

IAU Commission A2 - Rotation of the Earth

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Annual Report 2016

Co-Organized Symposium, Geodesy, Astronomy, and Geophysics in Earth Rotation - 18-23 July 2016; Wuhan, China

This joint science symposium, organized by Commission A2 (Rotation of the Earth) of the International Astronomical Union (IAU), Commission 3 (Earth Rotation and Geodynamics) of the International Association of Geodesy (IAG), and the International Earth Rotation and Reference Systems Service (IERS), and hosted by Wuhan University, Shanghai Astronomical Observatory and the Institute of Geodesy and Geophysics, was a forum for assessing our current ability to observe the Earth's time varying rotation, for assessing our current understanding of the causes of the observed variations, for assessing the consistency of Earth rotation observations with global gravity and shape observations, for exploring methods of combining Earth rotation, gravity, and shape observations to gain greater understanding of the mass load acting on the surface of the solid Earth, and for identifying improvements in the global geodetic observing system needed to further our understanding of the Earth's variable rotation.

Co-Organizing Symposium, Journées des Systèmes de Référence et de la Rotation Terrestre - 25-27 September 2017; Alicante, Spain

In the interest of enhancing the interactions between astronomy and geodesy, the Journées are devoted to the study of the space-time celestial and terrestrial reference systems and their evolution with time with the emphasis on the rotation of the Earth. The scope of the Journées will range from concepts and theoretical solutions to observational techniques and data analysis. The sub-title of this meeting is "Furthering our Knowledge of Earth Rotation" and our discussions will help to develop the tasks of the IAU/IAG Joint Working Group on "Theory of Earth rotation and validation" among others.

The topics to be discussed at the Journées include, but are not limited to:

1. Theory of Earth rotation variations: precession/nutation, polar motion, LOD/UT1
2. Observation methods of Earth rotation variations
3. Celestial and terrestrial reference systems and frames
4. Modelling of Earth rotation variations: solar system dynamics and global geophysical fluid mass transports
5. Relativity and new concepts in Earth rotation theory

Began Planning for Centennial Anniversary Celebration of Commission A2 June or July, 2019; Brussels, Belgium

The 100th anniversary of the IAU and of Commission A2 will be on July 28, 2019. The Constitutive Assembly of the International Research Council was held in Brussels during July 18-28, 1919. On the last day, July 28, the Assembly adopted a Statute creating the IAU. So, July 28, 1919 has been taken to be the birth date of the IAU (see <https://www.iau.org/about/90years/>) and July 28, 2019 will be its 100th anniversary. Along with creating the IAU, 32 Standing Committees were also created on July 28, 1919. One of these was Standing Committee 19 on Latitude Variations. In 1922, all the Standing Committees became Commissions. So, Standing Committee 19 on Latitude Variations became Commission 19 on Variation of Latitude. In 1964, this was renamed Commission 19 on Rotation of the Earth. In 2015, this became Commission A2 on Rotation of the Earth. So, July 28, 2019 also marks the 100th anniversary of Commission A2. To celebrate the centennial anniversary of Commission A2 a Symposium on Earth Rotation will be organized in June or July 2019 in Brussels. In addition, a full-length article describing the history of Commission A2 is being planned. Besides a general historical overview of the Commission, the article will include discussions of the Commission's involvement in the study of UT1/polar motion, precession/nutation, geodetic/astronomical constants, and reference frames. The article will also include a discussion of the Commission's relationship with other bodies such as the ILS, IPMS, BIH, IERS, and IAG and its Services (IVS, ILRS, IGS, IDS). And it will include a discussion of the Commission's involvement in satellite missions such as Hipparcos.

Prepared Proposal for GA Symposium, Reference Systems and Frames 20-31 August 2018; Vienna, Austria

Reference systems and frames are fundamental to positioning and navigating objects in space and on the Earth. Celestial reference frames are used to measure the passage of time, for navigation, and for studying the dynamics of the solar system. Most recently, celestial reference frames have become essential for studying the dynamics of more distant objects and for studying geophysical phenomena on the Earth. Terrestrial reference frames provide the fundamental framework and metrological basis for Earth observations. Since terrestrial reference frames are attached to the Earth, transforming the position of objects between the celestial and terrestrial reference frames requires knowledge of the Earth's changing rotation. Celestial reference frames, terrestrial reference frames, and the Earth's rotation therefore form an interconnected trio. Reference frames, either celestial or terrestrial, are represented by the positions of defining objects. For celestial reference frames these are the positions of radio sources or stars. For terrestrial reference frames these are the positions of fundamental observing stations on the ground. Reference frames need to be maintained and updated as observing systems improve and as the defining objects change their appearance and positions. This Symposium is meant to be a forum for discussing celestial and terrestrial reference systems and frames, the Earth orientation parameters that connect them together, and the fundamental standards needed to determine the reference frames and Earth orientation parameters.