

Teaching Thermodynamics – A New Concept

G. Job, R. Rüffler, T. Lankau

*Job-Foundation, Institute of Physical Chemistry, Bundesstr. 45, 20146 Hamburg, Germany
(georg.job@job-stiftung.de)*

Thermodynamics is generally considered as a difficult science by students. Its historical development has resulted in an unique structure which is generally incompatible with those of other physical sciences thereby making an intuitive understanding difficult.

The starting point of the new concept developed by Georg Job [1] is the realization that the direct metrication of the common perception of heat led straightforward to the quantity which is called entropy today. On this basis, a consistent dynamical theory of heat and matter [1, 2] can be developed which includes both classical and statistical thermodynamics. One of the advantages of the new concept is an uniform description of mechanical, electrical, thermal and substantial systems, but also of microscopic and macroscopic, reversible and irreversible, static and kinetic systems. In addition a modified thermodynamical calculus results in short calculations which can be easily predicted by the students. This new representation of thermodynamics is compatible with the traditional one as well as with a newly developed unified concept of physics by G. Falk. The theoretical aspects are complemented by the proposal of more than forty simple but nevertheless impressive demonstration experiments. The concept is supported by the newly founded “Eduard-Job-Foundation for Thermo- and Matterdynamics” (www.job-stiftung.de) which promotes a variety of projects in education, research and business.

[1] G. Job: “Neudarstellung der Wärmelehre (New Approach to Thermodynamics)”, Akademische Verlagsgesellschaft, Frankfurt am Main, 1972

[2] H.U. Fuchs: „The Dynamics of Heat“, Springer, New York, 1996