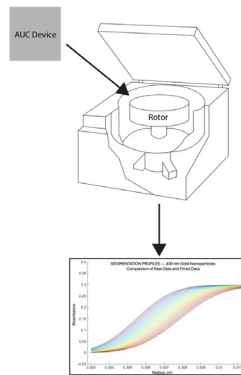


BTEC PROJECT HIGHLIGHT

Higher Order Technologies Analytical Ultra Centrifuge



Madeline Malloy, Nina Pierce, Susie Pompei, Rafa Urbina (BME '26)

Analytical ultracentrifugation (AUC) is a technique widely used in pharmaceutical research to characterize tiny particles and molecules but the instruments are large and expensive. Current systems also suffer from a fundamental design limitation: the optics and detectors sit outside the spinning rotor, creating a physical gap between the detector and sample that introduces vibration, noise, and measurement errors. The team developed a prototype of a compact AUC system that integrates the optics, electronics, and sample into a single rotating device. The result is a portable system with reduced noise and improved accuracy that is compatible with standard commercial centrifuges. The team has validated their design using a suite of techniques available at BTEC, including dynamic light scattering, gel electrophoresis, and UV-visible spectroscopy. The goal is to make high-quality ultracentrifugation accessible to all laboratories!

BTEC Advisory Board Members:



upcoming events

BTEC Scholars, Office
Hours for Undergrads

Apr 23 at 2, BTEC

BTEC x BMES
Design Competition



Apr 25 at 12, LSE B03



Senior Design Day

May 1 at 9,
Kilachand CILSE 101

Engineering Materials in
3D Workshop

July 16, BTEC

Laser Cutter and NC Mill
Workshop

July 31, SILab

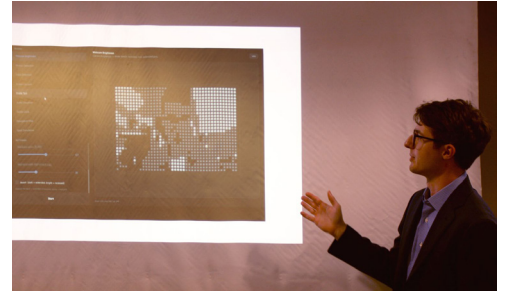
MEET THE 2026 BTEC PHD SCHOLARS IN RESIDENCE

Dev Bhatt (BME '28), Julia Linke (BME '29), Nazanin Nafisi (ME '27), Yash Patel (EE '30)

SILAB PROJECT HIGHLIGHT

Fluid Display by Charles Van Hook (EE '26)

Fluid Display is a tactile display device that uses microfluidic electroosmotic pumps to move fluid that pushes flexible membranes, forming raised dots. This array of dots can then translate dynamic visuals, like from screens or cameras, into a textured surface allowing those with visual impairments to gain a touch-based situational awareness.



BTEC ASSISTANT HIGHLIGHT

Avishi Singh (BME '26)

Avishi Singh began working at BTEC in 2024 and has since led the development of its cell culture workshops. Through hands-on experiments with spheroid cell culturing, she has helped expand the lab's mammalian culture capabilities. She most enjoys teaching and building a collaborative environment where students can create impact beyond BTEC and BU. Alongside this, she is passionate about prototyping and modeling, applying these skills to phantom design in her Senior Design project. She is excited to pursue her MEng in Biomedical Engineering and finish her undergraduate experience in a setting like BTEC that fosters collaborative entrepreneurship.



SILAB ADVISOR HIGHLIGHT

Madeline Malloy (BME '26)

Madeline Malloy started at SILab in May 2024. Madeline is known for bringing large-scale ideas to life, including standout projects like a whale shark chandelier and an intricately designed dragon head.

Beyond her own work, she is a constant presence in the lab, advising students on their projects and offering thoughtful, hands-on support to help them succeed. Outside of SILab, Madeline serves as Co-President of the BU Biomedical Engineering Society (BMES) student chapter, where she plays a key role in building community and fostering collaboration. Madeline is dedicated to creating opportunities that empower students to explore, create, and innovate.



KATIE KELSO AWARDED SUPERVISOR OF THE YEAR!

PAST EVENT HIGHLIGHTS

Lutron Lighting Innovation Competition

The Lutron Lighting Innovation Competition took place at SILab in February. Twenty-six teams were judged on creativity and build quality. The winning project, **Studio Ghiblight** by **Anna Tretiakova** and **Annalisa Emanuele (MechE '26)** was a Studio Ghibli themed light up fountain.



BTEC Workshops

In the BTEC x **Student Society for Biomaterials workshop** students gained hands-on experience in column chromatography and its applications. In the **qPCR workshop**, students performed and analyzed DNA quantification results obtained using the NanoDrop and qPCR.



12th Annual Dean's Imagineering Competition

This year-long design competition gives students the opportunity to express their creativity and entrepreneurial ideas with a view toward impacting society. Ten teams presented. The first place winner was **Fluid Display**, highlighted above. **Closed Loop Plastic Reuse**, a university-scale 3D print filament recycling system, by **Reuben Danyali (Environmental Policy)**, **Declan Lacey (ECE)**, **Nik Polyakov (MechE '28)** took second place.



TREC and EWB Clubs at SILab

The Terrier Ride Engineering Club (TREC) built a portable amusement park ride model in **SILab** and won the Visionary Award at the 2026 Ride Engineering Competition. The Engineers Without Borders (EWB) hosted Boston Green Academy high school students at SILab for safety training and helped with their engineering projects.

Diane Joseph-McCarthy, Executive Director BTEC
Kavon Karrobi, BTEC Manager
Katie Kelso, SILab Manager
For more information, email: btec@bu.edu