

THE PLANCK CONSTANT AND THE REDEFINITION OF THE SI

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Wednesday, November 14 ❖ 4:00 P.M. ❖ 118 NSH

Refreshments at 3:30 P.M. in 202 NSH

A redefinition of our system of units, the SI, is currently discussed and may be implemented as early as 2014. The definitions of the base units will move away from artifacts to fundamental constants. For example, the definition of the kilogram, which is currently given by the mass of an artifact kept near Paris, will be replaced by fixing the value of the Planck constant. One way to realize the kilogram after redefinition is with a device called watt balance.

In my presentation, I will give you a brief overview of the new SI system emphasizing the shortcomings of our current system of units. I will further explain the principle of the watt balance and a competing approach to measure the Planck constant. I will give an update of the current status of different watt balance experiments worldwide. I will end my talk explaining the two watt balances at NIST: NIST-3, a balance that is currently used to measure h and NIST-4 a balance that is under construction with the goal to realize mass after redefinition.