MATHEMATICAL HEART VALVE REPLACEMENT

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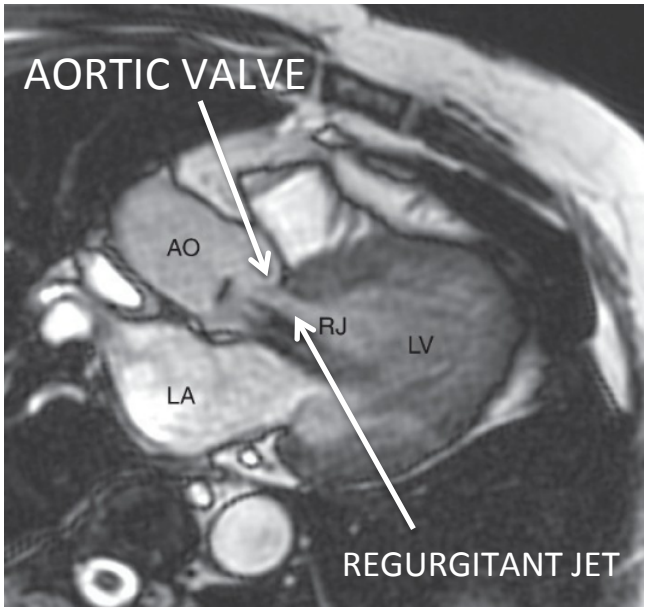
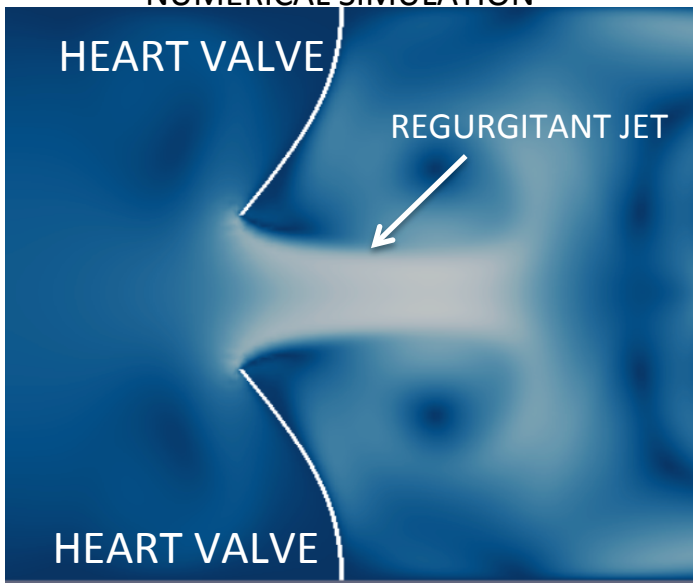
2 – 3 PM, PGH 646

MRI of aortic valve



The speaker will present the basic mathematical concepts used in the study of blood flow through the human cardio-vascular system. State-of-the-art mathematical and medical techniques will be discussed, including mathematical analysis and numerical simulation of nonlinear fluid-structure interaction problems modeling the interaction between blood flow and vascular tissue, as well as medical 3D printing of human organs.

NUMERICAL SIMULATION



All this has been used in an NSF/NIH/AHA-funded project on the mathematical study of nonsurgical replacement of aortic valves, performed at UH (Canic,Glowinski,Quaini), the University of Pittsburgh (Bukac), the Methodist Hospital in Houston (Dr. Little) and the University of Zagreb, Croatia (Muha). A description of the medical procedure, and the novel mathematics being developed for its optimal design, will be presented.

With the help of mathematics, what was science fiction yesterday, becomes reality today.