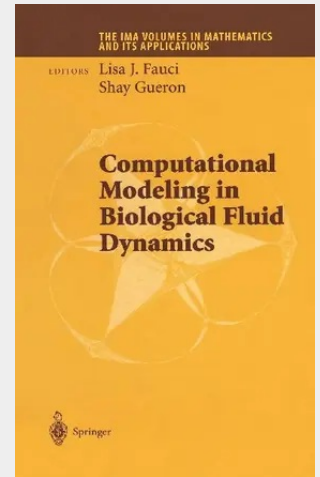


Computational Modeling in Biological Fluid Dynamics

This IMA Volume in Mathematics and its Applications COMPUTATIONAL MODELING IN BIOLOGICAL FLUID DYNAMICS is based on the proceedings of a very successful workshop with the same title. The workshop was an integral part of the September 1998 to June 1999 IMA program on "MATHEMATICS IN BIOLOGY." I would like to thank the organizing committee: Lisa J. Fauci of Tulane University and Shay Gueron of Technion - Israel Institute of Technology for their excellent work as organizers of the meeting and for editing the proceedings. I also take this opportunity to thank the National Science Foundation (NSF), whose financial support of the IMA made the Mathematics in Biology program possible. Willard Miller, Jr., Professor and Director Institute for Mathematics and its Applications University of Minnesota 400 Lind Hall, 207 Church St. SE Minneapolis, MN 55455-0436 612-624-6066, FAX 612-626-7370 miller@ima.umn.edu World Wide Web: <http://www.ima.umn.edu> v PREFACE A unifying theme in biological fluid dynamics is the interaction of moving, elastic boundaries with a surrounding fluid. A complex dynamical system describes the motion of red blood cells through the circulatory system, the movement of spermatazoa in the reproductive tract, cilia of microorganisms, or a heart pumping blood. The revolution in computational technology has allowed tremendous progress in the study of these previously intractable fluid-structure interaction problems.

Contains papers by biologists, zoologists, engineers, and mathematicians on a variety of issues in biological fluid dynamics. A variety of computational methods are presented both in general terms and in the context of applications.



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