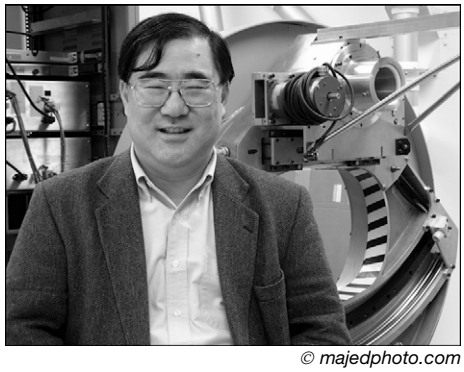
Bruce H. Hasegawa, PhD, 1951–2008

On May 22 the nuclear medicine and medical physics communities lost an extraordinarily brilliant scientist, talented teacher, devoted mentor, and, above all, a dear and true friend. Bruce Hasegawa, PhD, died at the age of 56 at the University of California San Francisco (UCSF) Medical Center a few days after suffering a massive stroke. His death is a great loss to the many students and scholars he mentored and the many colleagues he assisted and with whom he collaborated during his scientific journey. During his short yet productive life Bruce imparted a tremendous legacy that not only touched the lives of many colleagues but also affected the lives of many patients who benefited from his research successes.



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Bruce grew up on an almond farm (to which he affectionately referred as the "nut farm") on the outskirts of Fresno, CA. Coming out of the Clovis school system with perfect SAT scores, Bruce entered California State University at Fresno, majoring in physics and mathematics. After earning his bachelor's degree, he received a master's degree in mathematics at Cal State Fresno. When his advisor told him he was destined to have a great future in finite Abelian group theory, he became depressed and decided to apply his background in physics and mathematics to medicine. In 1974, he entered the graduate program in physiology and biophysics at the University of Washington in Seattle. He left the University of Washington without completing his degree and eventually returned to Fresno, where he taught undergraduate mathematics, physics, and biology at his alma mater.

In 1978 Bruce set out once again to earn his PhD. His career began to take shape as he worked toward his master's degree in radiology sciences at the University of Colorado Health Science Center (HSC) in Denver. His project involved development of scintillation camera systems. From Colorado he would venture farther east to earn a PhD in medical physics in 1986 under the mentorship of Charles Mistretta, PhD, at the University of Wisconsin, Madison. Bruce then moved to Cedars–Sinai Medical Center in Beverly Hills, CA, as director of medical imaging physics. Although the position was financially rewarding, he also wanted research opportunities and intellectual stimulation. The Hollywood lifestyle was not very appealing, and Bruce left after 3 mo to join the Radiology Department at UCSF as an assistant professor in residence. He rose through the academic ranks to the position of professor in residence and director of the Physics Research Laboratory. He joined the Nuclear Engineering Department at the University of California–Berkeley (UCB) as an associate professor in residence in 1997 and advanced to the position of professor in residence. He was deeply involved through his teaching and research with the joint UCSF/UCB Graduate Program in Bioengineering and was a cochair of the joint UCSF/UCB Graduate Group in Bioengineering for several years.

Throughout his educational and career journey Bruce left a trail of significant contributions to the field of medical imaging. He produced nearly 200 publications and conference proceedings and 13 book chapters. While at the University of Colorado HSC in the early 1980s, he sought to improve on earlier multipinhole collimator work by evaluating a 12-pinhole collimator for cardiac SPECT imaging (*1*). This work was ahead of its time, and it was not until recent years that the multipinhole SPECT has been successfully applied in small animal imaging and evaluated for human applications. Above all, Bruce is perhaps best known for his pioneering work on multimodality imaging, combining CT with SPECT to provide an overlay of radiotracer functional distribution on an anatomic image (*2*–*5*). Using equipment borrowed from GE, Bruce placed a single-head SPECT camera in close proximity to a CT ring. Using the same patient bed, he took sequential scans with the CT and SPECT and then developed the algorithms to coregister the images. This new concept was rapidly accepted by all major equipment manufacturers, and dual-modality SPECT/CT cameras were marketed and sold throughout the world. This technology revolutionized the way we view and interpret images and led to the development of PET/CT and PET/MR instruments. Bruce and colleagues even initiated work on a SPECT/MR device.

It is interesting to note that Bruce was not the lead or senior author on 3 of the initial 4 SPECT/CT publications. He modestly minimized his credit for the discovery and

development work and graciously shared authorship with members of his group and other colleagues. In recognition of his many contributions to the field of nuclear medicine instrumentation, Bruce was the 2008 recipient (posthumously) of the Edward J. Hoffman Award from the SNM Computer and Instrumentation Council. When he first learned that he would be the recipient of this award he responded, "Isn't there someone more deserving of this award than myself?" Bruce never sought accolades nor recognition for his scientific contributions. He was happy working quietly among his colleagues and would always promote a colleague or student before himself. Although his journey was cut short, we will long remember Bruce for his dedication to the field, scientific insight, collaborative spirit, humble acceptance of his own successes, and gracious nature of assigning credit and authorship.

Bruce was a dedicated and effective educator and mentor. He constantly sought opportunities to encourage young students to pursue scientific careers. His down-to-earth lectures on complex engineering problems and modest account of his own career path inspired many to pursue graduate studies in physics and bioengineering. He would make time for every student and colleague who called or dropped by his office. He gave freely of his time. As an educator, Bruce was dedicated to the improvement of the medical physics curriculum in order to better prepare students for the medical imaging field. He initiated and organized graduate bioengineering courses and made them available to students at both UCSF and UCB. His ability to explain complex problems in accessible terms with added humor made him an excellent and oft-sought-after lecturer and writer. His textbook *The Physics of Medical X-Ray Imaging*, subtitled *The Photon and Me: How I Saw the Light*, is a primer and essential reference for researchers in the medical imaging field (*6*).

As a mentor, Bruce was truly devoted to helping others develop successful careers of their own. Over the years, he served as a research and professional advisor to more than 40 graduate students, researchers, and faculty members. Through his guidance, many of these young investigators developed distinguished careers in both academia and in private industry. He was always happy to take a step back to provide visibility and credit to his junior colleagues. He spent hours of his own time critically reading other investigators' grant proposals and papers and took clear joy in the success of his colleagues. These actions are clearly the sign of a truly caring person.

Behind his brilliant mind was a simple man who appreciated life's simple pleasures. Bruce was genuine, kind, generous, humble, sensitive, and thoughtful. He enjoyed good food, classical music, opera, and even rock and roll. He often demonstrated his appreciation for faculty colleagues and staff through simple gifts of food, flowers, candy, and the occasional dim sum or jerk chicken lunch. He was always available to talk and to share in the celebration of the successful achievements of others.

Travel was a big part of Bruce's life. It began with family outings with his cousin, Ernie Kazato, MD, with whom he hiked throughout the western United States. With no immediate family of his own, Bruce would spoil his nieces, Sarah and Rebecca, and nephew, Michael, with trips of their choosing. Although he rarely spoke of his family connections, when he did relay stories one could tell that he had a great deal of appreciation and affection for his family.

Bruce's untimely departure is painful for all of us, as we lost a remarkable scientist, colleague, and warm-hearted friend. We will always cherish the legacy of his brilliance, the impact of his work in the imaging field, and the positive influence he had on the lives of his students, postdocs, colleagues, and, more important, patients. These wonderful memories of Bruce will be sustained in all of us forever.

Dr. Hasegawa's family has requested that donations in his memory be made to the UCSF–Dr. Bruce Hasegawa Memorial Fund, PO Box 45339, San Francisco, CA 94545-0339.

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