

John A. Ekaterinaris

Contact Information

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EDUCATION

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| 1977 | BS in Electrical and Mechanics Eng. | Aristotle University of Thessaloniki. |
| 1983 | M.Sc. | Georgia Institute of Technology (GIT), School of Mechanical Engineering. |
| 1987 | Ph.D.: | Georgia Institute of Technology (GIT), School of Aerospace Engineering. |

EXPERIENCE

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| Feb. 1988 - Feb. 1995. | Research Scientist, NASA/Ames Research Center, Moffett Field, California, USA. |
| Sept. 1989 - Nov. 1992. | Assistant Professor Naval Postgraduate School, Monterey, CA, USA. |
| Nov. 1992 - Sept. 1994. | Associate Professor Naval Postgraduate School, Monterey, CA, USA. |
| Nov. 1995 – Apr. 1997 | Senior Research Scientist, RISOE National Laboratory, Denmark. |
| Apr. 1997 – Oct. 2000 | Senior Research Scientist, NIELSEN Engineering and Research, Mountain View, CA, USA. |
| Oct. 2000 – Aug. 2005 | Research Director, Institute of Applied and Computational Mathematics (IACM), Foundation for Research and Technology Hellas (FORTH). |
| Aug. 2005 – today | Professor School of Mechanical and Aerospace Engineering University of Patras. |

INTERESTS

- Development and application of high order accurate numerical methods for the computation and investigation of basic mechanisms of flow transition and turbulence with direct numerical simulation (DNS) large eddy simulation (LES) of high-speed flows.
- Development of low numerical diffusion methods suitable for Computational Aeroacoustics (CAA) and noise generation and propagation from compressible viscous flows.
- Developments of the discontinuous Galerkin method for high order accurate solutions of complex aerodynamic problems and compressible turbulence.
- Development and evaluation of Computational Fluid Dynamics (CFD) methods for incompressible and compressible flows with applications to aerodynamics, turbomachinery, hydrodynamics and biofluids.
- Computation and investigation of time dependent flows with application in aeroelasticity, helicopter aerodynamics, wind turbines, and hemodynamics.
- Prediction and investigation of unsteady separation, dynamic stall, and flow control mechanisms for their control.
- Transition and turbulence modeling for CFD methods with application to high Reynolds number engineering applications.
- Simulation of multi-scale phenomena

Journal Publications

1. Jang, H. M., Ekaterinaris, J. A., Platzer, M. F., and Cebeci, T., "Essential Ingredients for the Computation of Steady and Unsteady Blade Boundary Layers," *ASME Transactions, Journal of Turbomachinery*, Vol. 113, 1991, pp. 608 - 616.
2. Ekaterinaris, J. A., and Schiff, L. B., "Numerical Prediction of Vortical Flow Over Slender Delta Wings," *Journal of Aircraft*, Vol. 30, No. 6, 1993, pp. 935 - 942.
3. Ekaterinaris, J. A., and Schiff, L. B., "Numerical Simulation of Incidence and Sweep Angle Effects on Delta Wing Vortex Breakdown," *Journal of Aircraft*, Vol. 31, No. 5, 1994, pp. 1043 - 1049.
4. Ekaterinaris J. A., Cricelli, A. S., and Platzer, M. F., "A Zonal Method for Unsteady, Viscous, Compressible Airfoil Flows," *Journal of Fluids and Structures*, Vol. 8, 1994, pp. 107 - 123.

5. Ekaterinaris J. A., and Menter, F. R., "Computation of Oscillating Airfoil Flows with One- and Two-Equation Turbulence Models," *AIAA Journal*, Vol. 32, No. 12, 1994, pp. 2359 - 2465.
6. Ekaterinaris J. A., "Effects of Spatial Order of Accuracy on the Computation of Vortical Flowfields," *AIAA Journal*, Vol. 32, No. 12, 1994, pp. 2471 - 2474.
7. Tuncer, I. H., Ekaterinaris J. A., and Platzer, M. F., "Viscous-Inviscid Interaction Method for Unsteady Low-Speed Flows," *AIAA Journal*, Vol. 33, No. 1, 1995, pp. 151 - 154.
8. Ekaterinaris J. A., and Schiff, L. B., "Navier-Stokes Solutions for an Oscillating Double-Delta Wing," *Journal of Aircraft*, Vol. 32, No. 2, 1995, pp. 228 - 234.
9. Ekaterinaris J. A., Coutley, R. L., Schiff, L. B., and Platzer, M.F., "Numerical Investigation of High Incidence Flow over a Double-Delta Wing," *Journal of Aircraft*, Vol. 32, No. 3, 1995, pp. 457 - 463.
10. Ekaterinaris J. A., "Analysis of Flowfields over Missile Configurations," *Journal of Spacecraft and Rockets*, Vol. 32, No. 3, 1995, pp. 385 - 391.
11. Srinivasan, G. R., Ekaterinaris J. A., and McCroskey, W. J., "Evaluation of Turbulence Models for Unsteady Flows of an Oscillating Airfoil," *Computers & Fluids*, Vol. 24, No. 7, 1995, pp. 833-861.
12. Ekaterinaris J. A., Chandrasekhara, M. S., and Platzer, M. F., "Analysis of Low Reynolds Number Airfoil Flows," *Journal of Aircraft*, Vol. 32, No. 3, 1995, pp. 625-630.
13. Ekaterinaris J. A., "Numerical Investigation of Dynamic Stall of an Oscillating Wing," *AIAA Journal*, Vol. 33, No. 10, 1995, pp. 1803-1808.
14. Ekaterinaris J. A., and Platzer, M. F., "Numerical Investigation of Stall Flutter," *ASME Transactions, Journal of Turbomachinery*, Vol. 118, 1996, pp. 197 - 203.
15. Van Dyken, R. D., Ekaterinaris, J. A., Chandrasekhara, M. F., and Platzer, M. F., "Analysis of Compressible Light Dynamic Stall Flow at Transitional Reynolds Numbers," *AIAA Journal*, Vol. 34, No. 7, 1997, pp. 1420 - 1427.
16. Ekaterinaris, J. A., "Upwind Scheme for Aeroacoustic Disturbances Generated by Low-Speed Flows," *AIAA Journal*, Vol. 35, No. 9, Sept. 1997, pp. 1848-1455.
17. Ekaterinaris, J. A. and Platzer, M. F., "Computational Prediction of Dynamic Stall," *Progress of Aerospace Sciences*, Vol. 33, No. 11-12, 1997, pp. 759-846.
18. Ekaterinaris, J. A., Sorensen, N. N., and Rasmussen, F., "Numerical Investigation of Airfoil Dynamic Stall in Simultaneous Oscillatory and Translational Motion," *ASME Journal of Solar Energy Engineering*, Vol. 120, Feb. 1998, pp. 75-83.
19. Ekaterinaris, J. A., "Simulation of Incompressible Flow of a Rotating Blade," *AIAA Journal of Propulsion and Power*, Vol. 14, No. 3, May-June 1998, pp. 367-374.

20. Ekaterinaris, J. A., "A new Formulation of Hardin-Pope Equations for Aeroacoustics," *AIAA Journal*. Vol. 37, No. 9, 1999, pp. 1033-1039.
21. Ekaterinaris, J. A., "Implicit, High-Resolution, Compact Schemes for Gas Dynamics and Aeroacoustics," *Journal of Computational Physics*. Vol. 156, 1999, pp. 272-299.
22. Ekaterinaris, J. A. and Kampanis, N. A., "A numerical prediction of acoustic fields generated by wind turbines," *Systems Analysis Modeling Simulation*, Vol. 39, 2000, pp. 49-74.
23. Ekaterinaris, J. A., "Implicit High-Order in Space Algorithms for the Navier-Stokes Equations," *AIAA Journal* Vol. 38, No. 9, Sept. 2000, pp. 1594-1602.
24. Weber, S., Jones, K. D., Ekaterinaris, J. A., and Platzler, M. F., "Transonic Flutter Computations for the NLR 7301 Supercritical Airfoil," *Journal of Aerospace Science and Technology*, Vol. 5, 2001, pp. 293-304.
25. Kampanis, N. A., and Ekaterinaris, J. A., "Numerical prediction of far-field wind turbine noise over terrain of moderate complexity," *Systems Analysis Modeling Simulation*, Vol. 41, 2001, pp. 107-122.
26. Ekaterinaris J. A., "Numerical Investigations of Dynamic Stall Active Control for Incompressible and Compressible Flows," *Journal of Aircraft*, Vol. 39, No. 1, Feb. 2002, pp. 71-78.
27. Castro, B. M., Ekaterinaris J. A., and Platzler, M. F., "Navier-Stokes Analysis of Wind-Tunnel Interference on Transonic Airfoil Flutter", *AIAA Journal*, Vol. 40, No. 7, 2002, pp. 1269-1276.
28. Ekaterinaris, J. A., "Aeroacoustic Predictions Using High-Order Shock-Capturing Schemes," *Journal of Computational Aeroacoustics*, Vol. 2, No. 2, 2003, pp. 175-192.
29. Ekaterinaris, J. A., "Performance of High-Order Accurate Low-Diffusion Numerical Schemes for Compressible Flow," *AIAA Journal*, Vol. 42, No. 3, 2004, pp. 493-500.
30. Ekaterinaris, J. A., "Predictions of Performance with Active Flow Control on Airfoils and Wings," *Journal of Aerospace Science and Technology*, Vol. 8, 2004, pp. 401-410.
31. Ekaterinaris, J. A., "High-Order Accurate Numerical Solution of Incompressible Flows with the Artificial Compressibility Method," *International Journal of Numerical Methods in Fluids*. Vol. 45, 2004, pp. 1187-1207.
32. Flouri, E., Ekaterinaris, J. A., and Kampanis, N. A., "High-Order Accurate Solutions for the Parabolic Equation," in the *Journal of Computational Acoustics*.
33. Ekaterinaris, J. A., "High-Order Accurate, Low Numerical Diffusion Methods for Aerodynamics," *Progress in Aerospace Sciences*, Vol. 41, No. 3-4, 2005, pp. 175-322.
34. Ekaterinaris, J. A., "High-Order Accurate, Low Numerical Diffusion Methods for Aerodynamics," *Progress in Aerospace Sciences*, Vol. 41, No. 3-4, 2005, pp. 175-322.

35. Kampanis, N. A. and Ekaterinaris, J. A., “A staggered Grid, High-Order Accurate Method for the Incompressible Navier-Stokes Equations,” *Journal of Computational Physics*, Vol. 215, No. 2, 2006, pp. 589-613.
36. Touloupoulos, I. and Ekaterinaris J. A. “High-Order Discontinuous Galerkin Discretizations for Computational Aeroacoustics in Complex Domains,” *AIAA Journal*, Vol. 44, No. 3, 2006, pp. 502-511.
37. Papaharilaou, Y., Ekaterinaris J. A., Eirini Manousaki, E., and, Katsamouris A. N. “Decoupled fluid structure approach for estimating wall stress in abdominal aortic aneurysms,” *Journal of Biomechanics*, Vol. 40, No. 2, 2007, pp.367-377.
38. Arabatzis, G., Vavilis, P., Touloupoulos, I., and Ekaterinaris, J. A., “Implicit High-Order Time-Marching Schemes for the Linearized Euler Equations,” *AIAA Journal*, Vol. 45, No. 8, August 2007, pp. 1819 – 1826.

Chapters in Books

1. **Calculation of Complex Turbulent Flows**, Advances in Fluid Mechanics, WIT Press, 2000, Chapter 8, “Numerical Prediction of Rotor Flowfields,” pp. 301 – 339.
2. V. A. Dougalis, J. A. Ekaterinaris, and N. A. Kampanis, **Effective Computational Methods in Wave Propagation**, Chapman & Hall CRC press. **Conference Presentations**

Supervised Graduate Students

1. R. L. Coutley, **M.Sc:** Naval Postgraduate School.
“Numerical Studies of Compressible Flow over a Double Delta Wing at High Angle of Attack,” March 1990.
2. J. D. Clarkson, **M.Sc:** Naval Postgraduate School
“A computational Investigation of Airfoil Stall Flutter,” March 1992.
3. S. P. Groshmeyer, **M.Sc:** Naval Postgraduate School.
“Numerical Investigation of the Effect of Leading Edge Geometry on Dynamic Stall of Airfoils,” Sept. 1990.
4. A. S. Cricelli, **M.Sc:** Naval Postgraduate School.
“Unsteady Aifoil Flow Solutions on Moving Zonal Grids” Dec. 1992.
5. M. R. Avila, **M.Sc:** Naval Postgraduate School.
“Computational and Experimental Investigation of the Aerodynamics Characteristics of Wind Surfing Sail Section,” Dec. 1992.

6. T. A. Johnston, **M.Sc.** Naval Postgraduate School.
“Computational Investigation of the Compressible Dynamic Stall Characteristics of the Sikorsky SSc-A09 Airfoil,” Sep. 1993.
7. R. VanDyken, **Ph.D:** Naval Postgraduate School.
“Experimental and Computational Analysis of Separation Bubble Behavior for Compressible Steady and Oscillatory over a NACA-0012 Airfoil,” March 1997.
8. B. Castro, **PhD:** Naval Postgraduate Scholl,
“Multi-Block Parallel Navier-Stokes Simulation of Unsteady Wind Tunnel and Ground Effects,” September 2001.
9. I. Tuncer **Postdoctoral:** Naval Postgraduate Scholl, 1993-1995
10. S. Weber **Postdoctoral:** Naval Postgraduate Scholl, 1998-2000

Current

- Ioannis Touloupoulos, **PhD.** School of Mathematics, Univ. of Athens.
- George Arambatzis **PhD.** School of Medicine, School of Mechanical and Aerospace Engineering , University of Patras.
- Konstantine Varsos **PhD.** School of Medicine, School of Mechanical and Aerospace Engineering , University of Patras.

Referee in Journals

1. AIAA Journal
2. Journal of Aircraft
3. Physics of Fluids
4. International Journal for Numerical Methods in Fluids
5. Journal of Aerospace Science and Technology
6. Journal of Computational Physics
7. Journal of Sound and Vibration
8. Journal of Wind Energy
9. ASME Journal
10. Computers and Fluids
11. Progress in Aerospace Sciences.

Associate Editor: Progress in Aerospace Sciences

Funded Research

Previous

- Dynamic Lift Studies for Enhanced Fighter Maneuverability. Funded by the Naval Air Development Center, Warminster PA. 1988-1993.
 - Numerical Investigation of High-Angle-of-Attack Missile Aerodynamics. Funded by the Naval Air Warfare Center, China Lake CA. 1991-1994.
 - Numerical Investigations of Heat Transfer and Transitional Unsteady Flow of Turbomachinery Blades. Funded by the NASA-LeRC, Cleveland, OH. 1990-1992.
 - Studies on Aerodynamics of Oscillating Devices as Lift Augmenters. Funded by the Naval Air Systems Command, Washington, DC. 1992-1994.
 - Visc-Wing Project for Wind Turbine Aerodynamics. Funded by the European Community, Sept.1995- Oct. 1997.
 - ROTOW, Investigation of Wind Turbine Blade-Tower Interaction, Funded by the European Community, Consultant to RISOE National Laboratory. Sept. 1998-Oct. 2001.
 - Development of High-Order Accurate methods for Rotor Aerodynamics, Phase I. and, Phase II., Funded by NASA-Ames Research Center, Moffett-Field CA, Jan. 1998 – 2001.
 - Know-Blade Project for Wind Turbine Aerodynamics. Funded by the 5th Framework program of the European Community, Jan.2001- Dec. 2004
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Current Research Projects

- Development of a Discontinuous Galerkin Method for Multiphysics Problems Governed by Hyperbolic Equations. Funded by the European Office of Aerospace Research (EOARD) of AFOSR, Oct. 2003 – present.
- Computational Prediction of High Speed Jet Flows. Funded by the European Space Agency (ESA) Jan. 2004 – Dec. 2007.
- GOAHEAD STREP Funded by the 6th Framework Program of the European Community July 2005 – July 2008.
- UFAST STREP Funded by the 6th Framework Program of the European Community Sept. 2005 – Sept. 2008.