

By [Mona S. Rowe](#) | August 20, 2014

In Memoriam: Samuel Krinsky



[+ ENLARGE](#) Samuel Krinsky

Samuel Krinsky, senior physicist in the Photon Sciences Directorate, passed away on April 26, 2014. Krinsky was 69 years old. According to his wife, Faith, he died soon after receiving a diagnosis of glioblastoma multiforme, an aggressive form of brain cancer.

After earning a B.S. in physics from MIT (1966) and then completing a Ph.D. in physics from Yale University (1971), Krinsky took a research associate position at Stony Brook University, where he met Martin Blume, then holding a joint appointment with the university and with Brookhaven National Laboratory.

“I proposed a condensed matter physics problem to Sam, and we wrote early papers together,” said Blume, who later became Brookhaven’s Deputy Laboratory Director and then left the Lab to join the American Physical Society as Editor-in-Chief of Physical Review. “Recognizing Sam’s abilities, I brought him to Brookhaven and worked to retain him and to support him as he took on more and more responsibility as a scientist and an administrator. I have always had the highest regard for Sam.”

Krinsky spent his entire career at Brookhaven. He started as an assistant physicist in the Physics Department in 1973 and was promoted to associate physicist in 1975. In 1977, he transferred to the AGS Department, where he began learning accelerator physics under Ken Green and Renata Chasman. His promotion to physicist came in 1978, and he received tenure in 1980.

“Sam, Rena, Ken and John Blewett formed the nucleus of the group that later became the NSLS Department in 1982,” recounted Richard Heese, accelerator physicist in the Photon Sciences Directorate.

“After the death of Ken and Rena, Sam was the only accelerator theorist on the team,” said Heese. “One indication of his capability was his early design of a 12 SP x-ray ring similar to what later on would be called a 3rd-generation light source. This was deemed too risky and was abandoned in favor of the 8 SP ring [eventually built in Japan]. Sam showed tremendous foresight, designing a ring of lower emittance and with 12 straight sections for insertion devices. Even at this stage, Sam was extremely interested in developing wigglers and undulators for use with electron accelerators as light sources, a passion that drove most of his career.”

“Unlike personnel in the group who had worked only with proton machines,” continued Heese, “Sam certainly appreciated the importance of good vacuum, stable magnets and good component alignment for these precision light sources and pushed very hard for these basics for NSLS. He also oversaw the alignment of the x-ray ring and the stabilization of the magnet power supplies.”

Sam was a major driver for development of the global orbit feedback system, for which the group won an R&D 100 award in 1989. They designed the system for NSLS to stabilize the orbit of the electron beam as it circulates around the synchrotron.

In addition, according to Li-Hua Yu, accelerator physicist in Photon Sciences, Krinsky made outstanding contributions to both theory and experiments for an x-ray free electron laser (FEL), receiving the International FEL Prize in 2008.

Yu said that the culmination of Krinsky’s work on FEL gain was the paper coauthored by Yu, Krinsky and the late Robert Gluckstern (University of Maryland) on the determination of the gain in the exponential regime. This work had a significant impact on the advent of x-ray FELs. The Linac Coherent Light Source at SLAC National Accelerator Laboratory was the first of these to be constructed, in 2009.

Krinsky is also credited for conceiving of and building Brookhaven’s Source Development Laboratory (SDL). “The demonstration of outstanding qualities of a high-gain, harmonic-generation FEL operating in deep-ultraviolet mode at SDL has played an important role in seeding FEL projects worldwide,” said Yu.

At NSLS, Krinsky was promoted to senior physicist in 1985 and served in various leadership roles: head of the NSLS Accelerator R&D from 1985 to 2001, deputy chair of the NSLS from 1986 to 2001, and manager of the FEL program from 1999 to 2002. In January 2008, he became group leader of Accelerator Physics in the NSLS-II Project to construct the National Synchrotron Light Source II. At the time of his death, Krinsky was managing the accelerator physics group within the Photon Sciences Directorate.

“It was Sam Krinsky who proposed the actual concept of the NSLS-II accelerator – the combination of double-bend achromat lattice complemented with damping wigglers,” said Timur Shafan, accelerator physicist in Photon Sciences. “This design of a medium-size low-emittance ring enables superior properties of radiation produced by powerful and yet highly confined electron beam produced by the NSLS-II light source. Sam’s concept made possible the natural succession of the NSLS ring, which he built 30 years ago, to a new level of brighter, more controllable, more complex accelerator system, which will be superior to NSLS-I in many ways and by many orders of magnitude.”

According to Shafan, Krinsky devised a robust approach in the development of the new machine: a conservative design of 2-nanometer (nm) radiation-emittance lattice complemented with a set of damping wigglers to bring the emittance down to the design value of 1 nm. At the same time, the storage ring energy was set at 3 billion electron volts (GeV) based on availability of short period insertion devices and budget considerations.

Recounting events in recent years, Shafan noted that the first of NSLS-II’s three accelerators, the 200-million-electron-volt linac, was commissioned in 2012. In 2013, the 3 GeV booster saw first beam. In March 2014, commissioning began on the 780-meter-long NSLS-II storage ring. Then in July, the team achieved a stored current of 50 milliamps with a newly installed superconducting radio-frequency cavity.

On a personal note, Shafan related that Krinsky shaped the current NSLS-II accelerator physics group. “Most of the accelerator physicists are indebted to Sam for being hired into this exciting project,” said Shafan. “Sam guided his group, educated his scientists and brought the SR design to completion. His door was always open and his staff discussed their projects with him all day. There was no problem that Sam would not help by his advice, his wisdom and his experience.”

A Fellow of the American Physical Society, Krinsky was also a recipient of Brookhaven Lab’s 1994 Distinguished Research & Development Award.

Krinsky is survived by his wife, Faith, and daughter, Sylvia. Son Benjamin died of glioblastoma multiforme in 1999 while a student at MIT.

Donations may be made to MIT in memory of Benjamin and Samuel Krinsky. Checks should be made payable to:

The Benjamin and Samuel Krinsky Undergraduate Research Opportunity Program Fund
c/o Bonny Kellermann ’72, Director of Memorial Gifts
600 Memorial Drive, W98-500
Cambridge, MA 02139

Obituary by Faith Krinsky

Samuel Krinsky, 69, a senior physicist at Brookhaven National Laboratory died on April 26 shortly after a diagnosis of glioblastoma multiforme, an aggressive form of brain cancer. He was one of a small group of scientists at BNL who began their efforts in 1976 to design and commission the National Synchrotron Light Source (NSLS), the first US accelerator designed and built from the ground up as an x-ray facility. Krinsky translated the physics of his NSLS X-Ray Ring design into specifications for its construction and led the effort to turn it into one of the nation's most productive major research facilities. His research spanned a broad range of beam physics. Author of some 160 publications, his work on synchrotron radiation has made possible a proliferation of research facilities based on x-ray free-electron lasers. He was a recipient of the 2008 Free Electron Laser Prize.

At the onset of his disease, Krinsky was leader of the Accelerator Physics Group at BNL working on NSLS II. His concept and design were the natural succession of the original NSLS x-ray ring that he had built 30 years before. A group leader at NSLS II, he assembled and led the next generation of beam physicists in the design of this next-generation light source facility. His life-long interest was in guiding and supporting the young people who want to devote their lives and careers to the pursuit of scientific inquiry. The new storage ring captured its first electron beam on April 5, 2014. Soon the many scientists who conduct experiments on NSLS-II will use its x ray beams to pursue new advances in science at Brookhaven Lab and around the world.

Samuel Krinsky was born in Brooklyn in 1945. His father Nathan was a family physician, and his mother Anna was a pediatric cardiologist. He earned a Bachelor of Science degree at MIT in 1966 and a PhD in high energy theory from Yale University in 1971. He joined the Institute for Theoretical Physics at Stony Brook and later began work as an assistant physicist at Brookhaven National Laboratory in 1973. In 1989, he was among nine Brookhaven Lab scientists and engineers who shared the R&D 100 Award, given by R&D Magazine to recognize the top 100 technological achievements of the year. Krinsky was also a recipient of Brookhaven Lab's 1994 Distinguished Research & Development Award. He was a Fellow of the American Physical Society.

Krinsky was a devoted husband and a loving father to his children Benjamin and Sylvia. He and his wife Faith, a high school English teacher, instilled in their children a love of learning and a sense of playful inquiry. He shared with them every day his joyful immersion in the life of the mind. In 1999 Benjamin, a junior at MIT, was stricken with glioblastoma multiforme and died 6 months after his diagnosis. After the loss of their son, Samuel and Faith became enthusiastic ballroom dancers who put one foot in front of the other to walk in time together.

It was Sam's last wish to fund a small stipend that could motivate a succession of bright, curious MIT undergraduates, unfettered by preconceived notions, to start thinking in new ways about glioblastoma multiforme. Since all known treatments are ineffective, he felt

that science-based investigations rather than treatment-based approaches could eventually yield a more positive outcome. As always, Sam believed that young people have the drive and energy to think hard and find new ways of understanding, especially when they work from love of science. His memorial fund will honor that spirit of passionate inquiry.