

THE NEW KELVIN

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The General Conference on Weights and Measures agreed at its 24th meeting in October 2011 on new definitions for four of the seven base units of the International System of Units (SI). Kilogram, ampere, kelvin, and mole will be defined in terms of fixed numerical values of the Planck constant, elementary charge, Boltzmann constant, and Avogadro constant, respectively.

A refined value of the Boltzmann constant suitable for defining the kelvin is presently determined by fundamentally different primary methods like acoustic gas thermometry, dielectric constant gas thermometry, noise thermometry, and the Doppler broadening technique. Details of the measurements, progress to date, and further perspectives will be reported.

Necessary conditions to be met before proceeding with changing the definition are given. The consequences of the new definition of the kelvin on temperature measurement will be outlined. After the new definition has been adopted as well the present method, the International Temperature Scale of 1990, ITS-90 and primary thermometers can be used to realize the unit. Both methods to realize the kelvin will be reviewed in this presentation.

For the complete paper, see:

J. Fischer, Progress towards a new definition of the Kelvin, [Metrologia 52 \(2015\) S364–S375](#)