

Boston Area QuarkNet
2022 Summer Workshop: Fusion
August 10-11, 2022
Roxbury Latin School Physics Lab

NOTE: Bring a calculator (or phone with calculator).

Agenda Wednesday, August 10

08:30 – 09:00	Gather, greet, and <u>sign-in</u> in the Roxbury Latin Physics Lab Do you have a QuarkNet account? If not, let Rick know.
09:00 – 09:15	Unit Conversion (therm, BTU, calorie, J, kWh, uc^2)
09:15 – 10:30	Energy Sources and the Sun: Combustion, Decay, Fission, Fusion
10:30 – 10:45	BREAK
10:45 – 12:00	Curve of Binding Energy
12:00 – 13:00	LUNCH – Bring your own or go to a West Roxbury restaurant.
13:00 – 14:00	Trip to MIT
14:00 – 15:00	Tour of the MIT Plasma Science and Fusion Center (190 Albany St., Cambridge, MA; phone: 617-253-8101 Paul Rivenberg: rivenberg@psfc.mit.edu cell: 617-447-1171)
15:00 – 15:30	Review of tour at Flour Bakery
15:30 – 16:00	Return to Roxbury Latin or drive home

NOTE: The MIT Nuclear Reactor Lab offers
live tours (see <https://nrl.mit.edu/outreach/tours> for information) and
virtual tours (<https://nrl.mit.edu/outreach/teacher-resources>).

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Agenda Thursday, August 11

- 08:30 – 08:45 Gather, greet, and sign-in in the Roxbury Latin Physics Lab
- 08:45 – 10:15 Rein Beeuwkes MIT '67 – March 2022 talk on the necessity of fusion
(Time 7:30 – 1:20:30) <https://www.youtube.com/watch?v=CNJf0VRIH1s>
- 10:15 – 10:30 BREAK
- 10:30 – 11:15 Zach Hartwig – January 2022 talk On the Road to 20 T SPARC magnet
(Time 0:00 – 35:00) <https://www.youtube.com/watch?v=UIMdJavK78w>
- 11:15 – 12:00 Martin Greenwald – August 2021 talk on physics of fusion
(Time: 0:00 – 30:00)
<https://www.youtube.com/watch?v=uKwWGUT8rCw&t=84>
- 12:00 – 13:00 LUNCH – Bring your own or go to a West Roxbury restaurant.
- 13:00 – 13:30 Fusion Devices: Tokamaks, Stellarators and Inertial Fusion
- Fusion Industry Association News (7/29/2022 – 9 min.):
<https://www.youtube.com/watch?v=EGTnByfSWOE>
- 13:30 – 14:00 Fusion Skeptic: <https://www.youtube.com/watch?v=JurplDfPi3U>
- 14:00 – 14:30 Fusion in Stars: Main Sequence and Red Giants
- 14:30 – 14:45 BREAK
- 14:45 – 15:15 Questions to consider:
Why does Earth's atmosphere persist as a gas, *i. e.* why are molecular collisions completely elastic?
What determines Earth's equilibrium surface temperature?
Why is Earth warmer as we go deeper?
- 15:15 – 16:00 Brainstorm ways to incorporate workshop material or workshop insights into your curriculum.