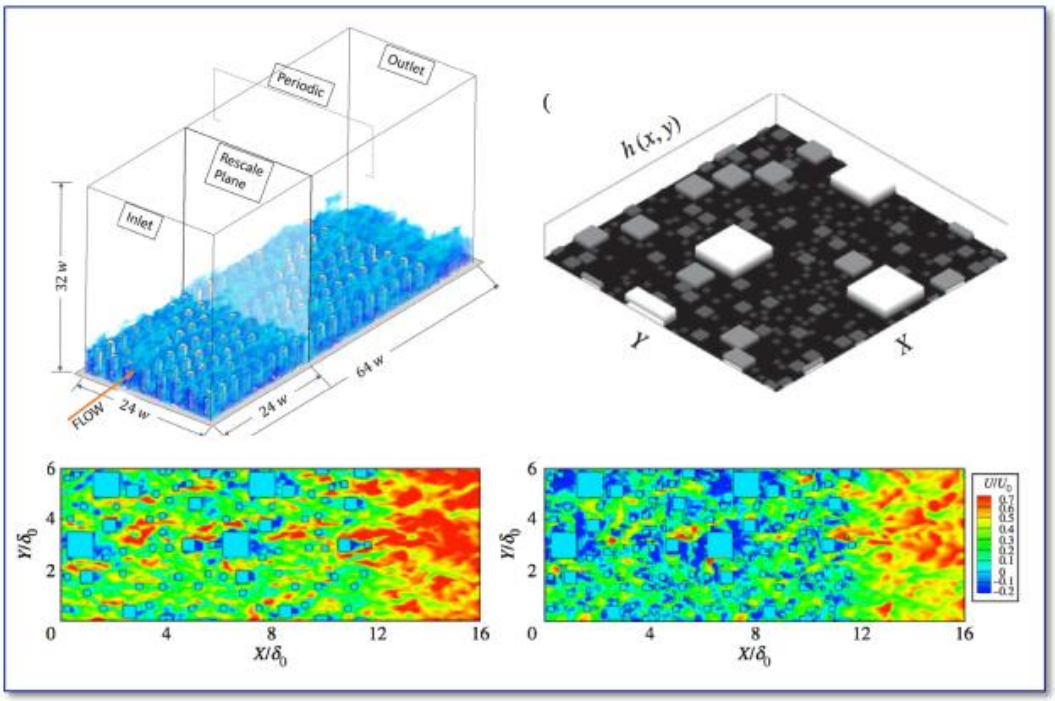
OIST SEMINAR

Date: March 21st, 2017 (Tue)
Time: 3:00 pm – 4:00 pm
Venue: C016 (Lab1, Level C)
Speaker: Professor Charles Meneveau
(Johns Hopkins University)

An update on the turbulence open laboratory and Lagrangian models of turbulence fine structure



Abstract

In this presentation we describe and present an update on the open numerical laboratory, the JHTDB which since 2015 contains a channel flow dataset. The benefits of such an effort to bring "big-data tools" to turbulence research and to "democratize" access to large DNS datasets is illustrated by means of an application to measure the statistics of finite time Lyapunov exponents in channel flow. We also summarize our recent efforts at developing a Lagrangian model for velocity

gradients in isotropic turbulence based on the Recent Fluid Deformation closure applied to initially Gaussian random fields. This work has been done with Perry Johnson, the JHU Turbulence Database Group, and the group of R. Moser whose code was used to generate the channel flow dataset.

BIO-SKETCH:

Charles Meneveau is the Louis M. Sardella Professor in the Department of Mechanical Engineering at Johns Hopkins University. He also has a joint appointment in the Department of Environmental Health and Engineering, and is Associate Director of the Institute for Data Intensive Engineering and Science (IDIES) at Johns Hopkins. He received his B.S. degree in Mechanical Engineering from the Universidad Técnica Federico Santa María in Valparaíso, Chile, in 1985 and M.S, M.Phil. and Ph.D. degrees from Yale University in 1987, 1988 and 1989, respectively. During 1989/90 he was a postdoctoral fellow at the Stanford University/NASA Ames' Center for Turbulence Research.

Professor Meneveau has been on the Johns Hopkins faculty since 1990. His area of research is focused on understanding and modeling hydrodynamic turbulence, and complexity in fluid mechanics in general. He combines computational, theoretical and experimental tools for his research. Special emphasis is placed on the multiscale aspects of turbulence. Currently he is focused on applications of LES to wind energy and on methods to share the very large data sets that arise in computational fluid dynamics.

Professor Meneveau is a foreign corresponding member of the Chilean Academy of Sciences, and a Fellow of the American Academy of Mechanics, the U.S. American Physical Society and the American Society of Mechanical Engineers. He received an honorary doctorate from the Danish Technical University (in 2016), the inaugural Stanley Corrsin Award from the American Physical Society (2011), the 2004 UCAR Outstanding Publication award (with students and other colleagues at JHU and NCAR), the Johns Hopkins University Alumni Association's Excellence in Teaching Award (2003), and the APS' François N. Frenkiel Award for Fluid Mechanics (2001).

He is Deputy Editor of the Journal of Fluid Mechanics and served for 13 years as the Editor-in-Chief of the Journal of Turbulence (until 2015). In the past, he has served as Associate Editor for the Journal of Fluid Mechanics, as member of the Editorial Committee of the Annual Reviews of Fluid Mechanics and as an Associate Editor for Physics of Fluids.

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