

## CenSSIS Mission

**CenSSIS** researchers seek to revolutionize our ability to detect and image biomedical and environmental-civil objects or conditions that are underground, underwater, embedded within cells or inside the human body. We address questions such as:

- How can we **detect breast cancers before they are life-threatening?**
- How can we **protect children from hidden land mines?**
- How can we **detect plaques before they cause sudden heart attacks?**
- How can we **remotely monitor the health of the ocean's ecosystem?**
- How can we **detect underground pollution plumes?**

Researchers use electromagnetic and acoustic waves to probe under surfaces and sense hidden things – like tumors, buried treasure, concealed weapons, land mines, and schools of fish. Since waves interact in complex ways, it is important to develop computer simulations that accurately predict their behavior. We need to have mathematical ways to analyze the waves that come out and to find out what is below the surface. And we need ways to process, store, and display the images using advanced computer hardware and software. These tools will help us design advanced sensing systems for basic research, commercial products, and homeland security.



**Boston University**

**Northeastern**

**Rensselaer**  
why not change the world?™

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**Lawrence Livermore National Laboratory**

**Woods Hole Oceanographic Institution**

**INEEL**  
Home of Science and Engineering Solutions

**MASSACHUSETTS GENERAL HOSPITAL**

**MEMORIAL SLOAN-KETTERING CANCER CENTER**

*This work was supported in part by CenSSIS, the Center for Subsurface Sensing and Imaging Systems, under the Engineering Research Centers Program of the National Science Foundation (Award # EEC-9986821).*



**CenSSIS**  
**Scholars**  
**Program**  
**Fall 2008**

**CenSSIS**

Center for Subsurface Sensing and Imaging Systems

## Apply To Become a CenSSIS Scholar

- Receive a \$250 voucher at Barnes & Noble at BU bookstore
- Receive support for one semester of CenSSIS UROP activity in a lab (within first two years)
- Take a CenSSIS EK131/132 class
- Participate in CenSSIS Student Leadership Council Meetings
- Attend CenSSIS Seminars
- Attend CenSSIS RICC
- Attend a CenSSIS partner fieldtrip
- Assist with CenSSIS K-12 outreach

## High Tech Tools and Toys Lab

The High Tech Tools and Toys Laboratory is a discovery based educational laboratory which allows students to use modern technology to solve real, open-ended problems in a series of Tools and Toys stations.

EK131/132 Subsurface Sensing & Imaging in fall and similar sections in spring address imaging and sensing. A CenSSIS senior elective course is offered, and some ECE senior design projects are in HTTTL.

## CenSSIS Field Trips and Seminars

Visit a hospital or oceanographic imaging center or attend a seminar by an expert on ground-penetrating radar or ultrasonic imaging. CenSSIS activities are designed to be interesting

and accessible to all students – including first-year undergraduates.

## CenSSIS – Undergrad Research Opportunities

These opportunities start when an undergraduate student is hired by a CenSSIS faculty member, or another faculty member working on related problems. Your funding will pay for your hours as you work in their lab on a suitable research question. The funds can be matched or supplemented by faculty funding, UROP office awards, or ENG SURF monies.

Students will work 5-10 hours/week, learning basic lab skills, equipment use, and engineering practice. Students with some undergrad research experience find it easier to locate internships, summer UROP support, and Research Experiences for Undergraduates funding.

## CenSSIS Student Leadership Council

The CenSSIS Student Leadership Council (SLC) meets once a month by phone or video conference to discuss CenSSIS academic research, education programs, and industry activities. Students from the four universities participate in and lead the SLC.

The SLC helped plan parts of the 2008 Research and Industrial Collaboration Conference (October 29, 2008) and

will help with the NSF Site Review Visit (April, 2009).

## CenSSIS K-12 Outreach Activities

CenSSIS has a deliberate strategy to encourage K-12 students to consider science and engineering careers. This involves campus visits, teacher training, and developing educational materials and activities that convey the excitement and challenge of imaging..

CenSSIS scholars can help with outreach activities, meet with K-12 students and teachers, and share their experiences that led to an engineering program. Most of these activities are on-campus, in the HTTTL.

## More Information on CenSSIS...

Main CenSSIS site:

<http://www.censsis.neu.edu>

Join the CenSSIS mailing list by sending an email to the SLC listserve:

[khicks@coe.neu.edu](mailto:khicks@coe.neu.edu)

To get a CenSSIS Scholars application:

<http://www.bu.edu/censsis>

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