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Title:

Introduction to Topical Issue on Extreme Flows

Date:

2016-01-01

Citation:

Hultmark, M., Marusic, I., McKeon, B. J. & Morrison, J. F. (2016). Introduction to Topical Issue on Extreme Flows. Experiments in Fluids, 57 (1), pp.1-2. <https://doi.org/10.1007/s00348-015-2094-4>.

Persistent Link:

<https://hdl.handle.net/11343/282954>

Introduction to Topical Issue on Extreme Flows

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Received: date / Accepted: date

The Extreme Flows Workshop was held in Princeton in May 2014 to honor the contributions by Professor Lex Smits to the field of fluid dynamics. His work was represented through a mix of oral and poster presentations, and discussions covered the state of the art and challenges associated with fundamental research over a range of Mach and Reynolds numbers, energy harvesting, biomimetic flows, vortex dynamics, and the development of instrumentation and analysis techniques. The workshop captured Lex's holistic approach to research, the breadth of his contributions, and the synergy he has achieved between scientific advances and the many developments in facilities, instrumentation and techniques.

The papers (all have been peer reviewed) in this topical issue are contributions from some of Lex's students, collaborators and friends. They cover characterization of vorticity transport in unsteady aerodynamic configurations [1–5]; scaling of the inertial region and an air-water outer interface in canonical wall turbulence up to high Reynolds numbers [6, 7]; instrument development that enables turbulence and heat flux measurements in the presence of small

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viscous scales [8,9]; energy harvesting in turbulence [10]; and large-scale unsteadiness of reattaching, compressible, turbulent shear layers [11].

We believe that this issue offers not only an interesting reflection on the work at the extremes of fluid mechanics and conditions in between, but also reflects the breadth and depth of Lex's interests. The fluid mechanics community has greatly benefited from his vision, leadership, generosity and, of course, his scientific contributions. We are grateful for his generous collaborations and mentorship, and look forward to further interactions.

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