

The BIPM key comparison database Newsletter – No 10 – December 2008

Dear Reader,

This issue of the KCDB Newsletter marks its tenth edition. I'm delighted with its success. I am sure you will have seen that we have broadened its scope and it's now more of a general BIPM Newsletter with information about other meetings. The main focus still relates to the work we do on the CIPM MRA and we are continually on the look-out for examples of where our readers from the National Metrology Institutes, industrial, and Government circles have been able to take advantage of it practically. Please keep up the steady flow of externally generated stories and comments.

In closing, I am sure you will join me in congratulating Claudine Thomas, as editor, in keeping up the standard, the frequency, and the high level of interesting articles in the Newsletter.

We at the BIPM wish you all a Happy and Successful Year 2009.

Andrew Wallard, Director of the BIPM

To improve future editions of the KCDB Newsletter, please send us feedback at BIPM.KCDB@bipm.org.

The success story of the KCDB Newsletter No 10:

* "The CIPM MRA Working on Traceability in Trade for Time-and-Money Saving" by Dr Sergey A. Kononogov and Prof. Lev K. Issaev (VNIIMS, Russian Federation), and Dr Kwang Hwa Chung and Dr Gun-Woong Bahng (KRISS, Republic of Korea).

⇒ A new signatory of the CIPM MRA

Since the issue of the KCDB Newsletter No 9, the BIPM has registered one new signature of the CIPM MRA:

- Dr Nodar Khatiashvili, Director-General of the Georgian National Agency for Standards, Technical Regulations and Metrology (GEOSTM), signed the CIPM MRA on 17 June 2008. Georgia became an Associate of the CGPM on 1 January 2008.

Consequently, the CIPM MRA has now been signed by representatives of 74 institutes from 45 Member States, 27 Associates of the CGPM, and two international organizations, and covers a further 121 institutes designated by the signatory bodies as holders of specific national standards. Click [here](#) to access the full list of participants in the CIPM MRA.

(Information available from the [BIPM website](#))

⇒ **A new Regional Metrology Organization: AFRIMETS**

At the October 2008 meeting of the CIPM, a new Regional Metrology Organization (RMO) was recognized and approved, namely the Intra-Africa Metrology System, AFRIMETS.

<p>The current membership of AFRIMETS represents more than 40 African countries, mainly organized into the following sub-regions:</p> <ul style="list-style-type: none"> • MAGMET • SOAMET • CEMACMET • EAMET • SADC MET / SADC MEL 	<p>The map shows the continent of Africa divided into five color-coded sub-regions: MAGMET (North Africa, including Tunisia, Algeria, Libya, Egypt, Mauritania, Mali, Niger, Chad, Sudan, Eritrea, and Djibouti), SOAMET (West Africa, including Senegal, Gambia, Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, and Benin), CEMACMET (Central Africa, including Cameroon, Gabon, Congo, DRC, Angola, and Namibia), EAMET (East Africa, including Ethiopia, Kenya, Somalia, and Madagascar), and SADC MET (Southern Africa, including Botswana, Lesotho, Swaziland, Mozambique, Zimbabwe, and South Africa). The map also labels the Mediterranean Sea, Red Sea, Indian Ocean, and Atlantic Ocean.</p>
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The previous participation of SADC MET in the activities of the CIPM MRA is now superseded by that of AFRIMETS.

The formation of AFRIMETS was initiated at a first General Assembly in July 2007 in South Africa, where a formal Memorandum of Understanding was adopted and signed by the majority of current members.

A second General Assembly was held in July 2008 in Tunisia, which was focussed on establishing more operational arrangements for the organisation, including the establishment of technical working groups in the various areas of metrology.

(Reported by Mr M. Streak, JCDCMAS Executive Secretary)

⇒ **Memorandum of Understanding between the BIPM, OIML and UNIDO**

On 3 December 2008 a Memorandum of Understanding was signed between the United Nations Industrial Development Organization (UNIDO), the International Organization of Legal Metrology (OIML), and the International Bureau of Weights and Measures (BIPM). The purpose of this strategic partnership is to enhance the impact of industrial development on economic growth, to minimize technical barriers to trade, and to assist in the beneficial integration of developing countries and transition economies into the global economy. The agreement is effective immediately.

<p>The text of the MoU, signed by Kandeh Yumkella (UNIDO Director-General), Andrew J. Wallard (BIPM Director) and Alan Johnston (OIML President), can be downloaded here.</p> <p><i>(From left to right: Andrew J. Wallard, Kandeh Yumkella and Alan Johnston, for the signature of the MoU in Vienna, Austria, on 3 December 2008)</i></p>	<p>A photograph showing three men in dark suits standing together. The man on the left is holding a blue folder. They are standing in front of a backdrop that features the UNIDO logo and the text 'UNIDO'.</p>
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(Information available from the [BIPM website](#))

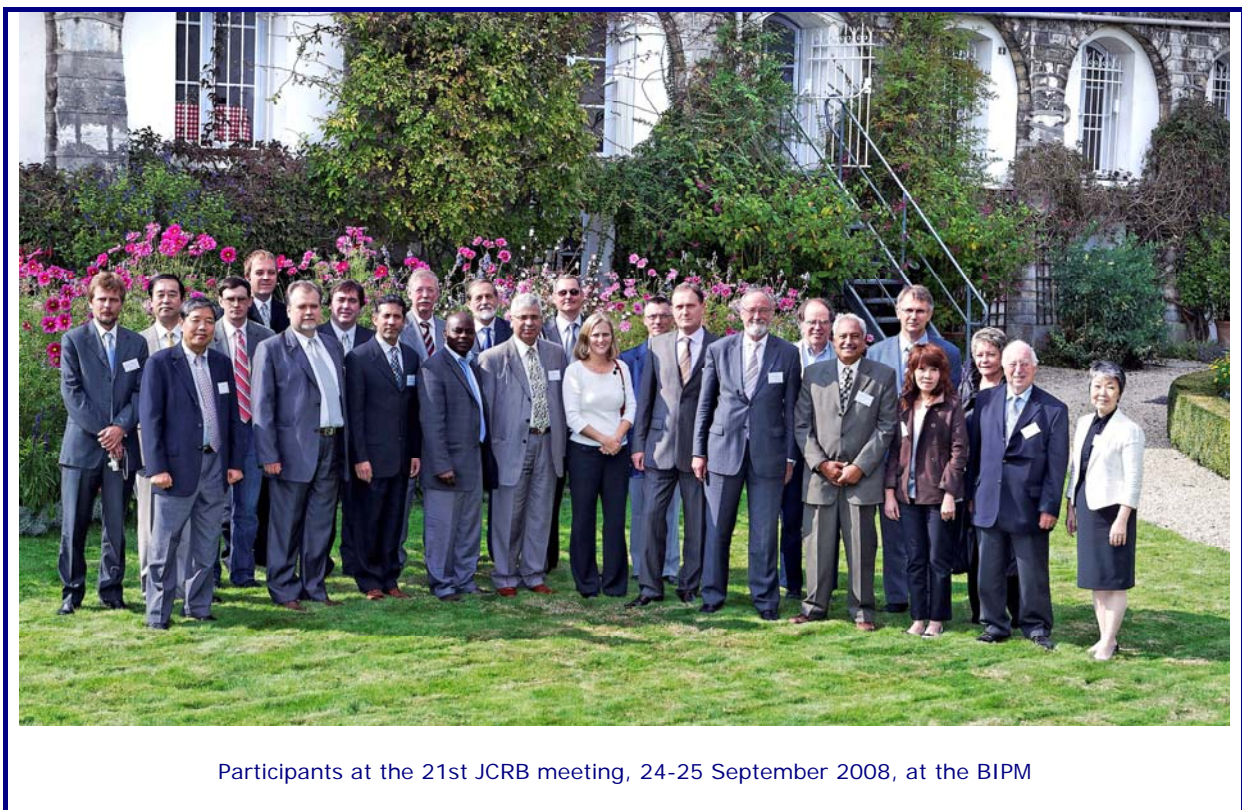
⇒ **Feedback from the 21st JCRB**

The 21st meeting of the JCRB was hosted by the BIPM in Sèvres (France) on 24 and 25 September 2008.

A new document "[Guide to the implementation of the CIPM MRA](#)" (CIPM MRA-G-01) was approved by the JCRB and the CIPM. This brings together all the current relevant policy documents and now that it is web-based, it can be updated regularly. The Guide should be useful to National Metrology Institutes and to technical and other committees in Regional Metrology Organizations. Please contact the [JCRB Executive Secretary](#) if you have difficulty interpreting the Guide.

The document "[Calibration and Measurement Capabilities in the context of the CIPM MRA](#)" (CIPM MRA-D-04) was approved by the JCRB and the CIPM. This document supersedes all the previously existing documents on CMCs and should now be applied by National Metrology Institutes and Regional Metrology Organizations.

According to a resolution of the 19th meeting of the JCRB, all the documents as well as the [CIPM MRA documents website](#) are now in the process of reformatting and consolidation.



The next JCRB meeting will be held at the BIPM on 17 and 18 March 2009.

(Reported by Prof. L. Mussio, JCRB Executive Secretary)

* [JCRB website](#)

⇒ Policy on traceability for CMCs

Resolution 19/4 of the 19th JCRB meeting (already quoted in the [KCDB Newsletter No 9](#)) concerning the policy on traceability for CIPM MRA CMCs was submitted to the CIPM in October 2008. The CIPM approved the following text:

For the purpose of publishing CMCs in the KCDB the following rules on traceability must be followed:

1. A laboratory with a primary realization of the unit of measurement concerned, or applying primary “higher-order” methods, must declare traceability to its own demonstrable realization of the SI.
2. A laboratory taking traceability from another laboratory must choose from either the BIPM or another laboratory having CMCs published in the KCDB with the appropriate level of uncertainty in the relevant area. In this case, the laboratory must still make a full assessment of the uncertainties involved in its measurement activity and must openly declare its chosen traceability route when submitting its CMCs for intra- and inter-regional reviews.
3. A laboratory is free to use measurement services provided by laboratories accredited by a signatory to the ILAC Arrangement, for calibration of instrumentation, reference standards or other components as parts of its measurement systems, provided that it can be shown that these components have only a minor influence on the total combined uncertainty of its CMCs.

Note: Paragraph 1 includes the case of laboratories using CRMs or high purity primary chemical references obtained from sources that are not recognized under the CIPM MRA only when the NMI has the recognized capability to analyse the composition by itself.

At its 21st meeting, the JCRB resolved that: “CMCs that do not comply with JCRB Resolution 19/4 (see above) will not be greyed-out from the KCDB (Resolution 21/1). The review of the traceability statements already established for the CMCs will be performed by the Regional Metrology Organizations in the periodical review of CMCs and Quality Systems”.

(Reported by Prof. L. Mussio, JCRB Executive Secretary)

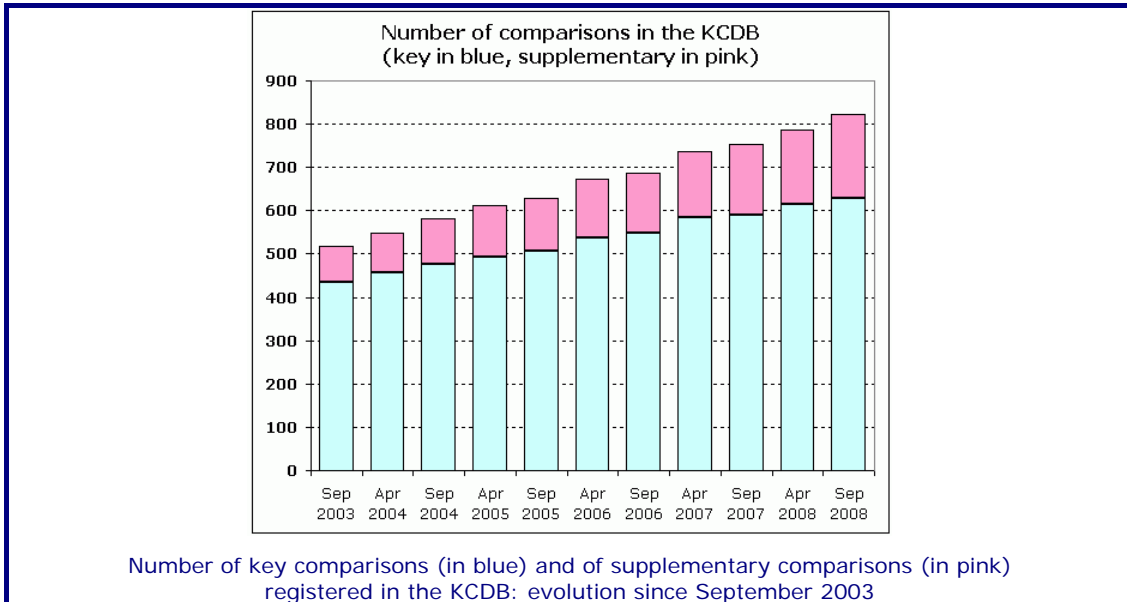
Greater visibility for BIPM calibration and measurement services

During the first quarter of 2009, the BIPM will make its calibration and measurement services more transparent to users of the KCDB. This will enable users to have easy access to follow traceability chains for National Metrology Institutes who take their traceability through the BIPM. The CIPM has approved the following implementation, which will be operational within the next three months: BIPM calibration services will be listed in formats similar to those that are displayed in the CMC section of the KCDB and will be published on the BIPM web pages. This is because the BIPM lists are not CMCs as defined by the CIPM MRA so they will not be placed in the KCDB; however a link to them will be prominently displayed on the pages of the KCDB CMCs. The BIPM calibration and measurement services are normally vetted through the relevant Consultative Committees of the CIPM as part of the BIPM Quality System (QS). Thus any additional services will be included when these are included in the QS.

(Reported by Dr R. Davis, Head of the BIPM Mass Section)

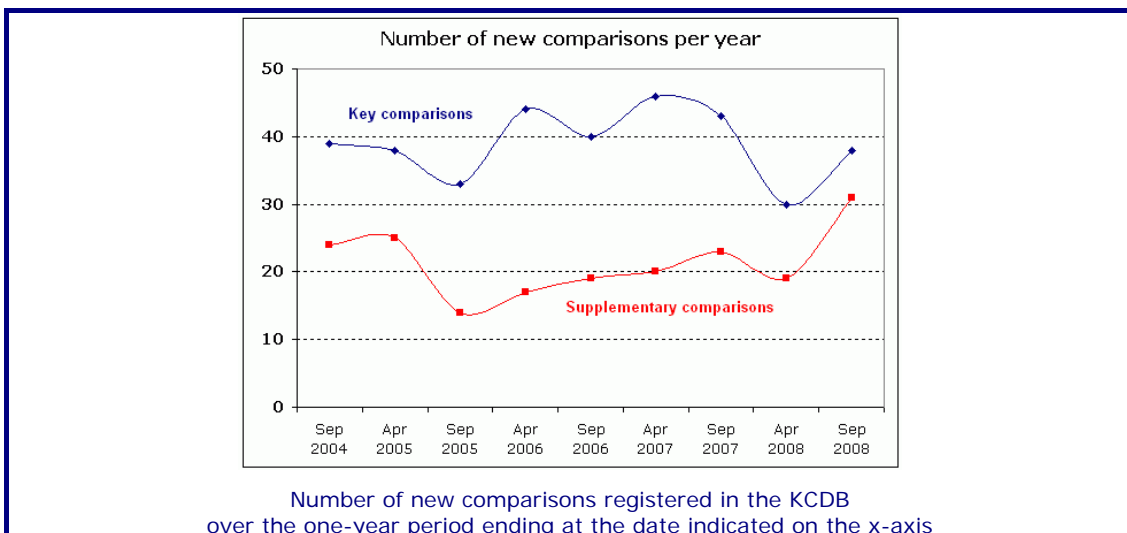
⇒ **Key and supplementary comparisons**

The key and supplementary comparisons database now covers 638 key comparisons (79 from the BIPM, 321 from the CCs, 1 from AFRIMETS, 82 from APMP, 26 from COOMET, 99 from EURAMET, and 30 from SIM) and 195 supplementary comparisons.



One observes that 31 new supplementary comparisons were registered over the last year. This is a higher rate than previously observed, and reflects the awareness of RMOs of the interest of declaring their internal exercises and posting the corresponding reports in the KCDB, mainly in support of their CMC claims.

Information on new key comparisons decided by the CCQM Working Groups at their meetings in October 2007 and at the CCQM in March 2008 reached the KCDB Office in August 2008. This explains the increase in the number of newly registered key comparisons, which returns to its average level of about 40 per year.



Updated graphs illustrating the participation in key and supplementary comparisons were made available from the Statistics page of the KCDB on 11 December 2008.

On 10 December 2008, among the 638 key comparisons that were registered:

- 88 corresponded to exercises prior to the implementation of the CIPM MRA (they were “Approved for provisional equivalence”);
- 73 of the 79 on-going BIPM key comparisons had results published in the KCDB; those are regularly extended when new data become available (10 new results were published since 6 August 2008); and
- another 242 CC and RMO key comparisons had their final reports approved and posted in the KCDB website, and corresponding tables of numbers and graphs entered in the database.

All together, the KCDB currently displays a total of 1182 graphs of equivalence.

The results of some 90 RMO key comparisons are published in the KCDB. Linkage is also computed for bilateral key comparisons subsequent to full-scale CC key comparisons; their results are added on the appropriate graphs of equivalence. The most complete graph available from the KCDB displays 66 degrees of equivalence, obtained from four RMO key comparisons linked to CCM.M-K1 (1 kg stainless steel mass standards).

The final reports (or appropriate references) of 103 of the 195 supplementary comparisons registered in the KCDB are also posted in the KCDB.

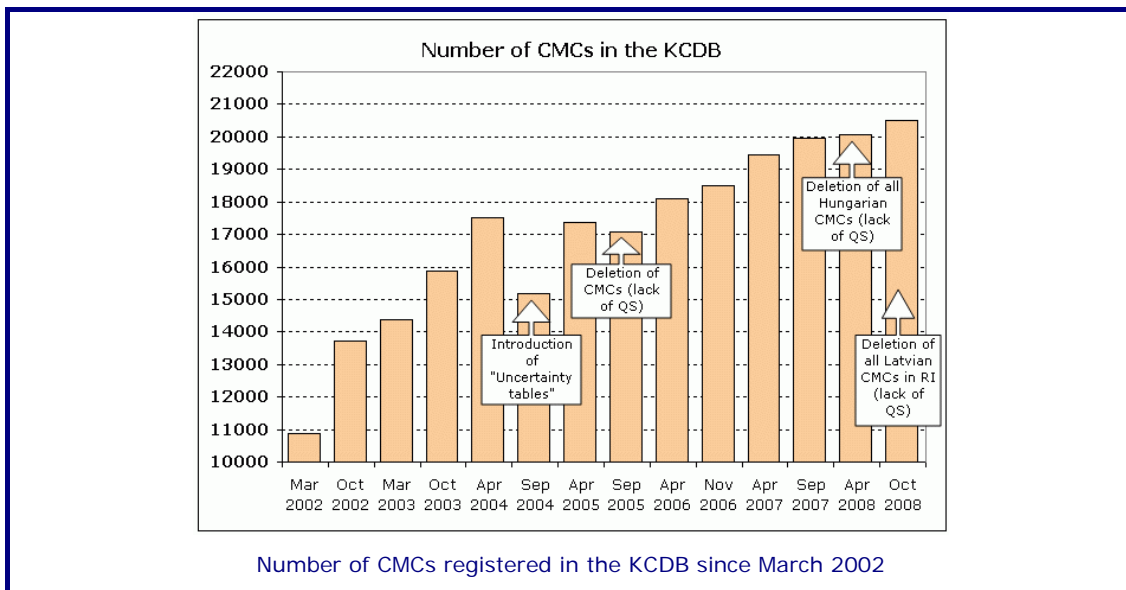
Note that final reports of key and supplementary comparisons posted in the KCDB are also generally published in the series of Metrologia Technical Supplements.

(Reported by Dr C. Thomas, BIPM KCDB Coordinator)

* Latest KC results published

⇒ **Calibration and Measurement Capabilities (CMCs)**

At the end of November 2008, more than 20600 CMCs were published in the KCDB. This is an additional 200 CMCs compared to the time of the last KCDB Newsletter in June 2008. Indeed, over the last six months, 17 newly approved sets of CMCs were published, among which the set identified “APMP.EM.6.2008” (175 new CMCs in Electricity and Magnetism), but 143 CMCs from Latvia were deleted on 1st October 2008 due to the lack of an approved Quality System (QS). Details on the number of CMCs currently published in the KCDB, per country and per metrology area, are available in real-time from the Statistics page of the KCDB.



The first CMCs declared by LACOMET, Costa Rica, were published on 26 November 2008. They cover the field of Mass Standards. This is a successful follow-up of the Workshop on enhancing the participation in the CIPM MRA held in South Africa in May 2007.

The KCDB Office notified the 20th and 21st JCRB meetings that it may be that some of those CMCs that were greyed-out in July 2005, following the decision of the 15th JCRB, will never be re-published as they are out of date and no longer correspond to services delivered by the laboratory. The KCDB Office therefore asked the JCRB to clarify the status of these CMCs: should they be deleted definitively from the KCDB? The 21st JCRB asked the RMOs to clarify the status of these CMCs before the 22nd JCRB meeting to be held in March 2009.

(Reported by Dr C. Thomas, BIPM KCDB Coordinator)

* Latest CMCs published

⇒ A major event at the BIPM: The BIPM Metrology Summer School 2008

The BIPM Metrology Summer School 2008 was held at the BIPM from 29 June 2008 to 11 July 2008. The Co-Directors of the School were Prof. Andrew Wallard, Director of the BIPM, Dr Alan Steele, NRC, Canada, and Dr Mike Sargent, LGC, United Kingdom. Dr Claudine Thomas, BIPM, acted as Scientific Secretary.

The programme included: 39 lectures on four main themes - "From classical SI to new SI", "The international organization of Metrology", "Metrology in Physics and its applications", and "Metrology in Chemistry and its applications"; four workshops on "Chemical methods", "Calculation of uncertainties by Monte-Carlo", "Electricity: the Quantum Hall Effect", and "Quality System, Accreditation, ISO Guide 34, and the KCDB"; comprehensive visits to the five scientific sections of the BIPM (including the fabrication of kilogram prototypes); a visit to the LNE laboratories in Trappes (France), and cultural activities including a talk by Dava Sobel, author of "Longitude", in the Cassini room of the Paris Observatory (in partnership with the LNE and the OP, respectively); and a poster session where 20 posters were presented by the School students.

Dava Sobel lecturing on "Longitude" in the Cassini room at the Paris Observatory on 9 July 2008



A total of 90 students from 34 Member States of the BIPM and Associates of the CGPM attended the School, and we invited a total of 42 teachers for lectures and workshop activities, all experts in their fields, including three Nobel laureates: Prof. Sir Harry Kroto, Prof. William Phillips, and Prof. Klaus von Klitzing, as well as Mrs Dava Sobel, scientific journalist. The heads of the BIPM scientific sections and their staff were involved in the BIPM visits and some of them acted as Chairpersons for the lectures.

The ambiance of the School was studious, hard-working, friendly, warm, and sometimes a bit emotional...



The material related to the School was distributed to the students and teachers on BIPM-customized USB keys, and also made available on the School's access-restricted website.

The answers to a questionnaire addressed to the students show that the BIPM Metrology Summer School 2008 was a great success, especially in achieving its primary purpose of encouraging interactions and friendship between the metrologists of the future.

(Reported by Dr C. Thomas, Scientific Secretary of the BIPM Metrology Summer School 2008)

* JCTYBC – Joint Committee Thank You BIPM staff and Claudine (.PDF file) informal speech pronounced at the Summer School party by Hans Rabus, on behalf of the Summer School students

⇒ **Celebration of the 25th anniversary of the redefinition of the metre**

On 17 November 2008, the BIPM welcomed the celebration of the 25th anniversary of the redefinition of the metre, an event organized by the Committee “Science et métrologie” of the French Académie des Sciences. The present definition of the metre was adopted in 1983 by the 17th CGPM and is based on a fixed value of the speed of light in vacuum. The practical realization of this definition has required the implementation of a “*Mise en pratique*” essentially composed of a number of recommended laser radiations. Over the next decade or so, the metrology community may have to redefine a number of base units of the SI in terms of fixed values of fundamental constants of nature, and the idea of the celebration was to recollect what has happened over these past 25 years and reflect on the present situation.

Around 70 colleagues from the Académie, French laboratories (including the LNE), French universities, and the BIPM attended the celebration, which consisted of a number of talks on the definition of the metre, the measurement of distances in geodesy and astronomy, and the performance of optical clocks and comb lasers. Some of the persons who were active in this field at the BIPM just after the time of the redefinition, and who are now retired, recounted some anecdotes of their experiences. Then a discussion took place on the subject of a possible redefinition of the second based on the transition of an optical clock. It was concluded that criteria should be set by the appropriate bodies (primarily the CCTF and CCU) for selecting candidate clocks. Such criteria may be, for instance, to choose an optical radiation measured by diverse laboratories with coherent results, but clearly the uncertainty of such devices, though continuously improving, is not yet sufficient to consider a redefinition in the coming years.

(Reported by Dr C. Thomas, Scientific Secretary of the Comité “Science et métrologie” de l’Académie des Sciences de Paris)

⇒ **The 14th International Congress of Metrology**

<p>The <u>International Congress of Metrology</u> is held every two years in France, and is organized under the auspices of the Collège Français de Métrologie.</p> <p>The 14th edition, “Metrology’2009”, will take place in Paris from 22 to 25 June 2009, with about 800 participants from 50 countries</p> <p>Press Release</p>	
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Metrology’2009 is a meeting place for industrialists and scientists through oral presentations, poster sessions providing privileged contact with specialists, six round-table sessions, an exhibition showing technical innovations and opportunities to talk with measurement professionals, and technical visits to companies.

The subjects that are planned for the round-table sessions are:

- What’s at stake for metrology in the health field;
- Metrology and reduction of greenhouse effect gas emissions;
- Metrology and industrial performance;

- Industrial temperatures and new materials;
- Accreditation, economic and strategic issues;
- Wireless measurements in the industrial environment.

The title of the plenary session scheduled on Wednesday 24 June 2009 is "International recognition of measurement certificates". This session will provide an opportunity to celebrate the 10th anniversary of the CIPM MRA. Three talks will be presented under the chairmanship of Prof. L. Mussio:

- "Creation of the CIPM MRA: why, how?" by Dr T.J. Quinn, Emeritus Director of the BIPM,
- "Presentation of the key comparison database" by Dr C. Thomas, BIPM KCDB Coordinator, and
- "The benefits of the CIPM MRA for industry, regulators, and accreditation bodies" by Prof. A.J. Wallard, Director of the BIPM.

(Reported by Dr C. Thomas, Member of the Organizing Committee and of the Scientific and Technical Committee of Metrology'2009)

* [Calendar of meetings held at the BIPM](#)

* [Other conferences, workshops and general assemblies](#)