Editorial

Markus Hütter* and Ger Koper

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DOI 10.1515/jnet-2015-6002

Dear readers,

The International Workshop on Nonequilibrium Thermodynamics IWNET2015 took place July 5–10, 2015, in Hilvarenbeek (The Netherlands). It has been the 7th workshop in the IWNET-series (see www.nonequilibrium-thermodynamics.org), with 74 participants from 22 countries. Previous meetings were held in Montréal (1996), Oxford (2000), Princeton (2003), Rhodes (2006), Cuernavaca (2009), and Røros (2012).

At IWNET2015, five pre-selected topics have been covered, with both a summer-school and a workshop part. The topics were Fundamental issues in nonequilibrium thermodynamics; Fundamental underpinnings of and rigorous mathematical results in nonequilibrium thermodynamics; Coarse-graining techniques and truly multiscale simulations; Role of thermodynamics in modeling the dynamics of complex materials under deformation; Heterogeneous systems, interfaces, system-boundaries and small systems. These topics are typical for the IWNET-series, as they cover both the fundamental aspects of nonequilibrium thermodynamics and advanced applications. Already in the early days of the IWNET-series, such a balance between fundamental and more applied topics has proven very fruitful; indeed, traditionally, a significant fraction of IWNET-participants has a strong interest in the modeling of complex fluids. The detailed program as well as the presentations of the invited lecturers of the IWNET2015 can be found online at www.iwnet2015.org.

Although most material covered in the invited lectures for the summer school part has already been published in various forms in the past, some of it was original and hence this issue contains three contributions related to these tutorial lectures: Mielke, Peletier, and Renger deal with a generalization of Onsager's reciprocity relations to gradient flows with nonlinear mobility (pp. 141–149); with respect to bridging scales, Ilg gives a tutorial example of systematic coarse-graining toward hydrodynamics with spin angular momentum (pp. 89–97); and the modeling of mechanical behavior of complex materials is addressed in the contribution of Gladkov, Kochmann, Hütter, Reese, and Svendsen with a non-isothermal phase-field approach (pp. 131–139).

The remainder of this issue contains five contributions related to regular oral presentations at the IWNET2015. Particularly, as far as fundamental/mathematical issues are concerned, the contribution of Santamaría-Holek, Pérez-Madrid, and Rubí discusses a local quasi-equilibrium description of multiscale systems (pp. 123–130). Giona, Brasiello, and Crescitelli elaborate on generalized Poisson-Kac processes (pp. 107–114), and the effect of finite propagation velocity (pp. 115–122). Cirillo, Colangeli, and Muntean study in their paper stationary currents in particle systems with constrained hopping rates (pp. 99–106), and Semkiv and Hütter examine the effect of physical aging and mechanical rejuvenation (pp. 79–88).

The next workshop in this series, IWNET2018, will take place end of June/beginning of July 2018 again in the Netherlands, organized by Markus Hütter (Eindhoven University of Technology) and Leonard Sagis (Wageningen University).

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