

CCT Member and Observer Activity Report

Period: May 2024 to May 2026

Institute: National Institute of Standards and Technology

State economy: United States of America

Number of persons involved in thermometry of the institute: 10

Short summary of research and development:

- Investigated the use of CO₂ and SF₆ as alternative fixed points to Hg in the ITS-90, gave a presentation at TEMPEMEKO 2025 and submitted manuscript to *Metrologia*
- Used Rydberg states of cold atoms to perform primary thermometry and published results in *Phys. Rev. Res*
- Developed Electro-optical frequency comb Doppler-broadening thermometry and published results in *Optics Express*
- Continued research into atomic and molecular systems for radiation thermometry using cooled atoms and molecules
- Performed research into 3d temperature reconstruction using magnetic particle imaging with results presented at TEMPEMEKO 2025
- Published summary paper on Johnson noise thermometry
- Continuing research into thermal infrared radiation thermometers calibrated using ITS-90 fixed points
- Development of new lock-in amplifier with linearities of 0.003 % for infrared radiometry and radiation thermometry
- Performed analysis to link NIST TPW scale to CCT K7
- Completed American Institute of Physics Conference Proceedings of the Tenth International Temperature Symposium held in Anaheim, USA from April 3 to April 7, 2023
- Studied immersion and heat flux issues in Zn cells and presented at TEMPEMEKO 2025
- Developed new cryo-cooled Ar point realization apparatus

Short summary of recent comparison activity:

- Participated in SIM.T-K9-4 (Draft A status)
- Participated in CCT K8
- Participated in SIM.T-K6 (pilot)
- Participated in SIM.T-K8 (pilot)