



David Jou, Georgy Lebon, José Casas-Vázquez

# Extended Irreversible Thermodynamics

- 4th edition of this outstanding and highly cited compendium on Extended Irreversible Thermodynamics
- Now including most recent developments in microfluidics, heat transport in micro- and nanosystems and fast solidification fronts in materials sciences
- New modern presentation of fundamental questions on the definition of non-equilibrium temperature, entropy, fluctuations of fluxes and boundary conditions

The fast progress in many areas of research related to non-equilibrium thermodynamics has prompted us to write a fourth edition of this book. Like in the previous editions, our main concern is to open the subject to the widest audience, including students, teachers, and researchers in physics, chemistry, engineering, biology, and materials sciences. Our objective is to present a general view on several open problems arising in non-equilibrium situations, and to afford a wide perspective of applications illustrating their practical outcomes and consequences. A better comprehension of the foundations is generally correlated to an increase of the range of applications, implying mutual feedback and cross-fertilization. Truly, thermodynamic methods are widely used in many areas of science but, surprisingly, the active dynamism of thermodynamics as a field on its own is not sufficiently perceived outside a relatively reduced number of specialized researchers. Extended irreversible thermodynamics (EIT) goes beyond the classical formalisms based on the local equilibrium hypothesis; it was also referred to in an earlier publication by the authors (Lebon et al. 1992) as a thermodynamics of the third type, as it provides a bridge between classical irreversible thermodynamics and rational thermodynamics, enlarging at the same time their respective range of application. The salient feature of the theory is that the fluxes are incorporated into the set of basic variables.

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