

DIVISION I/WORKING GROUP NUMERICAL STANDARDS OF FUNDAMENTAL ASTRONOMY

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TRIENNIAL REPORT 2009–2012

1. Introduction

At the 2006 General Assembly of the International Astronomical Union (IAU), a proposal was adopted to form the Working Group (WG) for Numerical Standards of Fundamental Astronomy (NSFA). The goal of the WG is to update the “IAU Current Best Estimates” conforming with IAU Resolutions, the International Earth Rotation and Reference Systems Service (IERS) Conventions, and the Syst me International d’Unit s (SI). The need for changes to the numerical standards are due mainly to the adoption of a new precession model, the redefinition of Barycentric Dynamical Time (TDB), and the significant improvement of the accuracy of recent estimates for a number of constants. The work from the first triennium culminated in the acceptance at the 2009 IAU General Assembly of Resolution B2 which adopted the NSFA list of Current Best Estimates as the IAU (2009) System of Astronomical Constants.

2. Developments within the past triennium

The NSFA WG has achieved several significant milestones within the last triennium.

- The WG published its report on the IAU (2009) System of Astronomical Constants (Luzum *et al.*, 2011). The report summarizes the numerical values for the constants and also provides the justification for the values chosen. This report has been published as an open access document to facilitate the availability of the information to users.
- Primarily through the efforts of WG member C. Hohenkerk, the NSFA WG web pages have been redesigned. In addition to being more visually appealing, the new web pages provide a better organizational structure and provide more complete information regarding the efforts and the results of the WG.
- The WG has drafted procedures for adopting new CBEs and is beginning to test these procedures on a suggested new value for the mass of Mercury. Based on this experience, refinements to the procedure are possible.

- WG member N. Capitaine is the primary author of a proposed IAU Resolution regarding the re-definition of the astronomical unit for consideration at the 2012 IAU General Assembly. The WG has provided feedback on the proposal in preparation for a wider discussion with the astronomical community.

3. Closing remarks

The NSFA WG continues to provide a service to the IAU and the broader astronomical community by using its knowledge and expertise to assemble a consistent set of Current Best Estimates. We are hoping to be able to continue this work within the IAU, but to continue this work with the current WG would require a modification to the structure of the IAU to allow for either a standing WG or a Service. We are expecting this issue will be resolved at the upcoming 2012 IAU General Assembly.

Brian Luzum
chair of Working Group

Reference

- Luzum, B., Capitaine, N., Fienga, A., Folkner, W., Fukushima, T., Hilton, J., Hohenkerk, C., Krasinsky, G., Petit, G., Pitjeva, E., Soffel, M., & Wallace, P. 2011, *Celest. Mech. Dyn. Astr.* 110(4), 293, DOI:10.1007/s10569-011-9352-4.