Francesca DE SANTI

Personal and Contact Information

Name, Surname Francesca, De Santi

Nationality Italian

Date of birth August 14th, 1986

Place of birth Torino, Italy

Address Department of Mechanical and Aerospace Engineering, Politecnico di Torino, Corso Duca degli Abruzzi 24, 10129, Torino, Italy

E-mai francesca.desanti@polito.it

Current Position

Jan 2010-present Ph.D student in Fluid Dynamics at the Politecnico di Torino.
Lagrange Fellowship 2011-2013
http://www.progettolagrange.it/en/strumenti/index.html

Research interests

Field Fluid Dynamics

- Shear-less turbulence energy mixing in the presence of a stable density stratification observed by a direct numerical simulation (DNS).
- Role of the linear and nonlinear interaction in the energy spectrum of perturbed systems and turbulence.
- Hydrodynamic stability of shear flows: modal analysis and initial-value problem formulation.

Environmental Scientific Computing

Field

- Sustainable Mobility

Publications

Preprints

[P1] S. Scarsoglio, F. De Santi, and D. Tordella, "Kolmogorov scaling bridges hydrodynamic linear stability and fluid turbulence," in preparation.

[P2] S. Scarsoglio, F. De Santi, and D. Tordella, "On the pulsation of transient 3D perturbations in shear flows," in preparation.

Journal Papers

[J1] S. Berrone, F. De Santi, M. Marro, S. Pierracini. "Coupling traffic models on networks and urban dispersion models for simulating sustainable mobility strategies" in press on Computers and Mathematics with Applications

Proceedings and Conference Presentations (Speaker underlined)

[PC1] R.M. Kerr, F. De Santi, D. Tordella, A. Parmar, "Stratified zig-zags on vortex pairs using vertically shifted perturbations", submitted to XXIII ICTAM, Beijing, China, 19–24 August 2012. (In press)

[PC2] S. Scarsoglio, F. De Santi, D. Tordella, "Transient and asymptotic pulsation of traveling waves in shear flows", submitted to XXIII ICTAM, Beijing, China, 19–24 August 2012. (In press)

[PC3] S. Scarsoglio, F. De Santi, and D. Tordella, "Does the Kolmogorov scaling bridge hydrodynamic linear stability and turbulence?", in Bull. Am. Phys. Soc., vol. 56, (64th Annual Meeting Division of Fluid Dynamics (APS-DFD), Baltimore MD, USA, November 20-22, 2011), p. 40, 2011.

[PC4] S. Scarsoglio, F. De Santi, and D. Tordella, "Collective behaviour of linear perturbation waves observed through the energy density spectrum," in Journal of Physics: Conference Series, vol. 318, (13th Euromech European Turbulence Conference, Warsaw, Poland, September 12-15, 2011), pp. 032004/1–6, ISSN: 1742–6588, 2011. doi: 10.1088/1742-6596/318/3/032004.

[PC5] F. De Santi, L. Ducasse, J. Riley, D. Tordella "Two-dimensional shearless turulence mixing kinetic energy self diffusion, also in the presence of a stable stratification" In: 3rd International Conference - Turbulent mixing and beyond, Trieste, 21-28 August, 2011. pp. 14-15

[PC6] S. Scarsoglio, F. De Santi, M. Mastinu, G. Barletta, K. Weaver, and D. Tordella, "Energy spectrum power-law decay of linearized perturbed shear flows", in 5th European Postgraduate Fluid Dynamics Conference Book of Abstracts, vol. 5, (5th European Postgraduate Fluid Dynamics Conference, Göttingen, Germany, August, 9-12, 2011), p. 9, 2011.

[PC7] F. De Santi, L. Ducasse, J. Riley, D. Tordella "Two-dimensional shearless turulence mixing kinetic energy self diffusion, also in the presence of a stable stratification", in 5th European Postgraduate Fluid Dynamics Conference Book of Abstracts, vol. 5, (5th European Postgraduate Fluid Dynamics Conference, Göttingen, Germany, August, 9-12, 2011), p. 9, 2011.

[PC8] S. Scarsoglio, F. De Santi, and D. Tordella, "Power-law decay of the energy spectrum in linearized perturbed systems," in Fourth International Symposium "Bifurcations and Instabilities 2/7 in Fluid Dynamics", vol. 4, (4th International Symposium "Bifurcations and Instabilities in Fluid Dynamics", Barcelona, Spain, July 18-21, 2011), p. 1, 2011

Conference and School Participations

Oct 26-29, 2009 Small Scale Turbulence and Related Gradient Statistics, EUROMECH Colloquium 512, Accademia delle Scienze di Torino, Torino, Italy

Jul 4-15, 2011 Summer School of Parallel Calculus, CINECA Calculus Center, Bologna, Italy

Visiting Position

Mar-Apr, 2012

Visiting graduate student

Massachusetts Institute of Technology, Cambridge MA, USA

Mathematics Department, Prof. G. Staffilani

Feb-March, 2011

Visiting graduate student

Massachusetts Institute of Technology, Cambridge MA, USA

Mathematics Department, Prof. G. Staffilani

Mar-Jul, 2010

Visiting under-graduate student

University of Washington, Seattle WA, USA

Department of Applied Mathematics, Prof. J.J Riley

Collaborations

2011-present Professor Gigliola Staffilani, Dept. of Mathematics, Massachusetts Institute of Technology US

2011-present Professor Robert Kerr, Dept. of Mathematics, University of Warwick UK,

2011-present Professor William O. Criminale, Dept. of Mathematics, University of Washington US

2010-present Professors James J. Riley, Dept. of Mechanical Engeneering, University of Washington US

National and International Research Project

Nov 2011-present

ISCRA C (Italian SuperComputing Resource Allocation, small project)

F. De Santi, S. Di Savino, L. Gallana, M. Iovieno, D. Tordella "Turbulent Mixing in Stratified Flow".
Coordinator: F. De Santi

2009-present

MITOR Project (between the Massachusetts Institute of Technology and Politecnico di Torino)

D. Tordella, G. Staffilani, F. De Santi, S. Scarsoglio "Long term interaction in flow systems"
Coordinators: Prof. G. Staffilani and Prof. D. Tordella

Professional experience

Oct 2010-Apr 2011 Fellowship Researcher for the project: "Coupling traffic models on networks and urban dispersion models for simulating sustainable mobility strategies"
Coordinator: Prof. Stefano Berrone, Politecnico di Torino

Computer Skills

Programs Office, LaTex, Comsol Multiphysics (Finite Elements), Fluent (Fluid Dynamics), Lusas (Structural Mechanics)

Language Matlab, Fortran, C, R

OS Microsoft Windows, Linux

Linguistic Knowledge

Italian Mother tongue

English Good (IELTS Certificate in English 2008, Marks 6.0)

French Sufficient

Spanish Sufficient

Education

Jul 2010 Master of Science, Mathematical Engineering
Politecnico di Torino, Torino, Italy
Thesis: Twodidensional turbulent transpont in the presence of a stable stratification or not
Advisor: Prof. D. Tordella
Additional Advisor: Prof J.J Riley (University of Washington)
Marks: 110/110 cum laude

Jul 2008 Bachelor of Arts, Mathematics for Engineering Sciences
Politecnico di Torino, Torino, Italy
Thesis: Convex analysis and optimization
Advisor: Prof. L. Pandolfi
Marks: 106/110

Jul 2005 High School diploma
Liceo Scientifico N. Copernico, Torino, Italy
Marks: 90/100

Awards

Sep 2011 "Premio OPTIME 2011" (best young graduates of the year), assigned by Unione Industriale of Torino.

References

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- Stefano Berrone
  Department of mathematical Science, Politecnico di Torino
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- James J. Riley
  Department of Mechanical Engineering, Univerity of Washington
  rileyj@u.washington.edu