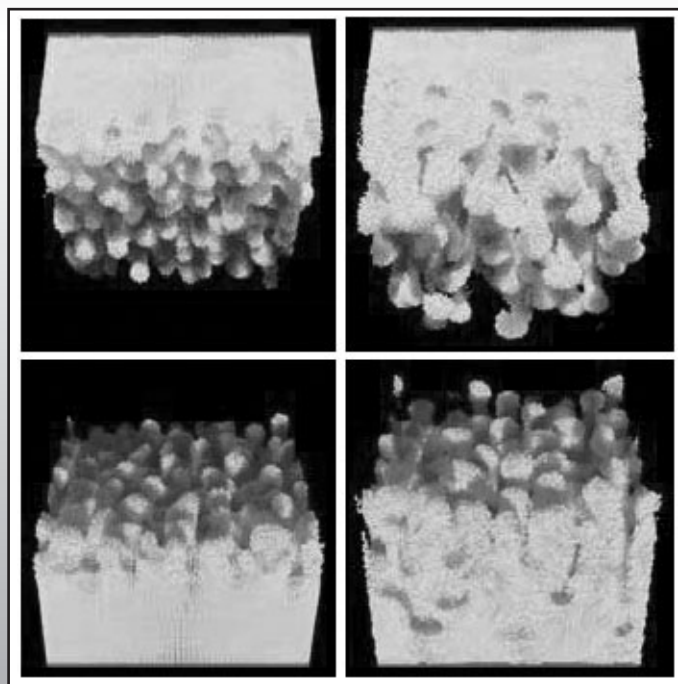


International Journal of
**Emerging
Multidisciplinary
Fluid Sciences**

Volume 1 · Number 1 · March 2009



Multi-Science Publishing
1756-8315

International Journal of Emerging Multidisciplinary Fluid Sciences

Volume 1 · Number 1 · March 2009

From the Editor	i
Incompressible SPH Simulation of Double-Diffusive Convection Phenomena Masaya Shigeta, Takahiro Watanabe, Seiichiro Izawa, and Yu Fukunishi.....	1
Nonlinear and Nonparallel Receptivity of Zero-pressure Gradient Boundary Layer Tapan K. Sengupta, Swagata Bhaumik, Vikram Singh, Sarvagya Shukl	19
Analysis of Power-Law Fluid Flow in a Microchannel with Electrokinetic Effects Cunlu Zhao and Chun Yang	37
Dynamic Characteristics of a Centrifugal Blood Pump with Conical Spiral Groove Bearings Yoichi Nakamura and Hiroshi Tsukamoto	53
Constructal Cooling Channels: Application to Heat Transfer in Micro-Channel Heat Sinks Bello-Ochende, T. and Meyer, J. P.	61

Front Cover Window: Simulated 3-D flow structure of salt fingers (page 12)

From the Editor

It is immensely gratifying to present this first issue of the International Journal of Emerging Multidisciplinary Fluid Sciences (IJEMFS). To create a space and justify a need for introducing a new journal in a field seemingly well matured and so full of publications is an arduous task and quite challenging.

The domain of fluid sciences is vast. The more we explore, the more we discover its omnipresence influencing our everyday life. It is therefore not surprising that over the years there has been a steady and significant rise in the number of journals that publish numerous fluid related research articles spanning various disciplines of physics, engineering and biology. Being both multidisciplinary and interdisciplinary in nature, the subject of fluid sciences provides boundless opportunities for research with scales ranging from pico and nano in biofluids to the synoptic scale (of the order of 1000 kilometer) in meteorology. While the overall research contributions in the field of fluid sciences have been overwhelming, there are some emerging areas that are making rapid progress and need special attention. Hence, launching a new journal - IJEMFS, with this specific aim to foster and publicize innovative research, both basic and applied, from across all disciplines of fluid sciences is only appropriate and timely. The IJEMFS will act as a source for dissemination of the latest information on research advances in the following multidisciplinary areas of fluid sciences but not limited to:

Biofluid science: complex movement of biological fluids, cardiovascular and pulmonary systems, development of prostheses and study of their behavior, blood pumps, micro-fluidic filter systems, drug delivery, etc. Nano and Micro fluid science: micro-electro-mechanical systems (MEMS), nanofluidics, microfluidics, microchannel flows, spray and aerosols, etc. Thermal fluid science: two phase flows, combustion instability, cooling of electronics chips, heat transportation, etc. Engineering fluid science: vortex flows, synthetic jets, flow control, drag reduction, turbulent mixing, flow transition and instabilities, vehicle aerodynamics, wind turbines, wave energy, etc. Environmental fluid science: atmospheric boundary layer, oceanic waves, wind induced avalanche, tornados, hurricane, cloud dynamics, pollutants dispersion, etc. Geological fluid science: influence of water and other fluids in earth's crustal processes including the movement of chemicals and heat – believed to be responsible for seismic and volcanic activities which could also cause tsunami; effect of pore fluid pressure on fracturing of rocks, etc.

The long journey of the IJEMFS, from conception to publication, has been a learning and rewarding experience. I have been fortunate to have a very supportive team of my fellow members of the editorial board who have contributed a great deal in making it happen. In particular, I wish to acknowledge continuous help from Drs. Satoyuki Kawano, Ganesh Raman and Tapan Sengupta. I also thank the reviewers for providing the critical and constructive inputs which were very essential for selection of papers. Finally, I wish to place on record my sincere thanks to the staff at Multi-Science Publishing..

As you may have noticed, the front cover page of the IJEMFS has a window which showcases one of the most attractive graphics from the papers inside the volume. This is a special feature of the IJEMFS which will give freshness to every issue. The IJEMFS will quarterly publish original and innovative works from various disciplines of the fluid sciences. We hope to take the standard of the IJEMFS to a greater height and maintain it at the international level with the support of our able contributors and readers. I welcome the research fraternity from the fluid sciences to join the IJEMFS family and make it truly global.

Editor,
Dr. S.D. Sharma
IIT Bombay, Mumbai, India
March 2009

