

# UCONN THERMO FISHER SCIENTIFIC CENTER FOR ADVANCED MICROSCOPY AND MATERIALS ANALYSIS (CAMMA)

INNOVATION PARTNERSHIP BUILDING AT UCONN TECH PARK

## About

The UConn Thermo Fisher Scientific Center for Advanced Microscopy and Materials Analysis (CAMMA) is a partnership between Thermo Fisher Scientific and the University of Connecticut. Thermo Fisher Scientific is a world leader in the manufacturing and development of electron microscopes. This center involves the use of Thermo Fisher Scientific instrumentation to analyze various materials. Both scanning and transmission electron microscopies are being used in CAMMA. Seven state of the art electron microscope systems are located in this laboratory.

Various researchers from academia, industry, national laboratories, and others are involved in collaborative projects where such instrumentation is used. This partnership involves research projects in collaboration with Thermo Fisher Scientific and fellowships for graduate students studying materials where characterization using electron microscopes is crucial.

## Areas of Expertise

- Metallurgy
- Semiconductors
- Magnetic materials
- Adsorbents
- Catalysts
- Sensors
- Biomaterials
- Polymers
- Synthesis
- Characterization
- Batteries
- Electrochemistry
- Thermal Analyses
- Absorption
- Emission
- Diffraction
- Scattering
- Alloys
- Flexible electronics
- Emulsions Micelles Surfactants
- Separations
- Academic Industrial Interactions
- Technology Transfer

## Instrumentation

### 3 SEM

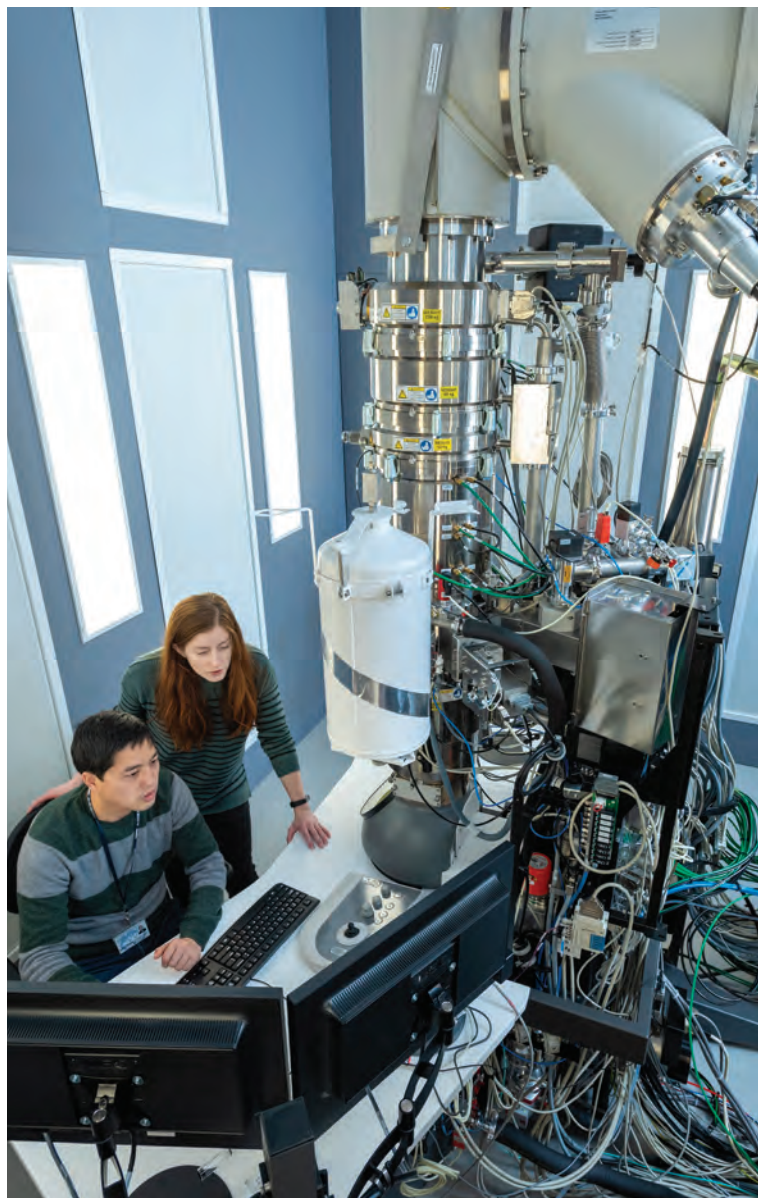
Surface imaging and analysis of any solid material

### 3 Dual Beam FIB/SEM

Ion beam milling for patterning, sectioning and sample preparation

### 3 S/TEM

Extreme resolution imaging and analysis of thin sections and nano-features



## Center Characteristics

### Overview

CAMMA involves research in the area of applications and developments in electron microscopy. With state of the art electron microscopes in CAMMA we are able to observe single atoms, structures at the molecular level, the chemical nature of materials, and information regarding physical and chemical properties. Several research projects are being done in collaboration with Thermo Fisher Scientific. Some projects involve use of electron microscopes with all different types of materials, development of methods to analyze materials in the electron microscopes, new ways to activate systems in the microscopes, how to correlate information from the different systems, and others.

### Focus

The center focuses on the advanced characterization of materials, which has nearly limitless applications, ranging from clean energy and alternative fuels to advanced manufacturing technology, semiconductors, vaccine development, and the development of medical devices.

### History

The center opened its doors in mid-2015, with the arrival of the first five microscopes from Thermo Fisher Scientific. These instruments were housed in UConn's Institute of Materials Science. The center moved to its permanent home in Tech Park's Innovation Partnership Building when construction was completed in March 2018.

### Funding

Funding for the center is being provided in roughly equal amounts by both UConn and Hillsboro, Oregon-based Thermo Fisher Scientific, and is expected to exceed \$25 million over a 15-year period.

### Next Steps

The center currently houses a total of seven instruments from Thermo Fisher Scientific, including the flagship microscope, Titan Themis TEM, which is capable of more than one-hundred million times magnification, allowing scientists to see the individual atoms that materials are made of, determine their arrangement, and measure the electrical and magnetic forces they exert on one another.

In addition to the acquisition of the instruments, the agreement includes research funding and support for an electron microscopy scientist and numerous graduate student fellowships. The new microscopy center may also draw researchers from peer academic institutions and industry to the facility to take advantage of its advanced materials characterization capabilities.

### Key Components of CAMMA

- 7 new state-of-the art instruments
- A new facility staff scientist position
- A half-time field service engineer from Thermo Fisher Scientific
- Research funding
- Graduate scholarships
- Training of staff
- Engagement contributions

## Contact

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