The BIPM e-News is published twice a year and covers all BIPM activities. It is circulated to stakeholders by email and is also available on the BIPM website.

Michael Kühne, Director

Interview with the next Director of the BIPM, Dr Martin Milton

The BIPM is pleased to announce that Dr Martin Milton joined the BIPM on 1 October 2012 as Deputy Director/Director Designate to take over the directorship from the present Director of the BIPM, Prof. Michael Kühne, on 1 January 2013. Dr Milton answered a few questions on his background and his thoughts on the BIPM.

Can you give a brief resume of your career so far?

I left Oxford University with a degree in physics in 1981 and joined the National Physical Laboratory (NPL) in the UK. After spending my first two years working on precision measurements of the fundamental constants I moved to what was then the emerging field of laser-based measurements of the atmosphere. This began a research career that took me back to the basis of where traceability for these measurements comes from, and the field of Gas Metrology. During my time as a scientist at the NPL, I was given the time to study for a PhD at Southampton University and to broaden my knowledge of how organizations work by studying for a Master of Business Administration (MBA) at the London Business School.

When did you first come into contact with the BIPM?

I left Oxford University with a degree in physics in 1981 and joined the National Physical Laboratory (NPL) in the UK. After spending my first two years working on precision measurements of the fundamental constants I moved to what was then the emerging field of laser-based measurements of the atmosphere. This began a research career that took me back to the basis of where traceability for these measurements comes from, and the field of Gas Metrology. During my time as a scientist at the NPL, I was given the time to study for a PhD at Southampton University and to broaden my knowledge of how organizations work by studying for a Master of Business Administration (MBA) at the London Business School.

After a few months in post as Deputy Director, what are your first impressions of the BIPM?

A priority for me as Deputy Director is to get a view of all of the activities that go on here. It’s impressive to see how much goes on behind the scenes to make our laboratory and coordination activities happen effectively. I am also impressed by the number of people we have visiting the BIPM each week. Whether it is to take part in comparisons in the laboratories, or to be involved in the workshops and meetings that we host, there are always visitors around.

The BIPM is facing some exciting challenges over the next few years – what will your priorities be as Director?

There are a lot of important projects within our Programme of Work for 2013 to 2015 and they are set against a background of responding to the challenges addressed by the ad hoc Working Group, which was set up following the meeting of the General Conference on Weights and Measures in 2011. It is clear that developing the BIPM long-term financial plan and strategy, together with the next programme of work must be a collaborative process. If we can do this successfully it should set a framework for the work of the BIPM for many years to come.

Is there a particular scientist/person that inspired your career as a scientist and a metrologist?

The scientist who I am most inspired by is Paul Dirac. At the end of his career, in 1963, he gave a small insight into the thoughts of a great scientist in a fascinating paper in the Scientific American. It had the title “The evolution of the physicist’s view of nature”. In one short piece, he explains his arguments for the non-existence of magnetic monopoles through to his views on the importance of the fine structure constant and the possibility of fixing the values of the velocity of light and the charge on the electron.

Have you had opportunities to experience French life outside the confines of the BIPM and how are your language skills?

I have always enjoyed life in France, and have had more holidays here with my family than anywhere else. There is every incentive to work on my French language skills to be able to communicate effectively with colleagues and to make the most of the opportunities here.
To consolidate more than 50 years of mutual cooperation between the BIPM and the International Atomic Energy Agency (IAEA), a Memorandum of Understanding (MoU) was signed by the Director of the BIPM, Prof. Michael Kühne, and the Deputy Director General, Director of Nuclear Sciences and Applications Department of the IAEA, Mr Daud Mohamad on 25 June 2012. The signing ceremony took place at the IAEA headquarters in Vienna, Austria, during the 13th International Symposium on Biological and Environmental Reference Materials.

The ceremony marked a step towards new pathways for the future following collaborations that have existed since 1959 between the IAEA and the Consultative Committee for Ionizing Radiation (CCRI). The BIPM Ionizing Radiation Department has worked closely with the IAEA Dosimetry and Medical Radiation Physics Group in the intervening years to provide reference dosimetry and support for the World Health Organization (WHO)/IAEA Secondary Standards Dosimetry Laboratory (SSDL) Network programme. More recently the collaborations have involved comparisons of reference materials and similar work is planned for future collaborations.

The IAEA signed the CIPM MRA in 1999 and was one of the first signatories to publish Calibration and Measurement Capabilities (CMCs) in the key comparison database (KCDB). The IAEA is a Member of the CCRI Section I and an Observer in Sections II and III as well as having a standing invitation to the CCRI. The IAEA is a Member of the CCQM and participates in CCQM key comparisons.

Three new members have been provisionally elected to the International Committee for Weights and Measures (CIPM) and took their seats at Session II of the 101st meeting: Dr Brian Bowsher, Managing Director, NPL, United Kingdom of Great Britain and Northern Ireland; Dr Vladimir Krutikov, Rosstandart, Russian Federation; and Dr Takashi Usuda, Director of the International Metrology Cooperation Office, NMIJ/AIST, Japan. This follows the resignations of Dr Seton Bennett, Prof. Lev Issaev and Dr Mitsuru Tanaka.

A meeting of representatives of Member States and National Metrology Institute (NMI) Directors was held at the BIPM headquarters from 16 to 17 October 2012. The main topics of discussion were: the BIPM Programme of Work and Budget for 2013 to 2015; and the report of the ad hoc Working Group on the role, mission, objectives, long-term financial stability, strategic direction and governance of the BIPM established by the CIPM in accordance with Resolution 10 (2011) by the CGPM at its 24th meeting.

The dotation, compared to the 2012 dotation to which was added the 2012 contributions of those States that acceded to the Metre Convention since the previous CGPM meeting, will be increased by 1% per year.

The additional discretionary contribution agreed for the period 2009 to 2012 will be discontinued.

Subscriptions of Associate States will be increased in accordance with Resolution 4 (2011).

The need to replenish the capital investment fund (CIF) was recognized.

The expenditure during the years 2013 to 2015 should be fully balanced by the income.

Activities of the Programme of Work 2009 to 2012 should be continued during the Programme of Work 2013 to 2015 to a maximum possible extent.

The BIPM’s revised Programme of Work and Budget for the three-year period 2013 to 2015 was described in detail, along with the expected cost savings when compared to the draft Programme of Work and Budget for the four-year period 2013 to 2016 as submitted to the CGPM. The prioritization was necessary following the adoption of Resolution 3 (2011) by the CGPM which included a three-year dotation and other decisions and considerations which were:
There was general agreement among the representatives of Member States and NMI Directors that a strategic long-term perspective is needed for the BIPM and that they would like more involvement and greater transparency during the planning and preparation of the Programme of Work. Their increased involvement should not however become an exercise in micromanagement. Involving the representatives of Member States and NMI Directors to a greater extent during the early planning of the Programme of Work may increase the likelihood that the Programme of Work and the corresponding dotation align more effectively with Member States’ expectations. This issue is addressed in ad hoc Working Group Recommendation 2 for ‘the BIPM/CIPM to develop a consolidated planning process’.

The report of the ad hoc Working Group on the role, mission, objectives, long-term financial stability, strategic direction and governance of the BIPM was discussed in great detail and included presentations on: the conclusions and recommendations of the ad hoc Working Group; the CIPM position on the recommendations; the procedure to implement Recommendation 2 of the ad hoc Working Group; and the formation of CIPM Standing Sub-Committees and Working Groups to address in particular the major issues raised by the ad hoc Working Group. The discussions resulted in a series of conclusions to each of the ad hoc Working Group Recommendations (see Responses by the representatives of Member States and NMI Directors to the ad hoc Working Group recommendations). The meeting concluded with three presentations: updating the CIPM MRA and related JCRB matters; the CIPM MRA after 13 years - lessons learned and ways to improve; and metrology for the 2020s.

Delegates at the 2012 Meeting of representatives of Member States and NMI Directors.

Responses by the representatives of Member States and NMI Directors to the ad hoc Working Group recommendations

The following is a summary of the responses by the representatives of Member States and NMI Directors to the 20 Recommendations made by the ad hoc Working Group on the role, mission, objectives, long-term financial stability, strategic direction and governance of the BIPM:

- In response to ad hoc Working Group Recommendation 1 ‘Develop a compact and clear statement on the role, mission and objectives [of the BIPM] based on the original objectives set by the Metre Convention, but reinterpreted for the 21st Century’ the representatives of Member States and NMI Directors supported the development of a statement on the BIPM mission, role and objectives and encouraged the CIPM to make rapid progress and achieve an acceptable statement as soon as possible.

- Ad hoc Working Group Recommendation 2 ‘The BIPM/CIPM to develop a consolidated planning process’ was described in detail together with the suggested procedure for its implementation. The rationale behind the Recommendation is to improve the approval process for successive BIPM Programmes of Work. The representatives of Member States and NMI Directors supported the objectives, welcomed the progress being made and agreed with the planned timescale. It was recognized that development of the strategy process is an ongoing and iterative activity. The framework should be developed before the end of 2012.

- Ad hoc Working Group Recommendation 3 stated that: ‘NMI Directors and Government Representatives are asked to take an active interest in the development of the BIPM long-term strategy and successive Programmes of Work and Budget by timely responding to the proposals (failure to respond means: assent)! The representatives of Member States and NMI Directors agreed with Recommendation 3.

- Ad hoc Working Group Recommendation 4: ‘The long-term financial plan, including capital investments, should be provided to Member States (addressing building, equipment, staff, assets and liabilities such as the Pension and Provident Fund) with a number of possible scenarios.’ Representatives of Member States and NMI Directors encouraged the CIPM Standing Sub-Committee on Finance to continue its work to build confidence and improve transparency [in the BIPM financial planning] and to develop mechanisms to implement its findings.
Members will go up for (re-)election. Working Group Recommendation 13: ‘CIPM Members be elected Ad hoc necessarily be held every two years. meeting follows a more structured agenda, e.g. day 1 for discussion of supported Recommendation 12. It was proposed that the yearly yearly meetings with the NMI Directors and Member State Representatives should be held and may be combined if appropriate, depending on the agenda. ’ The representatives of Member States and NMI Directors agreed with Recommendation 11. Opportunities for electronic distribution should be explored where possible.

Working Group Recommendation 12 suggested that ‘Regular yearly meetings with the NMI Directors and Member State Representatives should be held and may be combined if appropriate, depending on the agenda.’ The representatives of Member States and NMI Directors supported Recommendation 12. It was proposed that the yearly meeting follows a more structured agenda, e.g. day 1 for discussion of technical and scientific issues and day 2 for discussion of finance and strategy. The general opinion was that a CGPM meeting should not necessarily be held every two years.

Working Group Recommendation 13: ‘CIPM Members be elected for a fixed term of 4 years, renewable. Every two years, half of the CIPM Members will go up for (re-)election.’ The representatives of Member States and NMI Directors agreed with the proposal that CIPM members be elected for a fixed 4-year term, renewable. The CIPM is charged to work out the selection criteria for and the process of selecting and electing CIPM members, including appropriate involvement of Member States. Draft proposals should be made ready by the end of 2012.

Working Group Recommendation 14: ‘The CIPM will review the list of criteria to be fulfilled by CIPM candidates. The full range of skills necessary to oversee the BIPM in the modern era will be taken into account.’ Representatives of Member States and NMI Directors supported Recommendation 14. Draft proposals should be made ready by the end of 2012.

Working Group Recommendation 15: ‘All CIPM candidates will be scrutinized against these criteria and the results of this with the names of the potential candidates will be provided to a CGPM Election Working Group. The CGPM Working Group to give recommendations to the CGPM. Privacy protection of candidates will be taken into account.’ The CIPM will formulate proposals, which will be presented to the representatives of Member States and NMI Directors at the 2013 yearly meeting, and prepare a Draft Resolution to be presented at the next CGPM meeting.

Working Group Recommendation 16: ‘On balance it is suggested that Consultative Committee Presidents not be drawn from the CIPM in order that the CIPM maintains a global and independent view.’ It was concluded that Consultative Committee Presidents should not necessarily be CIPM members. It is recommended that the CIPM appoint the most qualified candidates: criteria for selecting Consultative Committee Presidents will be formulated. Representatives of Member States and NMI Directors agreed to a fixed 4-year term renewable.

Working Group Recommendation 17: ‘Full CGPM meetings should be held every 4 years and a CGPM with limited agenda should be held in between (so every two years a CGPM). The full CGPM should decide on the BIPM budget for a four year period.’ It was concluded that CGPM meetings every two years are not favoured, dependent on the CIPM developing an acceptable option in respect to the election of CIPM members.

Working Group Recommendation 18: ‘The duration of CGPM meetings should become reduced to two or at most three days. Consultative Committee Presidents will only present a very short summary report and will be available to answer questions (reports should be provided in advance).’ Representatives of Member States and NMI Directors agreed to a reduction in the duration of the CGPM meetings.

Working Group Recommendation 19: ‘The management structure of the BIPM Pension and Provident Fund will be reviewed by the CIPM with eventual recommendations to the CGPM.’ Representatives of Member States and NMI Directors agreed with Recommendation 19. First results will be presented in 2013.

Working Group Recommendation 20: ‘The BIPM and CIPM are asked to determine how and when all proposals can be implemented without conflict with the Metre Convention and its annexed Regulations and eventual other legislation.’ Recommendation 20 is being implemented while the other Recommendations are being progressed.

Session II of the 101st meeting of the CIPM

Session II of the 101st meeting of the CIPM was held at the BIPM headquarters from 18 to 19 October 2012. Discussions focused among other things on the outcomes of the meeting of representatives of Member States and NMI Directors which was held at the BIPM headquarters from 16 to 17 October 2012.

The CIPM discussed in detail the considerations of the representatives of Member States and NMI Directors on the 20 Recommendations above. The CIPM developed a document summarizing the conclusions to the ad hoc Working Group Recommendations that were agreed at the meeting of representatives of Member States and NMI Directors, which will be made available to participants.

The draft Terms of Reference of the three standing sub-committees addressing strategy, finance, and pensions and health insurance and the two ad hoc Working Groups addressing CIPM membership, and conditions of employment of BIPM staff members, set up by the CIPM at Session I of its 101st meeting, were presented and
discussed. Reports from the seven Consultative Committees that had met since October 2011 were presented and discussed. The President of the Consultative Committee for Time and Frequency (CCTF) presented six Recommendations to the CIPM. Recommendation CCTF 1 (2012) was accepted by the CIPM and may be prepared as a Draft Resolution for the 25th meeting of the CGPM. The CIPM noted the five other CCTF Recommendations. Vacancies for the seats of President of the Consultative Committee for Mass and Related Quantities (CCM) and the Consultative Committee for Photometry and Radiometry (CCPR) were discussed. The CIPM appointed Dr Philippe Richard, METAS, Switzerland, as President of the CCM and Dr Takashi Usuda, NMIJ, Japan, CIPM member, as President of the CCPR. The visit to the depository of the metric prototypes took place, in particular for the CIPM to witness the storage conditions of the international prototype of the kilogram (IPK) and its official copies.

Reports were given on the administrative and financial affairs of the BIPM including a report on Member States in financial arrears and an update on the actions taken by the BIPM on this matter following the decisions made by the CGPM in 2011, in particular Resolutions 6 (2011) and 7 (2011). A progress report was given on the 2012 estimated outturn. Amendments to the BIPM Financial Regulations (Article 15) were approved by the CIPM. The CIPM also approved the BIPM 2013 budget. A report was given on the progress to set up a cost accounting system.

The work of the Joint Committee of the Regional Metrology Organizations and the BIPM (JCRB) was reported and included Recommendation 29/1 (approval of changes to document CIPM MRA-G-01 that involve the updating of references to other CIPM MRA documents) and Recommendation 29/2 (approval of changes in Section 9 of the document CIPM MRA-D-05 amending the procedure to monitor the impact of comparison results). Both Recommendations were approved by the CIPM. A modified text of the ‘Declaration of Cooperation’ document which establishes the Joint Committee on Traceability in Laboratory Medicine (JCTLM) was presented. The modifications were approved by the CIPM.

The CIPM recommended to the Joint Committee for Guides in Metrology (JCGM) that it continues with the investigation into the development of an online, annotated version of the International Vocabulary of Metrology (VIM3) and the development of an International Vocabulary for Nominal Properties (VIN) as work items for JCGM WG2. The latter recommendation was in response to a draft recommendation from the International Union of Pure and Applied Chemistry (IUPAC).

The CIPM discussed the draft protocol for the use of the international prototype of the kilogram (IPK) in preparation for the redefinition of the kilogram. A refined version of the protocol will be submitted to the CCM for finalization.

The CIPM agreed with the reinstatement of a key comparison in the field of large organic molecules to be carried out by the Chemistry Department during the BIPM Programme of Work for 2013-2015 as a result of additional support, both financially and by secondment, from NMIs.

As of 9 October 2012, the BIPM key comparison database (KCDB) included a total of 25245 CMCs, with approximately 1000 new CMCs published during the last year. 42 % of these CMCs were already posted in the KCDB at the end of 2004, and on average some 1900 new and revised CMCs were approved annually during the years 2005 to 2011, with a similar number anticipated in 2012. Fewer than 200 CMCs are currently temporarily removed from the KCDB. Following an Action required by the 28th meeting of the JCRB in September 2011, the KCDB Office has split the EXCEL CMC files made available on the JCRB CMC website for use in the CMC declaration and review process by category within the areas of Mass, Ionizing Radiation, Length, and Acoustics, Ultrasound and Vibration.

As of 9 October 2012, the KCDB included a total of 816 key comparisons and 323 supplementary comparisons, with an increased rate of registration of new supplementary comparisons when compared to previous years. Altogether 65 % of the comparisons registered in the KCDB are complete and have their final reports posted in the KCDB, this percentage has been stable for several years. Nearly 1900 graphs of equivalence, covering all fields of Metrology, are currently posted in the KCDB.

Of the 36 Associates of the General Conference which participate in the CIPM MRA, only 15 currently have CMCs published in the KCDB.

News from the KCDB

Key and supplementary comparisons database
The 29th meeting of the Joint Committee of the Regional Metrology Organizations and the BIPM (JCRB) was hosted by the National Institute of Standards and Technology (NIST) in Gaithersburg, Maryland, United States of America, on 25 to 26 September 2012. The following is a summary of the most important discussions and outcomes of the meeting:

Monitoring the Impact of Comparison Results
The JCRB reaffirmed the importance of ensuring that the results obtained by NMIs in comparisons are checked for accordance with their published CMCs. In cases where the uncertainties stated in published CMCs are not verified by results obtained from a later comparison, it is imperative that the NMIs concerned, and if necessary, the RMOs to which they belong, fulfil their responsibility to correct the inconsistency by following the procedure outlined in section 9 of the document CIPM MRA-D-05.

Workshop on Best Practices in CMC Reviews
A Workshop on Best Practices in CMC Reviews will be held at the BIPM headquarters on 18 to 19 March 2013, immediately before the 30th meeting of the JCRB.

The objectives of the workshop are:
› to help reduce the resources and time required for the review of new and modified CMCs, whilst not compromising their integrity,
› to improve communication and the sharing of knowledge between all parties involved in the CMC review processes and the necessary quality system review, by learning how the RMOs and CCs undertake their tasks,
› to agree on actions and recommendations to disseminate, adopt and implement the “best practices” and opportunities for any further efficiencies that are identified.

In preparation for the workshop, each RMO has been requested to submit a paper on the issues faced during CMC reviews to the JCRB Executive Secretary who will develop a summary document for circulation to all workshop participants one month in advance. The expectation is that the RMO papers will form the basis of the discussion on how to improve CMC review practices.

GULFMET
A delegation from GULFMET was invited to the 29th meeting of the JCRB to present the latest developments in their efforts to establish an RMO to carry out the functions necessary to allow its members to participate in the CIPM MRA. The delegation was headed by GULFMET Vice-President, Mr Adel Fakhroo, and included Mr Omar Kanakrieh, Mr Saeed Al Shahrani and Mr Salah Salem Alrumaihi.

Next Meetings of the JCRB
The 30th meeting of the JCRB will be held at the BIPM headquarters on 19 to 20 March 2013. The 31st meeting of the JCRB will be hosted by the National Institute of Metrology (NIM) in Beijing, China, on 18 to 19 September 2013.

BIPM Circular T will celebrate 25 years in January 2013
The 300th issue of BIPM Circular T will be published by the Time Department in January 2013, after 25 years of uninterrupted monthly publication.

The Consultative Committee for Time and Frequency (CCTF) defined BIPM Circular T as the key comparison on time, and assigned it the identifier “CCTF-K001.UTC” in 2006. However, Circular T has existed since 1977, well before the responsibility for the maintenance of Coordinated Universal Time (UTC) was transferred in 1988 from the Bureau International de l’Heure (BIH) to the BIPM.

As of October 2012, 70 time laboratories in NMIs, observatories and other institutions contribute data to the calculation of UTC. These laboratories maintain local atomic timescales UTC(k) that obtain traceability to UTC through BIPM Circular T. The large number of participants is essential to guarantee world-wide dissemination of UTC.

Time laboratories operate industrial atomic clocks, primary frequency standards and time transfer methods. They contribute to the calculation of UTC following procedures established by the BIPM Time Department. Their UTC(k) provide local approximations to UTC with standard uncertainties ranging from 2 ns to 20 ns.

All previous issues of BIPM Circular T, as well as updated information on data and results are available via the ftp site of the BIPM Time Department.

ftp://62.161.69.5/pub/tai/
Final preparations for the future BIPM ensemble of reference mass standards

As the redefinition of the kilogram approaches, the BIPM Mass Department is preparing for the forthcoming challenges in mass metrology. In 2011, the General Conference on Weights and Measures (CGPM) encouraged the BIPM ‘to develop a pool of reference standards to facilitate the dissemination of the unit of mass when redefined’ Resolution 1 (2011). Since then, the BIPM Mass Department has been assembling a new ensemble of 12 reference mass standards and four stacks of cylinders. Fig. 1 shows the storage network laboratory.

The standards will be stored in an uncontaminated and continuously analyzed environment to ensure the best possible mass stability. Three mass standards made of different materials (one 1 kg Pt/Ir cylinder, one 1 kg natural silicon sphere and one 1 kg stainless steel cylinder) plus one 1 kg stack of cylinders (made of Si, Pt/Ir or stainless steel) are stored under each storage condition (argon, nitrogen, vacuum and ambient air). These were chosen to test which combination of storage conditions and materials leads to the optimum mass stability. The stack of cylinders is designed to have the same mass and volume as the single-piece standard of the same material but with a larger surface area. Therefore mass changes due to surface effects may be studied.

Four different storage environments are being prepared for the twelve mass standards and the four stacks of cylinders: under a low-flow argon gas (fig. 2, left), under a low-flow nitrogen gas (fig. 2, right) and under vacuum (1 mPa) (fig. 3). In addition, three standards plus a stack of cylinders will be stored in air at ambient atmospheric pressure, in the same storage conditions that have been traditionally used at the BIPM.

The storage containers (Fig. 4) are electro-polished, have an inner volume of about 4 litres and have been designed to accommodate all the different standards. All containers are equipped with manual isolation valves which allow each container to be removed and put back into the network without altering the storage conditions of the standard inside. In addition, gas storage containers have a bypass tube (Fig. 2) which allows the tubes of the network to be purged without the purge gas flowing through the container. All the containers were constructed in the BIPM mechanical workshop.
The fabrication of all 12 reference mass standards and the four stacks of cylinders of the BIPM ensemble is complete and characterization (mass, volume and surface) is almost finished.

The gas and vacuum storage networks are under study and have been working continuously and satisfactorily for over six months. The storage networks will be ready to receive the mass standards of the ensemble in the next few months.

In future, the mass of the artefacts will be frequently inter-compared. Storage conditions will be maintained during the weighings. The mass of each individual element will be compared to the mean mass of the ensemble, which will be calculated by giving each element a statistical weight that reflects its stability. The mean mass will therefore be more stable than any of the individual masses. In addition, after the forthcoming redefinition of the kilogram, by calibrating one (or more) of the mass standards using available watt balances and other primary realizations of the kilogram (with the help of transfer mass standards), traceability of the whole ensemble will be assured with respect to the fundamental constants. It will then be possible to use the ensemble to disseminate the new SI unit of mass.
**Workshops**

**BIPM Workshop on Challenges in Metrology for Dynamic Measurement**

The BIPM Workshop on Challenges in Metrology for Dynamic Measurement was held at the BIPM headquarters on 15 to 16 November 2012, attended by 58 scientists from 21 countries. The subject cuts across many areas of metrology, which were well represented in the diverse gathering. There were nine technical talks from invited speakers from both industry and NMIs, followed by a series of breakout sessions to discuss outcomes for specific areas. It is still true that traceability from NMI-level to the calibration laboratory is mostly available on a static basis, with just a few facilities in some NMIs where research in the field of dynamic measurement is performed. In particular, verification of dynamic measurement capabilities via key comparisons is a long way off, due to a lack of validated methods and accepted procedures. However, this successful and productive workshop helped to bring out the common problems and solutions, and will act as a reference point for ongoing developments. A report summarizing the breakout discussions and conclusions and recommendations from the workshop is in preparation, and will be published on the BIPM website.

**Workshop on the mise en pratique of the new definition of the kilogram**

The Consultative Committee for Mass and Related Quantities (CCM) hosted a workshop at the BIPM headquarters on 21 to 22 November 2012. Approximately 55 people attended. Technical talks included progress being made toward realizing the proposed new definition of the kilogram using the x-ray crystal density technique (often referred to as the “Avogadro” method) and electromagnetic techniques (often referred to as the “watt balance” method). In addition to realizing the new definition through a robust set of operational experiments, workshop discussions also focused on ways of disseminating the kilogram unit to best meet the needs of scientific, legal and industrial mass metrology. The workshop completely achieved its objective to improve the present draft of the mise en pratique that is being produced by the CCM in anticipation of the new definition.

**Marcus du Sautoy pays a visit to the international prototype of the kilogram (IPK)**

Every year the CIPM opens the caveau at the BIPM headquarters in order to inspect the storage conditions of the IPK. The IPK, which is used infrequently, is the artefact whose mass currently defines the SI kilogram. (Plans are well underway to move to a new definition of the kilogram based on a fundamental constant.) A special visitor was invited to the opening of the caveau on 18 October 2012: Marcus du Sautoy, Simonyi Professor for the Public Understanding of Science and Professor of Mathematics at the University of Oxford, UK. The occasion was filmed for a mini-series on the SI being produced for the BBC by Big Wave Productions Ltd, and narrated by Prof. du Sautoy. This was the team’s second filming visit to the BIPM headquarters. They have also included many other locations important to the history, and future, of metrology. The BBC mini-series is scheduled for broadcast in the UK in the spring of 2013.

**Advance notices**

The following links provide access to information about forthcoming meetings at the BIPM headquarters as well as other conferences and meetings.

**Calendar of meetings held at the BIPM headquarters**

**Other conferences and workshops**