



## UT-Battelle and Eaton Sign Crada



*Gerald Ludtka with  
the HMFP device  
and samples.*

UT-Battelle and Eaton Innovation Center have signed a cooperative research and development agreement to investigate the potential applicability of the High Magnetic Field Processing (HMFP) technology for prototype commercial applications by capitalizing on the Oak Ridge National Laboratory (ORNL) Materials Processing Group's unique thermomagnetic facilities and expertise. The agreement involves the investigation of magnetic processing effects on the microstructure and physical or mechanical behavior of selected ferrous alloys.

The partners hope to achieve enhanced material performance that will lead to higher-power-density components, resulting in component weight reduction or higher torque/loading ratings for various applications, materials and fabrication cost savings, reduced material processing energy consumption, and a "greener" (smaller carbon footprint) manufacturing operation.

The use of large magnetic fields in materials processing is just being realized as superconducting-magnet-technology advances and potential benefits are being demonstrated through research. The effect of a large magnetic field on phase equilibrium and transformation kinetics has been demonstrated by ORNL's researchers, and others have shown that grain boundary chemistry and precipitation kinetics are also affected by large magnetic fields. Utilizing previous funding from the Department of Energy's Energy Efficiency and Renewable Energy (EERE) program, ORNL researchers were the first to demonstrate HMFP as a revolutionary technology for functional and structural materials. In addition, they have shown that HMFP is a significant and novel enabling manufacturing technology that significantly influences materials' microstructure, kinetics, and mechanical performance at the nanoscale, opening a new dimension of materials by design. The total estimated value of this agreement is \$750,000 over a 12-month period.

This CRADA is funded through the EERE Technology Commercialization and Deployment Fund, which requires that a project impact the mission of EERE to be eligible and that it carry a one-to-one match of private funding dollars for every dollar of EERE money requested. The EERE mission impact must be demonstrated in the project's ability to reduce greenhouse-gas emissions, energy intensity (i.e., reduce the use of electricity, natural gas, oil, coal, or other primary energy source), or U.S. dependence on foreign sources of petroleum or natural gas and to promote production of clean, renewable energy.