



# Director's introduction

I am delighted to report here the highlights of the work of the BIPM laboratories and secretariat during 2019. The greatest of these has been our continued work to promote the changes to the SI system which were focused around the celebration of World Metrology Day on 20th May, and our piloting of the first key comparison subject to the new definition.

Our performance in 2019 was also marked by another year of sound financial performance. We provide summary financial information in this report. The Financial Report is available on-line<sup>†</sup>.

The preparation of this report took place during a period when activities on the BIPM site were limited because of the confinement measures imposed in France in response to the global COVID crisis. I am very pleased to report that most BIPM staff have been able to continue to work on site or remotely through this period and we have been able to sustain all of our services. We will be able to report in more detail on this at the end of the year.

**Martin Milton**  
BIPM Director

## Highlights of 2019

- The revised SI was launched on 20 May 2019 along with the publication of the 9th edition of the SI Brochure. World Metrology Day was one of the most successful ever held involving events registered in 43 countries and the poster being translated into more than 15 different languages.
- The new version of the BIPM key comparison database (KCDB 2.0) has been launched. It implements many of the changes agreed in the review of the CIPM MRA, including support for the complete CMC process from draft to publication, and a numerical search capability.
- Crucial steps towards the completion of the BIPM Kibble balance for realizing the new kilogram definition were achieved in 2019; the relative standard uncertainty has been reduced to  $5 \times 10^{-8}$ , which has allowed the BIPM to participate in the first CCM key comparison of kilogram realizations.
- A new instrument (the 'ESIR') has been developed for comparisons of standards of pure beta-emitting radionuclides. Accurate measurements of such radionuclides are needed for applications in nuclear medicine and environmental protection.
- The accuracy of the global atmospheric composition measurement scale has been demonstrated by measurements in the BIPM laboratories of standards of CO<sub>2</sub> in air from 14 institutes world-wide. Among the standards are those used within the WMO-GAW monitoring network on which all global background observations of CO<sub>2</sub> and long-term trends are based.
- Different algorithms have been tested for the incorporation of time data from new GNSS systems (including the Chinese BeiDou system and the European Galileo system) into UTC which will lead to greater robustness of the system and reduced uncertainty.

<sup>†</sup>This report includes summaries of the BIPM financial performance, and complements the Financial Report <https://www.bipm.org/en/committees/cipm/publications-cipm.html#ra> and the Proceedings of the CIPM <https://www.bipm.org/en/committees/cipm/publications-cipm.html> (both of which are available in French and English).