

Numerical Dynamics - astro854

Degree - M.Sc. in Astrophysics (PO von 2014)

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| <i>Module</i> | Elective Advanced Lectures: Modern Astrophysics |
| <i>Module No.</i> | astro850 |

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| <i>Course</i> | Numerical Dynamics |
| <i>Course No.</i> | astro854 |

| Category | Type | Language | Teaching | | Semester |
|----------|------------------------|----------|----------|----|----------|
| | | | hours | CP | |
| Elective | Lecture with exercises | English | 2+1 | 4 | ST |

Requirements for Participation:

Preparation:

Form of Testing and Examination: Requirements for the examination (written): successful work with exercises and programming tasks

Length of Course: 1 semester

Aims of the Course: The students will have to familiarize themselves with the various numerical recipes to solve the coupled 2nd-order differential equations as well as with the limitations of these methods

Contents of the Course: The two-body problem and its analytical solution. Ordered dynamics: integration of planetary motion, solar system, extra-solar planets. Collisional dynamics: integration of stellar orbits in star clusters, star-cluster evolution. Collisionless dynamics: integration of stellar orbits in galaxies, cosmological aspects

Recommended Literature:

Write-up of the class;

S. J. Aarseth; Gravitational N-body simulations: Tools and Algorithms (Cambridge University Press, 2003)