Duquette Named Horton Professor of Materials Engineering at Rensselaer

TMS Member David Duquette has been named John Tod Horton Distinguished Professor in Materials Engineering at Rensselaer Polytechnic Institute. The endowed professorship is one of the highest honors bestowed on a Rensselaer faculty member.

“Since joining Rensselaer in 1970, Professor Duquette has been fiercely dedicated to the Institute, its faculty, and students,” said Rensselaer Provost Robert Palazzo. “Under David’s stewardship, the Department of Materials Science and Engineering has achieved considerable success in nanotechnology, while also maintaining a world-class academic reputation. He is an intellectual leader, a truly exceptional researcher and educator, and without a doubt one of the finest materials engineers of his generation.”

Duquette, who has been recognized for his work in the fields of corrosion, electrochemical phenomena, and processing, has recently expanded his research interests to work on the challenge of on-chip interconnect technology for semiconductor applications.

At Rensselaer, Duquette supervises materials science graduate students. In January, he was named to the Board of Governors of the National Institute for Nano-Engineering (NINE), a partnership between Sandia National Laboratories and a group of universities and corporations, including Rensselaer. Duquette also serves on a National Materials Advisory Board panel that is producing a comprehensive report on the status of education in corrosion science and engineering in the United States.

Anderson Leads Research on Magnets for Electric Motors

TMS Member Iver Anderson is leading a research team at the U.S. Department of Energy’s Ames Laboratory to advance electric drive motor technology used in electric cars, fuel-cell automobiles, and plug-in hybrids.

Anderson, director and chair of the TMS Public & Governmental Affairs Committee, is senior metallurgist at Ames and adjunct professor of materials science and engineering at Iowa State University. Along with fellow researchers Bill McCallum and Matthew Kramer, Anderson has designed a high-performance permanent magnet alloy that operates with good magnetic strength at 200°C to help make electric drive motors more efficient and cost effective.

“It’s important that those motors be made economically with an operating envelope that fits how they will be driven,” said Anderson. “The automotive companies in this country have set out a series of parameters that they would like electric motors to meet.”

The most desirable permanent-magnet materials are neodymium-iron-boron magnet materials (Nd2Fe14B), he explained, but these tend to lose much of their magnetic energy at fairly modest temperatures. To make a permanent magnet alloy that operates with good magnetic strength at higher temperatures, researchers designed an alloy that replaces pure neodymium with a mixed rare earth (a combination of neodymium, yttrium, and dysprosium). The influence of the yttrium and dysprosium allowed for much less degradation of magnetic properties with temperature.

The researchers processed the alloy in a fine, spherical powder form using gas atomization. This method would allow the automobile industry to make the motors with a high-volume manufacturing process.

“We need to support our auto companies and help them develop better products,” said Anderson. “We can do that by getting things worked out at the basic science end—that’s our job.”