

MATFAB FY 2025 SUMMARY REPORT

MATFab Mission, Vision, and Values

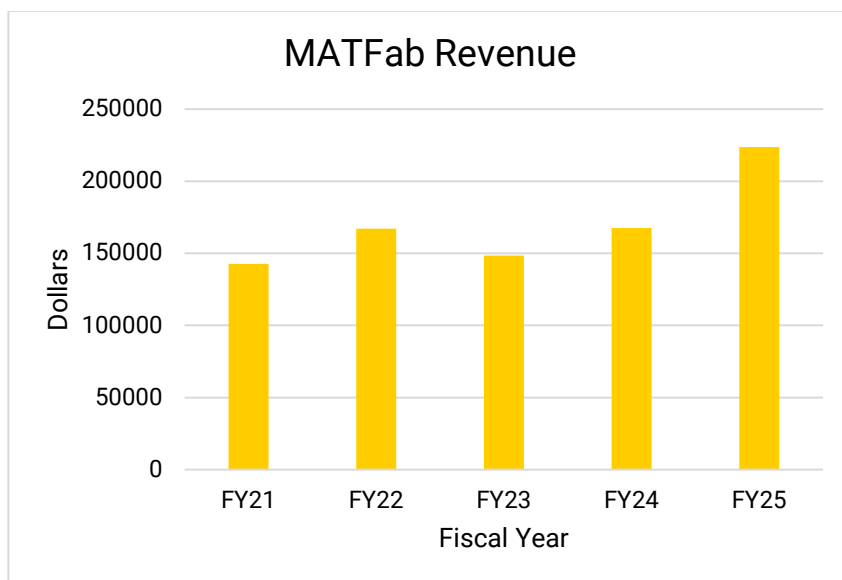
The Materials Analysis, Testing, and Fabrication (MATFab) Facility was created in 2018 to consolidate instrumentation and expertise in materials characterization and fabrication on the University of Iowa campus. This unit serves a critical research mission on the University of Iowa campus as it focuses on chemical and physical characterization of hard materials and fabrication of films, surfaces, and devices with micro- and nano-resolution. It serves faculty research needs in the University of Iowa Carver College of Medicine, College of Dentistry, College of Engineering, College of Liberal Arts and Sciences, College of Pharmacy, and College of Public Health. In addition, it provides access to cutting-edge techniques for researchers at local, state, and regional universities, colleges, and industrial partners.

Mission: Our mission is to empower innovation and discovery in science and engineering by providing advanced fabrication and characterization of natural and engineered materials.

Vision: To be a premier facility for materials fabrication and characterization in the Midwest by offering state-of-the-art capabilities, technical expertise, and educational opportunities.

Values: Provide high quality data, technical support, and training for our users in a timely and professional fashion.

Key Numbers



The MATFab Facility supports projects associated with over \$277 million in federal funding and oversees more than \$5.1 million in capital equipment for the University of Iowa.

Figure 1: Total revenue associated with instrument recharge in the last five fiscal years shows continued growth of the MATFab facility.

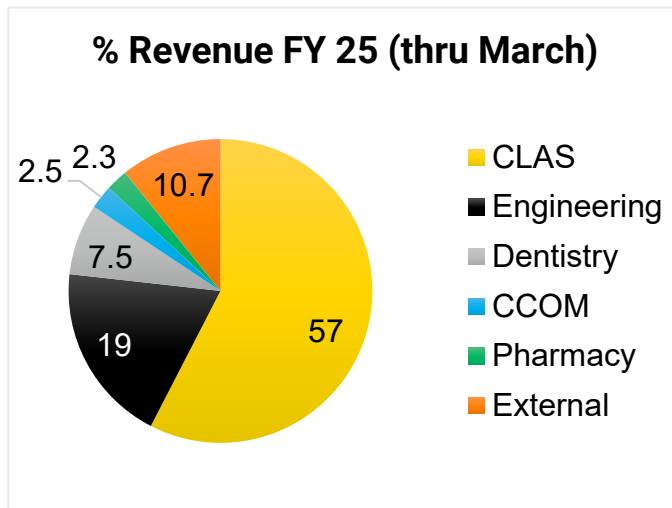


Figure 2: Percent revenue from each University of Iowa collegiate unit demonstrates broad use of the MATFab facility.

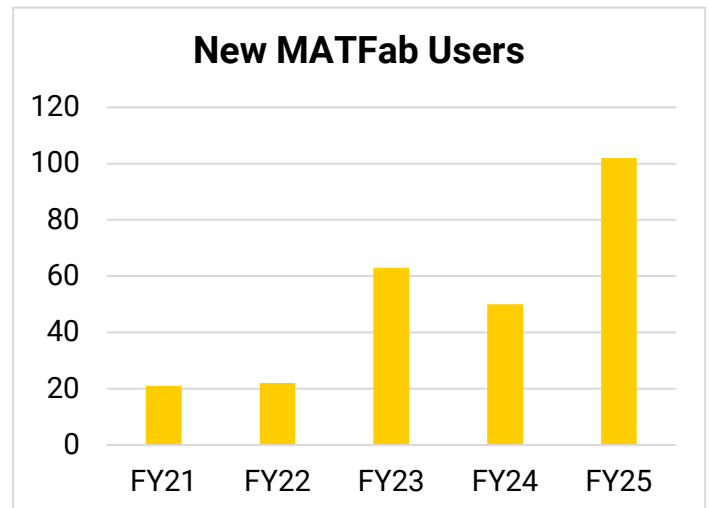


Figure 3: Continued growth for the MATFab facility is shown as the number of new users in the last five years. We currently have over 300 total users as of May 2025.

Enhancing our capabilities

The MATFab facility continues to collaborate with University of Iowa faculty to strengthen our research infrastructure. New fabrication equipment, funded by the Support for Space Technology Innovation & Education Award (PI: Professor Casey DeRoo, Physics), will be installed in summer 2025. This project also includes the addition of new cleanroom and wet bench capabilities to support advanced micro- and nanofabrication on campus. Additionally, we have recently installed a field-emission scanning electron microscope (FE-SEM), acquired through the NSF MRI grant "Acquisition of a Field Emission Scanning Electron Microscope to Expand Characterization Capabilities at the University of Iowa (PI: Professor Emily Finzel, EES)." This instrument offers enhanced imaging capabilities for a broad range of natural and engineered materials.



Figure 4: The new Field Emission Scanning Electron Microscope (FE-SEM) was installed in the MATFab facility in fall 2024.

MATFab Seed Grant Initiative

This year, the facility launched the MATFab Seed Grant Program to support the development of new research directions and promote the use of innovative applications on our instrumentation. The goal is to generate proof-of-concept data that can strengthen proposals for external funding. The program is open to University of Iowa faculty, staff, postdoctoral scholars, and graduate students. Eight awards were provided to researchers across campus:

Milad Arzani, Biomedical Engineering, College of Engineering

Professor Cristina De Mattos Pimenta, College of Dentistry

Dr. He Feng, Department of Earth and Environmental Sciences, College of Liberal Arts and Sciences

Professor Katheryn Rothenberg, Biology, College of Liberal Arts and Sciences

Professor Hyeongmin Seo, Chemical and Biochemical Engineering, College of Engineering

Professor Susan Shen, Department of Psychiatry, Carver College of Medicine

Trong Bien Tran, Pharmaceutical Sciences and Experimental Therapeutics, College of Pharmacy

Dr Andy Wang, Chemical and Biochemical Engineering, College of Engineering

MATFab First Annual “Materials Frontier Symposium”

The first annual MATFab “Materials Frontier Symposium” was held on April 18, 2025, with the goal of showcasing advances and applications in materials science at the University of Iowa. Drs. Michael Sinnwell and He Feng led a workshop on the newly acquired field-emission scanning electron microscope, providing attendees with insights into its capabilities. The poster session featured research from both undergraduate and graduate students, covering a broad range of topics in fabrication and characterization. Plenary speakers for the event, Professors Fatima Toor (Electrical and Computer Engineering) and Korey Carter (Chemistry), presented cutting-edge materials science research being conducted at the University of Iowa.



Figure 5: Undergraduate and graduate students present at the MATFab “Materials Frontier Symposium” in April 2025.



Figure 6: Professor Fatima Toor delivers the plenary lecture at the MATFab “Materials Frontier Symposium”

Materials Frontier Symposium Student Poster Awards

First Place – Joel Dillman, Undergraduate Researcher, Toor Group, College of Engineering

Second Place – Nicole Shapiro, Graduate Researcher, Cwiertny Group, Colleges of Engineering/College of Liberal Arts and Sciences

Third Place – Evan Hagen, Graduate Researcher, Toor group, College of Engineering