CCL status report to CCU

CCL President Dr Ismael Castelazo
Executive Secretary Dr Gianna Panfilo

1. Overview

The CCL is concerned with matters related to the definition and realization of the metre, practical length and angle measurement, and coordinate metrology. The CCL also provides advice to the CIPM (International Committee for Weights and Measures) in the field of length metrology. In addition, the CCL is responsible for implementation of length - related aspects of the Mutual Recognition Arrangement (MRA), through which National Metrology Institutes (NMIs) recognize each other's measurements.

The future direction for the CCL concerns new areas such as 3D dimensional nanometrology, support for industry's move to non-contact surface scanning (healthcare and energy sectors), extending 3D metrology traceability to larger ranges (aerospace, precision civil engineering), compensating for thermal and refractive index effects at different scales, and issues of traceability at the nanometre and sub-nanometre scales (advanced science).

2. Committee key information

The CCL has 25 members and 4 Observers, its 18th meeting (virtual) will be from 25-27 October 2021.

The CCL is composed by 4 Working groups: the CCL Working Group on the CIPM MRA (WG-MRA), CCL Working Group on Dimensional Nanometrology (CCL-WG-N), CCL Working Group on Strategic Planning (CCL-WG-S) and the CCL-CCTF Working Group on Frequency Standards (CCL-CCTF-WGFS) in common with CCTF. All the working groups will meet virtually few weeks before the CCL meeting in 2021.

3. Last relevant activities

- A Focus Issue on Length metrology has been organized by Metrologia in collaboration with CCL President Dr Ismael Castelazo and Guests editors Dr Andrew Yacoot and Prof Andrew Lewis both from National Physical Laboratory (NPL) to highlight recent developments in fundamental length metrology and its applications. For this Focus Issue, the contributions deal with latest research in traceable dimensional and angle metrology, across all length scales, in particular papers fulfil one or more of the following criteria:
    - report on novel research into providing traceability to the SI metre
    - describe work which benefits from the reworded metre definition and updated Mise en Pratique
    - show research being used to address issues and applications in industrial measurement scenarios relating to fundamental traceability
    - make contributions to the accuracy of the length-related component of derived units like pressure, acceleration or other units with a length-related component
    - report on novel contributions to length-related constants that are of fundamental importance to physics.

Up to July 2021, 6 papers have been published.

- Survey on digitalized SI metre has been sent to members and observers of CCL to investigate on aspects of a “digital Si metre”, to introduce the discussion on the meaning of “Digitalisation of the SI metre”, on the use of it and on how it might benefit all stakeholders in the SI. The community answered to the questionnaire showing interest and contributing to the discussion.
- Migration of CMCs in quantity equation with the development of some guidance. One tool has been developed to avoid manual conversion.