

Plasma Diagnostics

A joint UCLA/UCI/UCSD advanced plasma course--auditors welcome!

Scope: A survey of plasma diagnostic techniques. Although the emphasis is on diagnostics employed in magnetic fusion, material relevant to space, industrial, and high-density plasma physics diagnostics is also presented. Each lecture covers the physical principles behind the measurement, a brief history, instrumentation, representative data, and pitfalls.

Time: Tuesday/Thursday 12:30-1:50 during Winter quarter 2021 (1/5-3/11).

Instructor: Bill Heidbrink, bill.heidbrink@uci.edu.

Usual format:

12:30-12:45	Review of previous lecture (discussion of homework)
12:45-1:35	Guest lecture
1:35-1:45	Q & A
1:45-1:50	Homework assignment

Credit: Students enrolling for credit are expected to consider review questions for 30-60 minutes after each lecture, either individually or with colleagues. Answers to the homework questions are discussed at the beginning of the next session.

Schedule

- 1/5. Introduction; Neutral & charged particle detection (*Heidbrink, UCI*)
- 1/7. Langmuir probes (*Carter, UCLA*)
- 1/12. Magnetics (*Strait, General Atomics*)
- 1/14. Plasma processing diagnostics (*Zhou, Intel*)
- 1/19. Plasma material interaction & deposition analysis (*Koel, Princeton*)
- 1/21. Line & continuum radiation. (*Gupta, TAE Technologies*)
- 1/26. X-rays (*Delgado, Princeton Plasma Physics Lab*)
- 1/28. Interferometry & Faraday rotation (*Van Zeeland, General Atomics*)
- 2/2. Thomson scattering (*Diallo, Princeton Plasma Physics Lab*)
- 2/4. Electron cyclotron emission (*Austin, UT Austin*)
- 2/9. Beam emission spectroscopy (*McKee, UW Madison*)
- 2/11. Motional Stark effect (*Victor, Lawrence Livermore National Laboratory*)
- 2/16. Charge exchange recombination spectroscopy (*Collins, Oak Ridge National Laboratory*)
- 2/18. Neutrons & gamma rays (*Heidbrink, UCI*)
- 2/23. Time of flight & radiography (*Beg, UCSD*)
- 2/25. Imaging (*Granstedt, TAE Technologies*)
- 3/2. Tomography (*Salewski, Technical University of Denmark*)
- 3/4. Collective scattering and reflectometry (*Schmitz, UCLA*)
- 3/9. Integrated data analysis (*Fischer, Max Planck Institute for Plasma Physics*)
- 3/11. Review (*Heidbrink, UCI*)