

Abstract Submitted
for the OSS07 Meeting of
The American Physical Society

On the Importance of Physical Laws and the Scientific Method

PIERRE-MARIE ROBITAILLE, The Ohio State University — At the end of the 19th century, Langley assumed that the Sun was a blackbody and utilized the principles of thermal radiation to deduce a temperature of $\sim 6,000$ K for the solar photosphere. Yet, Kirchhoff's Law of Thermal Emission requires thermal equilibrium with an enclosure in order to ascertain a valid temperature. The Sun cannot meet this requirement. Nonetheless, Langley's estimate remains the accepted temperature of the solar photosphere. Similarly, in 1965, Penzias and Wilson set a source temperature of ~ 3 K using a signal of unknown origin. The thermal nature of this signal would eventually be affirmed. However, the source of this signal cannot be in thermal equilibrium with an enclosure. Therefore, setting a real temperature in this setting also constitutes a violation of thermodynamics. Planck has warned that objects with convection currents cannot be treated as blackbodies. Both the photosphere and the oceans of the Earth sustain convection currents. Proper scientific method requires that the laws of physics, established in the laboratory, be observed. It is also improper to utilize laws experimentally verified only in the solid and apply them to other states of matter. The belief that blackbody radiation is universal is invalid as previously discussed.

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Date submitted: 12 Apr 2007

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