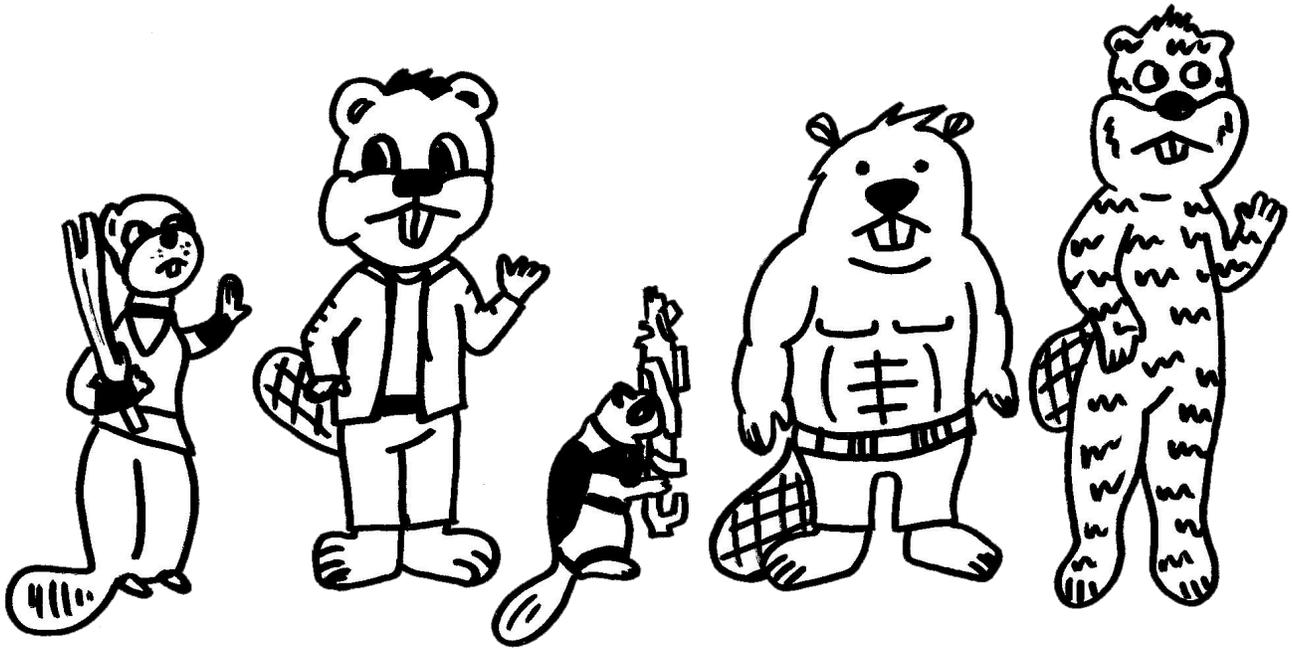


# Freshman Explorations Class of 2021



Thursday, August 31

Dear Class of 2021,

Freshmen Explorations is a way for you to experience some of the many learning opportunities that MIT has to offer. In addition to tours of the world's top research labs and facilities, we are offering open houses and presentations related to a variety of MIT programs and resources, including UROP, department offerings, the chaplains, the MIT COOP, and much more. Inside, you will find the schedule and descriptions of all of the activities that are occurring during Freshman Explorations. Have fun exploring!

Sincerely,

The Office of Undergraduate Advising and Academic Programming (UAAP)

## Freshman Explorations Tours by Time

Tour Time	Tour Name	Page Number
10 AM to 5 PM	MIT TurboVote	3
10 AM	Tasan Group: Understanding how metals transform, deform, fail	3
10 AM	Ultra High Temperature Materials Science and Electrolytic Metal Extraction: Allamore Group Lab Tour	4
10:45 AM	Get to Know MIT Career Services and Tour Google!	5
10:45 AM	Ultra High Temperature Materials Science and Electrolytic Metal Extraction: Allamore Group Lab Tour	4
11 AM	Black Convocation	5
11 AM	What are MIT rocket scientists up to?	5
12 PM	5.301 Freshman UROP Chemistry Connection and Chemistry Lab Tour	5
1 PM	J-PAL - UROPs, Internships, and What We Do!	6
1 PM	3D Printing & Human Computer Interaction Research	6
1 PM	ChemE Freshman Exploration Lab Tour	6
2 PM	Student Well Being Open House	7
2:30 PM	Hot Tips & Cool Cones: Libraries Tour & Ice Cream Social	7
3 PM	Hot Tips & Cool Cones: Libraries Tour & Ice Cream Social	7
3 PM	Electrochemical Materials Laboratory Tour	7
3 PM	ChemE Freshman Exploration Lab Tour	7
3:30 PM	MIT Media Lab – Opera of the Future	8
4 PM	Healthy Snacks with Prehealth Advising	8
4 PM	Drop-In Info Session with CEE	8
4:20 PM	Discover Course 3 (Materials Science + Engineering)	8
5 PM	UROP Open House	9

### MIT TurboVote

**Time:** 10 AM to 5 PM

**Location:** Lobby 10

**Tour limit:** NA

Stop by Lobby 10 and sign up for TurboVote, MIT's new voter registration system. If you're a US citizen and at least 18 years-old on or before Election Day, you can use TurboVote to register to vote, sign up to receive election reminders, and apply for your absentee ballot. It's quick, easy, free... and important!

### Tasan Group: Understanding how metals transform, deform, fail

**Time:** 10 AM

**Location:** 8-032

**Tour limit:** 25

Research activities in Taşan Group are following three main directions listed below, that address Methods, Mechanisms and Materials, respectively:

**Methods:** We continuously develop and expand our high resolution multi-probe multi-field mapping method. This approach relies on in-situ SEM (thermo-mechanical tests accompanied by in-lens SE, EBSD, ECCI, EDX, DIC analyses and crystal-plasticity simulations. It enables mapping of all critical constituents and fields associated with the deformation of multi-phase materials (e.g. microstructural strains, stresses, phase fractions, dislocation densities, damage incidents, crystallographic texture, etc.) at high spatial resolution.

**Mechanisms:** Employing multi-field mapping methods, we investigate the underlying physical mechanisms of microstructural transformation, plasticity, damage and healing processes in nanostructured multi-phase alloys. Micro-processes of interest include dislocation interactions, mechanical twinning, mechanically-induced martensitic transformation, nano-precipitation, damage nucleation, growth and coalescence, crack closure or blunting, interstitial segregation or diffusion, etc.

**Materials:** With the improved understanding of critical microstructural mechanisms, we design novel alloys that have properties superior than those of existing materials. Of specific interest is to design damage-resistant and/or healable microstructure design concepts, which would enable efficient re-use strategies to be realized, reducing carbon dioxide emissions associated with materials production. Recent examples of designed materials include metastable dual-phase high entropy alloys, TRIP-Maraging steels, graded Dual-Phase steels, healable TRIP steels, etc.

### **Ultra High Temperature Materials Science and Electrolytic Metal Extraction: Allanore Group Lab Tour**

**Time:** 10:00 AM; 10:45 AM

**Location:** 13-5095

**Tour limit:** 15

Research Topics:

- Electrolysis of molten sulfides for the extraction of copper, molybdenum, rhenium
- E-waste recycling and precious metal recovery using molten sulfide electrolytes
- Thermodynamic modeling and electrochemistry of molten oxides and sulfides for metal extraction
- Theory and application of liquid sulfide thermoelectrics
- Development of sustainable potassium fertilizers from K-rich minerals

The tour will showcase the equipment required for the electrochemistry of high temperature systems.

### **Get to Know MIT Career Services and Tour Google!**

**Time:** 10:45 AM

**Location:** Google, 355 Main Street, Cambridge, MA 02142

**Tour limit:** 60

Learn about how MIT Career Services can help you your first year and take a tour of Google, a local “freshman friendly employer”. The tour of Google will also include learning more about their Engineering Practicum opportunity, which is open to first-year student applicants, and hearing from a panel of MIT alumni. Sign-up is required in advanced and is first come, first served. Please sign-up at <https://goo.gl/uhdKBn> by Wednesday, August 30th at 3pm.

### **Black Convocation**

**Time:** 11 AM

**Location:** 5-134

**Tour limit:** NA

Come join black students, faculty and staff as we celebrate the start of your MIT career. There will be good food and good people! All members of the African Diaspora are welcome!

### **What are MIT rocket scientists up to?**

**Time:** 11 AM

**Location:** Begins in front of Room 33-202 (123 Massachusetts Avenue)

**Tour limit:** 20

Come visit the Arthur Gelb and Robert C. Seamans Jr. Laboratories, which have been designed to enhance undergraduate engineering education by providing facilities, equipment, and space for students to study, design, construct, test, and operate aerospace engineering projects. You will also visit the Wright Brothers Wind Tunnel, which operates between 0.25 atmospheres and 20 atmospheres, making it the only non-government pressurized wind tunnel in the United States. During the tour, freshmen will also hear about UROPs in the department and how to find one.

### **5.301 Freshman UROP Chemistry Connection and Chemistry Lab Tour**

**Time:** 12 PM

**Location:** 6-321 Moore Room

**Tour limit:** NA

Find out how Chemistry Laboratory Techniques (5.301) offered during MIT's Independent Activities Period (IAP) guarantees freshmen a UROP opportunity in the Chemistry

Department for 2018. Event includes a Pizza Lunch and ends with a walking tour of the Undergraduate Chemistry Labs.

### **J-PAL - UROPs, Internships, and What We Do!**

**Time:** 1 PM

**Location:** E19-258

**Tour limit:** NA

J-PAL ([www.povertyactionlab.org](http://www.povertyactionlab.org)), a research center in the Economics Department, supports research evaluating the effectiveness of social policies around the world using Randomized Controlled Trials. We then work to pull lessons from the research and conduct outreach efforts to policy makers to use the evidence to inform their policy decisions. The tour will be a brief presentation on our work and how we use UROPs and Interns to support our efforts. Cookies will be served!

### **3D Printing & Human Computer Interaction Research**

**Time:** 1 PM

**Location:** 32-211 (don't take the elevator, take the small staircase opposite the Dreyfoos elevator)

**Tour limit:** NA

We will give a tour of our lab space and show some of our recent research projects on 3D printing and Human Computer Interaction.

<http://hcie.csail.mit.edu/people.html>

<http://hcie.csail.mit.edu/research.html>

### **ChemE Freshman Exploration Lab Tour**

**Time:** 1 PM, 3 PM

**Location:** 66-0044

**Tour limit:** NA

The tour will go through the undergraduate lab, which has been prepared this summer for the Chemical-Biological Engineering lab course, offered this fall. As a student in this laboratory majoring in Science or Engineering, you would learn how to solve technological problems and these skills have lead previous students to go into fields of study such as the development of clean energy resources, materials, pulp and paper manufacturing, pharmaceuticals, plastics, personal care products, synthetic fibers, food processing, waste treatment, pollution abatement, public health and biotechnology. During your visit of lab 66-0044 lab you will see benchtop bioreactors integrated with an online mass spectrometer, used to study metabolism of various cells such as bacteria, yeast microalgae, and mammalian cells, upright and inverted microscopes, HPLC, biochemical analyzers, spectrophotometers and a fluorescence plate reader. Your hosts will give you specifics on

some of the work that UROPs have been doing in the lab, including that from current rising sophomore and senior.

### **Student Wellbeing Open House**

**Time:** 2pm

**Location:** 5-104

We are hosting an open house for students to come meet all staff in Student Services and Wellbeing (SSAW). SSAW includes the offices of Student Support Services (S3), Student Disability Services (SDS), Violence Prevention & Response (VPR), Alcohol and Other Drugs Services (AODS), and the CARE Team. You can start your tour at any of the offices or stop by S3 to pick up a passport. We are located in building 5, Room 104. We will be giving out Tech Cash and MIT swag if you get your passport stamped by all the offices.

### **Hot Tips & Cool Cones: Libraries Tour & Ice Cream Social**

**Time:** 2:30 PM, 3PM

**Location:** Lobby 7

**Tour limit:** NA

Can I study in any library on campus? Where can I study 24/7? Can I borrow fun stuff like manga and graphic novels? What about borrowing textbooks for class? Find the answers to these burning questions and more on our walking tour. Learn about all the ways the Libraries can help you with coursework and research, then cool off with free Ben & Jerry's ice cream.

### **Electrochemical Materials Laboratory Tour**

**Time:** 3 PM

**Location:** 13-5055

**Tour limit:** 8

In the Electrochemical Materials Group we make, design and investigate materials for novel solid-state electrochemical information storage devices, batteries, and energy conversion. Understanding of the interfaces and bulk properties of the materials are the key for future development. Prominent examples of the research are the understanding of material kinetics to device performance for memristive information storage/logic devices. All-solid-state Li batteries co-operating on waste heat for stationary energy grid storage, miniaturized all solid state thin film batteries for on-chip power supply in portable electronics. New design rules for solar-to-fuel conversion materials may help shape next generation's ability to store solar energy through solar-driven thermochemical water and CO<sub>2</sub> splitting in sizable-tanks. We focus on new perovskite materials, thermodynamics and kinetics to increase solar-to-fuel efficiencies for reactors. Micro-solid oxide fuel cells are fascinating solid-state devices to understand electro-chemo-mechanics for energy conversion membranes and are particularly interesting due to their high specific and volumetric energies for portable electronics to classic batteries.

### **MIT Media Lab - Opera of the Future**

**Time:** 3:30 PM

**Location:** E14 333

**Tour limit:** 10

Opera of the Future seeks to extend expression, learning, and health through innovations in musical composition, performance, and participation. Get a chance to explore current projects in development (including City Symphonies, Spaces that Perform Themselves, and new explorations) and learn more about research opportunities (UROPs) in the lab.

### **Drop-In Info Session with CEE**

**Time:** 4 PM

**Location:** 1-131

**Tour limit:** NA

From custom tracks in civil engineering, systems engineering, environmental engineering to immersive fieldwork opportunities, Course 1 is a flexible degree with many opportunities. If you're interested in learning more about CEE, drop in any time between 3pm and 4pm to chat with some of our current students.

### **Healthy Snacks with Prehealth Advising**

**Time:** 4 PM

**Location:** E17-294, GECD (40 Ames St. entrance recommended)

**Tour limit:** 100

Come by the Prehealth Advising Office to meet the Prehealth team and learn about the services we have for prehealth students. This will be an informal gathering with healthy snacks for students to meet other fellow students and learn a little about what it is like to be a prehealth student at MIT!

### **Discover Course 3 (Materials Science + Engineering)**

**Time:** 4:20 pm, 4:40 pm

**Location:** 13-4071 (Outside 4th floor elevators)

**Tour limit:** 10

Students will get an overview of the various projects that a UROP student can do in the EMAT/PMAT (Electronic/Photonic Materials Research Group) as well as a tour of equipment such as the sputtering system and a plasma asher. They will learn how samples are fabricated, developed and see how they are stored (e.g. PbTe in a vacuum box).

## **UROP Open House**

**Time:** 5-6pm

**Location:** Twenty Chimney's (W20-306)

Come enjoy an ice cream sundae with UROP staff and students - learn more about research opportunities at MIT and how to get involved!