Scientific Computing

CBC Talk on Blood and CSF flow - May 6, 2011

Professor Francis Loth, from University of Akron, Ohio, will present his recent work on blood and CSF flow in Bakrommet at 11:00. Loth has worked with blood and CSF flow for close to 20 years, both with numerical simulations and laboratory experiments, and is internationally recognized for his research on these topics.

Total number of participants: 16
Total number of guests outside of CBC: 2
Number of different nationalities represented: 4
Total number of speakers: 1
Total number of talks: 1

Professor Loth began his education in Aerospace Engineering studying at WVU and the University of Cincinnati. He then completed a specialization in turbomachinery at the von Karman Institute for Fluid Dynamics in Belgium. After this, he switched topics to biofluids, the fluid dynamics of biological flows. He went to study biofliuds at the Georgia Institute of Technology for his PhD. In 1993, he was awarded the NSF-NATO Postdoctoral Fellowship and spent this year doing biofliuds research in France at the University of Aix-Marseille. He then worked as a post-doctoral fellow in the BME Department at The Johns Hopkins University. Dr. Loth joined the ME faculty at the University of Illinois at Chicago in 1996 and was promoted to Associate Professor in 2002. He moved to the University of Akron in 2008 as an Associate Professor and F. Theodore Harrington Endowed Chair.

Research Accomplishments

Professor Loths area of research is fluid dynamics of biological flows. This field examines the importance of fluid dynamics in the development, progression, and diagnosis of disease. During the past two decades, fluid mechanics have become appreciated by medical and biological investigators as a key factor in both the cause of arterial disease and the regulation of cellular biology in both normal and diseased arteries. The ability to model biological flow-systems experimentally and numerically has become an important component of fundamental research on vascular disease.

His first area of research examines the contribution of blood flow patterns in the development and progression of arterial disease. His laboratory has developed software tools to extract the three-dimensional geometry of a blood vessel from medical images taken non-invasively. This geometric information is then used to create numerical and experimental models to examine the blood flow patterns in greater detail than is possible with medical imaging. The objective of the proposed research is to determine the role of fluid and solid stresses in the development of vessel disease in carotid bifurcations, vascular grafts, and arteriovenous (AV) dialysis grafts.

His second research area is in the study of craniospinal disorders related the motion of cerebrospinal fluid. Based on non-invasive measurements inside the human body of geometry and motion, engineers can help understand pathology if they can describe the physics that brought about the observed motion. Simulation of the cerebrospinal fluid motion may allow physicians to have predictions about hydrodynamic parameters such as pressure drop before and after surgical procedures.

What	▪ Talk
When	May 06, 2011 from 11:00 AM to 12:00 PM
Where	Bakrommet@Simula
Contact Name	Kent Andre Mardal
Attendees	Anders Helgeland Andre Massing Benjamin Kehlet Francis Loth Gabriella Rutkowska Glenn Lines Ida Drøsdal Joakim Sundnes Karen Støverud Kent Andre Mardal Kristoffer Selim Martin Alnæs Sam Wall Steffen Muthing Svein Linge Øyvind Evju
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