

Pietro De Palma
Curriculum Vitae
September 2021

Education

Pietro De Palma was born in ████████████████████. He graduated with honours in Mechanical Engineering at the Università di Bari in 1989. He spent one year at von Karman Institute for Fluid Dynamics (Belgium) where he attended the Diploma Course in Fluid Dynamics and in 1990 he graduated with honours and was awarded the "Belgian Government Prize". In 1993 he obtained the Doctorate in Mechanical Engineering at Politecnico di Bari.

Employment history

He has been assistant professor of hydraulic and thermal machines at Politecnico di Bari from June 1992 until October 1998. In November 1998, he became associate professor at Università di Roma "Tor Vergata"; in November 2001 he moved to Politecnico di Bari as associate professor. From December 2003 he is professor of Energy Systems at Politecnico di Bari.

Teaching

Pietro De Palma has taught courses in the fields of Energy Systems, Fluid Dynamics, and Computational Fluid Dynamics, such as: Energy Systems, Fluid Machinery I, Fluid Machinery II, Fluid Dynamics, Computational Fluid Dynamics, Turbomachinery, Thermal Plants.

Main research interests

His main research interests are: 1) design of numerical methods for compressible and incompressible flows; 2) stability analysis of wall-bounded flows; 3) turbulence and transition modeling; 4) combustion and ionized-flow modeling; 5) numerical analysis of complex flow in turbomachinery; 6) energy systems; 7) microfluidics and particle methods. He has published about 180 scientific papers.

Grants and contracts

Piano Operativo Nazionale R&C: "APULIA SPACE" project (PON03PE_00067_6) 2013-2016. He has been responsible for the research lines: 1.6.1) Re-entry problems in planetary atmospheres: fluid dynamic models; 1.6.5) Re-entry problems in planetary atmospheres: development of a numerical algorithm.

Piano Operativo Nazionale R&C: "INNOVHEAD" project (PON02_00576_3333604) 2012-2015: "Innovation technologies for reduction of polluting exhausts, fuel consumption and operating costs of internal combustion engines for heavy duty applications". He has been responsible for the research lines: 4.8) Numerical simulation of methane flame; 4.9) Development of a plasma model and flame simulations.

Piano Operativo Nazionale R&C: "PRINCE" project (PONa3_00372) 2011-2013: "Innovative processes for energy conversion". He has been responsible of the Work Package WP5 "Design, construction and validation of a computational cluster".

He has been principal investigator for two industrial research projects with General Electric (2010-2012): 1) Prediction of the performance of centrifugal pumps working in supercritical conditions"; 2) Development of prediction models for the performance of centrifugal pumps working with cavitating fluids and two-phase fluids". He has been

principal investigator of the PRIN-2007 project (2008-2010): “Novel computational fluid-dynamic methods for the simulation of aerospace vehicles”.

He is group leader for the research line “Advanced numerical methods for the solution of the Navier-Stokes equations” of the Center of Excellence in Computational Mechanics (COFINLAB 2001) at Politecnico di Bari.

He has been responsible of the local research unit (Università di Roma "Tor Vergata) for the PRIN-1999 project (2000-2001): “Development of innovative methods for computational fluid dynamics of turbomachinery”.

Memberships, awards, and visiting

He is member of EUROMECH and “Accademia Pugliese delle Scienze. Awards: Emerald Highly Commended Award 2002; Emerald Highly Commended Award 2007. In February 2014 he has been visiting scholar at the DynFluid Lab of ENSAM ParisTech. He is member of “Accademia Pugliese delle Scienze”.

Service in Academy

From January 2021 he is member of the Board of Directors of Associazione Italiana delle Macchine e dei Sistemi per l'Energia e l'Ambiente (AIMSEA, SSD ING-IND/08 e ING-IND/09).

From January 2020 he is member of the Board of Directors of dell'Accademia Pugliese delle Scienze.

From March 2017, he is Head of the Ph. D. School at Politecnico di Bari. From October 2012 to September 2018, he has been Deputy Director of the Department of Mechanics, Mathematics, and Management at Politecnico di Bari.

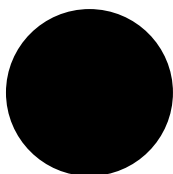
From October 2012 to September 2015, he has been Coordinator of the II level degree Course in Mechanical Engineering of Politecnico di Bari.

From 2009 to 2012, he has been member of the Board of Directors of Politecnico di Bari, elected as representative of full professors.

He is member of the Advisory Board of the Doctorate in Mechanical Engineering at the Politecnico di Bari.

Reviewing activity

Pietro De Palma has been reviewer of the Journal of Fluid Mechanics, European Journal of Mechanics-B, AIAA Journal, International Journal for Numerical Methods in Fluids, Journal of Computational Physics, Physics of Fluids, Computer & Fluids, International Journal of Mechanical Sciences, Energies, Tribology International, Applied Energy.



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Journal articles and book chapters (from 2010)

1. Tamburrano P., Sciatti F., Plummer A.R., Distaso E., De Palma P., Amirante R., “A review of novel architectures of servovalves driven by piezoelectric actuators”, *Energies*, 10 (7), 156 (2021) (ISSN: 19961073).
2. Tamburrano P., Distaso E., Plummer A.R., Sciatti F., De Palma P., Amirante R., “Direct drive servovalves actuated by amplified piezo-stacks: Assessment through a detailed numerical analysis”, *Actuators*, 14 (16), 4858 (2021) (ISSN: 19961073).
3. De Cillis G., Cherubini S., Semeraro O., Leonardi S., De Palma, P.,” POD-based analysis of a wind turbine wake under the influence of tower and nacelle”, *Wind Energy*, **24**, 609-633 (2021) (ISSN: 10954244).
4. Distaso E., Amirante R., Calò G., De Palma P., Tamburrano P., Reitz R.D., “Predicting lubricant oil induced pre-ignition phenomena in modern gasoline engines: The reduced GasLube reaction mechanism”, *Fuel*, 281, 118709 (2020) (ISSN: 00162361).
5. Parente E., Robinet J.-C., De Palma P, Cherubini S., “Modal and nonmodal stability of a stably stratified boundary layer flow”, *Physical Review Fluids*, 5 (11), 113901 (2020) (ISSN: 2469990X).
6. Distaso E., Amirante R., Cassone E., De Palma P., Sementa P., Tamburrano P., Vagliocco B.M., “Analysis of the combustion process in a lean-burning turbulent jet ignition engine fueled with methane”, *Energy Conversion and Management*, 223, 113257 (2020) (ISSN: 01968904).
7. Distaso E., Amirante R., Calò G., De Palma P., Tamburrano P., “Evolution of soot particle number, mass and size distribution along the exhaust line of a heavy-duty engine fueled with compressed natural gas”, *Energies*, 13, 3993 (2020) (ISSN: 19961073).
8. Tamburrano P., Plummer A.R., De Palma P., Distaso E., Amirante R., “A novel servovalve pilot stage actuated by a piezoelectric ring bender (Part II): Design model and full simulation”, *Energies*, 13 (9), 2267 (2020) (ISSN: 19961073).
9. P. Tamburrano, A. R. Plummer, P. Elliott, P. De Palma, E. Distaso, R. Amirante, "A Novel Servovalve Pilot Stage Actuated by a Piezo-electric Ring Bender: A Numerical and Experimental Analysis", *Energies*, 13 (3), 671 (2020) (ISSN 1996-1073).
10. A. M. Pantaleo, M. Simpson, G. Rotolo, E. Distaso, O.A. Oyewunmi, P. Sapin, P. De Palma, C. N. Markides, “Thermoeconomic optimisation of small-scale organic Rankine cycle systems based on screw vs. piston expander maps in waste heat recovery applications”, *Energy Conversion and Management*, **200**, 112053 (2019) (ISSN 01968904).
11. M. Farano, S. Cherubini, J.-C. Robinet, P. De Palma, T. M. Schneider, “Computing heteroclinic orbits using adjoint-based methods”, *Journal of Fluid Mechanics*, 858, R3 (2019) (ISSN 1070-6631).
12. M. Farano, S. Cherubini, P. De Palma, J.-C. Robinet, “Nonlinear optimal large-scale structures in turbulent channel flow”, *European Journal of Mechanics B/Fluids*, **72**, 74-86 (2018) (ISSN 09977546).
13. A. M. Pantaleo, J. Fordham, O. A. Oyewunmi, P. De Palma, C. N. Markides, “Integrating cogeneration and intermittent waste-heat recovery in food processing: Microturbines vs. ORC systems in the coffee roasting industry”, *Applied Energy*, **225**, 782-796 (2018) (ISSN 03062619).
14. M. Farano, C. Mancini, P. De Palma, J.-C. Robinet, S. Cherubini, “3D global hydrodynamic stability analysis of a diffusion flame”, *Fluid Dynamics Research*, **50**(5), 051401 (2018) (ISSN 0169-5983).

15. M. Di Renzo, J. Urzay, P. De Palma, M. D. de Tullio, G. Pascazio, “The effects of incident electric fields on counterflow diffusion flames”, *Combustion and Flame*, **193**, 177-191 (2018) (ISSN 00102180).
16. R. Amirante, P. De Palma, E. Distaso, P. Tamburrano, “Thermodynamic analysis of small-scale externally fired gas turbines and combined cycles using turbo-compound components for energy generation from solid biomass”, *Energy Conversion and Management*, **166**, 648-662 (2018) (ISSN 01968904).
17. M. Di Renzo, P. De Palma, M. D. de Tullio, G. Pascazio, “An efficient flamelet progress-variable method for modeling non-premixed flames in weak electric fields”, *Computers and Fluids*, **157**, 14-27 (2017)(ISSN 0045-7930).
18. M. Farano, S. Cherubini, J.-S. Robinet, P. De Palma, “Optimal bursts in turbulent channel flow”, *Journal of Fluid Mechanics*, **817**, 35-60 (2017) (ISSN 1070-6631).
19. S. Cherubini, P. De Palma, “Subcritical transition scenarios via linear and nonlinear localized optimal perturbations in plane Poiseuille flow”, *Fluid Dynamics Research*, **48**(6), 061409 (2016) (ISSN 0169-5983).
20. A. Coclite, L. Cutrone, M. Gurtner, P. De Palma, O. J. Haidn, G. Pascazio, “Computing supersonic non-premixed turbulent combustion by an SMLD flamelet progress variable model”, *International Journal of Hydrogen Energy*, **41**(1), 632-646 (2016) (ISSN 0360-3199).
21. S. Cherubini, J.-C. Robinet, P. De Palma, “A nonlinear control strategy for finite-amplitude perturbations in a boundary-layer flow”, *Energy Procedia*, **81**, 1143-1150 (2015) (ISSN 1876-6102).
22. M. Di Renzo, A. Coclite, M. D. de Tullio, P. De Palma, G. Pascazio, “LES of the Sandia flame D using an FPV combustion model”, *Energy Procedia*, **82**, 402-409 (2015) (ISSN 1876-6102).
23. G. Caramia, G. Carbone, P. De Palma, “Hydrodynamic lubrication of micro-textured surfaces: Two dimensional CFD-analysis”, *Tribology International*, **88**, 162-169 (2015) (ISSN 0301-679X).
24. M. Farano, S. Cherubini, J.-S. Robinet, P. De Palma, “Hairpin-like optimal perturbations in plane Poiseuille flow”, *Journal of Fluid Mechanics*, **775**, R2 12 pages (2015) (ISSN 1070-6631).
25. A. Coclite, G. Pascazio, P. De Palma, L. Cutrone, M. Ihme, “An SMLD joint PDF model for turbulent non-premixed combustion using the flamelet progress-variable approach”, *Flow, Turbulence and Combustion*, **95**(1), 97-119 (2015) (ISSN 1386-6184).
26. S. Cherubini, P. De Palma, J.-c. Robinet, “Nonlinear optimals in the asymptotic suction boundary layer: Transition thresholds and symmetry breaking”, *Physics of Fluids*, **23**(3), 1.4916017 (2015) (ISSN 1070-6631).
27. S. Cherubini, P. De Palma, “Minimal-energy perturbations rapidly approaching the edge state in Couette flow”, *Journal of Fluid Mechanics*, **764**, 572-598 (2015) (ISSN 1070-6631).
28. S. Cherubini, P. De Palma, “Minimal perturbations approaching the edge of chaos in a Couette flow”, *Fluid Dynamics Research*, **46**(4), 041403 (2014) (ISSN 0169-5983).
29. S. Cherubini, J.-C. Robinet, P. De Palma, “Numerical study of the effect of freestream turbulence on by-pass transition in a boundary-layer flow”, *Energy Procedia*, **45**, 578-587 (2014) (ISSN 1876-6102).
30. D. Bruno, A. Panarese, P. Diomede, S. Longo, F. Taccogna, P. Minelli, S. T. Surzhikov, A. S. Dikaljuk, P. De Palma, M. D. de Tullio, “Particle Methods for Nonequilibrium Hypersonic and Plasma Flows”, *The Open Plasma Physics Journal*, **7**, 88-100 (2014) (ISSN: 1876-5343).

31. S. Cherubini, J.-C. Robinet, P. De Palma, “Nonlinear control of unsteady finite-amplitude perturbations in the Balsa boundary-layer flow”, *Journal of Fluid Mechanics*, 737, 440-465 (2013) (ISSN 1070-6631).
32. S. Cherubini, M. D. de Tullio, P. De Palma, G. Pascazio, “Optimal perturbations in boundary-layer flows over rough surfaces”, *Journal of Fluids Engineering*, 135(12), 4025028 (2013) (ISSN 0098-2202).
33. S. Cherubini, M. D. de Tullio, P. De Palma, G. Pascazio, “Transient growth in the flow past a three-dimensional smooth roughness element”, *Journal of Fluid Mechanics*, 724, 642-670 (2013) (ISSN 1070-6631).
34. S. Cherubini, P. De Palma, “Nonlinear optimal perturbations in a Couette flow: bursting and transition”, *Journal of Fluid Mechanics*, 716, 251-279 (2013) (ISSN 1070-6631).
35. S. Cherubini, P. De Palma, J.-C. Robinet, A. Bottaro, “A purely nonlinear route to transition approaching the edge of chaos in a boundary layer”, *Fluid Dynamic Research*, 44, 031404 (2012) (ISSN 01695983)
36. S. Cherubini, P. De Palma, J.-C. Robinet, A. Bottaro, “Edge states in a boundary layer”, *Physics of Fluids*, 23, 1051705-1-4 (2011) (ISSN 1070-6631).
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38. M. D. de Tullio, P. De Palma, M. Napolitano, G. Pascazio, “Recent advances in the development of an immersed boundary method for industrial applications”. In: *Computational Fluid Dynamics 2010*. p. 601-606, BERLIN HEIDELBERG:Springer-Verlag, 2011, (ISBN 978-3-642-17883-2).
39. L. Cutrone, P. De Palma, G. Pascazio, M. Napolitano, “A RANS flamelet-progress-variable method for computing reacting flows of real-gas mixtures”, *Computers and Fluids*, 39, 485-498 (2010)(ISSN 0045-7930).
40. S. Cherubini, J.-C. Robinet, P. De Palma, “The effects of non-normality and non-linearity of the Navier-Stokes operator on the dynamics of a large laminar separation bubble”, *Physics of Fluids*, 22, 014102-1-15 (2010) (ISSN 1070-6631).
41. S. Cherubini, J.-C. Robinet, A. Bottaro, P. De Palma, “The optimal and near-optimal wave packet in a boundary layer and its ensuing turbulent spot”, *Journal of Fluid Mechanics*, 656, 231-259 (2010)(ISSN 0022-1120).
42. G. Rossiello, P. De Palma, G. Pascazio, M. Napolitano, “Analysis of high-order-accurate fluctuation splitting schemes for steady advection”, *Int. J. of Comp. Fluid Dyn.*, 24, 217-225 (2010) (ISSN 1061-8562).
43. G. Rossiello, P. De Palma, G. Pascazio, M. Napolitano, “Recent Developments in High-Order-Accurate Fluctuation Splitting Schemes”, in *Computational Fluid Dynamics Review 2010*, M. M. Hafez, K. Oshima, D. Kwak (Eds.), July 2010 (ISBN: 978-981-4313-36-0, 981-4313-36-X).
44. S. Cherubini, J.-C. Robinet, P. De Palma, F. Alizard, “The onset of three-dimensional centrifugal global modes and their non-linear development in a recirculating flow over a flat surface”, *Physics of Fluids*, 22, 114102-1-18 (2010) (ISSN 1070-6631).
45. S. Cherubini, P. De Palma, J.-C. Robinet, A. Bottaro, “Rapid path to transition via nonlinear localized optimal perturbations in a boundary-layer flow”, *Physical Review E*, 82, 066302 (2010).

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