
ANS Unofficial Orientation 2018-2019



Massachusetts Institute of Technology

Welcome Event Schedule

- ~~GSC Orientation~~
- Unofficial ANS Orientation - now!
- Grad Mixer - 18:00 tonight, NW12-320
- Official NSE Orientation - 8:30 tomorrow, 24-115
- Registration Day Breakfast - morning, Sept. 4th, 24-115
- LN₂ Ice Cream Social - 15:00-18:00, Sept. 4th, 24-115
- Welcome Barbecue - 18:00 Sept. 7th, Edgerton Courtyard

Meet your panelists...

Panelist	Alma Mater	Lab
Travis Labossiere-Hickman	University of Tennessee	CRPG
Isaac Meyer	UC Berkeley	CRPG
Erica Salazar	Stanford	PSFC Materials
Chi Wang	SJTU	Red Lab + Green Lab
Ezra Engel	West Point	LNSP



Meet your classmates...

Name	Research	Country
Jacob Adams	Fusion	US
Gustavo Aguiar	Fission	Brazil
Jerry Akinsulire	Fission	US
Dakota Allen	Fission	US
Rachel Bielajew	Fusion	US
Zhiyuan Cheng	Fission	China
Nicholas Costa	Fission	US
Benjamin Dacus	MATS	US
Richard Ibekwe	Fusion	UK

Name	Research	Country
William (Reed) Kendrick	Fission	US
Haeseong Kim	Fission	Korea
Ethan Klein	ADNS	US
William Koch	ADNS	US
Evan Leppink	Fusion	US
Xinyao (Anna) Liang	Fission	China
Lige Liu	MATS	China
Christina Migliore	Fusion	US



Meet your classmates...

Name	Research	Country
Thanh Nguyen	Fusion	Canada
Can Pu	Fusion	China
Sean Robertson	Fission	Canada
Zachary Skirpan	Fission	US
William Stewart	Fission	US
Amelia Trainer	Fission	US
Guoqing Wang	MATS	China
Shangjie Xue	MATS	China
Ka-Yen Yau	Fission	US



What does ANS do?

- Represent you at faculty meetings
- Organize some department events
- Organize social events (like the **ATOMIC RETREAT!**)
- Organize the ANS seminar series
- Volunteer for educational outreach activities
- Also an award-winning chapter of the national American Nuclear Society



ANS Board

Travis Labossiere-Hickman (tjlaboss@mit.edu) Miriam Kreher (mrathbun@mit.edu)	Co-Presidents
Ka-Yen Yau (kayenyau@mit.edu)	Public Information Officer
Zhuoran Han (zhuoranh@mit.edu)	Treasurer
Adam Reynolds (adamreyn@mit.edu) Brian Casel (caselb@mit.edu)	Social Chairs
Isaac Meyer (icmeyer@mit.edu) Mohammad Shahin (shahinm@mit.edu)	Graduate Student Council representatives
Kieran Dolan (kpdolan@mit.edu)	Athletics Chair
Guillaume Giudicelli Patrick White	Immediate Past Co-Presidents



S.M. track

http://web.mit.edu/nse-academic/MS_degree_reqs.pdf



Ph.D. track

http://web.mit.edu/nse-academic/DOC_degree_reqs.pdf



Brief overview of Ph.D. track: GPA

- Three separate GPA requirements:
 - 6 modules
 - 3 field of specialization classes
 - Overall GPA
- All GPA's ≥ 4.5 is a clear pass
- All GPA's ≥ 4.0 is a “marginal” pass (most people)
- Any GPA < 4.0 requires a petition



Brief overview of Ph.D. track: Modules

- Fall semester, first half:
 - 22.11, Quantum; Bilge Yildiz
 - 22.15, Numerical Methods; Nunu Loureiro
- Fall semester, second half:
 - 22.12, Radiation detection; Mingda Li



Brief overview of Ph.D. track: Modules

- Spring semester, first half:
 - 22.14, Nuclear Materials; Ju Li
 - 22.13, Nuclear Systems; Matteo Bucci
- Spring semester, second half:
 - 22.16, Nuclear Policy; Scott Kemp
 - (sometimes 22.13 just to mess with us)



Brief overview of Ph.D. track: Quails



Brief overview of Ph.D. track: Example

- First semester
 - Modules: 22.11, 22.12, 22.15
 - FOS: 22.312
- Second semester
 - Modules: 22.13, 22.14, 22.16
 - FOS: 22.211
- Third semester
 - FOS: 22.212
- Oral Exam



Shopping, Part 1

The image shows a Google Maps interface with a walking route highlighted in blue. The route starts at the Central subway station and passes through several shopping destinations: Whole Foods Market, Harvest Co-Op Market, Target, and Hmart Cambridge. The route ends at Flour Bakery. The sidebar on the left lists the destinations and provides route details for walking: 21 minutes and 1.0 mile. The map shows a grid of streets in Cambridge, MA, with various landmarks and businesses labeled.

Destinations:

- MIT Building 24, 60 Vassar St, Cambridge, MA
- Hmart Cambridge, 581 Massachusetts Ave, Cambridge, MA
- Target, 564 Massachusetts Ave, Cambridge, MA
- Harvest Co-Op Market, 580 Massachusetts Ave, Cambridge, MA
- Whole Foods Market, 115 Prospect St, Cambridge, MA

Route Details:

- via Massachusetts Ave: 21 min, 1.0 mile
- Mostly flat

Map Labels: Whole Foods Market, Harvest Co-Op Market, Target, Hmart Cambridge, Flour Bakery, Central, Sennott Park, Cambridge Brewing Company, The Middle East Restaurant and Nightclub, MIT Building, Steinbrenner Stadium, Johnson Ice Rink, Killian Co.

Shopping, Part 2

The screenshot displays a Google Maps interface with a blue sidebar on the left and a map on the right. The sidebar lists the following destinations:

- MIT Building 24, 60 Vassar St, Cambridge
- Stratton Student Center, 84 Massachusetts St, Cambridge
- Trader Joe's, 748 Memorial Dr, Cambridge
- Whole Foods Market, 340 River St, Cambridge
- Add destination

Below the list, the sidebar shows options for sending directions to a phone and a walking route summary: **via Vassar St**, 38 min, 1.9 miles. A 'DETAILS' link is also present. The map shows a blue walking route connecting these locations in the following order: Whole Foods Market, Trader Joe's, Hyatt Regency Cambridge, Stratton Student Center, and MIT Building 24. A pop-up box on the map indicates the total walking time is 38 min and the distance is 1.9 miles. The map includes labels for 'RIVERSIDE', 'THE PORT', 'CAMBRIDGEPORT', and 'AREA 2/MIT'. Landmarks like 'Boston University' and 'Charles River' are also visible.

Unofficial Resources

- Your student buddy
- ANS board
- Groupme
 - Rad Grads
 - NSE First Years
 - Other groups for trivia, drinking, etc.
- NSE Wiki: <https://wikis.mit.edu/confluence/display/NSE/NSE+Wiki+Home>



Clarifying the Registration Process

1. [After this semester] Pre-register for something, anything by the deadline to avoid a late fee.
2. Once real registration opens, sign up for the classes you actually want to take.
3. Meet with your “registration officer”, a.k.a. “academic advisor” (different than your research advisor) on Registration Day.
4. Submit registration after he or she has approved it.



Expect to need help during your first year! It's normal.

- MIT and Department Resources
 - OGE, NSE, ISO, Counseling Websites (in notes)
 - Staff (Pete, Heather, Brandy, Lisa, Nancy, others!)
 - Professors (not limited to just your advisors)
- ANS Resources
 - ANS Wiki (in notes)
 - ANS Officers (we represent you!)
- NSE Students as Resources
 - Older grad students (research group, buddy)
 - Your fellow first years (GroupMe, email, text)

Student #lyfe

- Take time to be a person. Self-love is love.
- P.E. Classes: fencing, archery, squash, sailing
mitpe.mit.edu
- The Anno
- Beantown! Tripadvisor, concerts, bars, sportsball
- Free stuff with MIT ID: MFA, ICA, Harvard Museums, Harvard Library Card, discounted orchestra tickets
- Student Bars: Thirsty, Muddy, R&D

Retreat! It's not just for the French



- 9/14-9/16
- Leave at 6 pm, home by noon!
- Somewhere in NH
- Glamping

Retreat! It's not just for the French



Field of Specialization: Nuclear Materials

ERICA SALAZAR



Required Courses

- 36 units required
 - 22.71, 3.20 and one of 22.72, 22.74 or 3.21
- What are these numbers? – *Required Classes**
 - 22.71 – Modern Physical Metallurgy, *C. Tasan*
 - Steel! How different steels are made (phase diagrams) and produce different properties. Introduction to dislocations and defects.
 - 50%/50% mix of undergrads and graduate students
 - 3.20 – Materials at Equilibrium, *A. Allanore*
 - Laws of Thermodynamics! Introduction to statistical thermodynamics and how its relation to gases, phase diagrams, and crystal lattices.
 - Part of the Materials Dept. qualification requirement (larger class)

Required Courses

- What are these numbers? – *Select one from below*
 - 22.72 – Corrosion: The Environmental Degradation of Materials, *M. Li*
 - Corrosion! Applies thermodynamics and kinetics of electrode reactions to aqueous corrosion of metals. Covers materials degradation in marine environments, oil and gas production, and energy conversion and generation systems, including fossil and nuclear.
 - 22.74 – Radiation Damage and Effects in Nuclear Materials, *B. Yildez*
 - Radiation damage! Studies the origins and effects of radiation damage in structural materials for nuclear applications.
 - 3.21 – Kinetic Processes in Materials, *C. Thompson, M. Cima*
 - Kinetics! Provides the foundation for the advanced understanding of processing and microstructural evolution through atomistic kinetic processes in materials (diffusion, nucleation, phase transitions, etc.)
 - Part of the Materials Dept. qualification requirement (larger class)

Ask other students and faculty!

- The Materials FoS is growing in applications (fission, quantum, fusion)
- Selecting appropriate classes for your interest/research can be hard
 - Feel free to send me an email with any questions and I can point you to a person that can help: ericasal@mit.edu
 - Talk with materials focused faculty:
 - *Michael Short* (Materials in extreme env.—fission, etc.)
 - *Ju Li* (Materials in extreme env.—fission, Quantum, etc.)
 - Mingda Li (Quantum, Nano etc.)
 - Bilge Yildiz (Materials in extreme env.—fission, fuel cells, etc.)
 - Paola Cappellaro (Quantum, etc.)
 - Zach Hartwig (Materials in extreme env.—fusion, superconductors etc.)
 - Dennis Whyte (Materials in extreme env.—fusion, etc.)
 - Matteo Bucci (Materials in extreme env.—fission, etc.)

Plasma Science and Fusion Center (PSFC)

ERICA SALAZAR

Multi-disciplinary Laboratory

PSFC research ranges from fusion energy, plasma physics, plasma applications, superconducting magnet technology, magnetic resonance spectroscopy, etc.

The PSFC is comprised of faculty, scientists, researchers, and students from many departments:

- Aero/Astro
- Chemistry
- Electrical Engineering and Computer Science
- Materials Science and Engineering
- Mechanical Engineering
- Nuclear Science and Engineering 😊
- Physics

Locations

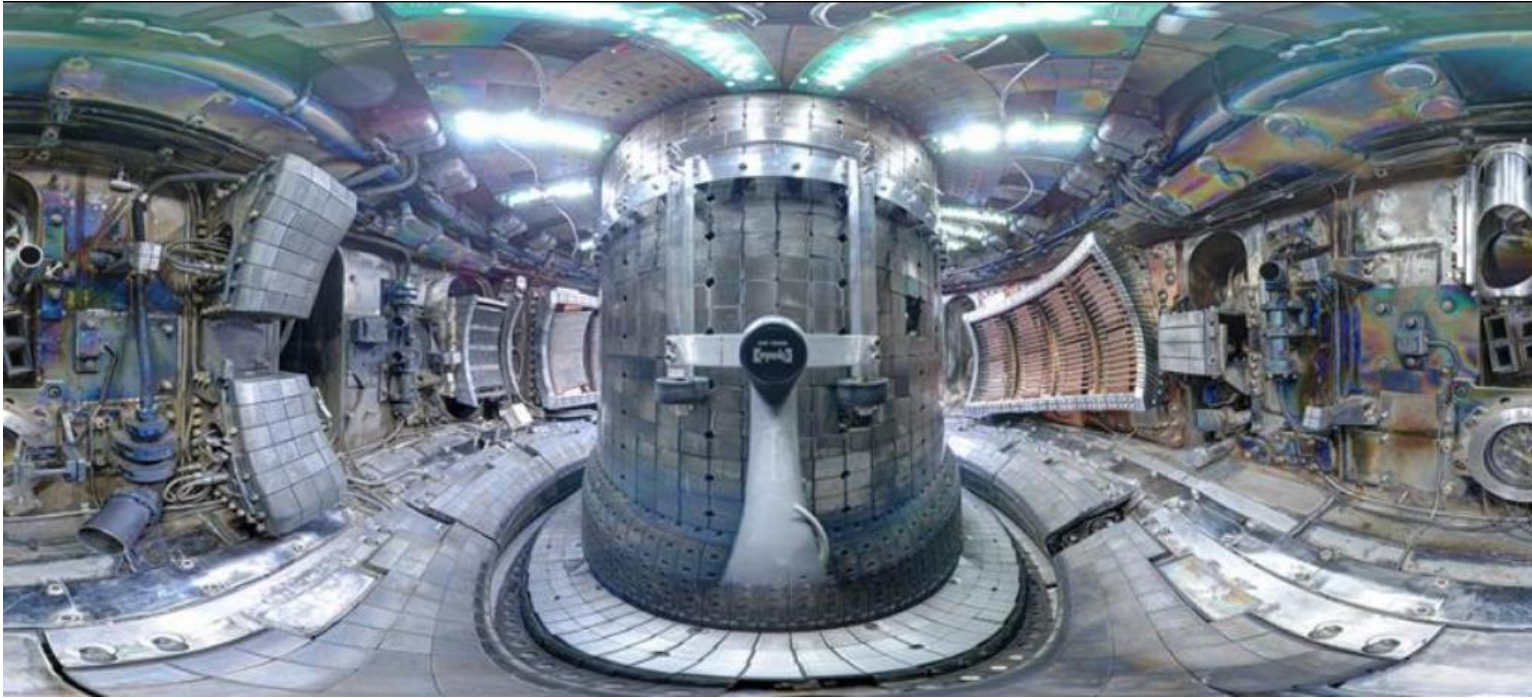
PSFC is located in NW13, NW14, NW15, NW17, NW20, NW21, and NW22.

Ask for directions! (I still do)

Request ID access to specific buildings (if your research or work requires it)



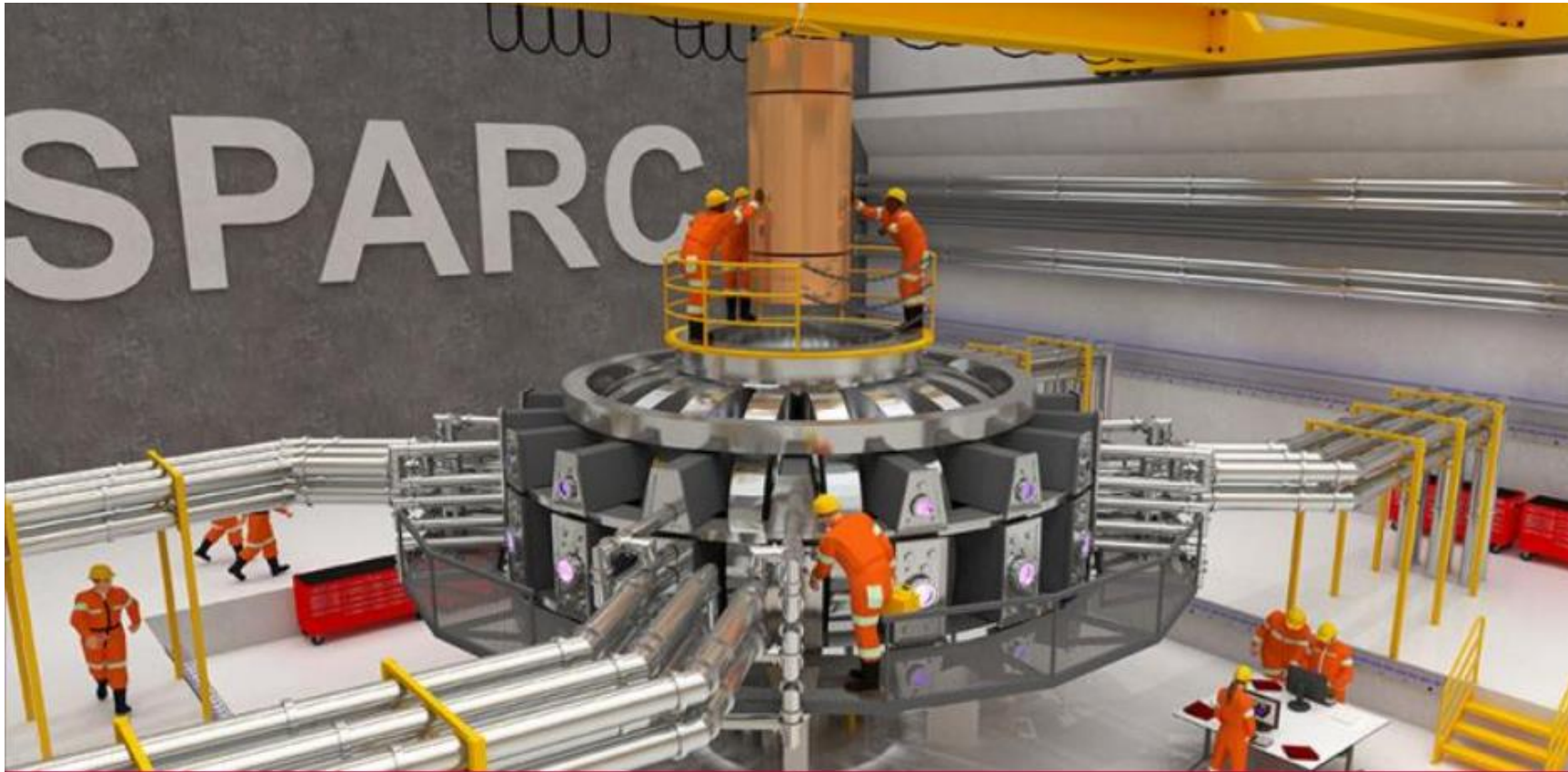
Alcator C-mod tokamak



- Operated in NW21 for more than 20 years! Stopped operation in 2016.
- Many great fusion and plasma technologies came out of the Alcator C-mod reactor.
- Holds the record for highest volume average plasma pressure in magnetic confinement reactor!
- Ask for a tour!

SPARC and LIFT

New research projects at the PSFC!



Thank you!!

P.S. – there is a PSFC IM soccer team that is looking for players! Let me or Kevin Montes (kmontes@mit.edu) know if you're interested in joining!

COURSE REGISTRATION

36

Fall & Spring

24

Summer

TAX

Don't worry about it...