

Astrophysical accretion, 2009

Lecturer: Yuri Levin, yuri@strw.leidenuniv.nl, 459 Oort building. Office hours: Tuesday 11—12. Webpage: <http://strw.leidenuniv.nl/~yuri>

Teaching Assistant: Marin Velandar, velander@strw.leidenuniv.nl, 460 Oort building. Office hours: Wednesday 14—16.

Textbook:

Accretion Power in Astrophysics, by Frank, King, & Raine.

Lectures: Mondays 11:15—13, room 427. Dates: 16, 23 February; 2, 9, 16, 23, 30 March; 6 April .

Assessment: 1. Weekly assignments, posted on Monday nights on my webpage, to be handed in on the following Monday in the beginning of the lecture (70%), and 2. A short (10–15 min.) presentation on some topic related to accretion physics (30%). No exam.

Extensions must be requested *in advance* from a teaching assistant or myself.

Collaboration policy. Students are allowed and encouraged to discuss problem sets with each other. However, the solutions must be written down individually: you can't copy someone else's solution. For "identical twin" solutions zero grade will be given.

Approximate Contents:

Week 1. Fluid dynamics and MHD.

Week 2. Spherical (Bondi) and nearly-spherical (Bondi-Hoyle) accretion.

Week 3. Accretion through the disc: Shakura-Syunyaev solution.

Week 4. Magnetic accretion (guest lecturer: Anders Johansen).

Week 5. Real stars: Boundary layer, magnetospheres, accretion shocks, Eddington luminosity.

Week 6. Protostellar accretion discs (guest lecturer: Richard Alexander).

Week 7. Compact binaries and Active Galactic Nuclei: the basics.

Week 8. Compact binaries and AGNs: super-Eddington accretion (guest lecturer: Andrew King)