Robert Adolph Becker

Institution's Department of Terrestrial Magnetism (1941), the National Bureau of Standards (1941–43) and the University of California's Radiation Laboratory (1943). At those places he worked on proximity fuses, rocket development and the Manhattan Project. During the last two years of the war, he worked at the University of Washington's applied physics laboratory on torpedoes that sense the magnetic fields of their targets.

In 1946, Bob joined the physics department of the University of Illinois as an assistant professor, where he remained for 15 years, attaining full professorship. While a member of the faculty, he wrote *Introduction to Theoretical Mechanics* (McGraw-Hill, 1954), which became a widely used textbook. (Many years later, after he retired, Bob greatly enjoyed providing full solutions to the textbook's problems in response to letters from fellow retirees who were studying his text for their self-edification, but who could not solve the tougher problems.)

Bob's research at Illinois was focused on proton- and deuteron-induced nuclear reactions—a topic that also led him to consider the relevance of those reactions to astrophysics.

Two successive Guggenheim fellowships in 1958–60 enabled Bob to take a sabbatical at Caltech as a visiting professor.

The year 1960 proved to be a major turning point in Bob's scientific career. In June, The Aerospace Corp, a nonprofit organization located in El Segundo, California, was created to provide the US Air Force with scientific and technical advice on military space systems. To set up a laboratories division, Aerospace called on Chalmers Sherwin, who had worked with Bob at the University of Illinois. Sherwin, in turn, invited Bob to Aerospace to set up its space physics laboratory.

One of the main objectives of space physics, which was still in its infancy at that time, is the characterization of the near-Earth environment in which space systems operate. Under the constant influence of solar activity, this environment was found to be highly dynamic and potentially harmful to spacecraft. As director of the space physics laboratory from 1960 to 1968, Bob assembled a group of young, talented experimentalists and theorists who accomplished pioneering research in this new field. Experiments evolved from simple, "piggyback" packages, which hitched rides on Air Force and NASA spacecraft, to missions dedicated to investigating single topics, such as the electrical charging of spacecraft. Bob had a remarkable ability to recognize talent in the young people he hired, many of whom later led distinguished careers.

Bob chose to retire from Aerospace in 1973 and moved to Carmel, California, where he continued to pursue his scientific interests, including the origin and evolution of the Solar System. We relish our memories of Bob's gruff demeanor, his utter disdain for bureaucracy (and his unique ways to sidestep it), his frequent admonitions and his colorful expressions. Most of all, we recall his unswerving dedication to scientific excellence.

George A. Paulikas
The Aerospace Corp
El Segundo, California
Dale Vrabec
Estes Park, Colorado

Arthur Constantine Damask

Arthur Constantine Damask

Arthur Constantine Damask, whose career began in metal physics and ended in medical physics and accident analysis, died in New York City on 27 January 1998 from complications following surgery.

Born in Woodstown, New Jersey, on 28 July 1924, Damask earned a BS from Muhlenberg College in 1949 and an MS and PhD in physics from Iowa State University in 1954 and 1964, respectively.

The first phase of Damask's career began in 1954, when he was stationed at Brookhaven National Laboratory as a guest scientist from the US Army's Frankford Arsenal research laboratory. Over a ten-year period, Damask was primarily involved in metal physics, working on such problems as order–disorder transformations in alloys and nucleation kinetics in precipitation processes. Radiation effects in solids also interested him, and he was responsible for some crucial experiments on radiation-enhanced diffusion in alloys, a phenomenon he elucidated through neutron experiments at the Nevada Test Site and at Lawrence Livermore National Laboratory. This work resulted in the preparation of a series of papers and culminated in the publication of a book, *Point Defects in Metals* (Gordon and Breach, 1963), which he wrote with George Dienes and which became a standard text.

The second and third phases of Damask's career unfolded after he was appointed to a physics professorship at Queens College (part of what is now City University of New York) in 1965, a position he retained until his retirement in 1991. Those phases involved his making notable contibutions in two distinct fields—medical physics and accident analysis.

Early in the 1970s, Damask became interested in forensic science—both practicing it and exhorting other physical scientists to do so. As he gained experience in the field, he quickly became known and respected among forensic practioners in the engineering sciences as a solver of puzzles, a writer of books, a teacher. He was one of those people who, upon entering a new field, feel driven to write about it, and, in his case, to write about it with the eye of a physicist. His Medical Physics series—written in part with Charles Swenberg and published by Academic Press—commenced in 1978 with *Physiological Physics, External Probes* and was followed in 1990 by *Injury Causation and Analyses* (volume 1 written with his son Jay; volume 2 written with his sons John and Jay) addressed what the laws of physics permitted and prohibited with respect to injury-based inferences. Five years later, with coeditor Thomas Bohan, Damask began his final forensic series, Forensic Accident Investigation, the second volume of which was issued late last year. In all these endeavors, Damask applied rigorous quantitative methods of analysis to the types of problem that all too often had been treated more with hand waving than with numbers. These problems included the nature and magnitude of crash-induced inertial forces and their effect on human bodies.

In 1984, Damask—who previously had cowritten, with Narciso Garcia, the textbook *Physics for Computer Science Students*—received broad national attention when he became the first person to use computer-generated animations to illustrate testimony in a criminal trial. Since he had thought that he was doing nothing unusual, this attention very much surprised him. Indeed, it was to him a source of continual surprise—and, usually, satisfaction—that, by introducing simple physics principles and illustrations into the courtroom, he was often able to clarify and help resolve fiercely disputed issues. He viewed this kind of intervention both as a valuable public service and as interesting applied science. His March 1987 PHYSICS TODAY cover story "Forensic Physics of Vehicle Accidents" was part of his effort to recruit more physical scientists to forensics and to join him in dispelling bogus legal arguments. (In the article, he recounted how the argument, "The laws of physics are obeyed in the laboratory but not in rural New Jersey," actually prevailed over his own scientific testimony!)

In addition, Damask served as an editor of the *Journal of Physics and Chemistry of Solids* from 1974.

Damask was a wonderful friend and colleague and a great role model for his two sons, as well as his students. He had an outgoing personality and a fine sense of humor. He will be greatly missed.

THOMAS L. BOHAN
Portland, Maine
GEORGE JAY DIENES
Las Vegas, Nevada
RUTHERFORD FISCHER
Queens College
Flushing, New York

Siegfried Flügge

On 15 December 1997, Siegfried Flügge, an emeritus professor of theoretical physics at the University of Freiburg, closed his eyes forever. He died at the age of 85 in Freiburg, Germany, after a short illness.

Born and raised in Dresden, Flügge began his graduate studies in physics at the University of Dresden. He transferred to the University of Frankfurt, but then moved again, to the University of Göttingen, where he earned his PhD in 1933 under the guidance of Max Born. In his dissertation, Flügge explored the structure of stars based on new discoveries about neutrons.

That same year, Hitler took power in Germany, the political storms intensified, Born fled the country, the circle in Göttingen he had founded broke apart and Flügge moved from one research facility to another. He first worked with Erwin Madelung in Frankfurt, then with Werner Heisenberg and Friedrich Hund in Leipzig, and then, in 1937, moved to Berlin to become the theorist-in-residence with Lise Meitner at the Kaiser Wilhelm Institute for Chemistry, which was then under the directorship of Otto Hahn. Flügge remained there even after Lise Meitner had to leave the institute—and Germany—in the summer of 1938 under what he called deplorable circumstances.

In 1938, Flügge finished his *habilitation* at the University of Frankfurt in nuclear physics and became a university lecturer at the University of Berlin. In 1944, late in World War II, he was appointed an associate professor of theoretical physics at the University of Königsberg in the province of East Prussia (then part of Germany).

Following the end of the war and the loss of Germany's eastern provinces, Flügge became a lecturer at the University of Göttingen. In 1947, he was appointed to a physics chair at the University of Marburg. His final academic home was the University of Freiburg, where he held a full professorship from 1961 until his retirement in 1977.

Throughout his numerous scholarly publications, Flügge specialized in theoretical nuclear physics, but equally important are his papers in other fields, which included astrophysics, viscosity, the slowing down of electron beams and surface absorption.

Another area in which Flügge was productive was fundamental quantum theory. In fact, quantum theory and modern methods of theoretical physics occupied a central place not only in Flügge's original publications, but also in his many textbooks, which covered virtually the entire curriculum of theoretical physics and its mathematical methods. His *Practical Quantum Mechanics* (Springer-Verlag), which was first published in German in 1947, went through many editions and was translated into several languages. Flügge also occasionally wrote epistemological essays on the general foundations of physics. Among his other literary achievements, his sole editorship of the 54-volume *Encyclopedia of Physics* (Springer-Verlag, 1956–84) remains truly invaluable.

SIEGFRIED FLÜGGE

Of historical note, Flügge witnessed the first splitting of the atom, which occurred at Otto Hahn's institute, and he wrote an article in 1939 that used mass defect calculations to estimate the energy released by the fission of uranium. That article, which appeared in *Naturwissenschaften* just days before censorship banned further publications on the topic in Germany, created an immediate sensation. It included the words: "All in all it must be pointed out once again that our present knowledge makes it possible to build a 'uranium device' of the kind described, but the available quantitative calculations have too great a margin of error to allow us to elevate this possibility to a certainty."

Returning from the war after six years as a soldier, I had the good fortune to meet Flügge at Göttingen. He subsequently became my doctoral dissertation supervisor in a field in which he himself had done pioneer research—namely, the theory of nuclear reactions. But Flügge's impact as a teacher went far beyond the mere supervision of dissertations. His lectures on the history of physics influenced me and others, as did his stimulating private conversations on the place of physics within human knowledge.

Flügge's passing away is not only a loss for the entire scholarly community, but, for those who were fortunate enough to have been close to him, it is also cause for deep sadness. In our memories, he will live forever.

FRIEDRICH SCHLÖGL
Aachen, Germany