

FDITE182 Radiation Processes in Astrophysics
(Dr. József Vinkó)

Description: The topic of this course is the theoretical overview of the electromagnetic radiative processes and the light-matter interaction in astrophysical media

Themes:

- blackbody radiation, LTE
- radiative transfer: basic definitions
- equation of radiative transfer and its solutions
- radiative transfer in case of scattering
- bound-bound transitions, NLTE, line broadening mechanisms
- spectra of supernovae, P Cygni line profile
- bound-free transitions, ionization, recombination
- free-free transitions, Thompson scattering
- Bremsstrahlung
- radiation from relativistic particles
- synchrotron radiation
- inverse Compton scattering

Literature:

- Courvoisier, Th. J.-L., 2013, "High Energy Astrophysics -- An Introduction" Astronomy & Astrophysics Library, Springer, Heidelberg, Germany
- Harwit. M. 1998, "Astrophysical Concepts" 3rd edition, Astronomy & Astrophysics Library, Springer-Verlag, New York
- Gray, D. F. 1992, "The Observation and Analysis of Stellar Photospheres" 2nd edition, Cambridge University Press, Cambridge, UK