

GUARUJÁ, BRAZIL
AUGUST 02 - 06, 2004
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Magnetic fluids are intelligent materials of unusually wide application possibilities. During last decades a great success has been made in development of stable ferrocolloids for practical use in engineering and in modern technology. Some of the new devices are already widely used in the everyday life. These achievements play an important role to stimulate the enthusiasm of scientific society to intensify and to widen the research as well as to find new application possibilities.

Magnetofluidics is a multidisciplinary research area. For deep understanding the complicated problems of stability of ferrocolloids and to learn their properties and new phenomena, investigation of various theoretical and experimental problems of physics, magnetism, physical and colloidal chemistry as well as hydrodynamics and heat and mass transfer have to be performed. In such a situation the organizing of scientific meetings and personal contacts between researchers, dealing with different problems, play an important role to accelerate the achievements. The tradition of international conferences on magnetic fluids was established in 1977 in Udine, Italy. After that regular conferences were organized in USA, United Kingdom, Japan, Latvia, France, India, Romania, and Germany.

Spectrum of scientific problems, number of presented papers and attending participants was monotonously growing. In middle of 90-ies there has been seen a tendency to reach a saturation. But now we experience a new growing. During the last decade a new generation of scientists is involved in the magnetic fluid research. Intensive broadening of research activities happens also in Brazil. This was one of reasons why the International Steering Committee entrusted to organize the 10th International Conference on Magnetic Fluids in São Paulo. The Organizing Committee of ICMF 10 under the leadership of Prof. Antonio M. Figueiredo Neto organized the ICMF 10 in the city of Guarujá, State of São Paulo, in Brazil, from 2 to 6 August 2004.

The program of the Conference includes almost 250 papers related to the following topics of ferrofluid research: 1) Synthesis and Design of Magnetic Colloids, 2) Physical Properties of Magnetic Fluids, 3) Magnetic Fluids Theory and Numerical Modeling, 4) Heat and Mass Transfer, 5) Rheological Properties of Magnetic Fluids, 6) Free Surface Phenomena and Ferrohydrodynamics, 7)

Technical Applications, 8) Biomedical Applications, and 9) Other Related Fields. More than 170 participants from 25 countries presented their papers in 15 oral and 10 poster sections. Many papers and presentations demonstrated high scientific level. Highly qualified theoretical analysis and fine experiments performed involving modern methods and measurement technique not only provide obtaining a new knowledge in traditional ferrofluid problems but also allow to widen the research activities to the new topics of modern nanoscience and nanotechnology. Besides, many papers were represented by young well qualified and enthusiastic researchers. This enhances a conviction that the research of ferrofluids and other magnetic nanosystems has good possibilities of further development.

An important characteristic of the ICMF-10 was the choice of the invited speakers and the subject of their talks. As the research on magnetic fluids is essentially multidisciplinary, experts from related areas were invited to present talks with the objective of enlarging the frontiers of the area and present new trends. Among the subjects presented in these talks we point out: 1) fundamental aspects of the physics of liquid crystals and elastomers involving symmetry concepts, 2) therapeutic uses of magnetic colloids in the treatment of cancer in vivo and in vitro, 3) thermodynamic aspects of the phase transition in dipolar fluids, 4) chain formation due to dipolar interaction between ferrofluid grains without the application of an external magnetic field, 5) the effect of the finite size of magnetic nanograins in their magnetic properties, and 6) molecular motors and nanotubules in biological systems.

In summary, the ICMF 10 stimulated the research in the area of magnetic fluids and also its connection with correlated areas of complex and supermolecular fluids. The Proceedings will be published in a special issue of the *J. Magn. Magn. Matter.* allowing disseminating to all the community the important results presented in the Conference.

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