



## Frederic Sansoz Receives Prestigious NSF CAREER Award

**Dr. Frederic Sansoz** has received a five year National Science Foundation Faculty Early Career Development (CAREER) Award for \$400,000 for his research entitled, “Microstructure and Size Effects on Metal Plasticity at Limited Length Scale.” This is one of the most prestigious awards given by the NSF.

“To receive this award and be placed amongst some of the top American researchers in my field is a great honor,” says Sansoz. “This is an opportunity to conduct fundamental research in the area of metallic nanomaterials, which can dramatically improve the existing state of knowledge in the experimental and computational mechanics community. The educational component of this grant will broadly revitalize the interest for materials science and engineering at UVM and help recruit engineering students from underrepresented groups. It will also stimulate international student exchanges with several European engineering-specific programs at undergraduate level via the existing International Student Exchange Program. I sincerely thank Vermont EPSCoR and my colleagues from the mechanical engineering program, the materials science program, and the College of Engineering and Mathematical Sciences for their continuous encouragement.”

“We are extremely proud that Dr. Sansoz’s received the NSF CAREER Award,” says Domenico Grasso, Dean of the UVM College of Engineering and Mathematical Sciences.

### **Nanoscale Research**

The nanoscale is unique because it is the size scale where the familiar day-to-day properties of materials like hardness and strength meet the more exotic properties of the atomic and molecular world. For example, nanoscale wires of gold are ultra-strong materials with strengths up to 100 times that of bulk metals. The proposed research is to gain fundamental understanding of the size-effects associated with microstructural features and sample dimension on the strength of such metallic “nanowires.” Sansoz’s research is expected to show new ways to fabricate nanorods and nanowires with specific defects that make them stronger, thereby providing a roadmap for others to make improved materials. To accomplish this, a combined experimental/modeling research approach will be used that harnesses the power of both atomistic simulation and atomic force microscopy. The simulation component of this project will be conducted via massively-parallel molecular dynamics simulations performed using UVM’s newly-established Vermont Advanced Computing Center.

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