

IOWA STATE UNIVERSITY

Center for Nondestructive Evaluation

**Fundamental and
applied science,
technology,
educational
innovations and
engineering
know-how to
serve the broader
NDE community**

ABOUT THE CENTER

The Center for Nondestructive Evaluation (CNDE) was formed in the mid-1980s as a National Science Foundation Industry/University Cooperative Research Center (IUCRC). Nondestructive evaluation (NDE) is the science, engineering and application of evaluating a structure or a system without adversely influencing its future functionality.

CNDE is uniquely positioned as the preeminent national leader in fundamental and applied science; technology; and educational innovations and engineering know-how serving the broader NDE community. CNDE's mission is to:

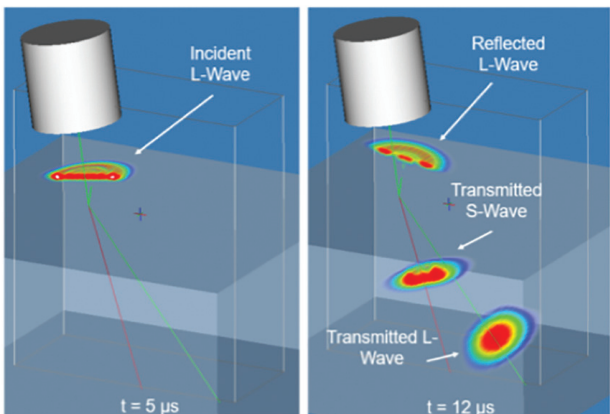
- » actively promote, develop and guide a national agenda for the future of the NDE discipline,
- » discover and translate new science to the NDE discipline,
- » develop innovative NDE technologies and transition them to the NDE end-users,
- » educate NDE experts and scientists, and
- » address the broader global NDE needs and grand challenges.

At CNDE, an interdisciplinary group of scientists and faculty converge to perform state-of-the-art research on a plurality of NDE techniques and applications. CNDE, its support staff, graduate and undergraduate students work closely with industry and government to advance all thing related to the broader field of NDE. CNDE is home to state-of-the-art research and commercial instrumentation, which enables cutting-edge investigations in numerous NDE modalities. Among many accomplishments has been the development and commercialization of simulation models for the three major inspection modalities: eddy current (ECSIM), ultrasonics (UTSIM) and radiography (XRSIM).

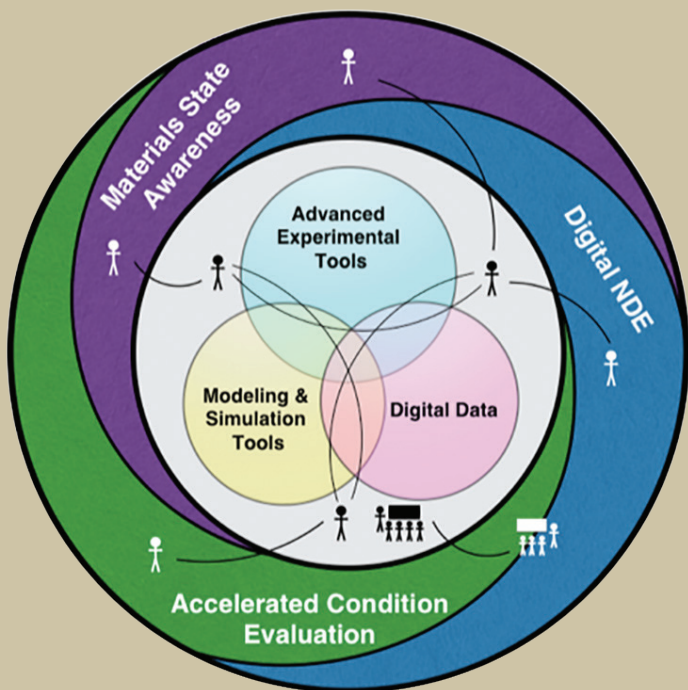
CNDE engages with industry and government sponsors in externally-funded research projects, expanding CNDE's capabilities for the benefit of the NDE community and its sponsors.

RESEARCH CAPABILITIES

- » **Ultrasonics:** Conventional Ultrasonics; Air Coupled Ultrasonics; Nonlinear Acoustics
- » **Laser Ultrasound:** Modeling of Propagating Fields; Probe Modeling and Design
- » **Acoustic Emission**
- » **Radiography:** Conventional X-ray; CT/Laminography
- » **Electromagnetic/Magnetic:** Eddy Current; ACPD; Magnetic Particle; Flux Leakage
- » **Fluorescent Penetrant**
- » **Thermal and Sonic IR**
- » **Terahertz Radiation/FTIR**
- » **Ground Penetrating Radar (GPR)**
- » **Microwave and Millimeter Waves**
- » **Structural Health Monitoring (SHM)**
- » **Technology Assistance Program (for Iowa Companies): CIRAS**
- » **Probe Fabrication:** Ultrasound (nonlinear); Electromagnetic; Strain/SHM; Microwave
- » **Other Capabilities:** Sample Fabrication/ Machining; Continuous Fiber Reinforced Polymer; Matrix Composite Fabrication
- » **Destructive Testing:** Fatigue; Uniaxial Tension, Compression and Torsion; Impact; Compression After Impact (CAI) for laminate composites



UTSim2: ultrasonic simulation software package



BENEFITS OF CNDE MEMBERSHIP

Members have direct access to and collaborate with:

- » Internationally-recognized research scientists, engineers and faculty
- » Comprehensive and state-of-the-art NDE facilities – “one-stop-shop”
- » Pre-competitive fundamental research
- » Beta test site for advanced simulation/modeling codes and tools
- » Leveraged research outcomes
- » Access to undergraduate and graduate students - future scientists and technical leaders
- » Ability to shape and impact future NDE research directions

NDE EDUCATION

Education, training and outreach are important components of the overall efforts at CNDE. Iowa State University (ISU) is the only U.S. institution to offer a Nondestructive Evaluation (NDE) minor at the undergraduate level. A multi-disciplinary qualification is available to engineering students at ISU. An associated lab provides hands-on opportunities. CNDE developed a first-in-the-nation graduate level certificate in NDE, through online learning. A 13-credit certificate option is available to engineering students or off-campus participants. CNDE also hosts (<https://www.nde-ed.org>), providing a wealth of NDE educational resources aimed at high school and junior college students.

SCHOLARSHIPS & FELLOWSHIPS

There are a number of undergraduate scholarships and graduate fellowships available for students pursuing educational goals in the field of NDE Scholarships

Scholarships

- » Donald O. Thompson Founders' Prize
- » Paul and Joyce Schafbuch Engineering Scholarship

Fellowships

- » R. Bruce Thompson Graduate Fellowship in CNDE
- » Trapp Graduate Fellowship in CNDE





BECOMING A SPONSOR

Through participation in the membership program, corporate and government sponsors guide the direction of CNDE research in critical areas of national need, with the ultimate goal of transferring research outcomes to effectively respond to national and industrial needs.

Full and affiliate membership options provide members with flexibility in choosing the level of engagement with CNDE and its sponsors.

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