FOREWORD

The IERS was created in 1987 by the IAU and the IUGG, replacing the Bureau International de l'Heure (BIH) and the International Polar Motion Service (IPMS), as a result of the ten-year international MERIT Campaign. The IERS started its activities in January 1988.

IERS was given the missions to define and maintain a terrestrial reference system based on the most precise space geodesy techniques at this time, to define and maintain a celestial reference system based on the directions of extragalactic radio sources and its tie to other celestial reference frames, and to monitor the Earth's orientation, i.e. the parameters that connect the terrestrial and the celestial reference systems as a function of time.

When operation began, the observational techniques available for these tasks where Very Long Baseline radio Interferometry (VLBI), Lunar Laser Ranging (LLR) and Satellite Laser Ranging (SLR). The Directing Board included representatives of the Coordinating Centres for these observing techniques, of the Central Bureau, and of IUGG, IAU and FAGS (Federation of Astronomical and Geophysical Data Analysis Services).

According to the Terms of Reference of the service, "the Directing Board exercises general control over the activities of the service, including modifications to the organisation and participation that would be appropriate to maintain efficiency and reliability, while taking full advantage of the advances in technology and in theory". The main decisions of the Directing Board in the first eight years of activity were the setting up of permanent monitoring of global atmospheric dynamical parameters in 1989, the adoption of the Global Positioning System (GPS) as an additional observing technique in 1989-93 and of DORIS (Doppler Orbitography by radio positioning integrated on satellite) in 1994-96, and the redefinition of the VLBI contributions in 1995-96.

In 1995, the IERS had achieved its primary missions, by providing globally distributed terrestrial and celestial references and the Earth's orientation with an accuracy equivalent to about one centimeter on the surface of the Earth.

After the initial IERS observing techniques reached maturity, new and powerful techniques were introduced. The environnement in Earth sciences - including funding aspects - evolves rapidely. The consideration of expectations and frustrations as well as the recognition of achievements led the Directing Board to organize a general public evaluation of the service, that would encompass a review of current operation, and advice on possible extensions to better meet new and future needs for global references. In December 1995 they decided that the 1996 IERS Workshop would be dedicated to this review, after a period of preliminary discussion. The discussion was organized under six topics, each analyzed by Topic Coordinators helped by a small group. The Topics were as follows.

1: Assessment of current missions
2: Astronomical reference frames
3: Vertical references, incl. geoid, sea level, etc.
4: Topography and crustal deformations
5: Unification of regional reference systems
6: Earth rotation dynamics and geophysical fluids

The Topic Coordinators prepared draft reports with recommendations and distributed them in advance to the IERS Workshop. The latter took place at Paris Observatory, 14-16 October 1996, with program and participants as given at the end of this volume. The draft reports and recommendations were discussed in detail during the workshop and then finalized by the Topic

Coordinators, taking into account the results of the discussions. The final texts are those published in this volume.

The lively discussions that took place in this context were extremely productive in that a number of important aspects were put forward or given increased emphasis. While some extensions of activities in the fields of astronomy, geodesy and geophysics were recommended, the Workshop also recognized the success of IERS in providing timely and accurate data on Earth rotation, and in the establishment and maintenance of accurate terrestrial and celestial reference frames.

The IERS Directing Board started to work on the implementation of the recommendations, at and between the two DB meetings already held in October and in December 1996. The major aspects of the foreseen evolution are as follows.

- Maintaining the International Celestial Reference Frame (ICRF) based on VLBI-derived directions of extragalactic radio sources, and of the tie of the Hipparcos galactic reference frame, as will be recommended by the IAU Working Group on Reference Frames to the 1997 IAU General Assembly. This activity will be performed in concertation with an IAU Working Group on reference frames.

- Coordinating the use of astronomical observations for tying the Solar System reference frames to the ICRF.

- Monitoring the global geophysical fluids that influence both the ground measurements and the Earth's rotation, an extension of the current activity on atmospheric data.

- Monitoring the motion of the Earth's centre of gravity.

- Fostering the provision of global vertical terrestrial references and of global horizontal references for the monitoring crustal deformations, in close cooperation with the International Association of Geodesy.

- Enhancing the role of Coordinators and extending their field of responsability to general themes of importance to IERS.

- Getting organized to interact with the Working Groups set up by IAU, IAG and IUGG on topics relevant to IERS missions.

- Strengthening the development and maintenance of the IERS Conventions.

- Developing or improving technical abilities for the global combination of products from analyses of the various observing techniques, and fostering internal competition within IERS on this aspect.

- Extending formally the Directing Board membership to better represent all components of IERS activities.

- Polling the IERS distribution lists to check the various types of users and their specific requirements.

The whole endeavour of reviewing IERS and making it evolve owes much to the dedication of the scientists that accepted to work on the requested evaluations and then took account of the input of the Workshop participants to finalize the documents in this volume. The IERS Directing Board is most thankful to these colleagues for their strong contributions. It is doing its best to use as efficiently as possible the momentum they created.

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IERS Directing Board