

## COMMISSION A3

## FUNDAMENTAL STANDARDS

*STANDARDS FONDAMENTAUX*

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**VICE-PRESIDENT**  
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**Nancy A. Oliverson**  
**Steven A. Bell**

**SECRETARY**  
**WEBMASTER**

## TRIENNIAL REPORT 2015-2018

### 1. Introduction

IAU Commission A3 (CA3), Fundamental Standards, is a Division A commission that was inaugurated as part of the restructuring of the IAU at the 2015 General Assembly (GA). Nicole Capitaine, Dennis McCarthy and Brian Luzum were co-proposers. John Bangert was much involved in drafting the proposal. Following the GA, Nancy Oliverson volunteered to act as the secretary. Steven Bell agreed to be webmaster and organised the setup of our website ([www.iauufs.org](http://www.iauufs.org)).

The purpose of our commission is to facilitate developing, implementing, and communicating fundamental IAU-endorsed standards for fundamental astronomy. Our work plan for the first 6-9 years is to:

- maintain and enhance existing links between the IAU, the International Earth Rotation and Reference Systems Service (IERS), the International Association of Geodesy's (IAG) Global Geodetic Observing System (GGOS), the Consultative Committee for Time and Frequency (CCTF), the Consultative Committee for Units (CCU), and other standards groups;
- coordinate and promote the continued good work of the IAU's Standards of Fundamental Astronomy (SOFA), the Working Group on Numerical Standards for Fundamental Astronomy (NSFA), and the Working Group on Cartographic Coordinates and Rotational Elements (CCRE);
- develop, implement, and disseminate new standards currently under consideration within the division; *e.g.*, International Celestial Reference Frame 3 (ICRF3);
- develop a web presence for communicating and coordinating standards, and to ensure that concerns of users are heard.

### 2. Developments during the past triennium

Since the 2015 GA, the main focus has been on setting up the website ([www.iauufs.org](http://www.iauufs.org)). Currently there are two main sections, one that deals with current standards and the other with developing standards. Current standards include links to the functional working groups SOFA, NSFA, and CCRE. There is also a section giving a summary of the

IAU and International Union of Geodesy and Geophysics (IUGG) resolutions that relate to reference systems, and in particular those after the IAU 1997 adoption of the International Celestial Reference System (ICRS) and Frame (ICRF). A section on units used in astronomy in the *Système International* (SI), with up-to-date information, is in development. The developing standards section currently includes information on the potential of the geoid, the mean pole, and ICRF3. This section was first implemented in order to provide commission members with information about the proposed improved definitions of time-scales being proposed to the CCTF in April 2016.

Six commission-wide e-mails promulgating commission and general IAU information were sent via the IAU office. In April 2016 this process and the website page were used to consult members on the draft proposal that was being put to the CCTF. Similarly in June 2016 a proposal to better define the geometry of visual binary star orbits was circulated. The statistics provided by AWStats show that in 2017 there has been on average 1800 unique visitors per month to the website. Of course they may be the same 1800 people each month. This is a significant increase from the average of 62 (August-December) in 2015 and the 270 unique visitors per month in 2016. The IAU website reports that the commission has 101 members as of January 2018.

In order to promote the commission and IAU standards, a poster was prepared in collaboration with SOFA and the NSFA and CCRE working groups. This poster, with updates as appropriate, was submitted and displayed at the “Understanding the Earth Core and Nutation” workshop, held at the Royal Observatory, Belgium, in September 2016, and at the 2017 *Journées des Systèmes de Référence et de la Rotation Terrestre* meeting (Alicante). At the workshop meeting in 2016, I did include CA3 in my review talk of SOFA, which was entitled “SOFA & IAU Standards”.

A useful consequence of various discussions, including those at the *Journées* meeting, highlighted the need to foster good understanding and communication about the different requirements and responsibilities of the communities that are particularly interested in the terrestrial and celestial reference frames and systems. This resulted in an invitation for CA3 to nominate someone to act as representative to the GGOS Bureau of Products and Standards (BPS) in order to “intensify” the cooperation between the IAG GGOS BPS and the IAU. The role is to “serve as a contact point between the BPS and the IAU and other entities (*e.g.*, IAG services) involved in standards and to ensure the interaction between the different communities”. The organizing committee (OC) recommended that the president of the commission take this role; alternatively they would appoint a suitable candidate. Thus, currently I have agreed to be the representative.

We have written letters of support (not all successful) for IAU symposia on reference systems and solar-system ephemerides. Looking ahead, we are involved with Commission A2 in organizing the reference-frame section at the division’s meeting at the GA. We are also currently involved in the proposal for the “The Earths Time-Varying Rotation: A Centennial Celebration” symposium in 2019.

### 3. Closing remarks

I acknowledge and thank all the OC members for their support. Thanks go, too, to the webmaster Steven Bell. It is unfortunate, but understandable, that the current vice-president, Brian Luzum, is unable to take on the presidency for the next three years. I thank him for his support, particularly for being one of the co-proposers. The OC thank the United Kingdom Hydrographic Office for hosting its website.

We are coming to the end of the first three years for this commission. There is still much work to be done and there is a continuing role for this commission.

Catherine Hohenkerk  
*president of the Commission*