Tópicos
Close binary stars

Schedule:

Monday 12:00 - 13:30
Thursday 12:00 - 13:30

Meeting room at IFA A

Professors:

Mónica Zorotovic
(monica.zorotovic@uv.cl)

Claus Tappert
(claus.tappert@uv.cl)

Maja Vuckovic
(maja.vuckovic@uv.cl)

Topics

Introduction (Mónica)
- History
- Formation of multiple systems
- Statistics and initial parameter distribution
- Classification based on observational characteristics
- Newton and Kepler's law
- Effects of tides

Mass transfer (Mónica)
- The Roche model and Roche lobe overflow
- Classification of close binaries based on Roche model
- Mass transfer
- Close compact binaries: CE phase, AML

Topics

Binaries with compact objects (Claus)

- Compact object
- Cataclysmic variables
- Nova
- Accretion
- X-ray binaries
- SN Ia
- Hot Subdwarf binaries

Observational properties (Maja)

- Derivation of orbital parameters from observations
- Time series analysis

Binary simulations

- MESA

Evaluations

- 2 presentations (1 with Monica + 1 with Claus) including questions after the presentation related to the topic (like a short oral exam)
- 1 homework with Maja on data analysis
- Final MESA project

(25% each grade)

Tentative dates:

- Presentation with Mónica (8/09 and 11/09)
- Presentation with Claus (27/10 and 30/10)
- Homework for Maja (up to 04/12)
- MESA project report (up to 17/12 midnight)

End of semester

December 19th

Bibliographic references

- An Introduction to Close Binary Stars (R.W.Hilditch; Cambridge University Press). ISBN 0-521-79800-0

- Interacting Binary Stars (J.E.Pringle and R.A.Wade; Cambridge University Press). ISBN 0-521-26608-4

- Evolutionary Processes in Binary and Multiple Stars (P.P.Eggleton; Cambridge University Press). ISBN-10 0-521-85557-8 / ISBN-13 978-0-521-85557-0

- Cataclysmic Variable Stars: How and Why they Vary (2001, Hellier, C., Springer). ISBN-13:978-1852332112

- Classical Novae (2008, Bode, M.F. & Evans, A. Cambridge University Press). ISBN-13: 978-0521843300

- Other online resources will be given in pdf