz, the facility became a genuine users' laboratory, with free access to anyone who wanted to use neutrons for research.

Maier-Leibnitz held many offices. He was president of the International Union of Pure and Applied Physics from 1972 to 1975. From 1974 to 1979, he was president of the German Research Foundation. He received many honors in Germany and abroad, including the Otto Hahn Prize (1986) and the Stern-Gerlach Medal (1996) from the German Physical Society and the Austrian Medal of Science and Art (1985) from the Austrian Physical Society. He also was Chancellor of the Order for Merit and Officer of the Legion of Honor of the Republic of France.

During the discussion of his valedictory lecture in 1980, "How Does One Find Something New?" someone insisted that "luck" should be mentioned. Maier-Leibnitz refused, telling the following anecdote: "In 1937, I irradiated a water-soluble uranium salt in a cloud chamber with neutrons. Because it was dissolved by the vapor, I covered it with the thinnest mica foil I had, and considered myself as the world champion in mica splitting." But this world-class mica also stopped the fission products. "Was this bad luck? No, it was my ignorance of chemistry," was the assessment of Maier-Leibnitz.

Maier-Leibnitz put all his effort unselfishly into the education of his students by creating a successful school of experimental physics. We have lost a great scientist who also was sincerely humane and loved nature. This generation is very grateful to this eminent scientist, teacher, and warm-hearted person.

PAUL KIENLE

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Robert Warren Morse

Robert Warren Morse, a low-temperature physicist and an authority in underwater sound, a university teacher and administrator, and a naval official, died of emphysema at his home in Falmouth, Massachusetts, on 19 January 2001.

Morse was born in Boston on 25 May 1921 and graduated from Bowdoin College in 1943 with a BS degree in physics. He then married and received a commission in the US Navy. These were two important guideposts toward his future life. He left the navy at the end of World War II, going to Brown University as a graduate student in physics. He received a MS degree in physics in 1946 and a PhD in theoretical acoustics under Bruce Lindsay in 1948.

His service in the navy stimulated what was to be a lifelong love of the sea; he maintained a small powerboat, and he devoted much of his early research to underwater sound, both for Brown and for the navy. Morse subsequently remained at Brown, becoming an assistant professor of physics in 1949. He later became a professor of physics (1958), department chair (1960), and dean of the college (1962). In 1956, as a member of the National Academy of Science's Project Nobska, he helped create the Polaris missile submarines. He also served as chair of NAS's Committee on Undersea Warfare.

Morse achieved fame in 1957 for his research on ultrasonic absorption in superconductors. He developed an



COURTESY, MORSE FAMILY

ROBERT WARREN MORSE

ultrasonic technique for determining the gap in the density of states of unpaired electrons in a superconductor. This measurement provided an important verification of the Bardeen-Cooper-Schrieffer theory of superconductivity.

In 1964, President Lyndon B. Johnson appointed Morse as Assistant Secretary of the Navy for Research and Development. Morse collaborated with Admiral Hyman Rickover in the development of the NR-1, a small nuclear submarine capable of exploring the ocean floor and thus extremely useful in oceanographic research. Morse left the navy post in 1966 to become president of Case Institute of Technology in Cleveland, Ohio. He then presided over its merger in 1967 with Western Reserve University. As was the case for most college presidents in that era, he struggled to maintain a balance between the raging student protests over the Vietnam War and the views of conservative boards of trustees. He took pride in the fact that, in a city torn by race rioting, he never had to call the police to put down a campus disruption, either over race or over the war.

Ultimately, Morse's liberal views fell victim to his board of trustees and he resigned as president in 1971. He then joined the Woods Hole Oceanographic Institution on Cape Cod, Massachusetts, as director of research in 1971. In 1973, he became the associate director of research and dean of graduate studies. He helped to found Woods Hole's joint academic program with MIT. He also headed the Woods Hole Marine Policy Center until his retirement in 1983. Always interested in research, he endowed in 1999 a Chair for Excellence in Oceanography in support of research at Woods Hole. He also established the Alice Cooper Morse Fund for the Performing Arts at Bowdoin College, in memory of his late wife.

The varied nature of Morse's career is reflected in an anecdote about a Brown alumnus serving in the US Marine Corps. During a simulated invasion on the Spanish coast, the young man climbed the coastal slope and came upon Morse, who was then the Assistant Secretary of the Navy. "Dean Morse," cried the student, "what are *you* doing here?" The answer might have been that Morse was at home anywhere—in the navy, in academic administration, in teaching, or in research.

All who made contact with Morse found him to have a warm and engaging personality. He was a first-class

teacher, an excellent researcher, and an administrator of great skill and courage.

ROBERT T. BEYER

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James Samuel Owens

James Samuel Owens, an optical spectroscopist, ceramic scientist, and industrial manager, died in Venice, Florida, on 26 October 2000 of congestive heart failure.

Owens was born on 27 March 1908 in McKinney, Kentucky, and raised in the nearby town of Hustonville. He earned a BS degree in physics from the University of Chattanooga in 1928 and then began graduate studies in physics at the University of Wisconsin, where he worked as a research assistant to L. R. Ingersoll from 1928 to 1929.

Owens considered transferring to electrical engineering, so he spent the summer of 1929 working for Western Electric in Chicago. Having decided that he preferred physics, he then accepted a research assistantship at the University of Michigan, earning his MS (1930) and PhD (1932) degrees in physics there. His doctoral thesis was entitled "The Quenching of Mercury Resonance Radiation by Hydrogen, Carbon Monoxide, and Nitrogen." His thesis adviser was O. S. Duffendack, who remained a lifelong friend and mentor.

From 1933 to 1939, Owens was a research physicist at the Dow Chemical Co in Midland, Michigan, where he worked in optics, spectrochemical analysis, and photochemistry and reported to J. Donald Hanawalt. From 1939 to 1943, Owens was assistant chief chemist with the Armstrong Cork Co in Lancaster, Pennsylvania, using spectroscopic techniques to study glass chemistry.

Returning to the University of Michigan, he worked from 1943 to 1946 for Duffendack as chief technical aide in the infrared section of the National Defense Research Committee, Office of Scientific Research and Development. Owens was responsible for developing infrared equipment and systems for the detection of personnel, vehicles, and ships, and also for communication. For this work, carried out in industrial and university laboratories across the country, he received the Presidential Certificate of Merit from President Harry S. Truman (in 1948).

Owens joined Ohio State University in 1945 as a professor of physics



JAMES SAMUEL OWENS

and as executive director of the university's Research Foundation in Columbus. As executive director, he was responsible for carrying out, in the university's departments and colleges, the research programs sponsored by industries and government agencies.

In 1951, he moved to Detroit to join the Champion Spark Plug Co as assistant to the manager of the ceramic division. He was named general manager of the division in 1954 and was elected a vice president of the company in 1971. Owens retired in 1973, but remained active in the Engineering Society of Detroit and the Detroit Section of the Society of Automotive Engineers until 1982, when he and his wife moved to Florida.

Owens was president (1974–75) of the Metropolitan Detroit Science and Engineering Fair; president (1973–74) of the Engineering Society of Detroit; president (1967–68) of the American Ceramic Society; and president (1965–66) of the International Association of Torch Clubs. He was also a Kentucky Colonel. This recognition, which particularly pleased him, was granted by the governor of his home state. He was the inventor or coinventor on 11 patents.

Owens thought like a physicist and taught others the excitement of quantitatively understanding the natural world and the operation of complex systems, even though his own career was not primarily in research. Rather, he organized and guided the engineering and manufacturing skills of others to produce many kinds of useful and practical ceramic materials and devices.

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