

Angelica Knudsen

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EDUCATION

Massachusetts Institute of Technology (MIT)

Candidate for Bachelor of Science, Mechanical Engineering and Physics

Cumulative GPA: 4.5/5.0

Relevant Coursework (taken and will take in current school year):

- Mechanical Engineering: Mechanics and Materials I, Dynamics and Control I&II, Thermal-fluids Engineering I&II
- Physics: Mechanics, Electricity and Magnetism, Waves and Vibrations, Special Relativity, Physics of Energy

Cambridge, MA

Expected May 2026

EXPERIENCE

MIT Department of Mechanical Engineering

SuperUROP Researcher at Hatsopoulos Microfluids Laboratory

- Measuring static and roll-off contact angle of water drop on feathers of ruby-throated hummingbird using contact angle goniometer
- Assessing hierarchical structure of barbes, barbules, and hooklets of iridescent and non-iridescent feathers using optical microscopy and scanning electron microscopy
- Synthetically reconstructing feathers using UpNano two-photon polymerization 3D-printer to compare properties with those of hummingbird feathers

Cambridge, MA

Sep 2024 – Present

MIT Department of Physics

8.02 (Electricity and Magnetism) Undergraduate Teaching Assistant

Cambridge, MA

Feb 2024 – May 2024

MIT Sea Grant

Student Researcher on Coastal Acidification of the Gulf of Maine

- Researched calibration methods and established SOPs for Manta +35, Hanna, and YSI Castaway sensors
- Visited oyster nurseries and farms and deployed sensors for weeks at a time
- Processed and graphed data using Python onto user interface

Cambridge, MA

Aug 2024 – Present

PROJECTS

Hydrophobicity of Feather-Inspired 3D-Printed Materials - Class Project for 2.671

Sep 2024 – Dec 2024

- Emulated feather microstructures through 3D-printed materials to probe how different parameters of feather-like ridges influence hydrophobicity
- Found that thinner ridges and steeper angles of the samples increased hydrophobicity, which is consistent with the theory behind feather hydrophobicity where minimizing surface area in contact with a water drop generally yields a more hydrophobic surface

Yarn Winder

Aug 2024

- Built entirely out of scavenged parts within 1 week (total cost: \$0)
- Included acrylic gears and plywood base laser cut from scraps

Modular Water Collector for Drone - Proof of Concept Class Project for 2.00A

Apr 2023 – May 2023

- Collaborated to build peristaltic pump on gear-bearing revolver to suck in and empty water into 8 100 mL test tubes
- Used CAD to laser cut and 3D print gear bearing revolver and test tube holder
- Designed system to attach to feet of drones with sufficient weight-carrying capacity

Ladder Climbing Robot for Activities Showcase

Feb 2023 – May 2023

- Collaborated with other members of MIT Robotics Team to build robot
- Designed a hinging mechanism that smoothly glides over and snaps onto rungs of ladder using rubber bands

ACTIVITIES

MIT Robotics Team

Mechanical Engineering Subteam Member

Cambridge, MA

Feb 2023 – May 2023

ADDITIONAL

Languages: Python, MATLAB, C++

Manufacturing: Laser Cutter, Mill, Bandsaw, Drill Press, 3D printer, Soldering

CAD: Autodesk Fusion 360, Rhino, SOLIDWORKS

Awards: 2022 VEX Robotics ND State Champion and Worlds Qualifier, 2022 U.S. Presidential Scholar Semifinalist, 2021 FBLA Cybersecurity State Champion