

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

**P**ierre 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-

ries and talk about the fruitful and joyful time they had spent together. The discussions, augmented by contributions from Dugas and Seitz, are reported in the Baruch and Bantigny article.

The agility of Pierre's mind was amazing: He had a vast imagination and was bursting with new ideas—some of them way out there, but most of them profound. Colleagues may remember seeing Bell Labs researchers in Murray Hill, New Jersey, waiting in line for Pierre's advice! He also was convivial and outspoken. In the lab, we viewed him more as a pal than as a boss—he was only four years older than most of us—and we admired him. Our group's Saturday morning meetings with Pierre in a nearby bistro in the Latin Quarter were famous among the semiconductor community. There, between pinball games, we discussed the progress of our work, and new ideas emerged.

Pierre was unselfish and generous, leaving to his coworkers the benefit of his own ideas. As a result, his published work is scanty. Many of us will remember his endless creativity, enthusiasm, imagination, and humor. But he hated paperwork, even for his own scientific ideas. We pressed him without success to write down the ideas about semiconductor lasers that he had presented orally at the Brussels solid-state electronics conference in 1958, ideas that were well ahead of their time.

Pierre became a member of the National Academy of Sciences in 1974 and a foreign associate of the National Academy of Engineering in 1976. He joined the French Academy of Sciences in 1988.

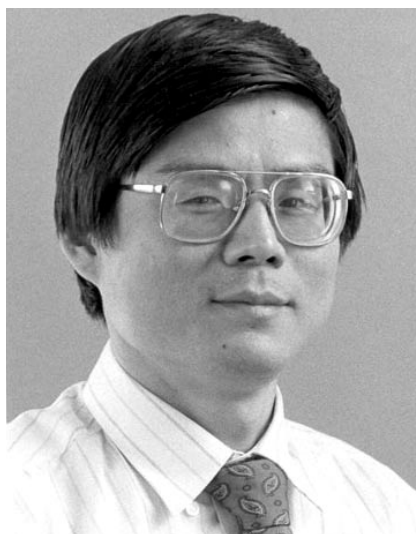
An atypical figure, Pierre was a main contributor to French physics revival during the postwar period. He left a profound imprint on a generation of solid-state scientists. All those who had the fortune of working with him know that they owe him much.

**Philippe Nozières**  
Collège de France  
Paris, France

**Pierre Baruch**  
Université Denis Diderot-Paris 7  
Paris, France

## Daniel Chonghan Hong

**D**aniel Chonghan Hong, a professor of physics at Lehigh University and the originator of the diffusing void model of granular flow, died of cardiac arrest, after a period of hospitalization, on 6 July 2002 in Hershey,



**Daniel Chonghan Hong**

Pennsylvania.

Dan was born in Seoul, South Korea, on 3 March 1956. He earned his BS (1979) and MS (1981) degrees in physics from Seoul National University and his PhD in theoretical condensed matter physics from Boston University in 1985. He did postdoctoral work at the Institute for Theoretical Physics (ITP; now the Kavli Institute for Theoretical Physics) at the University of California, Santa Barbara (UCSB), for the next three years and at Emory University from 1987 to 1988. He then joined the faculty at Lehigh.

As a graduate student, Dan worked with H. Eugene Stanley on fractal properties of the percolation backbone, random walks on percolation clusters, and transport in random composites. At the ITP, he turned his attention to pattern formation, which was then just beginning to attract wide interest among statistical physicists. With James Langer and Angelo Barbieri, Dan worked out the theory of microscopic solvability, showing that the Stefan model of solidification does not allow steady-state “needle crystal” solutions unless the surface tension in the model is anisotropic. Dan subsequently investigated several ramifications of microscopic solvability, especially for the Saffman–Taylor problem.

While working on both pattern formation and polymer physics at Lehigh, Dan added granular flow to his expanding list of interests in nonlinear dynamics. He approached the topic from a dizzying range of perspectives: discrete computer simulations, static stress analyses, thermodynamic analogues, Langevin-, Boltzmann-, and Enskog-equation

approaches, and continuum hydrodynamic formulations. His very first effort in this field was noteworthy: With Hugo Caram, he formulated a simple granular-flow model that focused on the diffusion of voids in the assembly of particles. They published their findings in *Physical Review Letters* in 1991. The diffusing void model is now recognized as an effective theoretical model for treating a broad range of dynamical phenomena in granular media. In his office, Dan prominently displayed a Lucite® chamber containing internal barriers and plastic spheres; the chamber demonstrated some of the model's first predictions.

Dan's range of interests, and his worldwide circle of collaborators and students, continued growing vigorously until his final months. He branched out into fracture and stick-slip failure, traffic flow, and a variety of pattern-formation problems, including surfactant effects in viscous fingering, ripple marks, and washboard roads. His final work, with Stefan Luding (then with the Institute for Computer Applications in Stuttgart, Germany) and Paul Quinn (then at Lehigh), on the behavior of a vibrated bed of dissimilar grains predicted the conditions under which larger grains may sink. This “reverse Brazil nut problem” remains a focus of active investigation worldwide. Dan was pleasantly surprised—and nonplussed—when his paper, with Joseph Both of Lehigh, on controlling the size of popcorn attracted international media attention before its publication in *Physica A* in 2000.

In addition to his technical publications, Dan wrote popular articles on science, philosophy, and religion for the Roman Catholic monthly *Dulsum Nalsum* and several Korean-American publications. He edited the *AKPA Newsletter* for the Association of Korean Physicists in America from 1995 to 1997 and from 1999 to 2000.

Dan's intellectual curiosity and discipline extended beyond physics. A born-again Christian, he had studied Greek to gain a better understanding of the Bible and was planning to study Hebrew as well.

Dan was an innovative and thorough researcher who related his work to everyday phenomena that other people could understand. He had an unusual ability to catch the simple physics behind a complex phenomenon. He was the source of a ceaseless stream of new ideas that few could keep up with, and he pursued those ideas with an energy and intensity that few could match. He had a keen sense of humor and