

**Statement of Ownership,
Management and Circulation**
(Act of 12 August 1970; Section 3685, Title 39, USC)

1. *Title of publication:* PHYSICS TODAY
 2. *Publication no.:* 0031-9228
 3. *Date of Filing:* 1 October 2003
 4. *Frequency of issue:* Monthly
 5. *No. of issues published annually:* 12
 6. *Annual subscription price:* \$250.00
 7. *Location of known office of publication:*
2 Huntington Quadrangle, Melville, NY 11747-4502
 8. *Location of the headquarters or general business offices of the publisher:* One Physics Ellipse, College Park, MD 20740-3843
 9. *Names and addresses of publisher, editor and managing editor:*
Publisher: Randolph A. Nanna, American Institute of Physics, One Physics Ellipse, College Park, MD 20740-3843
Editor: Stephen G. Benka, American Institute of Physics, One Physics Ellipse, College Park, MD 20740-3843
Managing Editor: None
 10. *Owner (if owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual, must be given. If the publication is published by a nonprofit organization, its name and address must be stated.):* American Institute of Physics, One Physics Ellipse, College Park, MD 20740-3843
 11. *Known bondholders, mortgagees and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages or other securities:* None
 12. *The purpose, function and nonprofit status of this organization and the exempt status for Federal income tax purposes:* Has not changed during the preceding 12 months
 13. *Publication name:* PHYSICS TODAY
 14. *Issue date for circulation data below:* August
 15. *Extent and nature of circulation:*
 - A. *Total number of copies (net press run)*
Average* 127 642 August** 128 172
 - B. *Paid and/or requested subscriptions*
 - 1,2. *Paid or requested mail subscriptions*
Average* 122 152 August** 124 047
 - 3,4. *Sales through dealers and carriers, street vendors and counter sales; other classes mailed*
Average* none August** none
 - C. *Total paid and/or requested circulation (sum of B1-B4)*
Average* 122 152 August** 124 047
 - D. *Free distribution (samples, complimentary and other free)*
Average* none August** none
 - E. *Free distribution outside the mail (carriers or other means)*
Average* 2 947 August** 2 760
 - F. *Total free distribution (sum of D and E)*
Average* 2 947 August** 2 760
 - G. *Total distribution (sum of C and F)*
Average* 125 099 August** 126 807
 - H. *Copies not distributed (office use, leftovers and spoiled)*
Average* 2 543 August** 1 365
 - I. *Total (sum of G and H—should equal net press run shown in A)*
Average* 127 642 August** 128 172
- Percent paid and/or requested circulation (C/G×100)*
Average* 97.64% August** 97.82%
- * Average number of copies of each issue during preceding 12 months
- ** Actual number of copies of single issue published nearest to filing date.
- I certify that the statements made by me above are correct and complete.
- Darlene Walters, Sr. Vice President Publishing

Konrad Bates Krauskopf

On 4 May 2003, Konrad Bates Krauskopf, a pioneering geochemist, died peacefully at his home in Stanford, California. Konnie, as friends knew him, had been a member of the Stanford University faculty since 1939 and was a professor emeritus after 1976.

Konnie was born in Madison, Wisconsin, on 30 November 1910, son of a chemistry professor at the University of Wisconsin and a homemaker. He grew up there and received his AB degree in chemistry at the university in 1931. He traveled west to attend the University of California, Berkeley, for doctoral study in chemistry under the direction of Gerhard K. Rollefson. Konnie received his PhD in 1934 with a dissertation on photochemical studies.

After a one-year instructorship at Berkeley, Konnie went to Stanford and decided to matriculate into the PhD program in geology. For his research, Konnie worked with Aaron C. Waters and received a second PhD in 1939 for a dissertation entitled "Geology of the Northwest Quarter of the Osoyoos Quadrangle, Washington." He admitted that continuing to do bench chemistry was far less interesting to him than geologic fieldwork. Concurrently, he served as an instructor of a Stanford undergraduate physical science course that combined his expertise in chemistry with his newfound interest in geology.

His professional life was filled with extraordinary achievements in both geology and geochemistry. He made numerous original contributions in all aspects of academic performance that one deems critically important: research, instruction, and public and professional service.

Conciseness and simplicity of expression characterized Konnie's teaching style. He presented with remarkable clarity subjects that generally were considered especially challenging. His lectures were polished and methodically delivered; he chose his words very carefully and forswore lecture notes. In guiding the research of advanced students, he cut them considerable slack, but was ready to provide incisive guidance when appropriate. He was the epitome of a model teacher.

Having provided geoscientists with discipline-defining texts in geochemistry and physical geology over a span of five decades, Konnie literally wrote the book on applying the principles of



Konrad Bates Krauskopf

physics and chemistry to Earth. His pioneering works focused on and illuminated the fundamental chemical and physical foundations of the Earth sciences. Among his acclaimed books are *The Third Planet: An Invitation to Geology* (Freeman, Cooper, 1974); *Fundamentals of Physical Science: An Introduction to the Physical Sciences* (McGraw-Hill, 1941); *The Physical Universe* (McGraw-Hill, 1960); and *Radioactive Waste Disposal and Geology* (Chapman & Hall, 1988)—the last produced well after Konnie had achieved emeritus status. Most of his works have run through several (up to seven) editions. His special research emphases included seminal studies of aqueous solution-metal complex equilibria and thermodynamic applications to solid-melt-fluid partitioning, research that he published at a time when most Earth scientists were mapping quadrangles. Konnie did that too: He published seven geologic quadrangle maps. Field associates were impressed by his seemingly endless supply of limericks—one to fit any occasion.

Konnie was a member of the military geology division of the US Army during World War II. In 1947, he was appointed chief of the G-2 geographic section in Tokyo and received a citation for meritorious civilian service in 1949. He served for more than a decade as a member, then chair, of the US National Research Council Board on Radioactive Waste Management and was responsible for an outstanding, problem-defining National Academy of Sciences report.

During his long career, Konnie received many honors. He served as

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president of the American Geological Institute from 1964 to 1965; he received its Ian Campbell Medal in 1984 and its Legendary Geoscientist Award in 2000. In 1961, the Geological Society of America gave him its Arthur L. Day Medal; he was president of the society from 1967 to 1968. Konnie was president of the Geochemical Society from 1970 to 1971 and received its V. M. Goldschmidt Award in 1982. Those medals and awards are the highest honors given by the three professional societies. He was also honored with the Mineralogical Society of America's Distinguished Public Service Medal in 1994.

Geochemistry has come a long way, thanks to intellectual leaders such as Konnie. Perhaps no other geochemist so expertly and faithfully served the Earth science profession in such far-ranging ways. Konnie was enormously effective in all of them—as geologist, geochemist, and science and technology adviser to the nation. He was a scientific icon. His insightful scientific contributions and keen wit are greatly missed.

W. Gary Ernst
Stanford University
Stanford, California

William George McMillan Jr

William George McMillan Jr, an emeritus professor of physical chemistry at UCLA, died of a heart attack on 23 November 2002 in Los Angeles, California. Throughout his career, he combined teaching and research with extensive service as a consultant to the US military.

A native Californian, Bill was born on 19 October 1919 in Montebello and graduated from Montebello High School, where he was greatly influenced by his chemistry teacher, Leon Brook. Bill received his BA in chemistry from UCLA in 1941 and two degrees from Columbia University: an MS in chemistry in 1943 and a PhD in chemical physics in 1945. His dissertation research in statistical mechanics with Joseph E. Mayer concerned the theory of solutions. The results, now known as the McMillan–Mayer theory, are still widely cited. From 1944 to 1946, still at Columbia, Bill was a research chemist on the Manhattan Project and worked on the separation of uranium-235.

On receiving a Guggenheim fellowship in 1946, Bill, with Edward Teller, carried out research in nuclear



William George McMillan Jr

physics at the University of Chicago. He became an assistant professor of chemistry at UCLA the following year, and by 1959 had risen to the rank of full professor. As chair from 1959 to 1965, Bill led the department of chemistry through a period of rapid growth and development of its research and teaching programs and established a strong infrastructure. His leadership was instrumental in bringing the department to national attention.

Bill felt a strong commitment to government service. Unlike many in academe (whom he frequently criticized as parochial), he thought the country was continually in mortal danger from the Soviet Union. He worked part-time from 1954 to 1971 for the RAND Corp in Santa Monica, California, as a consultant to the US military. At UCLA, he established defense science seminars (1964–66) to help revitalize the contact between young scientists in the universities and those in government service and in the defense community. While on leave from the university, Bill served from 1966 to 1968 in Vietnam as science adviser to General William Westmoreland. There, Bill developed concepts for artillery and military reconnaissance. After contracting hepatitis in Vietnam, he researched the disease and developed a physicochemical description of it.

Although much of Bill's time was spent in government service that gave rise to many specialized reports—some still classified—his academic publications dealt with a wide variety of topics. They ranged from early work on multicomponent systems to later statistical mechanical and quantum mechanical studies on

the Thomas–Fermi model of the atom, transitions in two-dimensional adsorbed layers, dispersion forces between molecules, a comprehensive review of the virial theorem, and applications to ions in solution.

In 1971, Bill founded McMillan Science Associates, which he built up over subsequent decades as a wide-ranging consulting company for high-technology and military projects. He was interested in topics as diverse as traffic flow, global warming, ozone depletion, and atmospheric studies of Venus. A part-time faculty member at UCLA in his later years, he continued his many activities after retiring from the university in 1990.

Over several decades, Bill served on numerous advisory boards and committees dealing with national security. Among his many citations and awards are the US Army's Distinguished Civilian Service Award (1968), Knight of the National Order of Viet Nam (1969), and the US Air Force's Exceptional Civilian Service Award (1984).

Bill was an enthusiastic and well-organized teacher in courses ranging from first-year chemistry to graduate courses in quantum chemistry and statistical mechanics. He would astonish students in a computer age with quick back-of-the-envelope calculations. He had a brilliant mind and could talk and write about anything from planetary physics to the thermodynamics of solutions.

Robert L. Scott
Charles M. Knobler
University of California
Los Angeles

Masahiro Wakatani

On 9 January 2003, Japan lost one of its most prominent theoretical plasma physicists when Masahiro Wakatani died unexpectedly from a cerebral hemorrhage at his home in Nara, Japan.

Wakatani was born on 15 May 1945 in Osaka, Japan. He graduated from Kyoto University in 1968 with a BSc in nuclear engineering and received a doctor of engineering degree in electrical engineering from the same university in 1973. His doctoral research, under Ryohei Itatani, was on the magnetohydrodynamic (MHD) equilibrium and stability of a toroidal pinch. In his thesis, he calculated the collision diffusion coefficients for that device, using the now-famous neoclassical transport theory that had just been developed by Roald Sagdeev and Alec Galeev. Their theory indicated