Astronomy and Astrophysics 43400
Gravitational Lensing
Spring 2003, University of Chicago

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- Class meeting time and place: WF 10:30 – 11:50 am, AAC 107
- Requirements: problem sets; the last problem set is a take-home final.
- Textbooks: No required texts. Two recommended books are – Gravitational Lenses by Schneider, Ehlers & Falco; Gravitational Lensing and Microlensing by Mollerach & Roulet.

Topics covered will include:

- the lens equation and Fermat's principle;
- simple examples: point lenses and isothermal lenses;
- magnification, shear, and time-delay;
- caustics;
- strong lensing statistics – optical depth and magnification bias;
- microlensing;
- weak lensing: the Born approximation;
- weak lensing: Kaiser-Squires reconstruction of cluster potential;
- weak lensing: cosmic shear;
- weak lensing: higher order statistics;
- weak lensing: microwave background.