

Pietro De Palma
Curriculum Vitae
Spring 2013

Education

Pietro De Palma was born in Bari (Italy) on April 29th 1966. He graduated with honours in Mechanical Engineering at the Università di Bari in 1989. He spent one year at the 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 the Politecnico di Bari.

Employment history

He has been assistant professor of hydraulic and thermal machines at the Politecnico di Bari from June 1992 until October 1998.

In November 1998 he became associate professor at the Università di Roma "Tor Vergata" ; in November 2001 he moved to Politecnico di Bari as associate professor.

From December 2003 he is full professor of hydraulic and thermal machines at the Politecnico di Bari.

Teaching

Pietro De Palma has taught Energy Systems, Fluid Machinery I, Fluid Machinery II, Fluid Dynamics, Computational Fluid Dynamics, Turbomachinery, Thermal Plants.

Main research interests

He is group leader for the development of innovative numerical methods in fluid dynamics for the Center of Excellence in Computational Mechanics supported by the Italian Ministry of University and Research (MUR, grant CofinLab-2001).

His main research interests are: 1) design of numerical methods for compressible and incompressible flows; 2) stability analysis of boundary-layer flows; 3) turbulence and transition modeling; 4) combustion modeling; 5) numerical analysis of complex flow in turbomachinery; 6) energy systems; 7) microfluidics.

Grants and contracts

He has worked under two research contracts supported by European Union from 1990 to 1996 (BRITE programs) and under four contracts supported by MUR (PRIN-1999, PRIN-2001, PRIN-2003 (leader of the research unit), PRIN-2007).

He has been principal investigator of the PRIN-2007 project: "Novel computational fluid-dynamic methods for the simulation of aerospace vehicles".

He is consultant of General Electric for several industrial research projects.

Memberships and awards

He is member of the AIAA

Awards: Emerald Highly Commended Award 2002; Emerald Highly Commended Award 2007.

Service in University

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

He is now Deputy head of the Department of Mechanics, Mathematics, and Management and Coordinator of the II level degree Course in Mechanical Engineering.

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.

Scholarly activity

Articles in refereed journals and book chapters

1. Struijs R., Deconinck H., De Palma P., "Multidimensional upwind schemes using fluctuation splitting and different wave models for the Euler equations", *Lecture Notes in Physics*, Vol. **371**, Springer-Verlag, Berlin Heidelberg, 1990, pp. 352-354; presentato anche al 2nd Belgium National Congress on Theoretical and Applied Mechanics, Bruxelles, 1990.
2. Napolitano M., De Palma P., "Efficient solution of compressible internal flows", in *Modern Research Topics in Aerospace Propulsion*, G. Angelino, L. De Luca, W.A. Sirignano editori, Springer-Verlag, New York, 1991, pp. 201-212 (ISBN 0-387-97417-2, ISBN 3-540-97417-2).
3. Deconinck H., Struijs R., Paillere H., Catalano L. A., De Palma P., Napolitano M., Pascazio G., "Development of cell-vertex multidimensional upwind solvers for the compressible flow equations", *CWI-Quarterly*, Vol. **6**, No. 1, Centrum voor Wiskunde en Informatica, Amsterdam, 1993, pp. 1-28.
4. Catalano L. A., De Palma P., Pascazio G., "A multi-dimensional solution adaptive multigrid solver for the Euler equations", *Lecture Notes in Physics*, Vol. **414**, Springer-Verlag, Berlin Heidelberg, 1993, pp.90-94.
5. Catalano L. A., De Palma P., Napolitano M., Pascazio G., "Cell-vertex adaptive Euler method for cascade flows", *AIAA Journal*, Vol. **33**, No. 12, AIAA, Washington, 1995, pp. 2299-2304 (ISSN 0001-1452).
6. Catalano L. A., De Palma P., Pascazio G., Napolitano M., "A higher-order multidimensional upwind solution-adaptive multigrid solver for compressible flows", *Lecture Notes in Physics*, Vol. **453**, Springer-Verlag, Berlin Heidelberg, 1995, pp. 241-245.
7. Catalano L. A., De Palma P., Napolitano M., Pascazio G., "A critical analysis of multi-dimensional upwinding for the Euler equations", *Computers and Fluids*, Vol. **25**, No. 1, Elsevier Science Ltd., Great Britain, 1996, pp. 29-38 (ISSN 0045-7930).
8. Catalano L. A., De Palma P., Pascazio G., Napolitano M., "Matrix fluctuation splitting schemes for accurate solutions to transonic flows", *Lecture Notes in Physics*, Vol. **490**, Springer-Verlag, Berlin Heidelberg, 1997, pp. 328-333.
9. Catalano L. A., De Palma P., Napolitano M., Pascazio G., "A very efficient local-adaptive multigrid method based on a simple-wave decomposition of the Euler equations", *Notes on Numerical Fluid Mechanics*, Vol. **57**, Vieweg, Braunschweig, 1997, pp. 187-219 (ISSN 0179-9614, ISBN 3-528-06957-0).

10. Catalano L. A., De Palma P., Napolitano M., Pascazio G., "Genuinely multidimensional upwind methods for accurate and efficient solutions of compressible flows", *Notes on Numerical Fluid Mechanics*, Vol. **57**, Vieweg, Braunschweig, 1997, pp. 221-250 (ISSN 0179-9614, ISBN 3-528-06957-0).
11. De Palma P., Pascazio G., Napolitano M., "A validation study of a hybrid fluctuation splitting scheme for transonic inviscid flows", *Lecture Notes in Physics*, Vol. **515**, Springer-Verlag, Berlin Heidelberg, 1998, pp. 373-378 (ISSN 0075-8450, ISBN 3-540-65153-5).
12. De Palma P., Pascazio G., Napolitano M., "A multidimensional upwind solver for steady compressible turbulent flows", *Computational Fluid Dynamics Journal*, Special number 2001, Japan Society of CFD, Japan, 2001, pp. 287-295 (ISSN 0918-6654).
13. De Palma P., Pascazio G., Napolitano M., "A hybrid fluctuation splitting scheme for two-dimensional compressible steady flows", in "*Innovative methods for numerical solution of partial differential equations*", M. M. Hafez e J. J. Chattot editori, World Scientific Publishing Co. Pte. Ltd., Singapore, 2002, pp. 303-333 (ISBN 981-02-4810-5).
14. De Palma P., "Numerical simulation of transitional turbomachinery flows", in *Computational Fluid Dynamics 2000*, N. Satofuka editore, Kyoto, 2000; Springer-Verlag, New York, 2001, pp. 449-454 (ISBN 3-540-41459-2).
15. Bonfiglioli A., De Palma P., Pascazio G., Napolitano M., "An Implicit Fluctuation Splitting Scheme for Compressible Flows", in "*Computational Fluid Dynamics 2000*", N. Satofuka editore, Kyoto, 2000; Springer-Verlag, New York, 2001, pp. 367-372 (ISBN 3-540-41459-2).
16. De Palma P., Pascazio G., Napolitano M., "Accurate and efficient solutions of unsteady viscous flows", *Int. J. Num. Meth. Heat and Fluid Flow*, Vol. **11**, No. 4, MCB UP Ltd, England, 2001, pp. 286-307 (ISSN 0961-5539).
17. Napolitano M., Bonfiglioli A., Cinnella P., De Palma P., Pascazio G., "Future directions for computing compressible flows: higher-order centering vs. multidimensional upwinding", invited lecture at the conference Computing the future III: Frontiers of Computational Fluid Dynamics -- 2000, Half Moon Bay, California; pubblicato in *Frontiers of Computational Fluid Dynamics -- 2002*, D. A. Caughey and M. M. Hafez editori, World Scientific Publishing Co., Singapore, 2002, pp. 113-127 (ISBN 981-02-4849-0).
18. De Palma P., Pascazio G., Napolitano M., "A second-order-accurate fluctuation splitting scheme for unsteady hyperbolic problems", invited lecture at the conference Computational Fluid Dynamics for the 21st century", Kyoto 2000; pubblicato in *Notes on Numerical Fluid Mechanics*, Vol. **78**, M. M. Hafez, K. Morinishi e J. Periaux editori, Springer Verlag, Berlin Heidelberg, 2001, pp. 103-116 (ISSN 0179-9614, ISBN 3 540-42053-3).
19. De Palma P., "Accurate numerical simulation of compressible transitional flows in turbomachinery", *AIAA Journal*, Vol. **40**, No. 4, AIAA, Washington, 2002, pp. 702-708 (ISSN 0001-1452).
20. De Palma P., Pascazio G., Rossiello G., Napolitano M., "A second-order-accurate monotone implicit fluctuation splitting scheme for unsteady problems", in "*Computational Fluid Dynamics 2002*", S. Armfield, P. Morgan, K. Srinivas editori, Springer-Verlag, Berlin Heidelberg, 2003, pp. 731-736 (ISBN: 3-540-00739-3).
21. Cinnella P., De Palma P., Pascazio G., Napolitano M., "A numerical method for turbomachinery aeroelasticity", *ASME Journal of Turbomachinery*, Vol. **126**, issue 2, ASME, 2004, pp. 310-316 (ISSN 0889-504X).

22. P. De Palma, G. Pascazio, G. Rossiello, M. Napolitano, "A third-order-accurate multidimensional residual-distribution scheme for unsteady problems", in *Computational Fluid Dynamics 2004*, C. Groth and D. W. Zingg Eds. (3rd International Conference on Computational Fluid Dynamics ICCFD3, Toronto, 12-16 July 2004), pp. 199-204, Springer, 2006 (ISBN 3-540-31800-3).
23. De Palma P., Pascazio G., Rossiello G., Napolitano M., "A second-order-accurate monotone implicit fluctuation splitting scheme for unsteady problems", *Journal of Computational Physics*, Vol. **208**, issue 1, 2005, pp. 1-33 (ISSN 0021-9991).
24. Bonfiglioli A., De Palma P., Pascazio G., Napolitano M., "An implicit fluctuation splitting scheme for turbomachinery flows", *ASME Journal of Turbomachinery*, Vol. **127**, issue 2, 2005, pp. 395-401 (ISSN 0889-504X).
25. De Palma P., de Tullio M., Pascazio G., Napolitano M., "An immersed-boundary method for compressible viscous flows", *Computers and Fluids*, Vol. **35**, issue 7, 2006, pp. 693-702 (ISSN 0045-7930).
26. P. De Palma, P. Valentini, M. Napolitano, "Dissipative particle dynamics simulation of a colloidal micropump", *Physics of Fluids*, Vol. **18**, 2006, 027103-1-12 (ISSN 1070-6631).
27. P. De Palma, "Numerical simulations of three-dimensional transitional compressible flows in turbomachinery cascades", *Int. J. Numer. Methods Heat Fluid Flow*, Vol. **16**, issue 4, 2006, pp. 509-529 (ISSN 0961-5539).
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36. D. T. Rubino, P. De Palma, G. Pascazio, M. Napolitano, "Solution of the steady Euler equations using Fluctuation Splitting schemes on quadrilateral elements", in

- Computational Fluid Dynamics 2006, H. Deconinck and E. Dick Eds. (4th International Conference on Computational Fluid Dynamics ICCFD4, Gent, 10-14 July 2006), pp. 365-370, Springer, 2009 (ISBN 978-3-540-92778-5).
37. G. Rossiello, P. De Palma, G. Pascazio, M. Napolitano, "High-order-accurate fluctuation splitting schemes for unsteady hyperbolic problems using Lagrangian elements", in Computational Fluid Dynamics 2008, H. Choi, H.G. Choi, and J.Y. Yoo Eds. (5th International Conference on Computational Fluid Dynamics ICCFD5, Seoul, 7-11 July 2008), pp. 405-410, Springer, 2009 (ISBN 978-3-642-01272-3).
 38. 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).
 39. 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).
 40. 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).
 41. 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).
 42. 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).
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 44. 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).
 45. 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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 47. 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).
 48. 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)
 49. 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).

Conference proceedings

50. Struijs R., Deconinck H., De Palma P., Roe P. L., Powell K. G., "Progress on multidimensional upwind Euler solvers for unstructured grids", *AIAA Paper 91-1550, 10th AIAA Computational Fluid Dynamics Conference*, Honolulu (Hawaii), 1991.
51. Catalano L. A., De Palma P., Napolitano M., "Explicit multigrid smoothing for multidimensional upwinding of the Euler equations", *Notes on Numerical Fluid Mechanics*, Vol. **35**, Vieweg, Braunschweig, 1992, pp. 69-78.
52. Catalano L. A., De Palma P., Napolitano M., Pascazio G., "A multidimensional upwind solution adaptive multigrid solver for inviscid cascades", *Proceedings of the 5th European Multigrid Conference*, Amsterdam, 1993, pp. 151-162.
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54. Catalano L. A., De Palma P., Napolitano M., Pascazio G., "A cell-vertex adaptive Euler method for cascade flows", *AIAA Paper 94-0076, 32nd Aerospace Sciences Meeting & Exhibit*, Reno (Nevada), 1994.
55. Dadone A., De Palma P., "An adaptive multigrid upwind solver for compressible viscous flows", *AIAA Paper 95-2181, 26th AIAA Fluid Dynamics Conference*, San Diego (California), 1995.
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57. Catalano L. A., De Palma P., Pascazio G., Napolitano M., "A multidimensional upwind solution-adaptive multigrid solver for compressible viscous flows", *6th International Symposium on Computational Fluid Dynamics*, Lake-Tahoe (Nevada), in *A collection of technical papers*, 1995, pp. 142-147.
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60. Catalano L. A., De Palma P., Pascazio G., Napolitano M., "A contribution to multidimensional upwinding and fluctuation splitting: nonlinear matrix schemes", *AIAA Paper 97-2031, 13th AIAA Computational Fluid Dynamics Conference*, Snowmass (Colorado), 1997.
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62. De Palma P., Pascazio G., Napolitano M., "A hybrid fluctuation splitting scheme for transonic inviscid flows", *Proceedings of the 4th ECCOMAS Computational Fluid Dynamics Conference*, Athens, John Wiley & Sons, Ltd., England, 1998, pp. 578-584.
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