Consultative Committee for Photometry and Radiometry (CCPR)

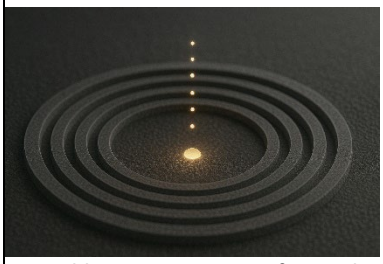
President M.L. Rastello, Executive Secretary J. Viallon

Meets every 3 years **Members/Observers/Liaisons** 26/2/2	**Working groups**: KC, CMCs, and WG-SP		
Comparison activity	**Completed**	**In progress**	**Planned**
CCPR KCs (& CC Supplementary)	21 (2)	7 (1)	2 (0)
RMO KCs (& SCs)	25 (16)	9 (12)	2 (1)
CC Pilot studies	1	1	2
CMC	1551 CMCs in 104 service categories		

CCPR fosters collaborations and innovation across a broad network of stakeholders, including NMIs, RMOs, DIs, and international organizations such as the CIE and WMO. The CCPR also engages with critical entities like the CIPM/CGPM, ISO, IEC, and various standards and testing organizations to address the evolving metrological needs of industries. CCPR's strategic approach centers on facilitating joint activities that bring together these stakeholders to identify and develop measurement standards and methods capable of meeting both current and future practical demands. Through these partnerships, CCPR promotes the continuous advancement of photometry and radiometry measurement capabilities serving a diverse array of industries and scientific fields. This ensures the alignment of global measurement systems and fosters innovation in sectors with high impact.

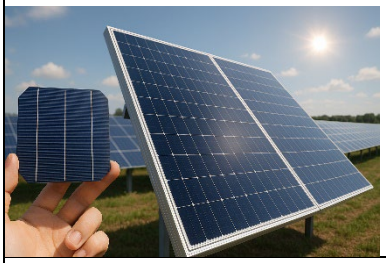
Supporting the third revolution in lighting, the CCPR is advancing photometric and radiometric measurement methodologies to address the unique characteristics of LED lighting, including temporal light modulation and complex spectral power distributions. These factors are critical for accurately quantifying the impact of light on humans and ecosystems. In response to the widespread adoption of solid-state lighting, CCPR is developing standardized measurement protocols and reference artifacts through international collaboration. These efforts ensure global consistency and traceability in optical measurements, enabling reliable performance evaluation, supporting energy efficiency goals, and reinforcing CCPR's mission to underpin innovation with robust and precise metrology**.**

Promoting SI-traceable measurements to support studies of Earth resources and environments. the CCPR's work is aligned with the UN Sustainable Development Goals, addressing key environmental challenges. This includes developing reliable field measurements for topics such as food security, biodiversity and detecting/monitoring small signals, necessitating decadal time scales, of Essential Climate Variables (ECVs). Since ECVs must be measured globally—often from space—and more than two-thirds require optical measurements, the CCPR is committed to ensuring trust in these vital indicators through the development and provision of targeted transfer standards and methods that can be employed pre- and post- launch including the development of SI-Traceable Satellites able to deliver calibrations from orbit.



Advancing radiometric measurements using single-photon detector and source standards are vital for accurately quantifying optical radiation at extremely low intensity levels, down to individual photons. This capability is crucial in fields such as quantum key distribution for secure communication, quantum computing, bio-photonics, and nano/MEMS photonic devices. To address these emerging challenges, the CCPR has established task groups focused on few-photon metrologies and single-photon radiometry. These groups are working to develop characterization methods, common terminology and standards to support technologies that require high sensitivity in photon detection, ensuring accuracy in low-intensity optical measurements.

Traceable measurements of optical properties of materials are essential for accurately characterizing product appearance, which significantly influences consumer purchase decisions by shaping perceptions of quality and desirability. The CCPR strategy focuses on developing traceable measurements of optical material properties and predictive modeling to precisely control surface visual appearance, enhance physics-based virtual rendering models, and characterize novel functional materials. By advancing these techniques, CCPR ensures reliability, precision, and stability in quality control while providing a metrological framework for research on human perception and vision across real and virtual worlds.



Energy & photovoltaics are key areas where the CCPR plays a vital role by providing SI-traceable measurements for accurate performance evaluation. As the world transitions to renewable energy, precise measurement of photovoltaic systems is crucial for ensuring efficiency and reliability. The CCPR supports the development and deployment of current and future solar technologies by establishing and advancing standardized metrology for testing and calibration. This ensures optimal energy generation, supports global sustainability goals, and fosters innovation in renewable energy, aligning with international efforts to address climate change and promote a sustainable future.

Workload Trend & Workload Management

10 KCs test the principal techniques and methods for the primary realization of measurement scales in photometry, radiometry and spectrophotometry and are regularly organized at the CC level with a repeat cycle of 10 years. The CCPR is currently on the second cycle for all the KCs. There are also supplementary comparisons at the RMO level to test specialized measurement scales or standards in the field of CCPR.