

In Memory of Yan Kucherov



Cold fusion researcher Dr. Yan R. Kucherov passed away on December 4, 2011 at the age of 60, from pancreatic cancer.

Kucherov was born February 23, 1951 in Kharkov, Russia. He received his B.S. and M.S. degrees in solid state physics and nuclear physics from the Moscow Physics Engineering Institute in 1975 and his Ph.D from SIA Luch in 1984.

From 1975 to 1993 Kucherov conducted research on accelerated crystal growth, plasma physics and cold fusion at SIA Luch Laboratory. His collaborator, Irina Savvatimova, recalled, "When I met Yan in 1989 he was a brilliant physicist and a well-respected man of great erudition." She noted that in the days following the Fleischmann-Pons announcement in March 1989, her colleague V.A. Romodanov questioned whether Russian scientists would "risk pursuing this line of research." She told him that Yan Kucherov would work with her. "And at this very moment I received a phone call," Savvatimova said. "It was Yan with a request to show him my installation. I laughed, because he called just at the moment when I was pronouncing his name." In the following week, Savvatimova, Kucherov and Alexander Karabut conducted their first experiments "using very simple detectors for neutron and gamma-emissions measurements." Savvatimova said they obtained "very interesting results" and "Yan's expertise and very deep knowledge of fundamental physics helped us to evaluate and interpret the obtained data correctly." They went on to publish numerous key papers in the field.

In 1993, Kucherov came to the U.S. as Director of Research for ENECO (Salt Lake City, Utah). Fred Jaeger, ENECO President from 1992 to 2000, recalled, "I first became aware of Yan's glow discharge plasma work from the ICCF3 Nagoya conference in the fall of 1992. Early the following year, we visited his lab at Luch and ENECO immediately began activities to sponsor immigration of his family to the U.S. With the recent collapse of the Soviet regime, there was a unique window of confusion and opportunity that made his emigration possible. He was admitted into the U.S. under a special class of visa that was specifically reserved for only highly-trained former Soviet nuclear scientists. One of my more joyous memories is the day his entire family was sworn in as U.S. citizens [in 1999]."

Jaeger described Yan as a "quiet, thoughtful professional" and a "patient teacher" with a favorite saying, "Okay, once again. . ." Jaeger said, "Yan's knowledge encompassed an unusually wide breadth and depth of physics. I was continually amazed how he was able to drill down on most any topic, then inter-relate that discussion with broader implications. He was able to connect many dots, derive unique theories and hypotheses, and build clever devices to test his intuitions. . . I learned much about physics from Yan, and

enjoyed our long conversations on many scientific topics."

While at ENECO, Kucherov began a collaboration with MIT Prof. Peter Hagelstein. Jaeger recalled, "He loved the rigorous challenge of debate and association with his peers, and especially enjoyed his encounters with Peter Hagelstein, both as a friend and respected scientist." Hagelstein first heard about Kucherov and the Luch experiments at early cold fusion conferences and from their 1992 *Physics Letters A* paper (Karabut, Kucherov, Savvatimova, "Nuclear Product Ratio for Glow Discharge in Deuterium," Vol. 170, pp. 265-272). He said, "Louis Smullin had experience with glow discharges, so he wanted to set up a version of the Luch experiment. . . Yan and Fred had a version of the Luch glow discharge fabricated, and shipped to MIT. That was a beast! We spent forever on it. At first the cathodes wouldn't load. It turns out that the chamber needed to be much cleaner than ours, since any organics prevented loading. Yan figured that since we were at MIT, we should know that. But we didn't."

Kucherov and Hagelstein worked together on a solid state thermionic converter, which they called a "thermal diode." Hagelstein recalled, "It seemed to me that the general approach of boiling carriers off of a highly doped semiconductor across a gap to a cold collector should be looked at. Yan was familiar with vacuum gap thermionic converters in Russia, and was enthusiastic about porting the scheme to semiconductors where the work function internally could be much less. Other people were working on it, but in their approach the emitter and collector had to be a micron or so apart. I felt that a modified version of the scheme in which scattering in the gap took place might be more practical." Kucherov built and tested devices and Hagelstein worked on modeling them. Hagelstein said, "Yan called excitedly one day, explaining that they managed to work very well. He sent me the data, and after comparing it with the models, it became clear that the experiments were working much bet-



ter than we might have hoped. . .Yan managed to get thermal to electric conversion in excess of 40% of the Carnot limit at 285°C, which I suspect is the highest that any solid state converter has shown even today." A number of patents were awarded on the device. However, ENECO was not able to supply funds to develop the technology into a commercial product.

Michael Melich, Research Professor at the Naval Postgraduate School, stated, "His great inventiveness both in the laboratory and with theory were the foundation of much of ENECO's intellectual accomplishments."

In 2006, Kucherov left ENECO and became a Senior Staff Scientist at Nova Research Inc. in Alexandria, Virginia. In 2010, he was hired by the Naval Research Laboratory (NRL) in Washington, DC as a Research Physicist in the Materials Science & Technology Division. He conducted research at NRL in the areas of ballistics, personal protective equipment and vehicle armor for the military; additionally, he was conducting research on cold fusion and electromagnetic launchers. NRL colleague Graham Hubler noted, "Yan was a true friend, outstanding human being and a talented colleague whose honor and integrity knew no bounds."

Kucherov's outstanding work garnered him numerous awards. On several occasions, he received SIA Luch's awards for Scientist of the Year and Inventor of the Year. In 1993, he was a recipient of the cold fusion field's first Truffle Prize (now called the Preparata Medal) for his "pioneering work on transmutation induced by glow discharge." He received a Silver Medal at the USSR Technical Achievements Exhibition (1988) and a Silver Medal for the Progress in Military Technology (1989). His latest work brought him the Naval Research Laboratory Award of Merit for group achievement.

Kucherov was a prolific inventor, with 58 patents. He published over 100 papers in scientific journals and proceedings.

Melich commented, "The importance of his family, his laconic style, his appreciation of the nature of science under the Soviets, his extraordinary solid grounding in the tradition of Russian science, and his love of music and concerts at Red Butte with friends meant that you would always learn something new from being with him."

Kucherov is survived by his wife, Oksana Kucherov; daughter Katerina Kucherov and son-in-law Alex Frolov; mother Maya N. Kucherov; mother-in-law Svetlana Russkaya and grandchildren Stanislava and Maria Frolov.