

Outline

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Goal (7.5 ECTS)

**Understand astrophysical processes
that can only be directly observed
on the Sun**

People

- Christoph Keller (Chair of Experimental Astrophysics)
- PhD Students
- Guest lectures by Frans Snik and others

Communication

- everybody: through Blackboard
- C.U.Keller@uu.nl

Course URL

www.astro.uu.nl/~keller/Teaching/SolPhys_2010

Content

- contact information
- course schedule, subscribe to [iCal link](#)
- lecture presentations, exercises, practicum material
- presentation topics and assignments including links to papers (only from UU computers)

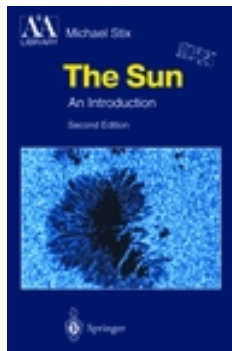
OSIRIS

The course web page takes precedence over OSIRIS.

Lectures

- copies of all slides used in lecture etc. on course web page
- hard copy of lecture slides at beginning of class

Michael Stix: The Sun



- mandatory
- Michael Stix, The Sun: An Introduction, Second Edition, Springer

Weekly Schedule

| Day | Time | Location | Topic |
|----------|---------------|----------|--------------------------|
| Monday | 11:00 – 12:45 | BBL 412 | Lecture |
| Tuesday | 9:00 – 10:45 | BBL 412 | Exercises, Presentations |
| Tuesday | 11:00 – 12:45 | BBL 412 | Lecture |
| Thursday | 13:15 – 17:00 | BBL ??? | Practicum |

Exercises

- exercises are integral part of course
- no specific course time allocated to solve exercises
- have to be submitted by deadline
- will be checked, returned, and discussed on Tuesdays
- solutions will not be made available in writing

Presentations

- select one original paper and present it to peers
- presentation in English
- 30 minutes
- public and private discussion of presentation
- grade is for level of understanding of paper

| Title | Chapter | Instructor |
|--------------------------------------|----------------|-------------------|
| The Sun | 1 | Keller |
| Instrumentation 1 | 2 | Snik |
| Instrumentation 2 | 2 | Snik |
| The Sun as a Star | 2 | Keller |
| Polarimetry 1 | 3.5 | Keller |
| Polarimetry 2 | 3.5 | Keller |
| Spectral Line Diagnostics 1 | 4.1, 4.2 | Keller |
| Spectral Line Diagnostics 2 | 4.1, 4.2 | Keller |
| Stokes Inversion | | Fischer |
| Waves | 5 | Keller |
| Basic MHD | 8.1 | Keller |
| Flux Tubes | 8.2 | Keller |
| Sunspots | 8.3 | Keller |
| Solar Cycle | 8.4 | Keller |
| Magnetic Fields and Solar-like Stars | | Jeffers |
| Chromosphere, Corona, and Solar Wind | 9 | Keller |

Exams

- Content
 - lectures
 - corresponding book chapters
 - exercises
 - practicum
 - paper presentations and questions
- written exam after course ends
- oral exams after that

Grades

- 20% presentation
- 20% exercises (honest attempts at solving them)
- 60% exam

Papers for Presentations

| Topic | Paper with Link to ADS | Student Name | Presentation Date |
|-----------------------------------|--|--------------|-------------------|
| Granulation | Stein & Nordlund 2000 | | 1.6.2010 |
| Supergranulation | Gizon et al. 2003 | | 1.6.2010 |
| Rotation | Schou et al. 1998 | | 1.6.2010 |
| Chromosphere | Carlsson & Stein 1997 | | 8.6.2010 |
| Corona | Gudiksen & Nordlund 2005 | | 8.6.2010 |
| Flares and Coronal Mass Ejections | Moore et al. 2001 | | 8.6.2010 |
| Abundances | Asplund 2005 | | 15.6.2010 |
| Solar shape and brightness | Kuhn et al. 1998 | | 15.6.2010 |
| Hidden Magnetic Energy | Trujillo Bueno et al. 2004 | | 15.6.2010 |
| Continuum Polarization | Stenflo 2005 | | 22.6.2010 |
| Sunspot Penumbra | Spruit & Scharmer 2006 | | 22.6.2010 |
| Simulated Sunspots | Rempel et al. 2009 | | 25.5.2010 |
| Neon abundance | Schmelz et al. 2005 | | 25.5.2010 |
| Hinode Solar Optical Telescope | Tsuneta et al. 2008 | | 25.5.2010 |