

**PROCEEDINGS OF THE WORKSHOP ON
“MAGNETIZABLE NANOFLUIDS AND NANOCOMPOSITES”**

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Guest Editor:
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FOREWORD

The Workshop on “*Magnetizable nanofluids and nanocomposites*” held in Timișoara in May 26–27, 2005 in the frame of the “*Timișoara Academic Days*”, followed the tradition established since the meeting in Timișoara, in 1980, when the first scientific workshop on magnetic fluids was organized in Romania. Since then several national and international scientific meetings on magnetic fluids were organized in Timișoara, among them the Fourth National Workshop on “Magnetic Fluids and Applications” (1994) (Romanian Reports in Physics, Vol. 47, Nos. 3–5 (1995)) and the Eighth International Conference on Magnetic Fluids (ICMF8) (1998) (J. Magn. Magn. Mater., vol. 201 (1999)). In both cases the organizers, the “Politehnica” University of Timișoara and the Timișoara Branch of the Romanian Academy, use the benefit of the patronage of the International Steering Committee of Magnetic Fluids and of the European Academy of Sciences and Arts and the support of the Romanian Ministry of Education and Research.

The establishment of the Laboratory of Magnetic Fluids in Timișoara (LMFT) in 1975 and the whole development of the field of magnetic nanofluids and their applications in Timișoara and in Romania as well, are insolubly related to Professor Ioan Anton, member of the Romanian Academy. His outstanding scientific advisory work and many-sided support of researches in the new field of ferrohydrodynamics and engineering and biomedical applications of magnetic nanofluids, are at the origin of valuable scientific results of the LMFT and of fruitful scientific co-operations with partners from Romania and abroad, which are reflected in this volume as well.

The proceedings of the Workshop on “*Magnetizable nanofluids and nanocomposites*” contain 15 papers covering the following main topics: synthesis of magnetic nanoparticles and magnetic nanofluids; magnetic nanocomposites; structural investigations; transport phenomena, liquid-vapor interfaces and numerical modeling; applications.

There are many interesting new results referring to the chemical synthesis of precisely sized magnetic nanoparticles, as well as of magnetic nanofluids and nanocomposites tailored to specific applications. Several works synthesize the results of comprehensive structural analyses by temperature dependent Mössbauer spectroscopy, X-ray diffraction, small angle neutron scattering (SANS) and neutron spin echo (NSE) investigations, which revealed structural processes and parameters from the level of effect of surfactant coating of magnetic nanoparticles to that of particle clusters and large agglomerates formed under the applied

magnetic field. Remarkable experimental and theoretical results on special heat transfer (“magnetic” Soret effect) and interfacial phenomena are presented and described by numerical (*e.g.*, Lattice-Boltzmann) models. Interesting papers refer to new and promising applications of magnetic nanofluids in adaptive optics for astronomical telescopes and in gas distribution control systems.

The rather attractive problems of a special category of nanomaterials considered in this special issue of the **Romanian Reports in Physics** and the high scientific level of the papers are expected to have a significant impact on the future development of the field.

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