other schemes that are being investigated for similar processes. In combination with the substantial decrease in the need for geological storage, the CFNS-enabled waste-destruction system would be much cheaper and faster than other routes, the researchers said.

"It's always been known that fusion is good at producing neutrons and fission is good at making energy," Valanju said. "Now, we have shown that we can get fusion to produce a lot of neutrons in a small space."

Producing an abundant and clean source of "pure fusion energy" continues to be a goal for fusion researchers. But the researchers said that harnessing the other product of fusion—neutrons—can be achieved in the near term.

"The hybrid we designed should be viewed as a bridge technology," said Mahajan. "Through the hybrid, we can bring fusion via neutrons to the service of the energy sector today. We can hopefully make a major contribution to the carbon-free mix dictated by the 2050 time scale" set by scientists of global warming.

Next steps will include performing extended simulations, transforming the concept into an engineering project, and seeking funding for building a prototype.

News of MRS Members/Materials Researchers

Alexander E. Farrell

Alexander E. Farrell, associate professor at the University of California, Berkeley, died in April 2008. Alex came to the Energy and Resources Group at UC–Berkeley after managing the Electricity-Industry Center at Carnegie Mellon University—a research and outreach center focused both on innovation and genuine academia–industry partnership in the energy field. Prior to that, Alex had been a postdoctoral fellow in the Science and Technology Policy program at the J.F. Kennedy School at Harvard University, and did his doctoral work on energy at the University of Pennsylvania. Prior to that, Alex served in the nuclear submarine fleet in the U.S. Navy, after receiving his undergraduate education at the U.S. Naval Academy. All of these periods of time, and experiences, were very much apparent in, and part of, who Alex was as a person.

Alex continued to collaborate with—and remained close friends and business partners with—several of the postdoctoral fellows from his time at Harvard. Similarly, the collaborations and friendships from Alex's time at Carnegie Mellon were some of the closest bonds I have ever seen between professional colleagues. Alex lived and breathed the science and technology policy methods, approaches, and, in fact, the overall ethos of the CMU community.

From day one of his time at Berkeley, Alex focused on transportation issues, and very rapidly became a key player in the state, regional, and international discussions on a wide range of transportation and energy issues. His projects extended over assessments of the energy and climate impacts of biofuels—(e.g., Farrell, Plevin, Turner, Jones, O'Hare, and Kammen, *Science* **311** 2006)—a paper that became a "cottage industry" in itself, with thousands of academic and media requests, and a remarkable team of students including Rich Plevin, Andy Jones, Brian Turner, and others, who have continued in the Alex tradition of careful and detailed analytical assessment of fuels.

At the same time, Alex and his doctoral student Adam Brandt were developing an assessment of the environmental impacts of unconventional forms of oil—those derived from tar sands, shale rock, and other sources—many of which come with a far larger "environmental footprint" than does gasoline (Farrell and Brandt, 2006). Their subsequent article became a "best seller" in a new journal, *Environmental Research Letters*, which is notable for the open access format that Alex favored. The Farrell and Brandt paper appeared in the inaugural issue. In fact, Alex has been the most frequent contributor to *Environmental Research Letters*.

These efforts led to a defining project in Alex's career—collaboration, analysis, and education and collaboration with industry, elected officials, and the non-governmental sector efforts around the design of a low carbon fuel standard (LCFS). The LCFS sets a fleet-wide maximum greenhouse gas impact for transportation—measured on a life-cycle basis—and has been globally influential in re-thinking how we assess and regulate vehicle pollution. The project was vetted frequently during the process of developing the two major reports with individuals from industry, government agencies, and colleagues in Europe who where working on various national and European Union commissions.

Governor Schwarzenegger signed Executive Order S-1-07 enacting the LCFS in January 2007.

For the Materials Research Society, Alex contributed to the *MRS Bulletin* special issue on materials and energy (April 2008); his article on bioenergy research needs, co-authored with Anand Gopal, remains highly cited.

Throughout his career, Alex continued to expand the range of technologies and practices he studied. The day he died, Alex was working on a detailed assessment of battery issues for work on plug-in hybrid vehicles (Lemoine, Farrell and Kammen, *Environ. Res. Lett.* **3** 2008).

DANIEL M. KAMMEN

Correction

In the March 2009 issue of *MRS Bulletin* **34** (3) (2009) p. 182, reference 90 was omitted: " The MD simulations further found that these wires exhibit both novel shape memory and pseudoelastic behavior under tensile loading[78–82, 90] that is not seen in the corresponding bulk material." Reference 90: H.S. Park, K. Gall, J.A. Zimmerman, *Phys. Rev. Lett.* **95** 255504 (2005).

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