



BOISE STATE UNIVERSITY

RESEARCH
STRENGTHS



SENSORS

From quickly detecting trace amounts of substances in the environment to diagnosing disease and imaging the Earth's subsurface, Boise State researchers are developing new sensing systems with expanded capabilities.

- A growing and dynamic field at Boise State that encompasses a range of disciplines and has led to new patents, partnerships and research awards
- Top academic credentials among outstanding faculty across the sciences and engineering
- Doctoral, master's and undergraduate students conduct hands-on research in sensor development as part of externally funded research programs
- FAA Center of Excellence for Research in the Intermodal Transport Environment conducts research in sensor and wireless sensing systems
- Partner university in U.S. Department of Energy's Nuclear Energy University Program as part of the Integrated Research Program on monitoring and sensor development for spent nuclear fuel storage; Boise State collaborates with Texas A&M, University of Wisconsin, University of Florida and University of Illinois
- Boise Hydrogeophysical Research Site attracts researchers from top research institutions in the United States and overseas to develop and test new, non-invasive methods to map the subsurface



SENSORS

Sensors measure a physical quantity and convert it into a signal that can be read by users or by other instruments. At Boise State, interdisciplinary programs in sensor development bring together faculty in chemistry, physics, civil engineering, biology, geosciences, electrical and computer engineering, materials science and engineering, and other fields.



SENSOR DEVELOPMENT:

> **OIL SENSORS** for monitoring under extreme conditions such as those seen by marine aircraft
> **MAGNETIC-BASED SENSORS** that operate based on changes in magnetic properties of materials
> **CORROSION SENSORS** to monitor cracking > **PORTABLE SENSORS** to detect arsenic, mercury, plutonium and other contaminants in ground and surface water > **BIOMEDICAL SENSORS** to provide early-stage diagnosis through a simple blood test > **RADIATION SENSORS** that remotely detect radiation levels > **NANOPARTICLE-BASED SENSORS** to detect biological species such as DNA, protein and bacteria > **SUBSURFACE SENSORS** to determine permeability, structure and other properties > **WIRELESS SENSOR NETWORKS** to monitor spent nuclear fuel containers, air quality and noise levels in aircraft cabins, and for other applications > **INFRASOUND SENSORS** for volcano monitoring and snow avalanche studies > **SENSOR PROJECTS** that utilize novel materials, wireless systems, nanoscale design, reconfigurable hardware 3D technology for advanced energy systems, and other advanced technologies

ISSUED AND PENDING PATENTS

- Imaging Device for Biomedical Use
- Molecular Interaction Measurement Device and Method
- Optical Monitoring and Computing Devices and Methods of Use
- Self Organizing Air Vent
- Magnetic Gas Sensor and Methods Using Antiferromagnetic Hematite Nanoparticles
- Mercury Selective Electrode
- Chalcogenide Glass Ionizing Radiation Sensor
- Multi-state Memory and Multi-functional Devices Comprising Magnetoplastic or Magnetoelastic Materials
- Modular Hydraulic Packer and Port System
- Determination of Permeability from Damping
- Wide Band Sensor
- Sensor Device

(Note: Boise State's patent portfolio continues to grow and new applications are in process.)

GRANTS AND AWARDS

- NASA
- Environmental Protection Agency
- National Science Foundation
- Keck Foundation
- U.S. Department of Defense
- U.S. Department of Energy
- National Institutes of Health
- Business and Industry



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RESEARCH AND ECONOMIC DEVELOPMENT

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