

Materials Science and Technology Division

personal profile

Dedication in the extreme

Dedication—it's a quality David Pugmire exudes, whether it be as allegiance to his favorite football team, the high-scoring Nebraska Cornhuskers or as perseverance in overseeing the installation of a piece of high-performance spectroscopy instrumentation.

Last season, Pugmire, who earned his doctorate in chemistry from the University of Nebraska-Lincoln, attended every Huskers home game—making the 26-hour round trip drive six times.

A fan since the age of 10 when his stepfather got him hooked on the team, the Nuclear Materials Science (MST-16) team leader called his passion for Nebraska football “an extreme hobby.” Although the Oregon native played football in high school, an injury his senior year ended his own gridiron career.

In Nebraska, “football is like a religion,” he said. A favorite fan quote is that on game day the 80,000-seat Memorial Stadium becomes “the third largest population center in the state ... It's unlike any other place I've been in all my life.”

This same dedication drives Pugmire's commitment to seeing an X-ray photoelectron spectrometer (XPS) installed and working in his laboratory in the plutonium facility TA-55's PF-4, a task he has devoted nearly five years of his career to seeing completed.

One of the incentives that drew Pugmire to Los Alamos, he said, “was the ability to apply the use of this instrument to a material not very well understood.” He admits that although working at the



Credit: Mick Greenbank, IRM-RMMSO

After years of hard work, MST-16's David Pugmire is about ready to bring online a new X-ray photoelectron spectrometer in his laboratory in TA-55's Plutonium Facility, PF-4.

Laboratory can be “frustrating,” the opportunity to work with other similarly motivated researchers and exotic materials and equipment is appealing.

Pugmire arrived at Los Alamos National Laboratory in 2002 after completing a National Research Council postdoctoral fellowship at the National Institute of Standards and Technology in Gaithersburg, Maryland, near Washington DC. At Los Alamos, his initial project was to study polytetrafluoroethylene's (PTFE) behavior under alpha-irradiation. The study was part of a follow-up to an incident in which aging PTFE seals under high levels of radiation exposure degraded their properties and performance. Laboratory officials wanted “a scientific, publishable, peer-reviewed work to base their judgment on because there wasn't any previous work out there,” Pugmire said. He has since published his results and presented them at several invited talks.

Now Interfacial Science Team Leader, Pugmire is looking forward to performing

plutonium surface science studies with the XPS equipment. “An instrument with its capabilities, its resolution, is not available for use on plutonium,” he said. In fact, although there is a technician and student lined up to assist with the work, he insisted he will “be the first to take XPS data on that instrument.”

Although approved for plutonium operations, the spectrometer is in the process of being upgraded before it comes online. Once fully installed, the XPS will renew a capability with plutonium not seen in PF-4 for 20 years and will support pit manufacturing research and various Laboratory-Directed Research and Development (LDRD) projects.

MST-16 Group Leader Barbara Martinez said Pugmire deserves his first-place position, given his diligence and patience during the lengthy project. “David is such a bright and energetic person,” she said. “It's been quite a challenge to make sure I've kept him engaged throughout this process.” He even brought his enthusiasm to his radiation

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damage studies, Martinez said, performing experiments on pieces of PTFE with the Ion Beam Laboratory “all before he even had a clearance.”

With the XPS due to be up and running by the end of the month, this year’s Cornhuskers have had to wait to see Pugmire in the stands. Still the scientist who admits to enjoying “the laid-back lifestyle of life in the Midwest,” has found time to appreciate the outdoor recreational activities of northern New Mexico. He, his wife Holly, and three girls, enjoy camping, fishing, and off-road, four-wheel adventures.

— *By Karen E. Kippen, MST Communications*



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