Electrodynamics and Radiative Processes I

Course Details

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IUCAA NCRA Graduate School

August-September 2018

Date : 6th August 2018

Schedule of Lectures

Course consists of ~14 lectures (1-1.5 hrs)
Mon, Tues and Thurs 14:30 - 15:30

August 6(L1), 7(L2), 9 (L3),
16(L4),
21 (L5), 23(L6),
28 (L7), 30 (L8)

September 3(L9),4(L10),6 (L11),
10(L12),11(L13),
18(L14),20(L15: if required)

Class on 9th August will be for 1.5 hours
You will be informed in case of rescheduling.

My contact

Contact: my office number in NCRA is F211;
the phone number is (020) 25719253.
email: bhaswati@ncra.tifr.res.in.

Information/updates/news about the course will be put up at webpage http://www.ncra.tifr.res.in/~bhaswati.

Lectures will be uploaded to this site after each class.

Make sure you check the webpage periodically.

Course Layout

L1-L3 : Radiative transfer

L4 : Basic theory of radiation field:
Review of Maxwell's equations, polarization

L5 : Radiation from moving charges:
Motion of charged particles in E, B fields, Retarded potential

L6 : Dipole approximation, Thomson scattering

L7: Relativity in electrodynamics

L8-9 : Bremsstrahlung radiation

Course Layout

L9-L10 : Synchrotron radiation

L11-L12 : Compton and inverse Compton scattering

L13 : Plasma effects, Dispersion smearing etc

L14: Radiative processes in astrophysical systems

Primary Reference

- Radiative processes in Astrophysics

Authors: Rybicki and Lightman

- High Energy Astrophysics

Authors: Malcolm S. Longair

Rest will be mentioned in the lectures

Evaluation Procedure

Assignment : 15 %

Project : 20%

Performance in class : 10 %

Quiz/mini-tests in class : 15 %

Final exam (closed book): 40 %

Evaluation Procedure

Project :
Will be assigned on 9th August
Submission of report (max 5 pages) by 7th September

Assignment :
Allotted on 6th September, Due on 27th September

Quiz/mini-tests in class :
Surprise tests will be conducted in the class

Final Examination :
27th September ~ 15:00 (tentative)

Let us start learning