ASME LI and ASME SBU Student Sections Present:

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Tackling Complex Flow Problems via Numerical Simulation: From Urban Pollution and Wind Energy to River Flooding

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Simulation-based engineering science has emerged as a powerful approach for tackling the major societal problems of our time related to human health, environmental sustainability, and renewable energy. Fluid mechanics problems frequently at the center of many of these challenges are often so complex that simulation-based research is the only viable approach for tackling them. Accurate numerical simulation of such flows poses a formidable challenge to even the most advanced computational methods available today. In this talk I will discuss the advances we have made in my group toward the development of a powerful computational framework for simulating such flows that takes into account arbitrarily complex geometries encountered in real-life applications, fluid-structure interaction for rigid and flexible bodies, can handle two-phase flows and free surface effects, and is capable of carrying out coherent-structure resolving simulations of turbulent flows in arbitrarily complex domains with dynamically evolving boundaries. The ability of the method to yield striking insights into the physics of a broad range of real-life problems will be demonstrated. Future grand challenges and opportunities for simulation-based fluid mechanics research will also be discussed.

Fotis Sotiropoulos is the Dean of the College of Engineering and Applied Sciences (CEAS) at Stony Brook University (SBU) as of October 2015. Prior to joining SBU Dr. Sotiropoulos was the James L. Record Professor of Civil, Environmental and Geo-Engineering, Director of the St. Anthony Falls Laboratory, and Director of the EOLOS wind energy research consortium at the University of Minnesota, Twin Cities. Prior to that, Dr. Sotiropoulos was on the faculty of the School of Civil and Environmental Engineering at the Georgia Institute of Technology, with a joint appointment in the G. W. Woodruff School of Mechanical Engineering. His research focuses on simulation-based engineering science for fluid mechanics problems in renewable energy, environmental, biological, and cardiovascular applications.

Location: The seminar will take place in room 173 of the Light Engineering building on Stony Brook University.

Time: 6:00 PM Sign-In and Refreshments. Meeting starts at 6:30 PM and ends at about 8:30 PM.

Cost: Attendance is free of charge for all attendees and includes light refreshments

Registration: Please register by contacting Wayne Oaks at wayne@acornengineering.me. Please provide your name, daytime phone number, company and society affiliation.