



ACCADEMIA NAZIONALE DEI LINCEI

Conference

A JOURNEY IN FLUID DYNAMICS, FROM SMALL-SCALE TURBULENCE AND SINGULARITIES TO COSMOLOGY

3-4 OCTOBER 2022

Organizing committee: Erik AURELL (KTH, Stockholm), Luca BIFERALE (Università di Roma Tor Vergata), Giorgio PARISI (Presidente della Classe di Scienze Fisiche, Matematiche e Naturali dell'Accademia Nazionale dei Lincei), Renzo PIVA (Linceo), Massimo VERGASSOLA (ENS, Paris)

PROGRAMME

Monday, 3 october

9.00 Welcome and introduction

Session 1: *Turbulence as a fundamental problem in science* - Chairperson: Renzo PIVA

9.45 Giorgio PARISI (Presidente della Classe di Scienze Fisiche, Matematiche e Naturali dell'Accademia dei Lincei): *Some personal considerations on turbulence*

10.05 Laszlo SZEKELYHIDI (University of Leipzig, Germany): *Weak solutions: K41 and beyond*

10.25 Sergio CILIBERTO (ENS Lyon, France): *Simultaneous memory effects in the stress and in the dielectric susceptibility of a stretched polymer glass*

10.45 Coffee break

Session 2: *Variational principles, beyond and below* - Chairperson: Luca BIFERALE

11.00 Alessandra LANOTTE (ISAC-CNR Lecce): *Onset of inverse energy cascade in two-dimensional dissipative quantum fluids*

11.20 Sabino MATARRESE (Università di Padova): *Cosmology beyond linear theory and the quest for initial conditions*

11.40 Clause BARDOS (Université Denis Diderot Paris): *About Quasilinear Approximation*

12.00 Olivier DARRIGOL (CNRS/Université Denis Diderot): *From Frisch to Navier*

12.20 Yann BRENIER (Ecole Normale Supérieure, Paris): *Common variational principles for Euler, Einstein and Schroedinger equations*

13.20 Break

Session 3: *Statistical mechanics of turbulence* - Chairperson: Erik AURELL

14.00 Konstantin KHANIN (University of Toronto Canada): *Coalescing fractional Brownian motions and KPZ problem*

14.20 Grigory FALKOVICH (Weizmann Institute of Science Israel): *Multi-mode correlations and the entropy of turbulence*

14.40 Gregory EYINK (Johns Hopkins University USA): *D'Alembert's Paradox and the Josephson-Anderson Relation*

15.00 Giovanni GALLAVOTTI (Sapienza Università di Roma): *Statistical ensembles in fluid dynamics*

15.20 Coffee break

15.40 Uriel FRISCH (Observatory of Nice, France): *Leonardo da Vinci, Andrei Kolmogorov and Giorgio Parisi: The energy decay of turbulence from Leonardo to multifractal theory*

Tuesday, 4 october

Session 4: *Dynamical systems and turbulence* - Chairperson: Massimo VERGASSOLA

9.45 Itamar PROCACCIA (Weizmann Institute of Science Israel): *A journey in solid dynamics, from small-scale singularities to macroscopy*

10.05 Alexei MAILYBAEV (IMPA Rio de Janeiro Brazil): *Shell model intermittency is the hidden self-similarity*

10.25 Carlo Massimo CASCIOLA (Sapienza Università di Roma): *What shall we do with inhomogeneous turbulence?*

10.45 Coffee break

Session 5: *Prediction and predictability, the limits of knowledge* - Chairperson: Giorgio PARISI

11.00 Berengere DUBRULLE (CNRS - CEA Paris): *Multifractality, universality and singularity in turbulence*

11.20 Rahul PANDIT (Indian Institute of Science Bangalore): *Insights from a pseudospectral study of a potentially singular solution of the three-dimensional axisymmetric incompressible Euler equation*

11.40 Angelo VULPIANI (Sapienza Università di Roma): *Understanding causation via linear response theory*

12.00 Sauro SUCCI (IIT Roma): *Lattice Fluids and Beyond*

12.20 Roberto BENZI (Università di Roma Tor Vergata): *Recollections*

13.20 Break

The Conference is organized in collaboration with



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<https://www.lincei.it/it/manifestazioni/journey-fluid-dynamics-conference>

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