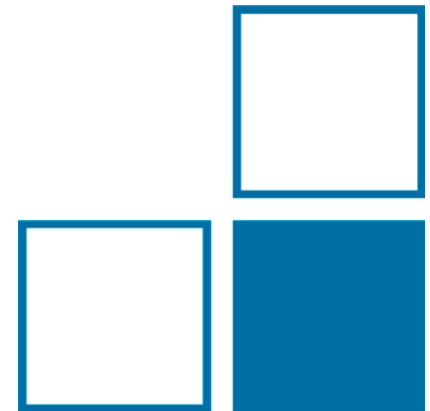


# CCM Working Group on the Realization of the Kilogram (CCM WGR-kg)

18 May 2017

Horst Bettin, PTB Germany

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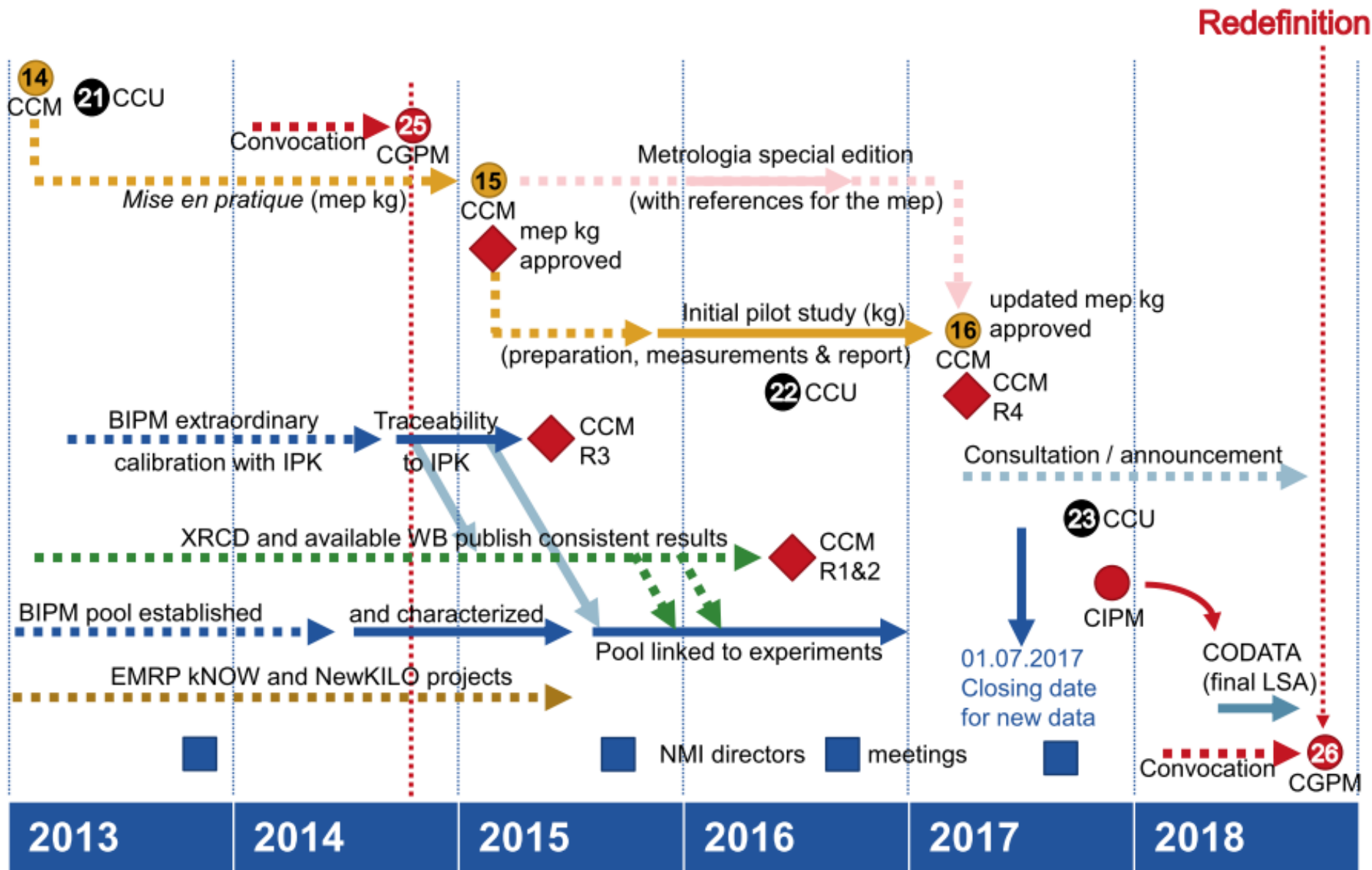


## New member (and delegates)

- UME (Turkey): Haji Ahmadov

**Next meeting of the CCM WGR-kg**  
**Friday 6 July 2018** in Paris, France,  
**satellite meeting of the CPEM 2018**  
**Together with the CCEM WGKG**

# Joint CCM and CCU roadmap for the new SI



## Preconditions for a new kg definition

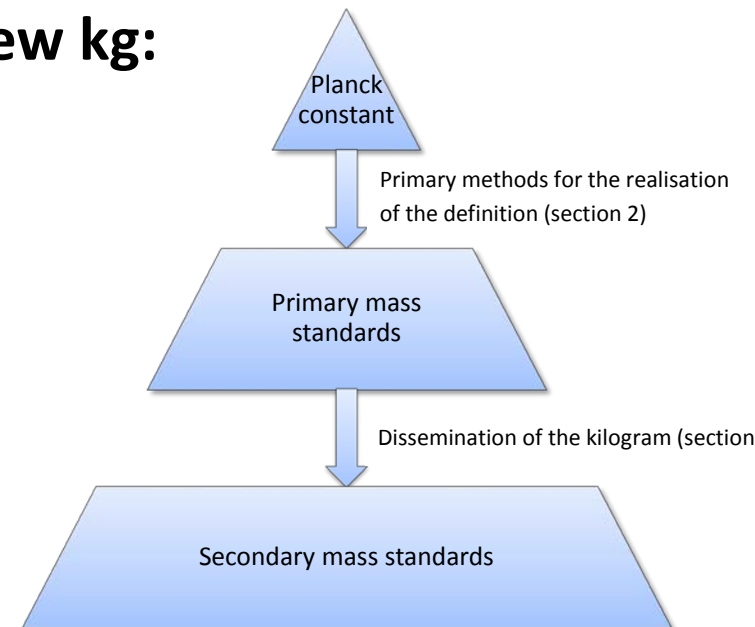
- New calibrations using the IPK
- 3 independent determinations of  $h$  with rel. unc.  $\leq 5 \times 10^{-8}$
- Two different methods
- 1 determination of  $h$  with rel. unc.  $\leq 2 \times 10^{-8}$
- Consistent results
- Ensemble of reference mass standards at BIPM
- *Mise en pratique*
- Procedures of realization and dissemination validated

## Alan Steele reports on recent experimental results and outlook

**Michael Stock**  
**reports about the status of the**  
**CCM Pilot Study CCM.R-kg-P1**  
**“Comparison of future realizations**  
**of the kilogram”**  
**and on-going Key Comparisons**

## History

- Version No. 9 provisionally accepted by CCM in 2015
- Draft version 10 distributed on May 2, 2017
- 2<sup>nd</sup> draft version 10 distributed on May 10, 2017
- Pilot Study: Measurements finished, Report Draft A-2
- Focus Issue of *Metrologia* on the new kg:  
8 papers published (plus foreword)  
at least 3 papers are still missing





## ***Mise en pratique* of the definition of the kilogram**

### **Changes**

- **SI Brochure: exact wording of definition**
- **Focus Issue of *Metrologia*: references**

### **Open questions**

- **Update after the Pilot Study necessary? – No.**
- **Additional publications about dissemination, Pilot Study?**
- **Use of the ensemble of reference mass standards?**
- **Technical protocol of the BIPM.M-K1 comparison?**
- **Periodicity of NMI participation for CMCs, see CCM Strategy**

**Stephan Schlamminger:  
Focus issue of *Metrologia* 2016  
“Realization, maintenance and dissemination  
of the new kilogram”**



## Preconditions for a new kg definition

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## Lars Nielsen reviews the Situation with the CCM Conditions

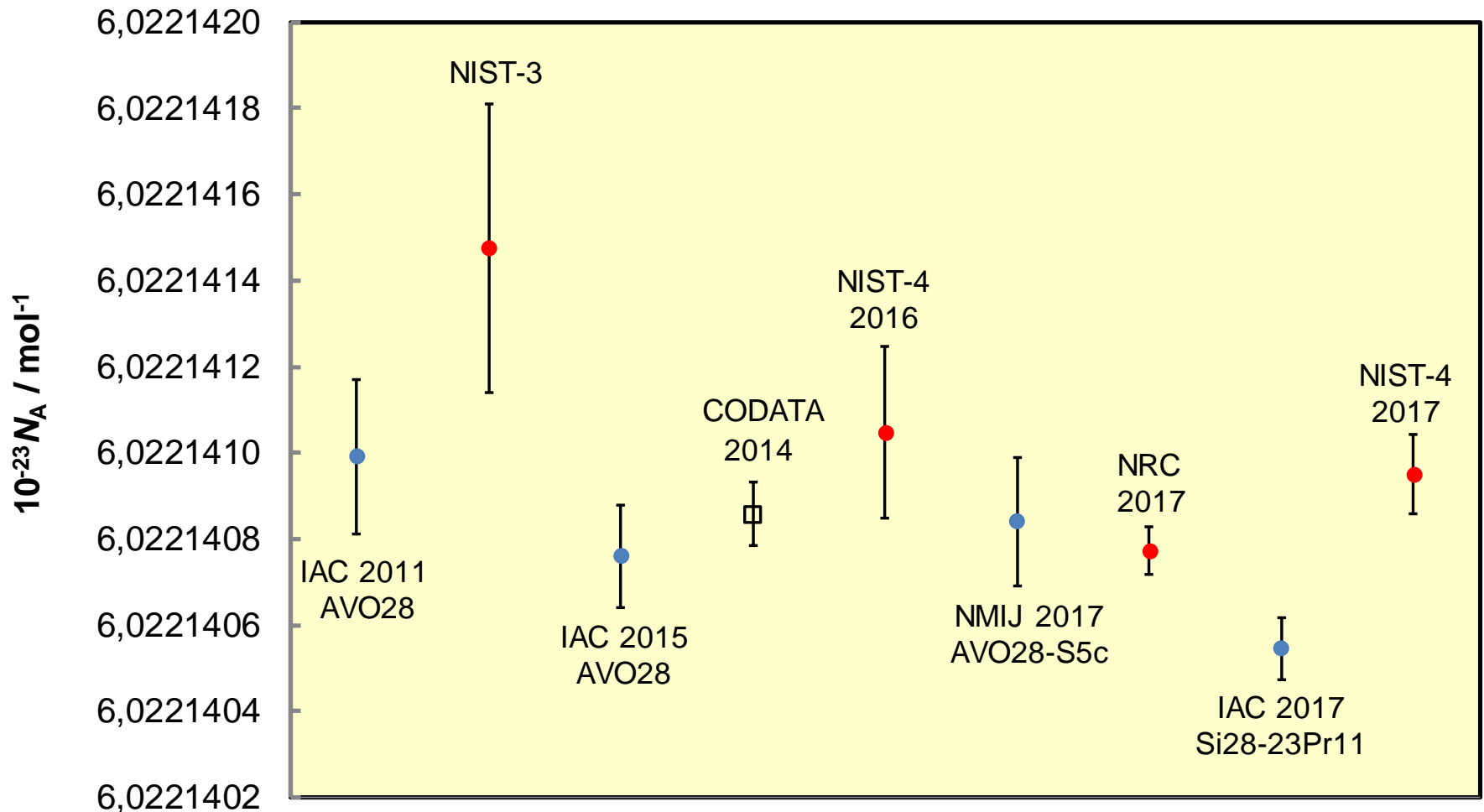
## Arguments in favour

- Low uncertainties
- Everything prepared, the world expects the revised SI
- Existing differences acceptable, if mean value is used

## Arguments contra

- Discrepancies, differences more than 60  $\mu\text{g}$
- Drift 100  $\mu\text{g}$  in 10 years, future?
- Experiments not well understood
- New Avogadro values for AVO28 spheres?
- Mean values over many years?
- More Kibble balances in work
- Ensemble of Reference Mass Standards ready? History known?

# Consistency?





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