THE Ames Laboratory
Creating Materials & Energy Solutions
U.S. DEPARTMENT OF ENERGY

ISU Photo by Bob Elbert.

Unique Instrumentation

Scientists and engineers at The Ames Laboratory have a long history in developing and creating unique, often one of a kind instruments for research and analysis. This unique capability, often conducted as part of the Laboratory's Work for Others effort, has created instrumentation for cutting edge research at other National Laboratories, Universities and Research organizations worldwide, including University of Central Florida, Oak Ridge National Laboratory, CERN and others.

One such instrument recently fabricated and installed is Iowa State University's glacier sliding simulator. Part of a project funded by the National Science Foundation, the simulator will aid in the study of glacial sliding related to rising sea levels. A ring of ice about eight inches thick and about three feet across with circulating fluid around it is central to the machine. This circulating fluid maintains the melting point so the ice slides on a thin film of water. Below the ice is a hydraulic press capable of exerting up to 170 tons of force on the ice, creating pressures equal to those beneath a 1300 foot thick glacier. The simulator's motors can rotate the ice ring at its centerline at speeds of 100 to 7,000 feet per year. Neal Iverson, the project's PI and an ISU professor of geological and atmospheric sciences, states "There hasn't been a device to do this, and so there haven't been any experiments." Iverson envisioned the initial design for the simulator, but Ames Laboratory engineers and fabricators made improvements to that design and made it a reality.

The Ames Laboratory has created many other unique instruments; some that have been licensed for manufacture. One such instrument, an absorption detection system in multiple capillaries won a 2001 R&D 100 award and was the impetus for an Ames Laboratory based spin-off company, Combisep, Inc. Combisep was acquired by another spin-off company, Advanced Analytical Technologies, Inc. (www.aati-us.com), in 2007. Development of the multiplexed capillary electrophoresis system, which makes it possible to rapidly separate samples of complex chemical or biochemical mixtures, was funded by the Department of Energy Office of Basic Energy Sciences, Division of Chemical Sciences.

For further information on Iowa State University's glacier sliding research project contact: Dr. Neal Iverson, niverson@iastate.edu or Mike Krapfl, ISU News Service, mkrapfl@iastate.edu

For further information on technology transfer opportunities contact: Debra Covey, Assoc. Laboratory Director, covey@ameslab.gov or go to www.ameslab.gov

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