

rameters." Sheikh-Bagheri is a medical physicist and senior software engineer at NOMOS Corp in Cranberry Township, Pennsylvania. Rogers is the group leader of the ionizing radiation standards department at the Institute for National Measurement Standards in Ottawa, Ontario, Canada.

The Sylvia Sorkin Greenfield Award, given for the best overall non-dosimetry paper published the previous year in *Medical Physics*, was shared by **Mia Skarpathiotakis, Martin Yaffe, Aili Bloomquist, Dan Rico, Serge Muller, Andreas Rick, and Fanny Jeunehomme** for their paper "Development of Contrast Digital Mammography." Skarpathiotakis, Yaffe, Bloomquist, and Rico are affiliated with the Sunnybrook and Women's College Health Sciences Centre in Toronto, Canada. Muller, Rick, and Jeunehomme are affiliated with G. E. Medical Systems in Buc, France.

In Brief

Britain's Royal Meteorological Society is presenting this year's Symons Gold Medal, its most prestigious award, to **Raymond Hide** at an awards dinner this month in Norwich, England. Among Hide's other

achievements, the society is acknowledging him for his "original and inspirational experimental and theoretical studies of nonlinear hydrodynamics and magneto-hydrodynamics of rotating fluids, and their application to understanding the dynamics of planetary atmosphere and interiors." Hide is a senior research investigator in the mathematics department at Imperial College, London, and emeritus professor of physics at the University of Oxford.

Effective this month, **Anthony M. Johnson** is the new director of

the Center for Advanced Studies in Photonics Research at the University of Maryland, Baltimore County. He holds joint faculty appointments as a professor in both the physics department and the computer science and electrical engineering department. He previously was the Foundation Professor of Optics & Photonics and Distinguished Professor of Physics at the New Jersey Institute of Technology in Newark. Since 1996, he had been the principal investigator and project director of NJIT's multidisciplinary optical science and engineering program.

Obituaries

Hilda Gertrude Kingslake

Rudolf Kingslake

Rudolf and Hilda Kingslake were a team for more than 70 years, and leave a very significant and distinguished legacy in the discipline of optical science and engineering through their individual and joint contributions. They died within 11 days of each other in February 2003: Hilda on the 14th—two days before her 101st

birthday—of end-stage dementia, and Rudolf on the 25th of myocardial infarction. They had both been residents at the Episcopal Church Home in Rochester, New York, for a number of years.

Hilda Gertrude Conrady was born in London, England, on 16 February 1902. Her father, A. E. Conrady, was professor of optical design in the newly established technical optics department of the Royal College of Science, a unit of Imperial College, London. The other two faculty members were F. J. Cheshire (director) and

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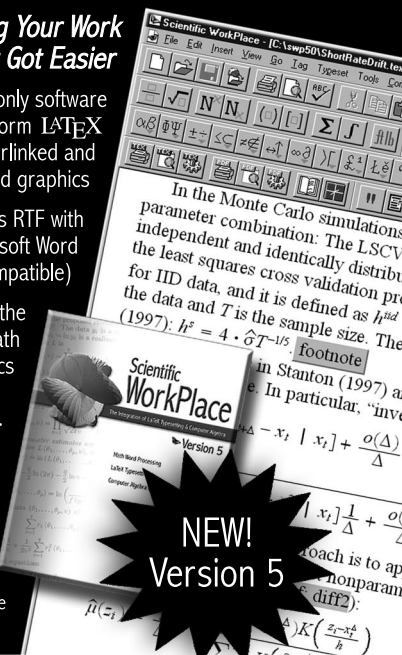
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L. C. Martin; B. K. Johnson was also appointed to assist in the laboratory instruction. This team had a strong influence on the future careers of both Hilda and Rudolf as they pursued the science and technology of optics.

Hilda was a student of her father and graduated in 1923, as part of the first graduating class, with a bachelor's degree in optics. She continued her work in optics as a research scholar in the department and published regularly on such topics as the Foucault knife-edge test and primary spherical aberration. Her first paper, published in 1924 in the *Transactions of the Optical Society, London*, appeared immediately following Rudolf's first paper. Hilda's byline, which reflects the style of the time, was "Miss H. G. Conrady" in papers published in the *Proceedings of the Optical Conferences* and the *Photographic Journal*. Later, after her marriage to Rudolf, she would sign "Hilda Kingslake née Conrady" and, much later, "Hilda Conrady Kingslake."

Rudolf Kingslake was born Rudolf Klickmann on 28 August 1903 in London, and was the eldest of five children. His father officially changed the family name to Kingslake in 1917. Rudolf, in reminiscing, told me that the boys at his school had fun with his surname change and often called him "Queenspond" instead of "Kingslake"! Rudolf's father recognized his son's talents early on and wrote that Rudolf's "reasoning powers [were] strongly developed—as applied to scientific subjects—mathematics, mechanics etc." He penned this in the family journal (now housed in the Kingslake Archive at the University of Rochester) when Rudolf was four years old.

After being educated in private schools, Rudolf attended Imperial College and was in the same program that Hilda had already enrolled in; thus he came under the tutelage of Conrady and Martin. Hilda, with a twinkle in her eye, never let Rudolf forget that he graduated the year after her and that she carried the Conrady genes. Rudolf graduated in 1924 with his bachelor's degree in optics and earned his master's degree in optics in 1926. In 1950, he was awarded a Doctor of Science. Following graduation in 1926, he continued for a second year as a Beit Fellow. Rudolf's notes from that period are revealing: "2nd year of Beit Fellowship and 6th year at college—finished chr-ab [chromatic aberration] work

and designed a lens with variable zonal aberration. Worked in Science Museum for a month—went to AC Works, Dallmeyers and the BBC [British Broadcasting Corporation]; Phys Soc [Physical Society] show in [January]. . . . offered job at Parsons in June 1927. tested Huygens lenses in June and helped with Keeler's ophthalmoscope. Went with Hilda to zoo."

Rudolf took the job at Sir Howard Grubb, Parsons and Co in Newcastle-on-Tyne as an optical designer. In 1928, he joined the International Standard Electric Co in London. The Kingslakes would, in just one-year's time, be at the start of a major academic optics program.

The Institute of Applied Optics (later renamed Institute of Optics) had just been established at the Uni-

versity of Rochester in March 1929. They started their careers in the US; Hilda was a very active member of the Optical Society of America (OSA), and through the society provided exceptional and distinguished service to the field of optical science and engineering and to the professional international community of scholars. Their many contributions to the life of the University of Rochester and the greater Rochester community are well regarded, recognized, and documented.

Rudolf had a lifelong career in association with the Institute of Optics and developed the teaching materials for the first courses in lens design and geometrical optics formally offered in the US. In 1936, the Kingslakes spent a sabbatical at Imperial College under an exchange arrangement that brought Martin to Rochester. With Rudolf's unusual sense of humor, he commented that "Martin and I exchanged jobs, houses, and cars—but not wives." He served the university as a full-time faculty member until 1937, when, at the invitation of C. E. Kenneth Mees, head of Kodak Research Laboratories, Rudolf joined the Eastman Kodak Co in Rochester. His initial appointment at Kodak was as a lens designer, but he became head of the department two years later.

During his first year at Kodak, Rudolf divided his time between that office and the Institute of Optics. In 1956, he was appointed director of optical design at Kodak's apparatus and optical division. Rudolf continued at the institute as a part-time professor until well into his eighties.

The Kingslakes made many contributions to the literature of our field. Hilda's early technical papers are still referenced and have lasting and significant value. Her insightful contributions on the history of optics are equally valuable, including her article "Fifty-Year History of the Optical Society of America, 1916–1966," which was published in the March 1966 issue of the *Journal of the Optical Society of America*, and *The First Fifty Years: The Institute of Optics, 1929–1979* (Institute of Optics, 1979), together with its sequel *The Institute of Optics, 1929–1987* (Institute of Optics, 1987). Hilda's last publication was on the history of optics: a paper in *Optics and Photonics News* in 1991 entitled "The First Institute of Optics in the World." The work traced the early days of the formation and de-



versity of Rochester in March 1929. T. Russell Wilkins of the physics department was appointed acting director. Over dinner at Brown's Hotel in London, the university's president, Rush Rhees, entertained, interviewed, and successfully recruited Rudolf to the institute. Rudolf was appointed assistant professor of geometrical optics and optical design on 15 June 1929 on the president's recommendation: "By training and experience he is admirably fitted to contribute to the development and significance of our new enterprise." When asked by the university's trustees about the relative youth of Rudolf in his first full-time appointment, Rhees reportedly said that they "should not be concerned since it was something that he would undoubtedly grow out of."

In the meantime, Rudolf's relationship with Hilda went further than just a visit to the zoo. They married on 14 September 1929 and sailed to America so that Rudolf could take up

velopment of Imperial College's optics department, of which her father had such a pivotal role and of which she and Rudolf had firsthand knowledge. Another important contribution to applied optics and its history is the article "Alexander Eugen Conrady, 1866–1944" that she wrote jointly with Rudolf. The article was published in 1966 in *Applied Optics*.

Rudolf is renowned for his many seminal papers on optical design that have so impacted the field. He is even more recognized for his dedication to teaching the principles and applications of optical design and his expository writings in lecture notes and books. Generations of students have attended his formal courses and even more professionals have returned to Rochester to attend short courses offered in the summer. One of his fondest memories was the two-week course that he and I taught together at Tel Aviv University under the auspices of the Israeli Physical Society back in 1973. His many books deserve special mention. They include *Lenses in Photography: The Practical Guide to Optics for Photographers* (Case-Hoyt Corp, 1951), *Lens Design Fundamentals* (Academic Press, 1978), *Optical System Design* (Academic Press, 1983), and *A History of the Photographic Lens*

(Academic Press, 1989). The multivolume series *Applied Optics and Optical Engineering: A Comprehensive Treatise* (Academic Press, 1965–69) has enduring value. Rudolf's last publication was a small but elegant volume on *The Photographic Manufacturing Companies of Rochester, New York*, published in 1997 by the International Museum of Photography at the George Eastman House, where Rudolf spent many volunteer hours sorting and cataloging photographic lenses, cameras, shutters, and other devices and instruments.

Conrady had published part one of his book *Applied Optics and Optical Design* (Oxford U. Press) in 1929 but died before completing the second part. However, he left a well-advanced manuscript in his remarkably clear handwriting that the Kingslakes were able to use to complete part two, which was published in 1960 as "edited and completed by Dr. Rudolf Kingslake" and contained a foreword signed by "Hilda G. Conrady Kingslake." Conrady was a major force in their lives and in the history of lens design. When, in 1990, SPIE—The International Society for Optical Engineering wished to establish the Conrady Award in Optical Engineering, William L. Wolfe, SPIE's president at

the time, wrote Rudolf and Hilda to ask their permission to use the Conrady name. As noted in her private papers, Hilda's reply was: "Of course I am more than happy to give the required permission, and thank the Committee for having the name under consideration, for Father was indeed the real pioneer in the teaching of lens design and applied optics. Rudolf was his great disciple who lectured straight Conrady in his first years of teaching at the University of Rochester." In 1990, SPIE presented the very first award to Hilda and Rudolf Kingslake. The Kingslakes were honored in another way by SPIE: In 1974, the society had established the Kingslake Medal and Prize for the most original paper to appear in the SPIE journal *Optical Engineering*.

The Kingslakes' involvement in professional societies was very significant. Rudolf was president of the OSA in 1947–48. Later, both of them were made fellows, and Rudolf, in 1973, received the society's highest award, the Frederic Ives Medal. They both received awards and commendations from many civic and other professional societies. The University of Rochester honored them by awarding an honorary degree to Rudolf in 1986 and creating the Rudolf and Hilda



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Kingslake Chair in the Institute of Optics in 1989.

Rudolf and Hilda Kingslake were real people—warm, friendly, modest, and caring. Certainly my wife and I are representative of the many people who counted Hilda and Rudolf as significant friends and vital colleagues. We cherish their memory and applaud their contributions.

Brian Thompson
University of Rochester
Rochester, New York

Pierre Aigrain

Pierre Aigrain was a man of many talents: a naval officer, engineer, physics researcher and educator, administrator, statesman, and industrialist. Above all, as he wrote in his book *Simples Propos d'un Homme de Science* [Some Simple Words From a Scientist] (Hermann, Paris, 1983), “My job has a name: science. Pure, applied or industrial, it was always of science I cared of, as researcher and as administrator.” He died on 30 October 2002, near Paris, of Alzheimer’s disease.

Pierre was born in Poitiers, France, on 28 September 1924. His career began with improbable opportunities: Under wartime conditions in 1941, he entered the Ecole Navale, the French Navy academy located on the naval base in Toulon. The navy had scuttled its ships when the German army invaded Toulon in 1942 and had relocated the academy inland. Nevertheless, Pierre fought in 1945, with his class, against the last German pocket of resistance. After V-E Day, Pierre, with other ensigns in his class, was sent to the US to be trained as a naval air pilot. But he did not fly. Instead, the French navy, with remarkable foresight, sent him to the Carnegie Institute of Technology (now Carnegie Mellon University) in Pittsburgh, Pennsylvania, to train in electronics. Under F. M. Williams, he graduated with a PhD in electrical engineering in 1948. His thesis addressed instabilities in synchronous machines.

In an article about Pierre one of us (Baruch), with Ludivine Bantigny, published in the October 2000 issue of the *Bulletin de la Société Française de Physique*, Frederick Seitz, then the head of the Carnegie Tech physics department, recalls that “Pierre rapidly permeated every nook and cranny of the institution that had any relevance to a broader mission related to absorbing as much knowledge of science as engineering. . . . Pierre followed [the nuclear and solid-state physics research programs] with deep inter-



Pierre Aigrain

est along with his primary research in electrical engineering. He rapidly became a very active member of the family of alert and creative individuals on campus, being admired on all sides for his breadth of understanding and enterprise.”

While in Pittsburgh, Pierre met Claude Dugas, a young physicist from the Ecole Normale Supérieure in Paris who was engaged in a French translation of Seitz’s classic book *Modern Theory of Solids* (McGraw-Hill, 1940). The two of them were to become the seeds of semiconductor physics in France. Yves Rocard, the director of the physics department at the ENS and a scientific adviser to the French navy, spotted them while visiting scientific institutes in the US. He quickly brought them back to Paris in 1949. They both defended their *doctorat d’état* theses: Pierre on point contact transistors, and Dugas on surfaces and catalysis.

Soon thereafter, they recruited graduate students from the ENS to form a group that specialized in semiconductor physics. In the lab, the group developed both theoretical and experimental approaches. The group first learned how to grow germanium and silicon crystals, and then focused on transport properties (the photoelectromagnetic effect, helicon waves, hot electrons); optical properties (recombination radiation); surfaces; compounds and thermoelectric materials; and radiation effects. That small community grew rapidly and initiated both academic and industrial semiconductor research in France.

In the US, Pierre’s reputation was already well established. His connections with several large companies—for example, Bell Laboratories, IBM

Corp, General Electric Co, and RCA—enabled him to arrange collaborative efforts and exchanges with researchers in France. He obtained research contracts from the US Navy and US Air Force, which was a precious help to France, a country that had to rebuild and to develop, with scarce resources, its science base.

Pierre and his students frequently consulted for the nascent semiconductor industry in France, with which they successfully established a cooperative relationship. But, somewhat paradoxically, they never conducted specific research on devices. Occasionally, they took part in the design, especially for test devices, but the real development was left to industry.

In 1954, Pierre was appointed as an assistant professor of physics and, in 1958, became a full professor of electrical engineering and, later, energetics on the faculty of sciences at the University of Paris—heir to the ancient Sorbonne. When, in 1970, the university was split into 13 new universities, Pierre opted for the University of Paris 7, now called the University of Denis Diderot.

He then turned his talents toward science policy. A leading member of the think tank on research structures that inspired Charles de Gaulle in his 1958 reforms of the French science system, Pierre was the scientific director for defense research from 1961 to 1965. He then was the general director of higher education (1965–67); head of DGRST, the French government research administration (1968–73); and then the undersecretary of state for research (1978–81). After spending a year (1973–74) in the US as a Henry Luce Professor at MIT, he returned to France to take a position in industry as the director general for science and technology with Thomson-CSF (now the Thales Group) in Paris. He served in that position twice: from 1974 to 1978 and from 1981 to 1983.

After retiring in 1983, he continued to consult for industry and to advise governments. He was very active in the evaluation of the European Commission’s research programs. He served, in 1987, as the president of the Société Française de Physique (French Physical Society). In all his activities, Pierre demonstrated the same enthusiasm and imagination—and disdain for bureaucracy—that he had for research. He never relinquished his primary interest for physics.

From 2001 to 2002, Pierre’s former students and friends met with him regularly at his home to share memo-