

### 3.5.3 Conventions Centre

**Introduction** The Conventions Centre provides updated versions of the IERS Conventions in electronic form following approval by the IERS Directing Board (DB) and printed versions at less frequent intervals than the electronic updates, mainly when major changes are introduced. The Centre is operated jointly by L'Observatoire de Paris (OP) and the U.S. Naval Observatory (USNO).

The IERS Conventions web is located at <http://iers-conventions.obspm.fr>. Until 24 Oct 2019 the IERS Conventions web and ftp were located at <http://maia.usno.navy.mil/conventions/> and <ftp://maia.usno.navy.mil/conventions>. The US Naval Observatory's Rapid Service/Prediction Center web and FTP sites (at [maia.usno.navy.mil](http://maia.usno.navy.mil) and [toshi.nofs.navy.mil](http://toshi.nofs.navy.mil)) have been undergoing modernization since that date. The expected completion of work and return of service is no earlier than Autumn of 2020. The printed IERS Conventions (2010), IERS Technical Note 36, is available in electronic form at these URLs and at <https://www.iers.org/IERS/TN36>. Updates continue to be provided in electronic form and are configuration managed starting in 2018. Conventions versions, starting with v 1.0.0 through the latest update, v 1.3.0, are found at the following URL: [http://iers-conventions.obspm.fr/conventions\\_versions.php](http://iers-conventions.obspm.fr/conventions_versions.php)

The IERS Conventions Centre continues to work with the IAU Division A Commission on Fundamental Standards that deals with celestial and terrestrial reference systems/frames and the transformations between them, time scales, precession-nutation models, Earth rotation and polar motion, including physical models (e.g., Earth's gravity field, solid Earth-tide modeling), star catalogs, ephemerides of Solar System bodies, special and general relativistic models for time and space.

#### Technical Content of the IERS Conventions

During 2019, one change in the technical content was completed. On 1 April 2019, Chapter 4 was re-written to be consistent with the International Terrestrial Reference Frame 2014 (ITRF2014). Note that Table 4.1 transformation parameters, relating ITRF2014 to previous ITRFs, has been revised.

#### Conventions Software

Software recommended for use in connection with the IERS Conventions consists largely of the library maintained by the IAU Standards of Fundamental Astronomy (SOFA) available at <http://www.iausofa.org>. The 16th release of this library was made available on 21 July 2020. Further details regarding the specifics of the release can be found at <http://www.iausofa.org/current.html>.

Chapter	Old Chapter #	Title	Position	Applicant	Status of Rewrite as of 30 SEP 2020
1	1	General definitions and numerical standards	Chapter Editor-in-Chief	Nick Stamatakos	In late 30-Sep-2020, Detlef Angermann provided a status update.
			Chapter Expert	Detlef Angermann	
			Assistant Chapter Expert	George Vergos, Riccardo Barzagli	
2	10	General relativistic models for space-time coordinates and equations of motion	Chapter Editor-in-Chief	Michael Efroimsky	A conversation among the Chapter Editor and Experts and the IERS CC staff has taken place, regarding software issues. Discussions of the necessary changes for the Chapter have started.
			Chapter Expert	Sergei Klioner	
			Assistant Chapter Expert	Sergei Kopeikin	
3	2/3 *	Celestial reference system and frame	Chapter Editor-in-Chief	Jean Souchay, Bryan Dorland	
			Chapter Expert	Sebastien Lambert	
			Assistant Chapter Expert	Dmitry Pavlov	
4	4	Terrestrial reference systems and frames	Chapter Editor-in-Chief	Dennis McCarthy, Frank Lemoine.	Altamini has made several requests and schedules for obtaining data needed for ITRF. New ITRF needed for rewrite.
			Chapter Expert	Zuheir Altamimi	
			Assistant Chapter Expert	Xavier Collilieux; Mathis Blossfeld	
5	5	Transformation between the International Terrestrial Reference System and the Geocentric Celestial Reference System	Chapter Editor-in-Chief	José Ferrandiz Leal, Nick Stamatakos	Chapter 5 re-write proposed for simplification guide by McCarthy, Stamatakos and Bizouard. Bizouard requests tex version for more editing. Stamatakos preparing tex version. Leal and Escapa will provide a status update Oct 2020.
			Chapter Expert	Alberto Escapa	
			Assistant Chapter Expert	Nick Stamatakos, Dennis McCarthy	
			Software Editor	Maria Davis	
6	6	Geopotential	Chapter Editor-in-Chief	John Ries, Srinivas Bettadpur, Erricos Pavlis	
			Chapter Expert	Jean Paul Boy	
			Assistant Chapter Expert		
7	7	Displacement of reference points	Chapter Editor-in-Chief	Erricos Pavlis	
			Chapter Expert	Jean Paul Boy	
			Assistant Chapter Expert	Nick Stamatakos, Dennis McCarthy, Dmitry Pavlov	
			Software Editor	Maria Davis	
8	8	Tidal variations in the Earth's rotation	Chapter Editor-in-Chief		
			Chapter Expert	John Gipson.	
			Assistant Chapter Expert	Christian Bizouard	
			Software Editor	Maria Davis	
9	9	Models for atmospheric propagation delays	Chapter Editor-in-Chief		
			Chapter Expert		
			Assistant Chapter Expert	Johannes Boehm; Erricos Pavlis, Manual Hernandez <sup>A</sup>	
			Software Editor	Maria Davis	
10	11	General relativistic models for propagation	Chapter Editor-in-Chief	Michael Efroimsky	Discussions on possible improvements of the Chapter have started. The active re-writing of the Chapter will begin after the content of Chapter 2 is clarified.
			Chapter Expert	Sergei Klioner	
			Assistant Chapter Expert	Sergei Kopeikin	

*Table 1: Status of participation in the IERS Conventions major update. "Old Chapter #" refers to what was published at the time of applications. A reordering of Chapters was agreed to at the 18 Sep 2018 IERS Conventions Centre staff telecon. For Chapter 9 (Models for atmospheric propagation delays), the following is noted: Boehm said he could help with the Microwave troposphere section; Pavlis said he could help with the optical wavelengths section. Hernandez cannot start to contribute until 2021.*

## Major Conventions Update

In anticipation of rewriting the IERS Conventions within the next few years, a call for participation was made. Many experts volunteered to be Chapter Editors-in-Chief, Chapter Experts and Assistant Experts, along with a Software Editor. The table below lists the Conventions major revision chapters along with the latest associated list of filled and vacant positions. There are still many positions vacant, and we urge those reading this report to reach out to colleagues to inform them of open positions or to consider volunteering by submitting a curriculum vitae along with a possible letter of support from their sponsoring institution.

In addition, on 17 June 2020, a call for a status update was provided to all Conventions contributors. The last column of Table 1 shows the

responses that have been received from that call for a status update. Additional calls for status updates will be sent in 2020 and 2021.

As part of the Conventions update, the Conventions staff has begun using the GitLab web-based DevOps lifecycle tool to implement a more robust and comprehensive configuration management scheme for Conventions updates. (Within some resources limitations, the Conventions Centre staff can provide assistance with using GitLab upon request. A training class led by Conventions staff member, Maria Davis, was to have been held in early 2020 to aid those unfamiliar with using GitLab; however, due to COVID-19 travel restrictions, the training class has been suspended pending safer travel and attendance and pending future funding approvals.)

In addition, Slack instant messaging has been implemented to enhance communication among Chapter contributors. Many of the re-write staff have signed up and are utilizing Slack to provide quick turnaround for discussions and dissemination of information regarding the Conventions. All contributors were notified via email and via Slack instant messaging of proposed simplifications to the Conventions text. An example from Chapter 5 was provided to contributors to guide them in this recommendation. Lastly, many contributors attended the 2019 Unified Analysis Workshop in Paris, France, where Conventions-related topics were discussed among various disciplines of the IERS, Global Geodetic Observing System (GGOS), and other associated organizations.

## Acknowledgements

The Conventions web pages at OP <http://iers-conventions.obspm.fr/> were maintained and improved. The IERS Conventions Centre would like to acknowledge the work of Maria Davis from USNO and Teddy Carlucci from OP for their work on the updated IERS web and ftp sites.

## Conventions Centre Staff

- Nick Stamatakos (USNO), co-director since 1 January 2016. (Per existing agreement between the IERS DB and the IERS Conventions, the USNO co-director became the representative to the IERS Directing Board on 1 January 2019.)
- Christian Bizouard (OP), co-director since 1 September 2016 (and the representative to the IERS Directing Board through 31 December 2018).
- Sébastien Lambert (OP)
- Maria Davis (USNO)
- Dennis McCarthy (USNO, contractor)

*Nick Stamatakos, Christian Bizouard*