

## TERMS OF REFERENCE

### Commission 7 "CELESTIAL MECHANICS AND DYNAMICAL ASTRONOMY"

#### Scientific Rationale

Celestial mechanics and dynamical astronomy are branches of fundamental astronomy dealing with the most basic questions regarding the motion and dynamical evolution of celestial bodies. These questions include perturbation theory, stability of motion, resonances, chaos and diffusion, reference frames, relativistic effects, the influence of non gravitational forces and of the interior physical structures on the dynamical evolution of bodies, as well as numerical methods for the integration of the equations of motion and for the analysis of the properties of the resulting evolutions. The main objects of celestial mechanics and dynamical astronomy are planets (of the solar system and extra-solar), small bodies, natural and artificial satellites, planetary rings, stars, stellar clusters and galaxies.

Recognizing that contemporary celestial mechanics and dynamical astronomy face new challenges brought about by a rapid development of observational and computational techniques, and by the amount and accuracy of the available data, in order to best serve the discipline, the IAU Commission 7 establishes the following:

#### Objectives

1. upgrading the general conditions for research in the field by improving the existing and establishing new contacts and collaboration with other IAU entities: divisions, commissions, working groups, officers and administration;
2. establishing an efficient information system to facilitate collaboration among the researchers in the field by maintaining an up-to-date Commission website with news important for the membership, reports on the activities of the commission's officers and its Organizing Committee, information on recent publications of interest, on the past and future meetings in the field, etc.
3. promoting celestial mechanics and dynamical astronomy through continuing support to the journal *Celestial Mechanics and Dynamical Astronomy*;
4. proposing, facilitating and supporting scientific meetings, in particular the IAU symposia, on celestial mechanics and/or dynamical astronomy and on their application to various dynamical aspects;
5. providing a scientific service to the researchers in the field by encouraging and formally supporting the organization and maintenance of the databases of relevant dynamical parameters for different kinds of celestial bodies;
6. providing a scientific service to other branches of astronomy and astrophysics by promoting collaboration and supporting meetings in other fields in relation to celestial mechanics and/or dynamical astronomy;
7. maintaining fruitful contacts and cooperation with other sciences: applied mathematics, mathematical physics, geophysics, space sciences, etc.
8. coordinating collection and dissemination of certified and documented software of interest for general applications, such as orbital integration, filtering, proper elements calculations, frequency analysis, statistical clustering;
9. offering advice and guidance on the expected future developments of celestial mechanics and dynamical astronomy; encouraging and supporting the related education and training of young researchers.