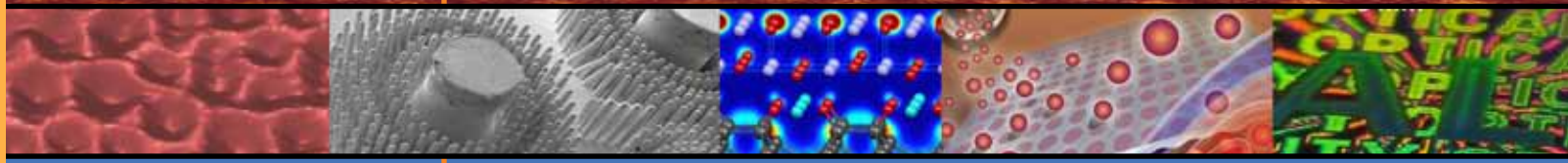
Yale UNIVERSITY

Design, Synthesis, Characterization, Understanding, and Utilization of Novel Interfacial Materials



Yale University

CRISP

CRISP explores the composition, structure, properties and potential applications of the "interface" or border region where two materials come into contact with each other.

As the spatial dimensions of materials are reduced, their behavior and performance become increasingly governed by what happens at their boundaries and their interfaces with other materials and systems. CRISP researchers investigate the transitions that take place at such interfaces, with the goal of discovering new phenomena, such as novel electronic, magnetic, and chemical behaviors, as well as ways to control, engineer, and utilize them. CRISP focuses on the interfacial behavior of metal oxides and metallic glasses, classes of materials that offer a wealth of new science and potential applications.

HIGHLIGHTS . . .

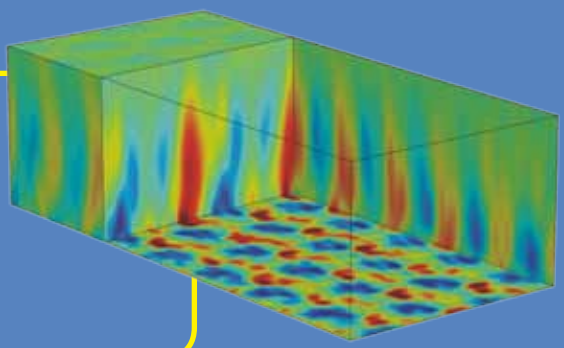
CRISP researchers have determined the detailed atomic-scale structure of oxide-semiconductor interfaces

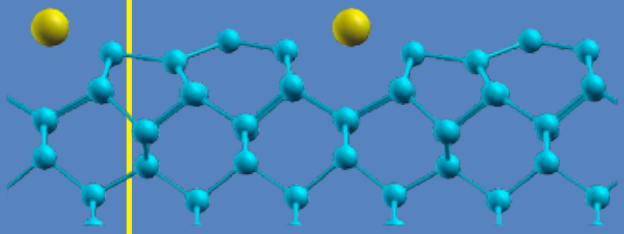
Nanorods of 15 nanometers in diameter and 10 microns in height made of high surface area metallic glasses for catalysis

DIRECTOR: Charles Ahn
http://www.crisp.yale.edu

RESEARCH FUNDAMENTALS...

The CRISP Non-contact Atomic Force Microscopy (NC-AFM) facility can achieve atomic resolution 3D maps of the tip-surface interaction potential.





First principles theory is an essential complement to materials growth and characterization and can invent new structures and behaviors.

"CRISP explores interfacial materials phenomena through an interdisciplinary approach that encompasses materials growth and characterization, first principles theory, and device development. Our objective is to realize materials that exhibit novel behaviors that enable new technologies."

Charles Ahn, CRISP Director

CRISP EDUCATIONAL MISSION:

The CRISP educational outreach program is a coordinated effort involving Yale and demographically diverse institutions, the New Haven public school system and Southern Connecticut State University (SCSU), a comprehensive urban university specializing in teacher education. A signature activity of CRISP is our combined REU/RET experience in which undergraduate students, selected particularly from underrepresented populations, team up with teachers from the SCSU Masters in Science Education program to carry out research at Yale. In addition, CRISP is actively involved in K-12 science education with the goal of increasing science literacy and stimulating students to consider research careers.

OUTREACH

More information about the workshops, internships, partnerships, and educational opportunities are available at: http://www.crisp.yale.edu/index.php/education_outreach