

New trends in modern statistical physics

Editorial

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The present topical issue contains twenty four regular research papers, dealing with selected, hot themes of modern statistical physics, which underwent the standard rigorous editorial process of CEJP.

A first group of papers deal with theoretical methods and applications of statistical and nonlinear physics. Some of these paper adopt very general theoretical methods and present a strong interdisciplinary character. The topics of these papers include foundations of thermodynamics, heat capacity in driven stochastic systems; relaxation, long-time asymptotics and phase transitions in long-range interacting systems; soliton formation and wave propagation; fluid model of granular particles; nonlinear stochastic oscillators; stochastic models for surface adsorption; nonlinear reaction-diffusion kinetics and evolution of colloid systems.

A second group of papers deal with applications of statistical physics methods to specific physical systems. In two papers the Authors analyze heavy-ion collisions and study quark-gluon plasma formation and multiparticle production processes. In four papers the Authors consider applications in condensed matter and study vortices in

superconducting systems and magnetic properties of the matter by analyzing 1D Hubbard model or cholesteric pitch-transitions. Finally few papers consider applications dealing with atomic systems and biological systems.

The idea to publish some topical issues, one of which is the present, in peer-reviewed international journals, collecting high level, accurately selected, original research papers, devoted to hot themes of statistical physics, born during the meeting of the $\Sigma\Phi 2011$, International Conference on Statistical Physics, held in Cyprus on July 2011. This idea found immediately a large consensus within the conference sessions.

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