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Shaping the future: The role of metrology in a changing world

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In November 2018, the General Conference for Weights and Measures, CGPM, established by the Metre Convention in 1875, decided in its 26th meeting on the revision of the International System of Units (SI). The signatory states of the Metre Convention represent about 98% of the world's economic power and, thus, the SI can be considered the backbone of international trade and the reliability of measurements worldwide.

A changing and increasingly digital world requires the SI to expand to a digital representation, thus enabling further scientific progress and innovation. In particular, the application of artificial intelligence (AI) poses an enormous potential for products and business models. Metrology can unlock this potential by building trust in AI-based evaluation of sensor data and model predictions. Furthermore, it plays a central role within the framework of quality infrastructure, creating global standards for innovative products.

These innovative technologies will in turn contribute significantly to tackling

current challenges such as climate change, resource scarcity and securing quality of life of future societies.

This talk will provide an overview of the advantages brought about by latest revision of the SI and related activities carried out by Physikalisch-Technische Bundesanstalt (PTB). In addition, it gives an outlook on future perspectives regarding realisation of units, which affects a wide spectrum of scientific and industrial sectors, ranging from AI-based medical devices and green energy solutions to quantum-technology-based space applications.