

Colorful Patterns Reveal the Structures in Fluids



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Analytical methods based on color visualization are widely used today not only in the physical sciences but also in the rapidly expanding arena of life sciences. In addition to visualizing fluid flows, we have now added color imaging of dehydrated drops of biological liquids (blood serum, bile, tear, gastric juice), which are used in medical applications. The foundations of these prospective diagnostic methods are now being discussed along with some impressive examples of color visualization .

This Journal contains papers from two different sources. One consists of papers extended from talks presented at the 11th Biannual Conference on Fluxes and Structures in Fluids. This conference was held at the Institute for Problems in Mechanics of the Russian Academy of Science on June 20-22, 2001. More than one hundred research scientists presented almost one hundred talks during the 3-day conference. The principal objective of the conference was discussing ways to construct closed models of environmental processes. The topic of flow imaging has come to play an important role in the journey toward achieving this goal. Recently, large sets of regular and chaotic structures in traditional and modern experimental studies can now be revealed by visualization techniques. The detailed structures of boundary layers and internal boundary currents in stratified and/or rotating fluids are now being studied under laboratory conditions. The most impressive applications of color flow visualization have been selected by the chairpersons of the various sessions for presentation in this Journal. However, it is beyond the scope of the Journal to present all the selected papers in a single issue. Therefore, papers not included in this issue will appear in subsequent issues. Parts of other presented papers are slated for publication in various Russian and International Journals.

The other source of material is invited papers from researchers all over the world who wish to submit papers to the Journal of Visualization.

We are grateful to all the authors for the effort to adapt their manuscripts to the Journal of Visualization's style and standards. We are especially grateful to the chairpersons of the Conference Sessions who screened and recommended these papers out of the large number of presentations, and who have been involved in the preliminary peer review process. We're very much looking forward to your participation at the next conference "Fluxes and Structures in Fluids", scheduled to be held June 23-26, 2003 in St. Petersburg, Russia.

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Cover Photo

Visualization of Two-dimensional Flows by a Liquid (Soap) Film Tunnel

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This image represents a two-dimensional jet produced in a soap film tunnel (Gharib and Derango, *Physica D*, Vol.37 pp.406-416, 1989). The small variation of the film thickness results in interference patterns, thus, providing an excellent means for flow visualization. The figure shows a laminar jet (Re number = 25), but the jet fluid has a lower surface tension than the ambient fluid, which results in a large growth rate for the jet.