

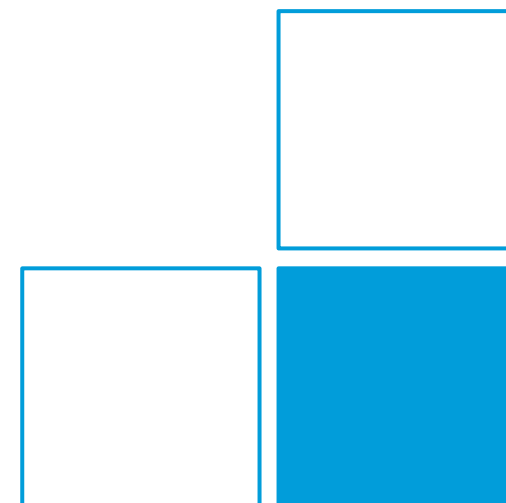
Welcome to the
Physikalisch-Technischen Bundesanstalt

National Metrology Institute of Germany

Division Precision Engineering

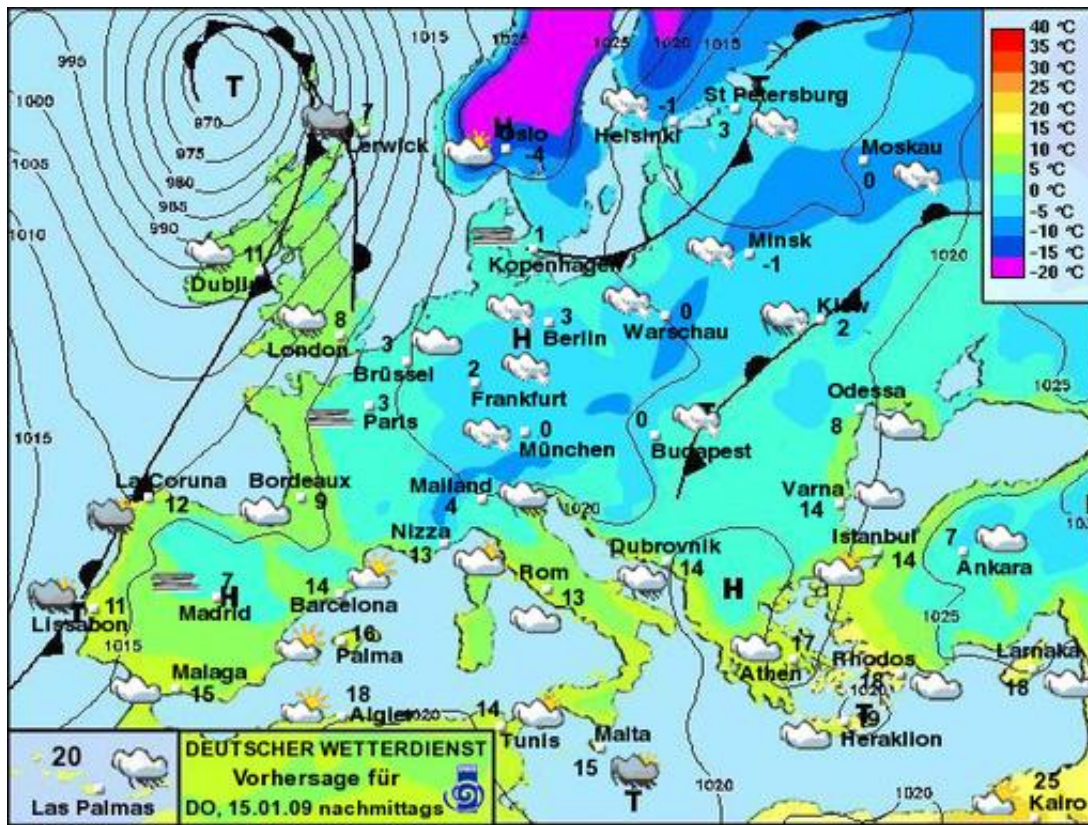


Die Physikalisch-Technische Bundesanstalt, das nationale Metrologieinstitut, ist eine wissenschaftlich-technische Bundesoberbehörde im Geschäftsbereich des Bundesministeriums für Wirtschaft und Energie.

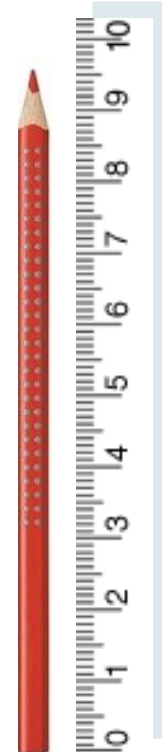


National Metrology Institute

Meteorology

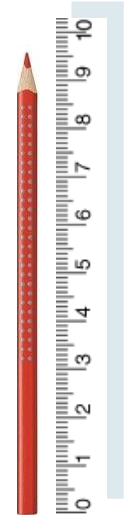


Metrology



Metrology:

- Science and Application of correct measurement
- Traceability of results to the SI through national standards
- Determination of results with verification of uncertainty



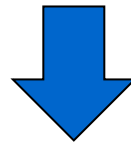
The Physikalisch-Technische Bundesanstalt:

- National Metrology Institute, founded in 1887
- Associated to Federal Ministry of Economics and Energy (BMWi)
- ca. 170 Mio. € Budget, plus third party funding
- ca. 1250 permanent staff and ca. 650 temporary staff, including ca. 135 PhD students
- 650 scientific papers per year
- Many legal tasks assigned to PTB (starting with basic constitutional law)



Jahre genau
1887 - 2012

»Progress and Reliability
in Metrology«



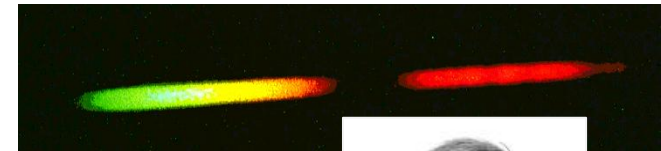
Better Measurement Methods



Better products



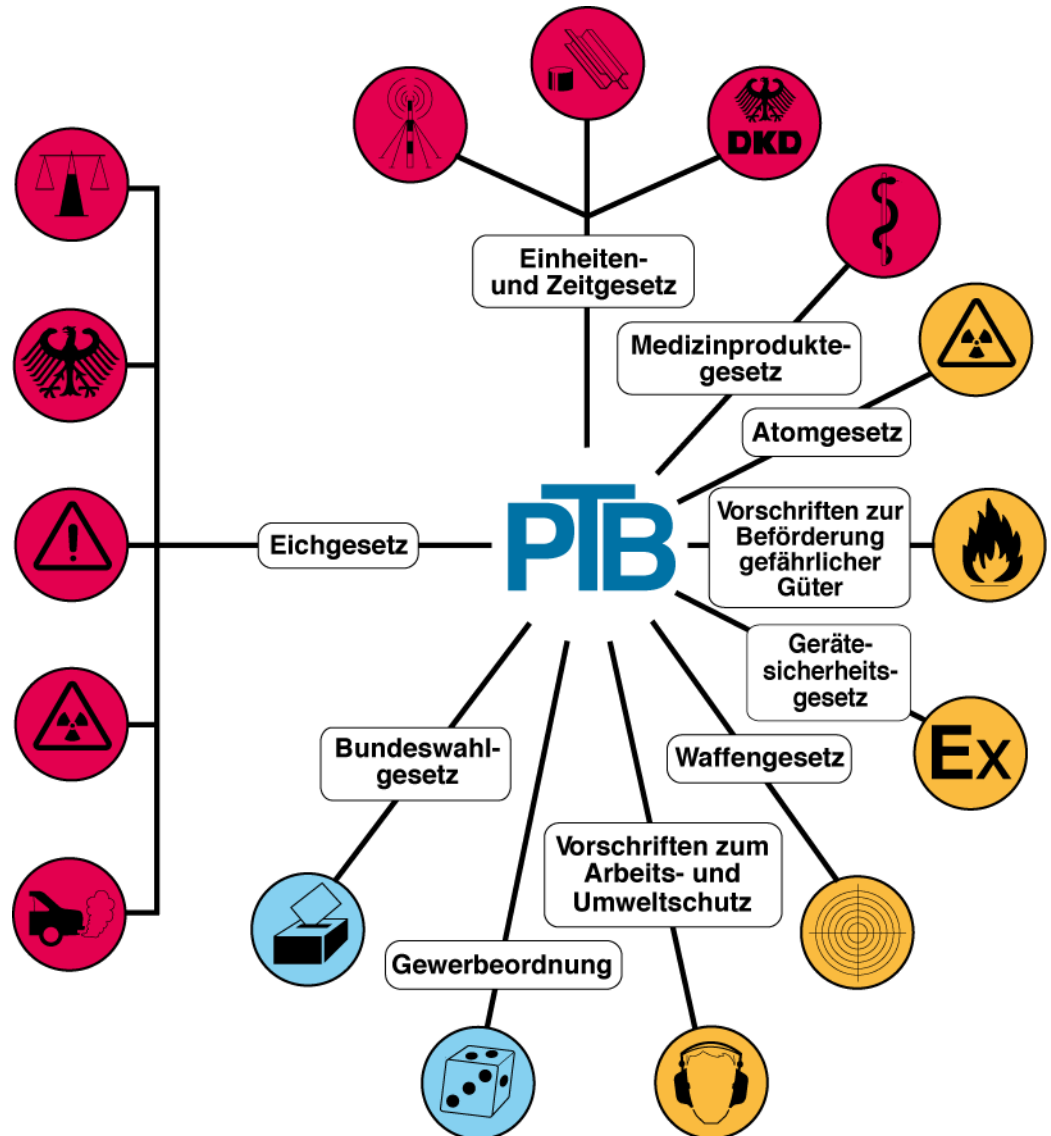
New science



Better protection



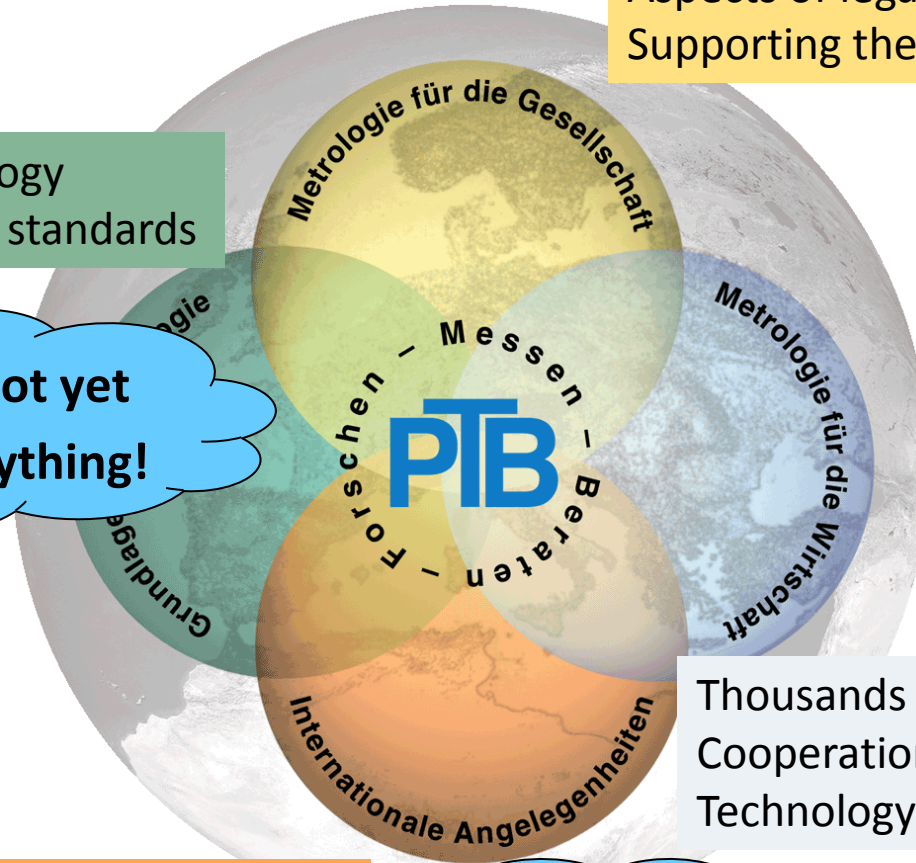
22 laws and regulations assign specific tasks to the PTB



Aspects of legal metrology
Supporting the verification authorities

Basic research for metrology
Improvement of national standards

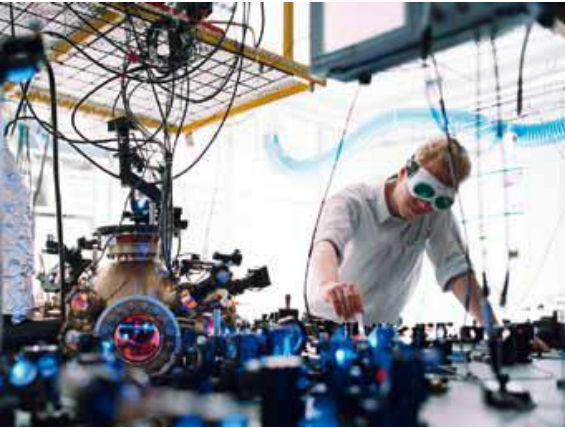
**We could not yet
measure anything!**



Thousands of calibrations per year
Cooperation projects with industry
Technology transfer

Technical cooperation
International representation of Germany in
metrology related issues

**One only buys, which
could be measured!**



PTB is not a typical government agency:

- 60 % Research / Development
- 30 % Calibration / Services
- 10 % Consulting / Cooperation in bodies

PTB is not a typical research institute :

- Constitutional mandate – ensuring uniformity of metrology in Germany
- Cutting-edge research required as inherent part of PTB's duties
- Many tasks are mandated by law



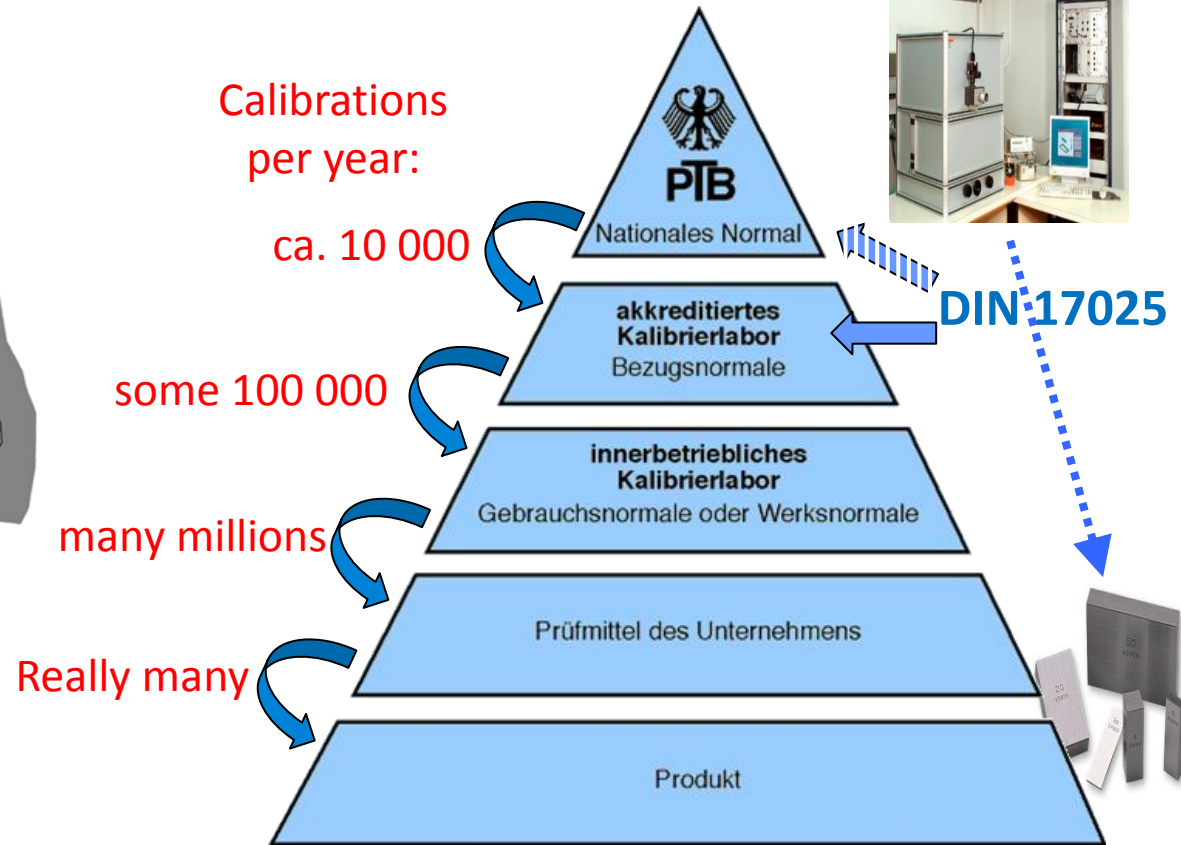
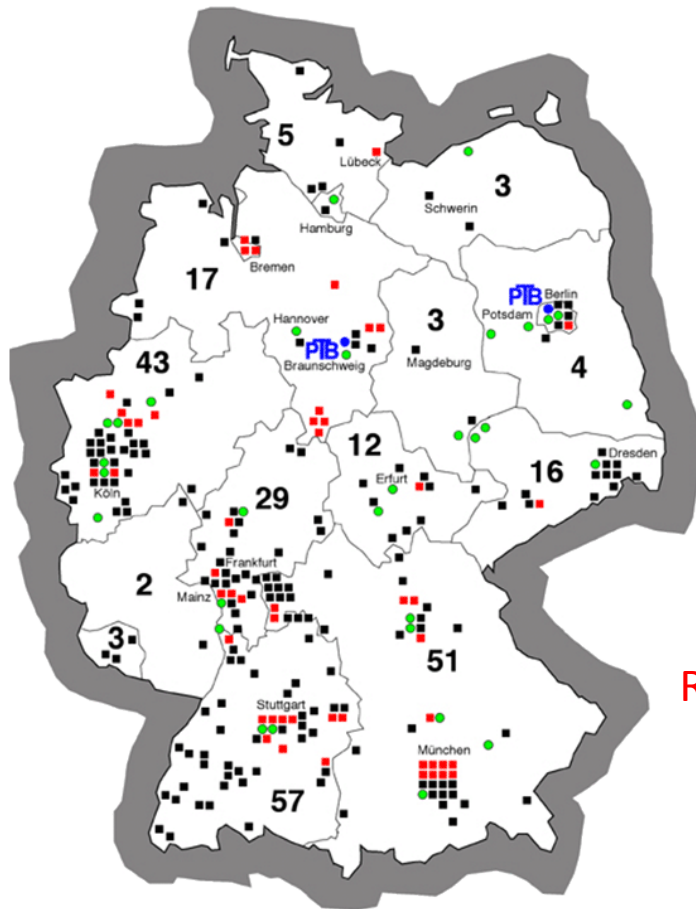
PTB forms an essential part of the scientific and technical infrastructure of Germany

Dissemination of PTB-time:

- Modem-Service
1200 accesses per day
- Internet-Information-Service (ntp)
300 Mio. accesses per day
- DCF77 radio transmission time signal
*more than 200 Mio. receivers
in Germany and Europe*



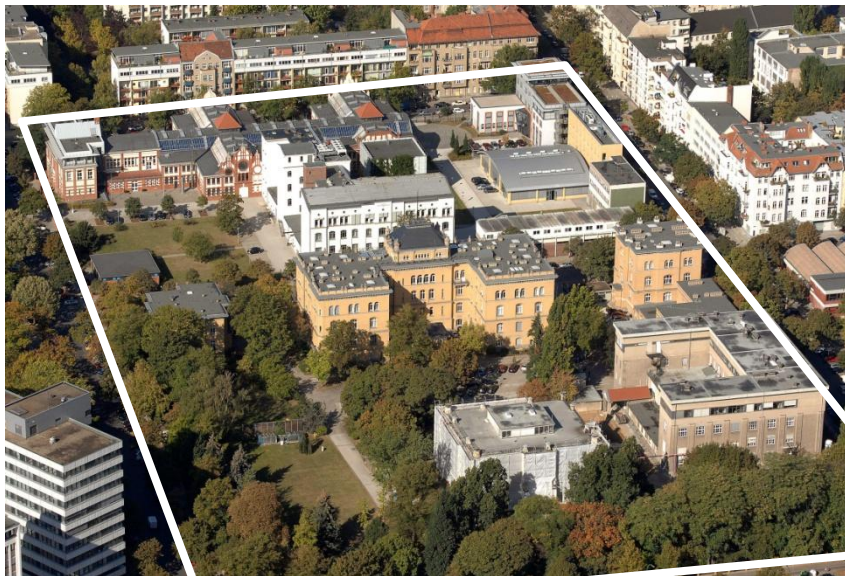
Traceability of the reference standards of verification offices and accredited calibration laboratories



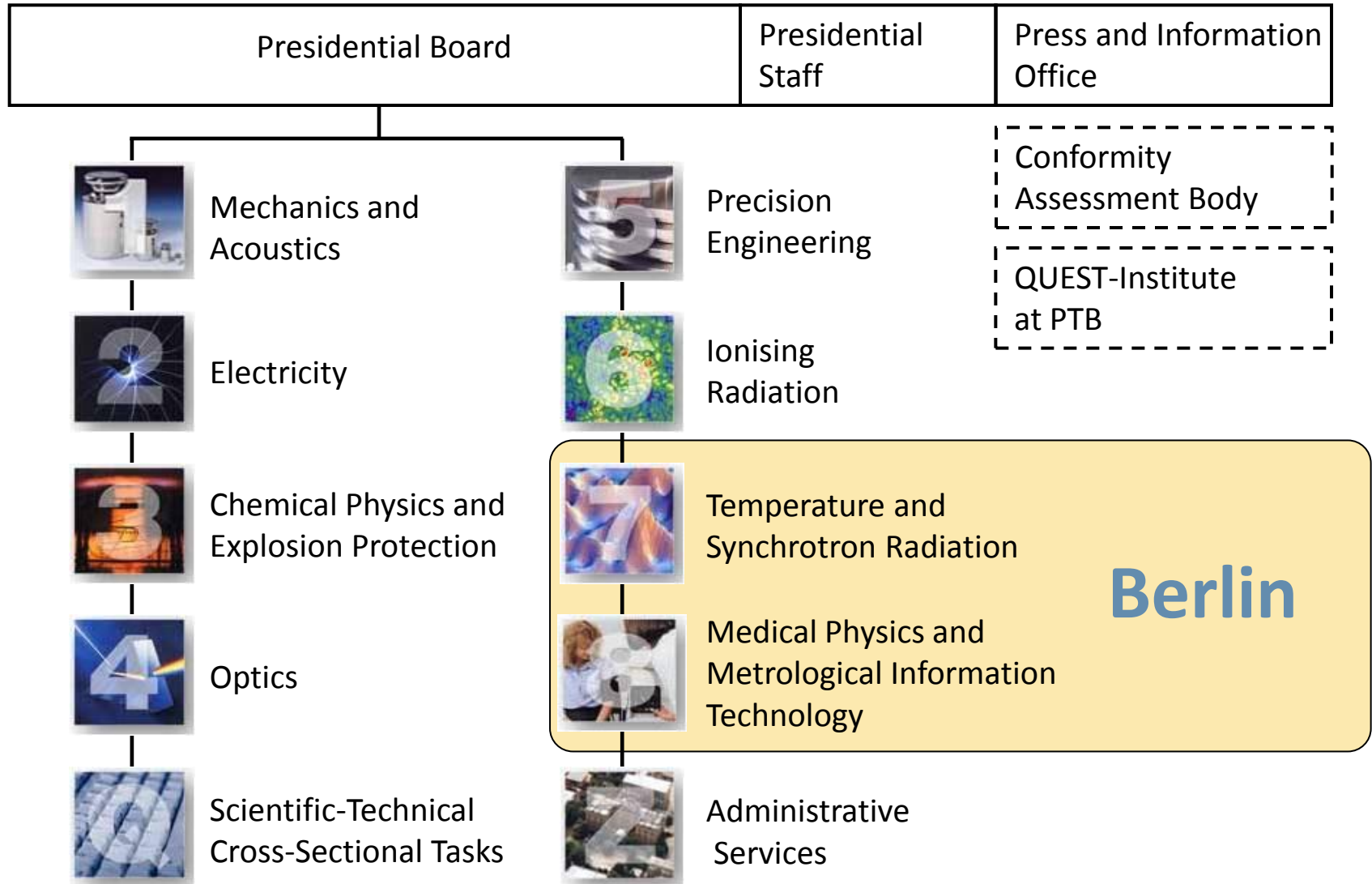
Braunschweig



Berlin-Charlottenburg



PTB-Laboratory at BESSY II and MLS
Berlin-Adlershof



Staff at PTB Berlin: ca. 450

5.1 Surface Metrology

L. Koenders

Hardness and tactile probing
U. Brand

Nanoforce metrology
V. Nesterov

Layer thickness and crystalline standards
I. Busch

3D roughness metrology
L. Koenders (ad.)

Calibration of Roughness Parameters
L. Jung-Albrecht

5.2 Dimensional Nanometrology

J. Flügge

Length and angle graduations
R. Geckeler

Displacement interferometry
J. Flügge (ad.)

AFM linewidth metrology
G. Dai

Electron microscopy
C.G. Frase

Scanning probe metrology
H.-U. Danzebrink

5.3 Coordinate Metrology

K. Kniel

Geometrical Standards
O. Jusko

Coordinate Measuring Machines
K. Wendt

Gear and Thread
M. Stein

Multisensor coordinate metrology
U. Neuschäfer-Rube

3D calibrations
J. Hirsch

5.4 Interferometry on mat. measures

R. Schödel

Interferometry on Spheres
A. Nicolaus

Multiwavelength Interferometry for Geodetic Lengths
F. Pollinger

Interferometric Calibration of Gauge Blocks
P. Franke

Interferometry on Prismatic Bodies
R. Schödel (ad.)

Conformity of Length Measuring Machines
I. Lohse

5.5 Scientific Instrumentation

F. Löffler

Design
H. Lüllmann

Fabrication of Measuring Instruments
P. Wagner

Manufacturing of Components
J. Rother

Surface technology
D. Hagedorn

Training
F. Löffler (ad.)

Manufacturing Technology
R. Meeß

Quality management: O. Jusko

Thank you for your attention!



**Physikalisch-Technische Bundesanstalt
Braunschweig und Berlin**

Bundesallee 100
38116 Braunschweig

Abteilung Fertigungsmesstechnik

Telefon: 0531 592-5010

www.ptb.de

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