

Metrological Timelines for visualizing and digitalizing metrological traceability

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Metrological Timelines for visualizing and digitalizing metrological traceability



VIM4 2CD: [metrological traceability](#)

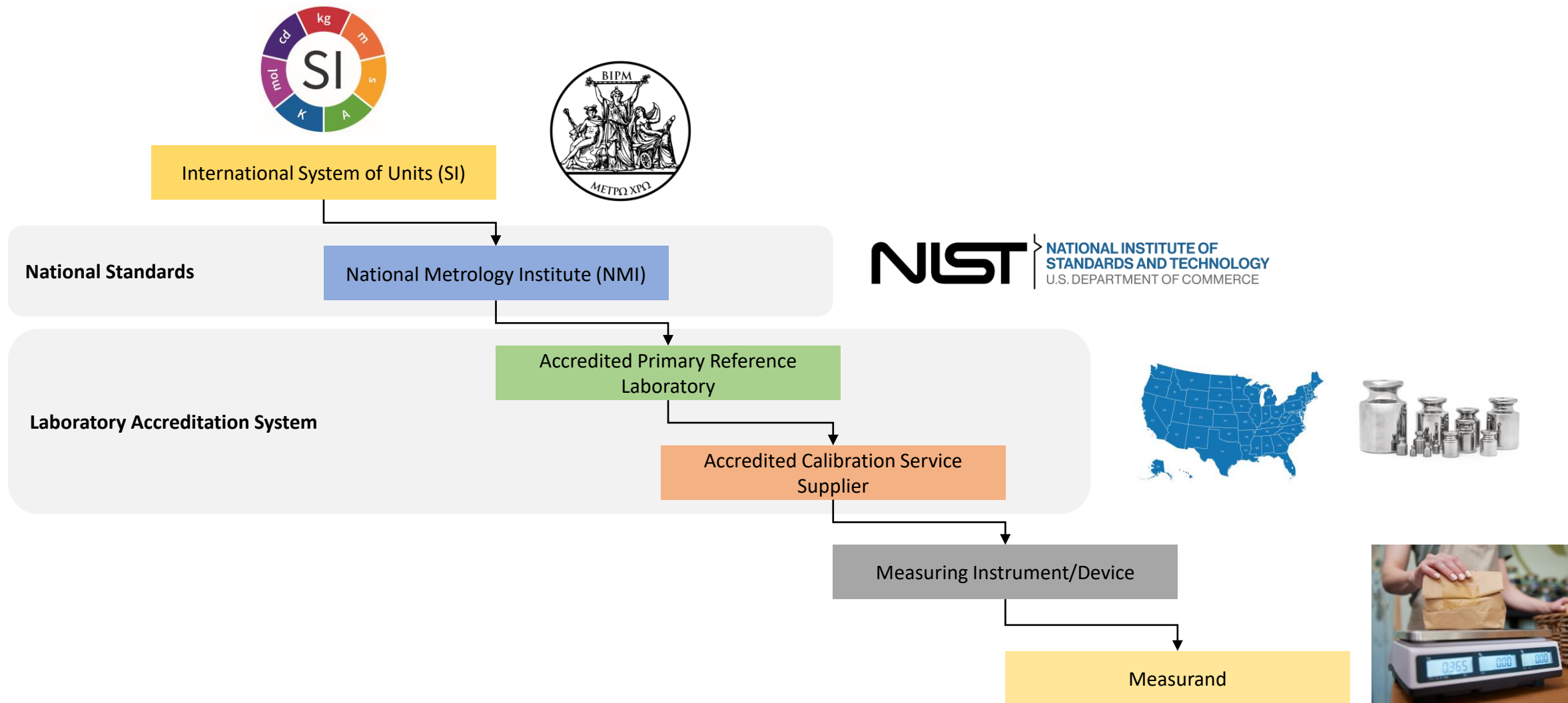
property of a **measurement result** whereby the result can be related to a reference through a documented unbroken chain of **calibrations**, each contributing to the **measurement uncertainty**

VIM4 2CD: [metrological traceability chain](#)

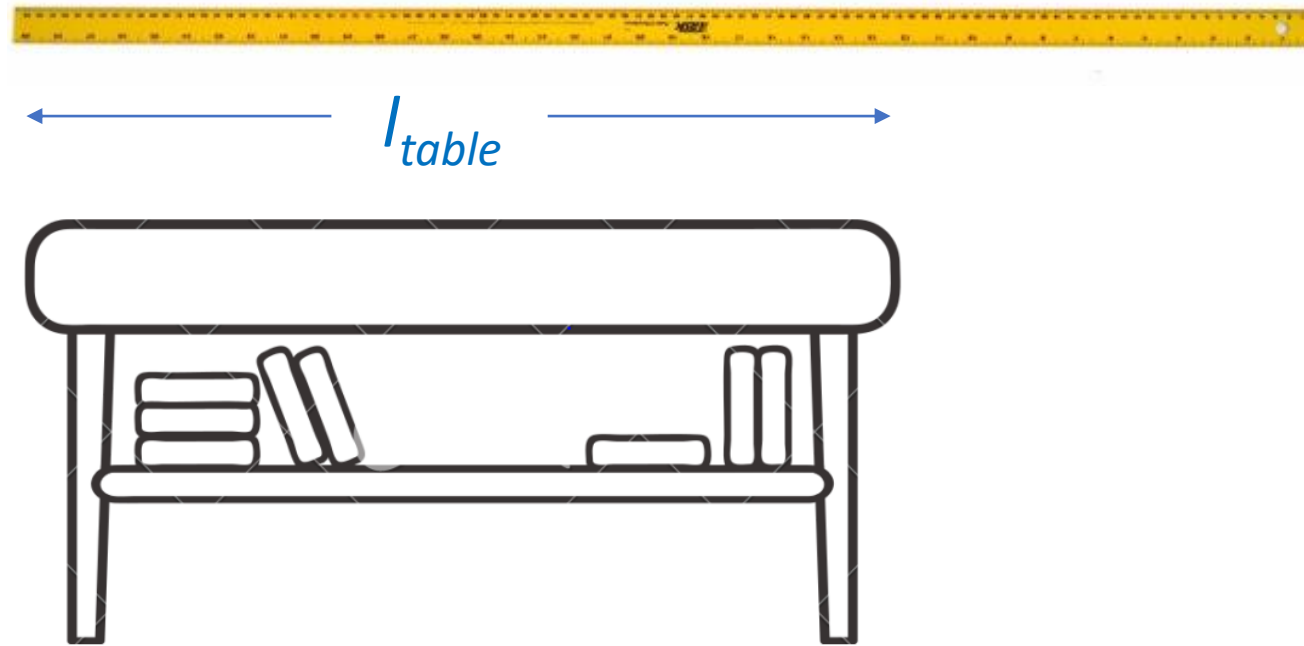
sequence of measurement standards and calibrations that is used to relate a **measurement result** to a reference

Metrological Traceability

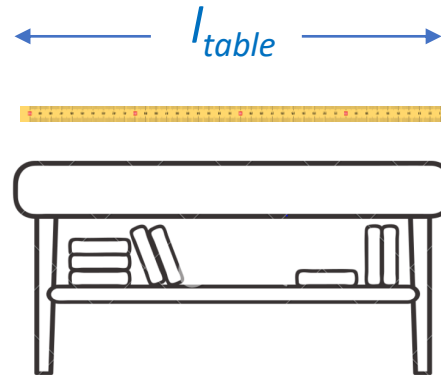
An Unbroken Chain from the SI to the Marketplace



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Paris, here I come ...!



Image courtesy of the BIPM

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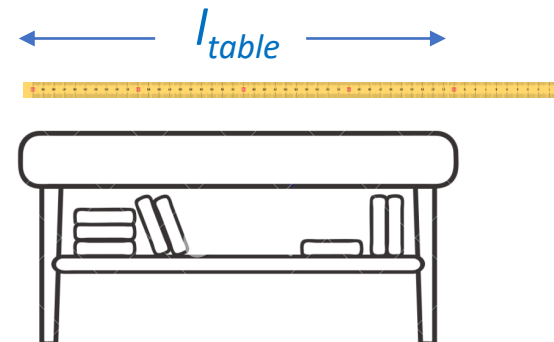
BIPM, here I am ...!



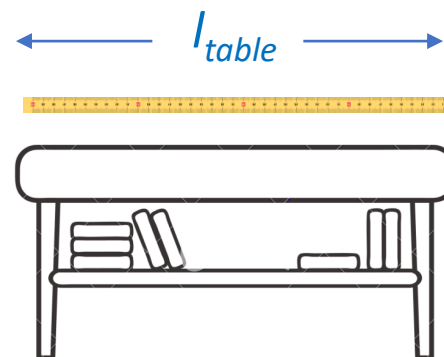
Image courtesy of the BIPM



Home I go ...!



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Measurement Assurance (Control) Chart

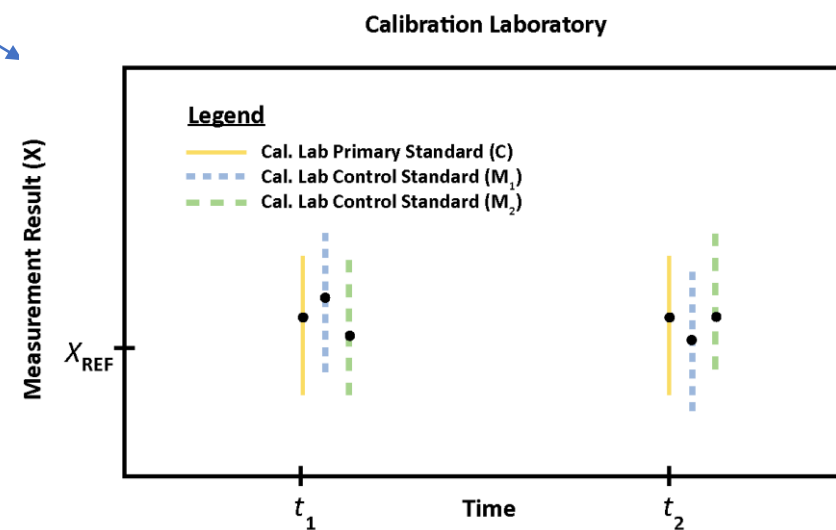
Control standard M_1



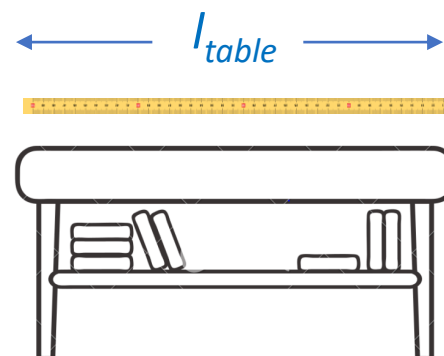
Control standard M_2



Control artifact



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Control standard M_1



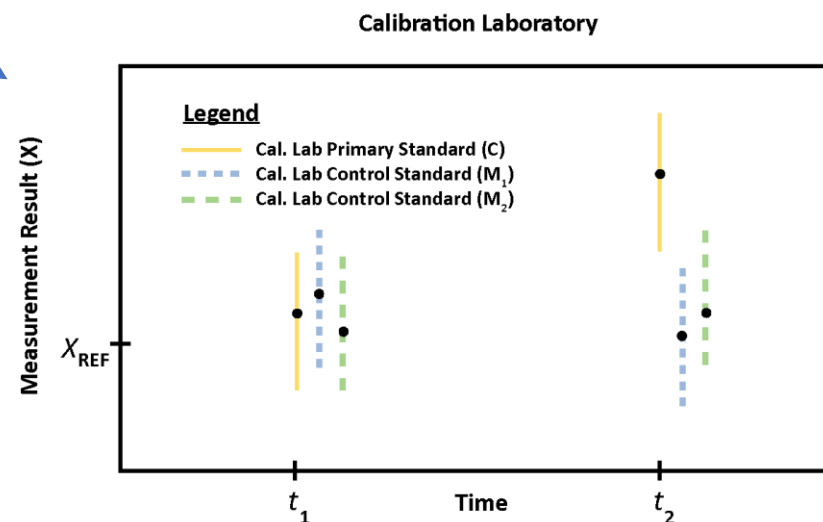
Control standard M_2



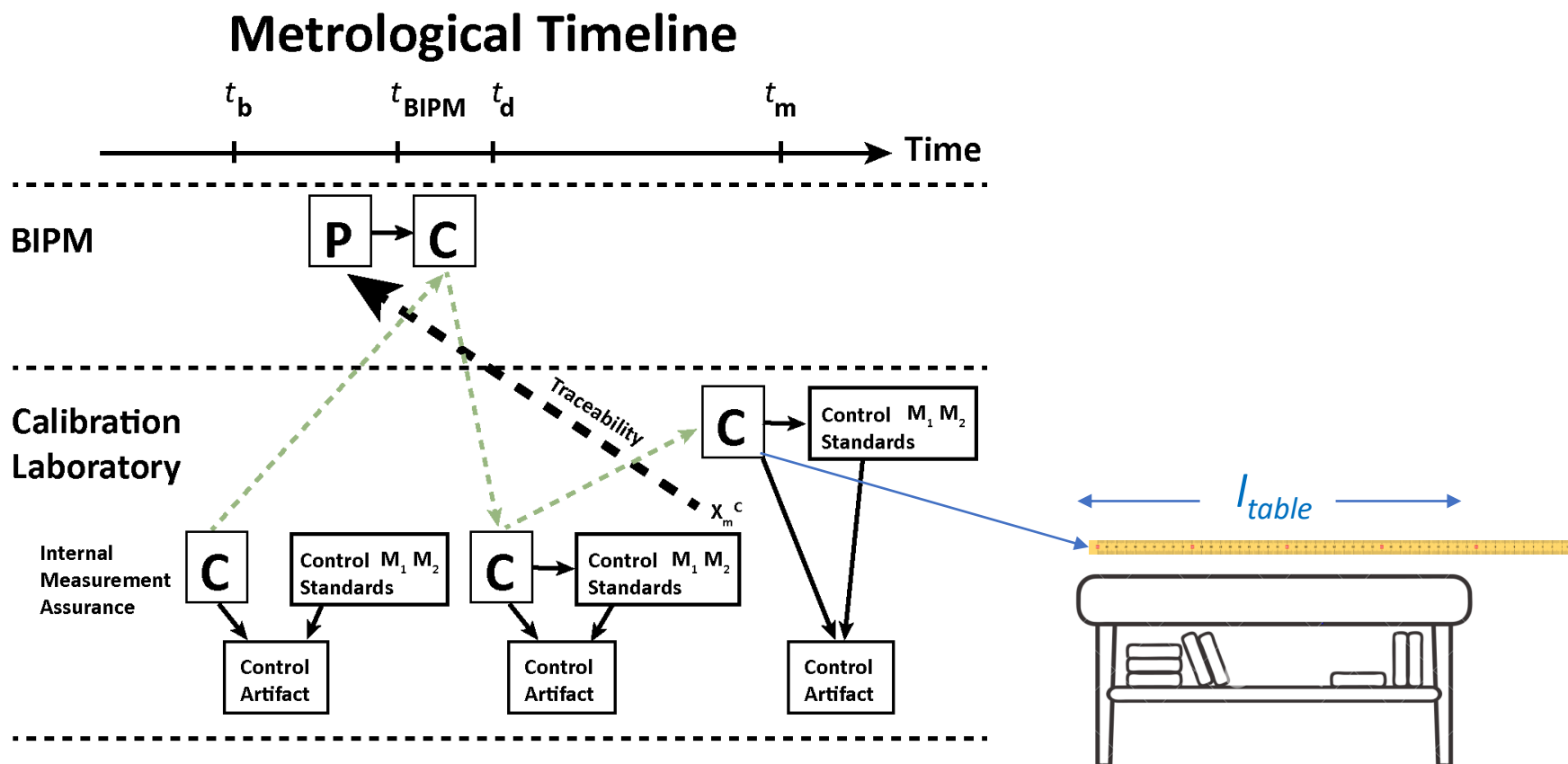
Control artifact



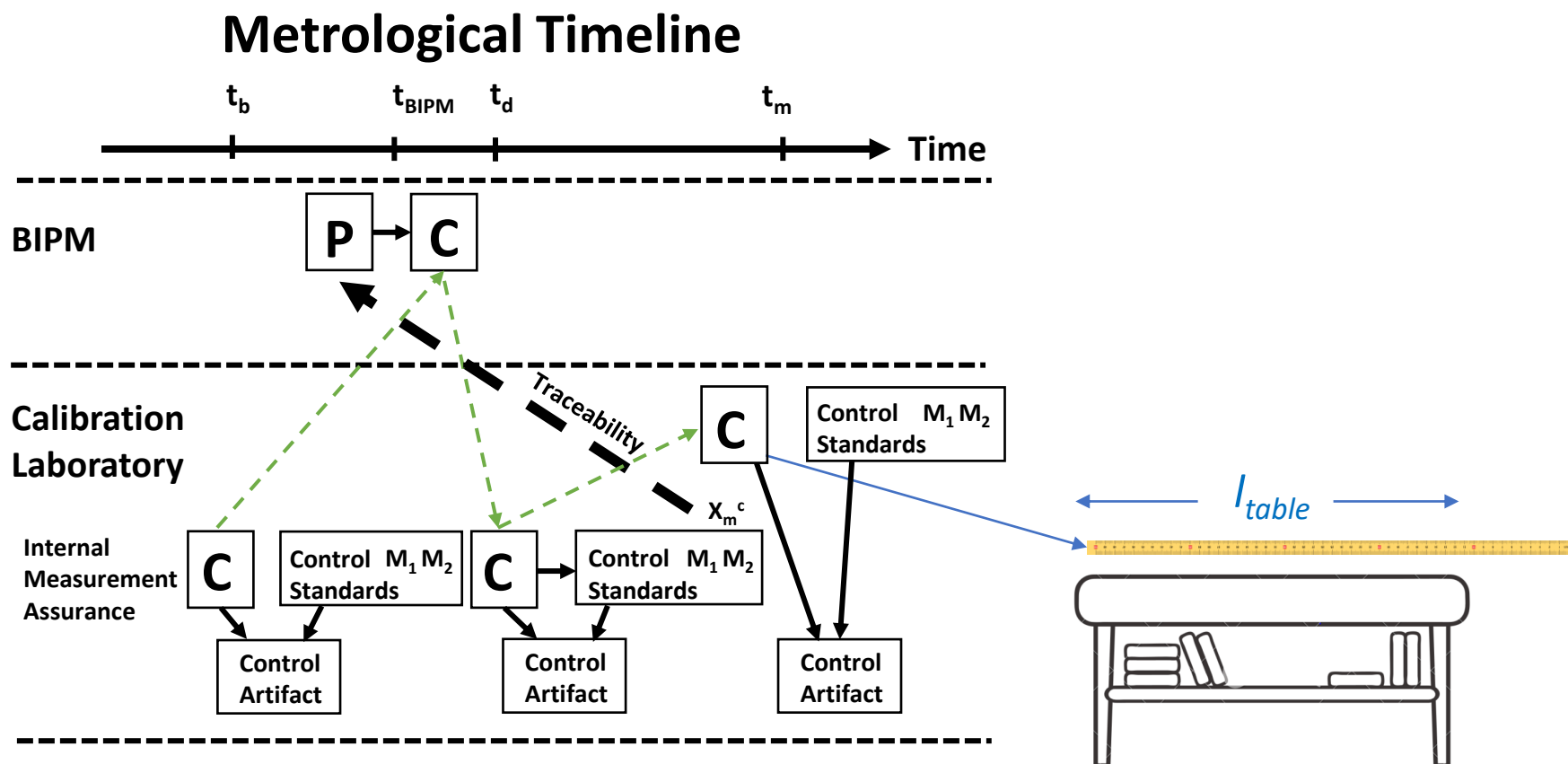
Measurement Assurance (Control) Chart



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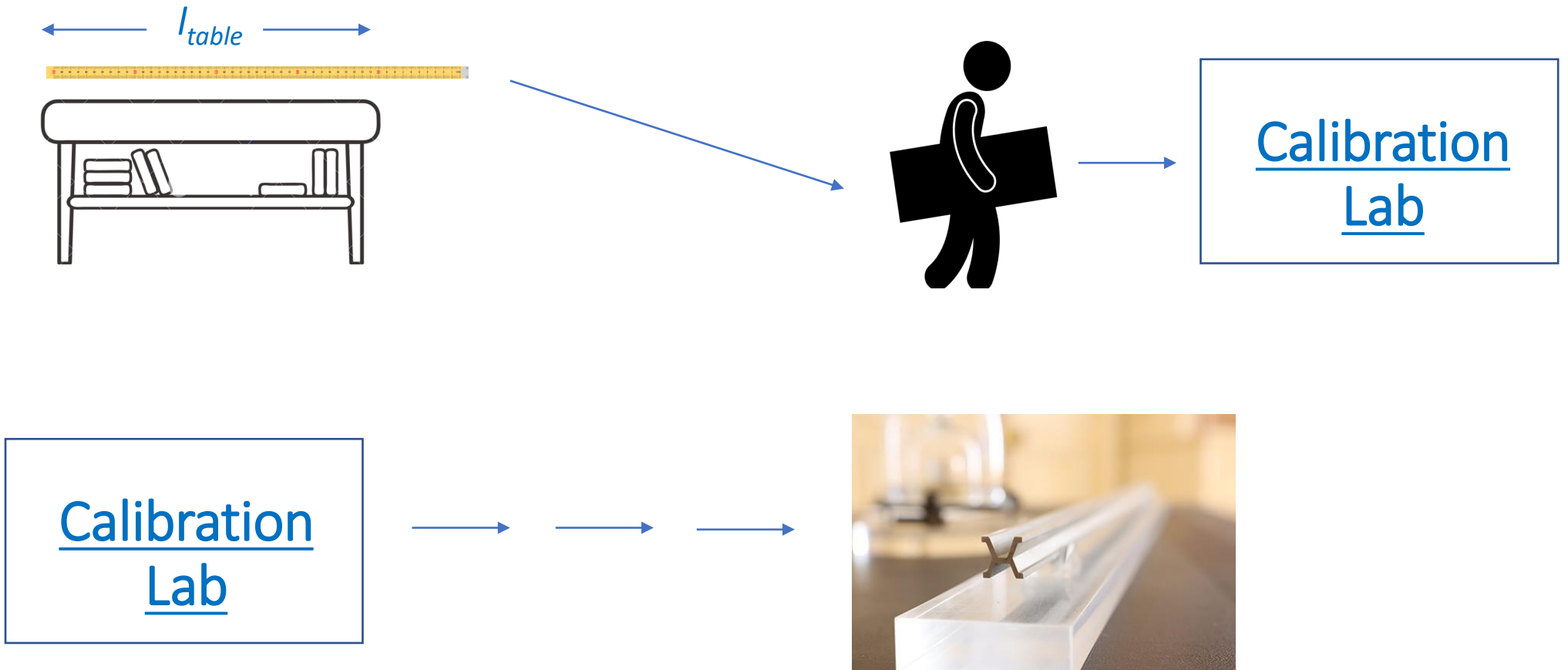
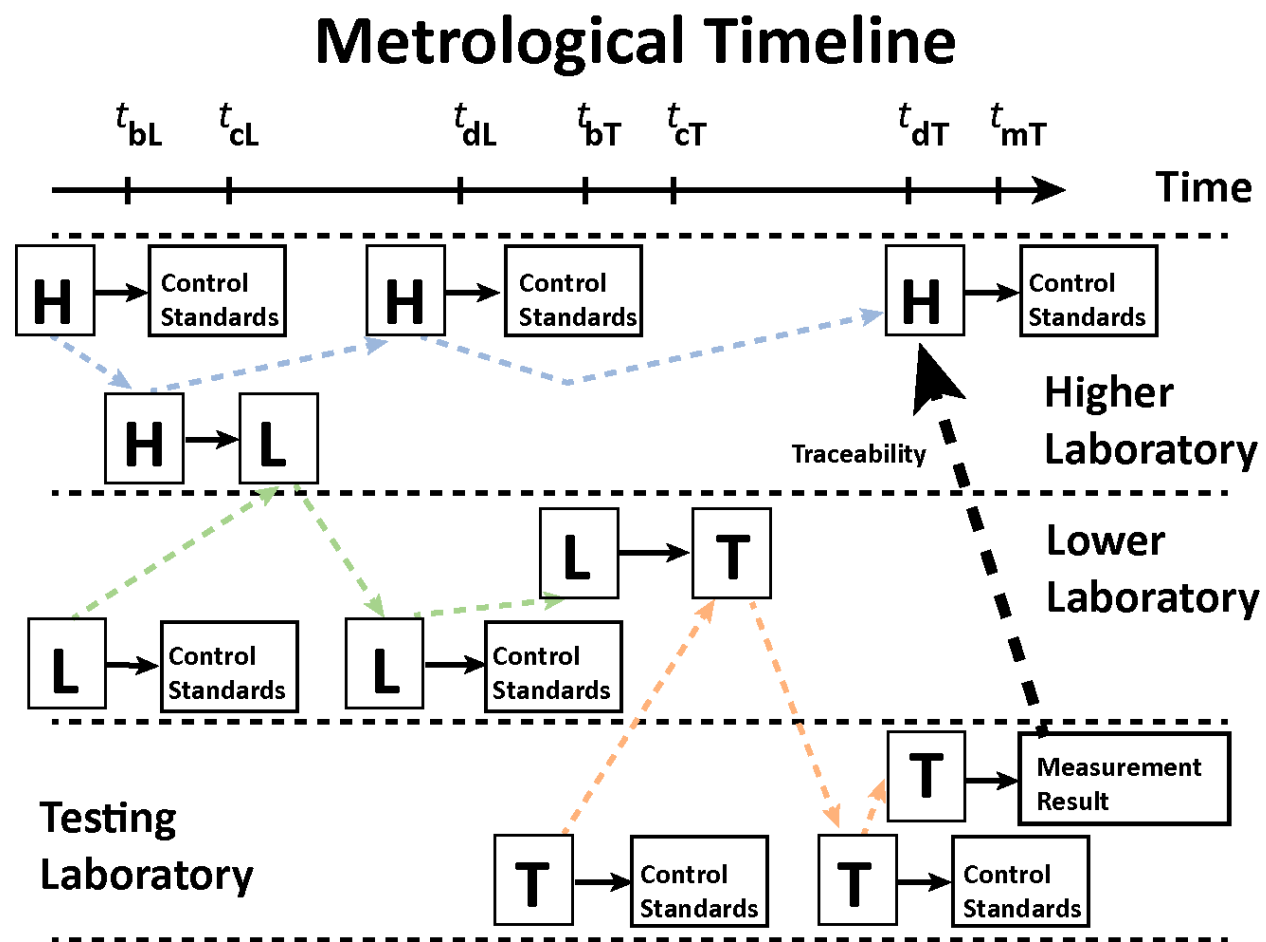
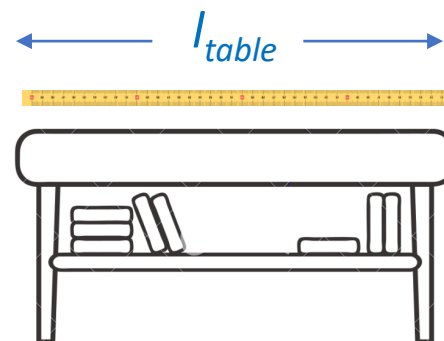


Image courtesy of the BIPM

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Traceability considerations with the 9th SI Brochure

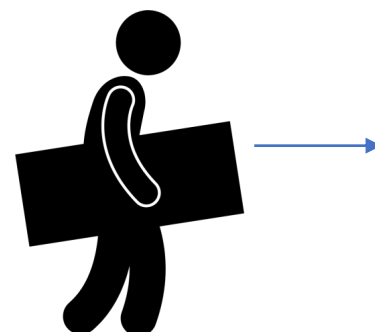
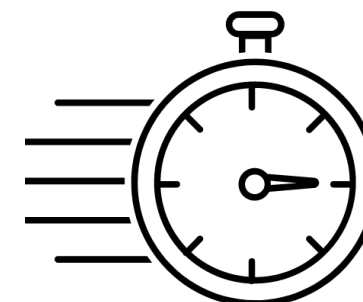
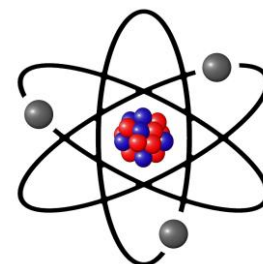


Image courtesy of the BIPM



Defining constants $\Delta\nu_{Cs}$ and c

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Defining Constants and Mises en Pratique

Definition of measurement unit for quantity under consideration

Mise en pratique

Physical realization of definition of measurement unit for quantity under consideration

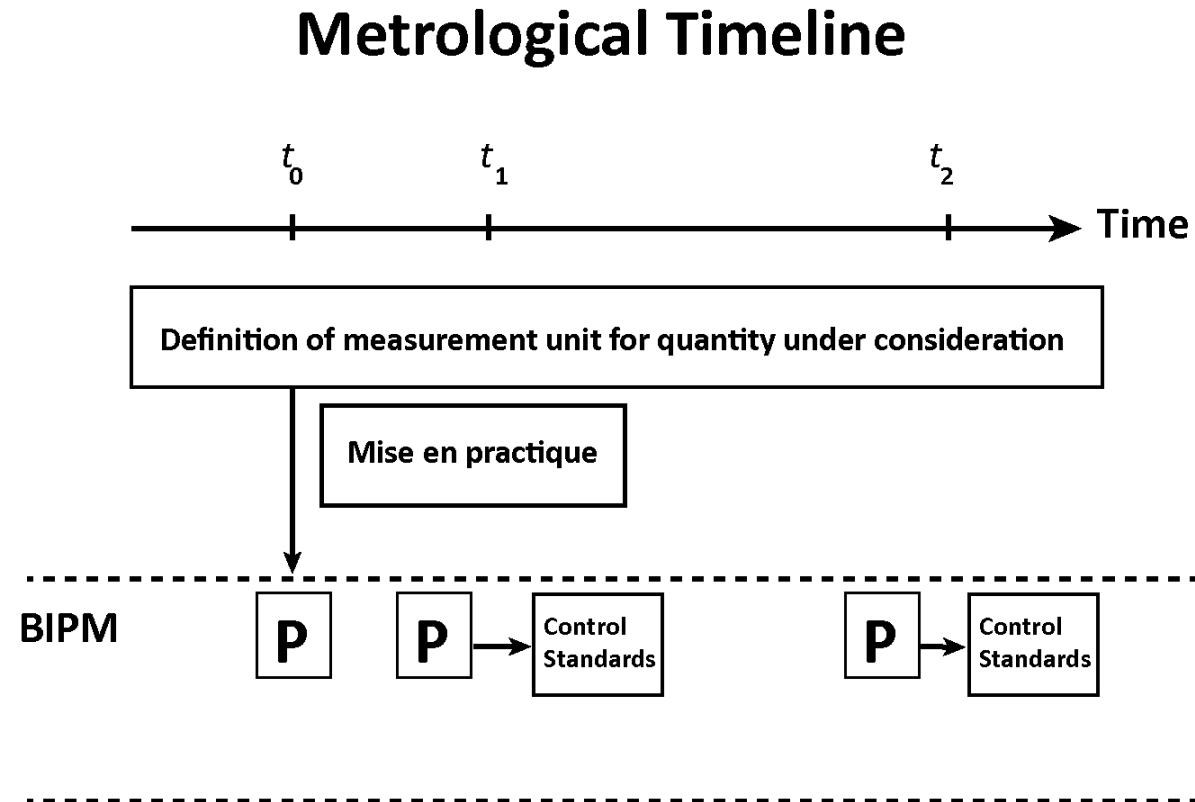
Calibration

P_1 : Working standard₁ in **BIPM**,
National Metrology Institute, or other laboratory ...

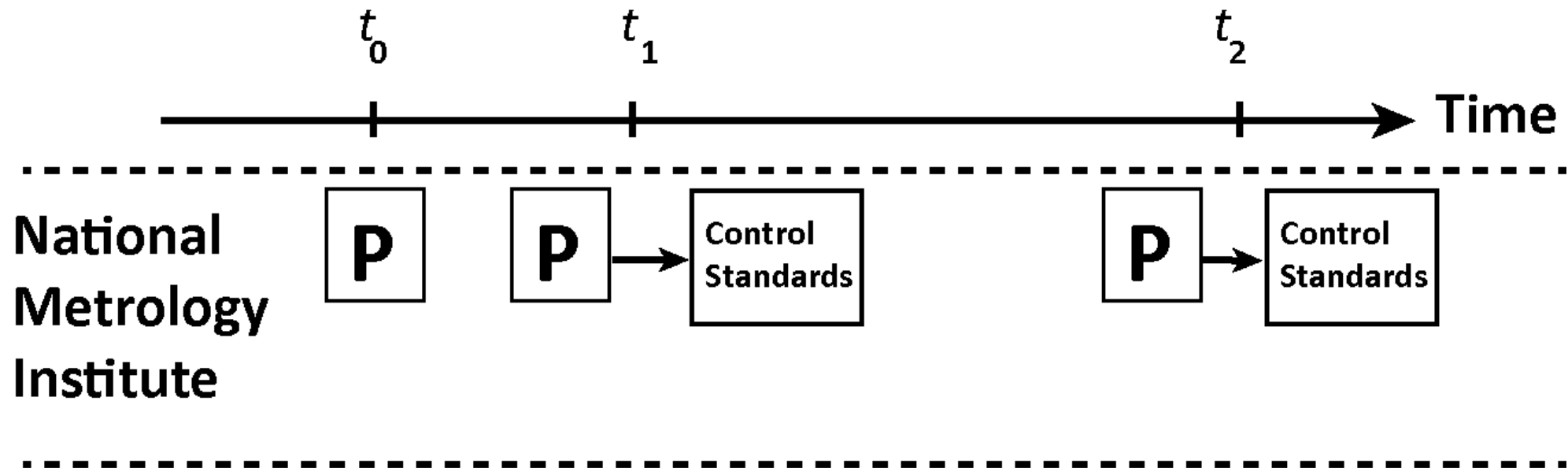
Calibration

P_2 : Working standard₂ in **BIPM**,
National Metrology Institute, or other laboratory ...

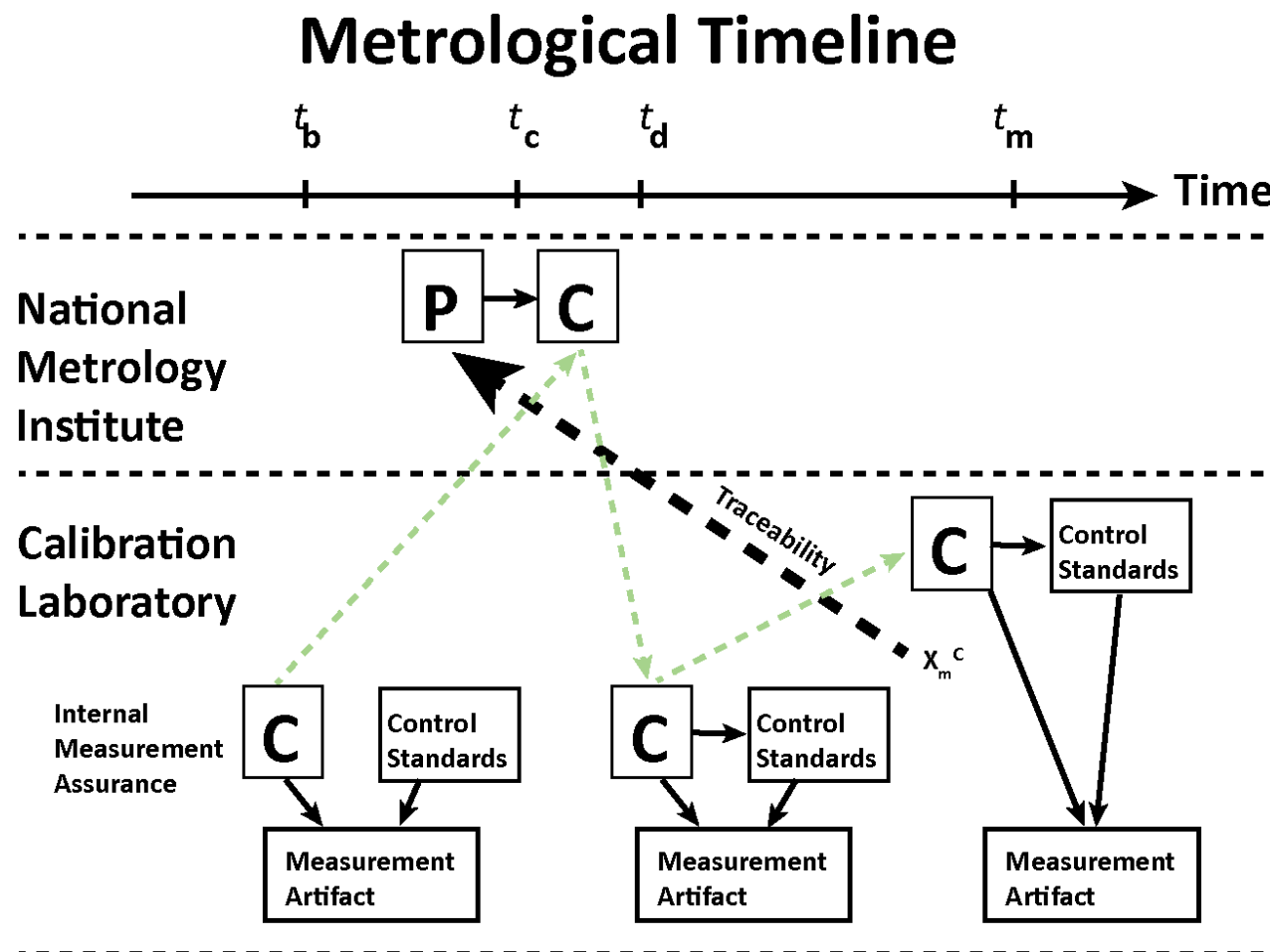
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Metrological Timeline



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Thank You !!



Ehrlich, C. and Rasberry, S. (1998)
Metrological Timelines in Traceability,
Journal of Research (NIST JRES), National
Institute of Standards and Technology,
Gaithersburg, MD



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Traceability questions:

- 1) What correction should be applied to a measurement result obtained at a given time with my instrument to match the result that would be obtained using the instrument (standard) to which traceability is desired?
- 2) What is the uncertainty of this corrected measurement result?

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