

## **FSI MODELING AND ISOGEOMETRIC TECHNIQUES FOR OCEAN AND MARINE ENGINEERING AND SCIENCE APPLICATIONS**

**Yuri Bazilevs**

Department of Structural Engineering, University of California, San Diego,  
9500 Gilman Drive, La Jolla, CA 92037, USA.  
E-mail: yuri@ucsd.edu

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In this talk a collection of numerical techniques is presented that involve novel formulations for fluid and structural mechanics, and fluid-structure interaction (FSI) [1], using Isogeometric Analysis [2] and FEM. Free-surface flow and FSI will also be discussed. A variety of simulations of important and challenging problems in ocean and marine engineering and science applications will be presented, including modelling of micro circulation in the upper ocean, ship hydrodynamics, offshore wind turbines, and novel propulsion systems for recreational boating.

### **REFERENCES**

- [1] Y. Bazilevs, K. Takizawa, and T.E. Tezduyar, *Computational Fluid--Structure Interaction. Methods and Applications*, Wiley, 2013.
- [2] J.A. Cottrell, T.J.R. Hughes, and Y. Bazilevs, *Isogeometric Analysis. Toward Integration of CAD and FEA*, Wiley, 2009.