

IAU Commission X2: Solar System Ephemerides

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This commission belongs to divisions A and F.

1. Data Exchange Standard.

At the Honolulu IAU the Commission 20 has approved the new Astrometric Data Exchange Standard, with the purpose of significantly enhancing the information content of the databases of astrometric information on asteroids, comets, natural satellites (the standard also includes the radar astrometry and the photometric information available with the astrometry). The practical adoption of the new standard, which would result in a very significant improvement in the quality of the orbits determined for all these bodies, depends upon the availability of certified software to ensure the integrity of the database when stored at the MPC and other interested institutions, when transmitted to orbit computers, and when actually used. Note also that the standard includes two formats, a machine readable XML and a human-readable version in Pipe Separated Variables (PSV) format; the conversion among these two needs also to be guaranteed. The process of development of this software is slow, mostly because it is done as voluntary work, without a systematic source of funding. Prototypes are now available, but not yet for all the functions and for all the languages in which the software was planned to be available. Commission X2 needs to continue to follow this process, with the goal of a full implementation before the next general assembly.

2. Organization of meetings. Commission X2 has taken part in two initiatives, one successful and one (so far) not successful.

- In collaboration with Commission A4 (CMDA) we started immediately after the Honolulu GA to promote the first of an intended series of meeting for the formation of young astronomers to the principles and methods of Celestial Mechanics, because without a diffused expertise in this field both the activities of comm. X2 and A4 would become very difficult. This was meant to follow the example of the "Cortina school" organized every 3 years between 1972 and 2003. This initiative has been successful, and the school shall take place in San Martino del Cimino (near Roma, Italy) between 27 August and 2 September 2017 (95 applications for participation have been received). The school shall be followed by the CELMEC 7 international congress, in the same location from 3 to 9 September 2017.
- The OC of the commission X2 worked somewhat, between September and December 2016, to the proposal of a Symposium to be held at the Wien GA, with the provisional title "New challenges in our Solar System ephemerides". Although a Letter of Intent was presented, the SOC was intimidated by the horrendous competition for symposia at the next GA. Moreover, we were convinced that our proposal was not yet fully defined, essentially because of the need to reconcile the two different points of view

which can roughly be traced to the previous commissions 20 and 4 (which have been unified in commission X2). We are still convinced that a unified approach is possible and would be very fruitful, but in December 2016 we have decided to give up the proposal for 2018 and prepare with a more timely effort a proposal for a symposium to be held in 2019.

3. Collaboration with Working Groups. Although there are no WG directly under commission X2 supervision, there are of course interactions with some of them:

- Numerical Standards in Fundamental Astronomy (NSFA) - Division A: The WG is considering a proposal (by Folkner) to adopt an updated GM of Ceres determined by the DAWN mission.
- Cartographic Coordinates & Rotational Elements - Divisions A & F: The WG is working on publishing the current standards. Changes include adoption of a new rotation model for Mars consistent with spacecraft radio tracking, and adopting a fixed longitude for Viking Lander 1 that defines the coordinate system on Mars, agreeing with previous definition of the center of crater Ares-0 within uncertainties.