

ALEXANDER POVITSKY

CV and List of Publications (August 2019)

Full Professor (tenured)

AIAA Associate Fellow

The University of Akron, Department of Mechanical Engineering

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web: <http://www.uakron.edu/engineering/ME/people/profile.dot?u=povitsky>

Professional Preparation:

Moscow Institute for Steel and Alloys (MISIS), Moscow, Russia Present name: The National University of Science and Technology (MISIS)	Metallurgical Engineering Program in Engineering Cybernetics (similar to program in Computational Science in the US)	B.Sc./M.Sc. 1978-1984
Moscow Institute for Steel and Alloys, Moscow, Russia	Mechanical Engineering (CFD, Thermo-fluids, combustion)	Ph.D. 1984-1988
The Technion-Israel Institute of Technology, Haifa, Israel	Aerospace Engineering (CFD, parallel computing, combustion, aerodynamics)	Postdoc, 1991-1994

Ph.D. Title: Modeling of turbulent combustion and conjugate heat transfer in rotating furnace for processing of high-temperature materials

Appointments:

2017-till now Full Professor, Department of Mechanical Engineering, The University of Akron, Akron, OH

Address: Auburn Science and Engineering Center (ASEC), 101, The University of Akron
Akron, OH 44325-3903

2003 –2017 Associate Professor (tenured in 2009), Department of Mechanical Engineering, The University of Akron, Akron, OH

Address: Auburn Science and Engineering Center (ASEC), 101, The University of Akron
Akron, OH 44325-3903

2001-2003: Associate Professor (tenure-track), Department of Mechanical and Industrial Engineering, Concordia University, Montreal, Canada

Address: 1455 De Maisonneuve Blvd. W. , Montreal, Quebec, Canada H3G 1M8

1997 – 2001: Senior Staff Scientist (since 1999), Staff Scientist (1997-1999), Institute for Computer Applications in Science and Engineering (ICASE) at NASA Langley Research Center, Hampton, VA.

Present name of ICASE is National Institute of Aerospace (NIA).

Address: 100 Exploration Way, Hampton, VA 23666

1994-1997: Lecturer, Department of Aerospace Engineering, The Technion-Israel Institute of Technology, Haifa, Israel

1991-1994: Postdoctoral Fellow, Department of Aerospace Engineering, The Technion, Haifa, Israel

Address: Department of Aerospace Engineering, The Technion – Israel Institute of Technology, Haifa 32000, Israel

1988 – 1991: Research Fellow, Moscow Institute for Steel and Alloys, Moscow, Russia

1986-1988: Research Engineer, Moscow Institute for Steel and Alloys, Moscow, Russia

Present name: National University of Science and Technology MISiS

Address: Leninsky Prospekt 4, Moscow, Russia, 119991

My research developments in aerodynamics include (i) development of vorticity confinement method for prediction of turbulent tip vortices for stationary and rotating wings, (ii) modeling of unsteady aerodynamics of flapping airfoils of micro air vehicles using high-order compact schemes and development of the optimal program of motion of wings, (iii) obtained directivity of sound for interaction of chains of shed vortices impinging into air vehicles, (iv) modeling of subterranean drilling mud dynamics to avoid explosions in oil and gas exploration

My developments in multi-scale micro- and nano- flows include (i) coupling of boundary singularity method (BSM) with molecular methods and continuum methods for micro- and nano-flows in transitional molecular-to-continuum regime with application to filtration, chemical vapor deposition and synthesis of micro- and nano- fibers; (ii) comprehensive model of laser irradiation shielding for multiple pulses in laser ablation, combined crater development, heat transfer and phase change, and (iii) development of robust computational methods for phase change (sublimation) in hypersonic in-flight ablation.

My research achievements in parallel computing include: (i) parallelization strategy for coupled continuum boundary singularity method and molecular direct simulation Monte-Carlo for nano- and micro- gas flows; (ii) development of processor scheduling algorithms for numerical solution of PDEs using implicit-in-time and compact high-order in space schemes; (iii) theoretical analysis of numerical stability for proposed sub-domain boundary conditions for implicit schemes.

External Financial Support at the University of Akron:

US Army Armament Research, Development and Engineering Center (ARDEC): Die Face Cutting, August 2016-August 2017 PI Sadhan Jana. Role: co-PI responsible for CFD modeling.

NSF I-Corps Sites University of Akron (*current*), Co-PI, Team lead on "Vorticity Confinement to Better Predict Aerodynamic Drag", 2014-2017

Weatherford Co: High-order of Approximation Modeling of Transient and Steady Processes in Drilling Environment, 2014-2015, Role: PI

Industrial Sponsor: High Temperature Processing of Materials, PI: Ed Evans (Chemical Engineering, University of Akron), 2014-2015. Role: co-PI responsible for CFD modeling.

Army Research Office (ARO): Vorticity Confinement Technique for Drag Prediction and Surface Interaction, 2012-2013, Role: PI.

Air Force Research Laboratory (AFRL): Implementation of Vorticity confinement, 2013, Role: PI.

Nano-Gas Jet: Production of Fibers, Fellowship for student Mikhaylenko, PI, 2014.

AFRL/Ohio: DAGSI Student and Faculty Grant (with M.Sc. students T. Snyder and K. Pierson), RB09-8, Drag Computation Using Vorticity Confinement, AFRL, Air Vehicles Directorate, 2009-2013, Role: PI.

AFOSR: Modeling of Flow about Pitching and Plunging Airfoil Using High-order Schemes, FA9550-07-1-0314, 2007-2008 , Role: PI.

AFOSR: Modeling of Interactions of Ablated Plumes at Various Altitude of Flight, FA 9550-07-1-0457, FA9550-08-1-0485, 2007-2009 , Role: PI

AFRL/Ohio: DAGSI Student and Faculty Grant (with Ph.D. student N. Mullenix), PR-2006-4, Modeling of Ablation Front Dynamics in Hypersonic Flight, AFRL Propulsion Directorate, 2006-2009, Role: PI.

External Research Funding at Concordia University, Canada

Natural Sciences and Engineering Research Council of Canada (NSERC): Airframe Noise Prediction and Control Using CFD Techniques, Research Grant, April 2002-April 2006, Role: PI.

NSERC: Modeling of aeroacoustics and nano-manufacturing processes, NSERC Summer Student Award for two undergraduate students, Role: PI

Recognitions:

Associate Fellow of AIAA (elected in January 2016)

Summer Air Force Awards (twelve awards in 2005-2019)

Summer Faculty Fellowship, AFRL at Kirtland AFB, New Mexico (2018)

Summer Faculty Fellowship, AFRL at Eglin AFB, Florida (2016)

Summer Faculty Fellowship, US Air Force Test Facility, Edwards AFB, California 2014 and 2015 (as a part of sabbatical leave (FIL))

Summer Faculty Fellowship, AFRL at WPAFB, Dayton, OH, 2005- 2009, 2011-2012 and 2019

Summer NASA Glenn Award: June-August 2015, Turbo-machinery Branch of NASA GRC

International Award

US-Germany: DAAD Research Stay for University Academics to facilitate Visiting Appointment at German Aerospace Center “Deutsches Zentrum für Luft- und Raumfahrt” (DLR), Braunschweig, Germany, while on FIL in Fall 2015. Awarded 07/28/2015.

Consulting while at UA

IllinoisRocstar LLC., NAVY SBIR Phase 1: Development of Adaptive Vorticity Confinement Based CFD Methodology for Rotorcraft Applications (Phase 1), 2013-2014. Role: External consultant/University co-PI.

School of Professional Engineers (online teaching toward PE exams) 2011-till now

External and visiting positions prior to my appointment at the UA in 2003

May -Aug 2002 Visiting Researcher
School of Computational Science at Florida State University
Host: Professor Youssuf Hussaini.

Oct 2002 Visiting Researcher
Department of Mechanical Engineering, University of Colorado at Boulder
Host: Professor Oleg Vasiljev

May 2002- June 2003 affiliated member-collaborator

Centre de Recherche en Calcul Appliqué (CERCA), Montreal, Canada.

Jan 2001-May 2001 Associate Researcher

School of Engineering at Hampton University, Hampton, VA

Investigator in a project: "Corrugated and Composed Nozzles with Applications for Jet Noise Reduction", funded by NASA Glenn Research Center.

Aug 1996 - Oct 1996 Visiting Researcher, Department of Mechanical Engineering

University of Manchester Institute of Science and Technology (UMIST), UK

Host: Prof M. Leschziner. Funded by Royal Society and Israel Academy of Science.

Internal Grants at the University of Akron:

Firestone Award: 2005, 2008

Summer Faculty Research Grant: 2004, 2005

Current Ph. D. advisor for: Himel Barua, Patrick Mahoney

Current M.Sc. advisor for: Akshay Pakala, Max Hanich

Graduated Ph.D. (6) and M.Sc. (4):

Himel Barua (M.Sc., defended in June 2016), M.Sc. Thesis: Computational Modeling of Chemical Vapor Deposition.”

Maxim Mikhaylenko (Ph.D., defended in September 2015, graduated in December 2015), Ph.D. Dissertation: “Development and Application of the Boundary Singularity Method to the Problems of Hydrodynamic and Viscous Interaction.”

Kristopher Pierson (M.Sc., May 2014, current position: Ph.D. student at the University of Akron) M.Sc. Thesis: “Modeling of Turbulent Tip Vortices of Fixed and Rotating Wings using Vorticity Confinement Technique Coupled with Total Variation Diminishing.”

Troy Snyder (M.Sc., 2012, current position: Ph.D. student at the University of Akron) M.Sc. Thesis: “A Coupled Wake-Integral/Vorticity Confinement Technique for the Prediction of Drag Force.”

Nathan Mullenix (M.Sc., 2005, Ph.D., 2010, UA), current position: Senior Research Engineer, GE Aviation, Cincinnati, OH. Ph.D. Thesis: “Fully Coupled Model for High-temperature Ablation and a Reactive-Riemann Solver for its Solution.”

Kedar Pathak (Ph.D., 2008, UA, current position: Associate Professor, U.V. Patel College of Engineering, India). Ph.D. Thesis: “Computational Modeling of Plume Dynamics in Multiple Pulse Laser Ablation of Carbon”.

Harish Gopalan (Ph.D., 2008, UA, current position: senior researcher fellow at NUS-Keppel Corp Research, Singapore). Ph.D. Thesis: “Numerical Modeling of Aerodynamics of Airfoils of Micro Air Vehicles in Gusty Environment.”

Shunliu Zhao (Ph.D., 2010, UA, current position: Carleton University, Ottawa, Canada, Postdoctoral researcher). Ph.D. Thesis: “Development of Boundary Singularity Method for Partial-Slip and Transition Molecular-Continuum Flow Regimes with Application to Filtration.”

Tinghui Zheng (Ph.D., 2005, Concordia University, current positions: Research Fellow, Hong-Kong Poly U. and Associate Professor, Sichuan University, Chengdu, China). Ph.D. Thesis: "The Effects of Vortex Profile on Sound Generation and Propagation in Non-uniform Flow."

Research awards of my graduate students:

1. In March 2016, Povitsky and graduate student Pierson received summer faculty-and-student award for 10 weeks summer research at Air Force Research laboratory at Eglin AFB.
2. In February 2016, graduate student Pierson is awarded 2016 Akron Engineer Award by Northeastern Ohio AIAA chapter for his M.Sc. research in vorticity confinement and AIAA publications.
3. In April 2014, M. Sc. student Pierson got the 3rd place in the Midwestern AIAA students' conference.
4. In 2012, Ph.D. student Mikhaylenko received NSF travel award to attend Boundary Element Method" workshop.
5. Ph.D. student Mullenix has received the best presentation award at the AIAA symposium in the Computational Methods Group in 2010. Also he was cited by Ohio Aerospace Institute for presenting his research at the 15th International Space Planes and Hypersonic Systems Conference in May 2008.
6. Graduated Ph.D. student Pathak won four Young Investigator travel awards to attend the NASA GRC/Rice University Workshop on Synthesis of Nanotubes in April 2007, the 5th International Conference on Photo-Excited Processes and Applications (ICPEPA-5) in September 2006, the 3rd MIT Conference of Computational Solid and Fluid Mechanics, June 2005, and the Conference on Analysis, Modeling and Computation of PDE and Multiphase Flow, celebrating the 70th birthday of Professor James Glimm, SUNY Stony Brook, August 2004.

Supervision of postdoctoral fellows:

Mona Golbabaie (2014-2015, postdoctoral fellow, funded by Weatherford)

Igor Zinovik (2005, current position: senior research scientist, Philip Morris, Switzerland)

Diomar Lobao (2002-2003, current position: Professor, Universidade Federal Fluminense-UFF, RJ, Brazil)

Avijit Chatterjee (1996-1997, current position: Professor, Department of Aerospace Engineering, IIT Bombay, India)

Courses taught (The University of Akron, Concordia University (Montreal), The Technion)

Undergraduate: Dynamics, Fluids-1 Fluids-2, Aerodynamics of Wings, Foundations of Design (numerical optimization part), Heat Transfer, Engineering Analysis 1 and 2, Algorithms in C++, Senior Design Project, ME lab.

Graduate and undergraduate: Gas Dynamics, Compressible Fluid Flow, Introduction to CFD

Graduate: CFD-1, CFD-2, Dynamics of micro- and nano- flows, Combustion, Heat Transfer

Development of new courses at The University of Akron:

- (a) I developed and taught a new *Undergraduate Mechanical Engineering Lab*, to study lift and drag force exerted on subsonic multi-element MAV wings. I set-up a new subsonic

wind tunnel, designed model wings, wrote experiments, and developed a FLUENT-based simulation tool.

(b) I proposed, developed and taught a new graduate course *_Micro- and Nano- Fluid Dynamics 4600:655* that has been approved and included in the University curriculum.

(c) Current development of transonic aerodynamic experiment for Compressible Fluid Flow class and ME Lab

Service for Professional Community:

I am a Managing Editor of "Nano MMTA" Journal - Nanoscale Systems: Modeling, Theory and Applications, from 2015.

I was a mentor in local AIAA Northeastern Ohio Chapter in frame of AIAA mentoring program. I mentor AIAA student member Mr. John Lightfoot (senior at Cleveland State University), 2015-2017.

I was a Session Chair at AIAA Computational Fluid Dynamics Conference, San Diego, CA, June 2013

I was a Session Chair (Modeling and Simulation of Micro- Fluids) at American Filtration Society conference, AFS-2010, San Antonio, TX, March 2010.

I was a Session Chair (Fluid Dynamics of Materials' Processing) in American Physical Society DFD Conference, 2010.

I was a guest journal editor in "Journal of Nanoscience and Nanotechnology" (2008) , "Mathematics and Computers in Simulations" (2004) and "Theoretical and Computational Nanoscience" (2006).

I co-organized the Workshop "Modeling of Transport Phenomena in Nanotechnology" at the World Congress in Computational Mechanics, Los Angeles, CA, July 2006, 25 participants.

I am a member of the steering committee of the annual MUFMECH (Midwestern Universities Fluid Mechanics Retreat) and the University of Akron representative there.

I am a reviewer for Physics of Fluids, AIAA J., J. of Theoretical and Computational Fluid Dynamics, Aerospace Science and Technology, Physica A, J. of Applied Physics, Computers and Fluids, Heat and Mass Transfer, Journal of Computational Acoustics, Building and Environment, Applied Numerical Mathematics, J. of Nanoscience and Nanotechnology, J. of Mathematical Physics, Journal of the Atmospheric Sciences, Physics Letters A, IMECE, NanoLetters, Journal of Aerospace Engineering, The Aeronautical Journal (Royal Society), Scientia Iranica, ASME Journal of Heat Transfer, Journal of Physics D, and Chemical Physics Letters.

I was a reviewer of proposals for ARO, NSF, NASA, Canadian NSERC and Israel Science Foundation (Canadian and Israeli analogues of NSF).

Service for University:

Member of University-wise Graduate Council (2018-2021)

Member of University-wise Faculty Research Committee (2011 -2017)

Member of University-wise Graduate Curriculum Committee (2014-2017)

ME Liaison for local AAUP chapter (from December 2015 till now)

Chair of Retention, Tenure and Promotion Committee, Department of Mechanical Engineering (2009-2010)

Member of Department Search Committee (2012-2014, 2017-2018)

Member of Graduate Program Revision Committee, Department of Mechanical Engineering (2009-2010)

Member of ME Graduate Studies Committee (2011- till now)

Pre-college activities:

Interviewer of Honors High School students (2006-till now)
Judge for the 60th annual Akron Public Schools' Science Technology, Engineering and Math EXPO, January 30, 2016
Super judge for WRD5 Science Day at University of Akron (March 2014)
Judge at State Science Day, Columbus, OH, May 2014
New Student Orientation (NSO) advisor for freshman ME and ASE, from 2015

Member of Graduate Committees for M. Sc. and Ph.D. applicants at the University of Akron:

Craig Laukiavich (Mechanical Engineering, Ph.D. Defense, December 2014)
Xi Yang (Chemical Engineering, Ph.D. Defense, April 2016)
Suma Rama Das (Mechanical Engineering, M.Sc. Thesis, October 2016)
Farzad Ahmadi (Electrical Engineering, Ph.D. Committee Member since July 2015)
Abbas Rahimi (Civil Engineering, Ph.D. Thesis Defense, February 2015)
Dipankar Biswas (Mechanical Engineering, Ph.D. Thesis Defense, November 2014)
Gabriel Manzo (Chemical Engineering, Ph.D. Thesis Proposal Defense, February 2014)
Ana Balasiou (Mechanical Engineering, Ph.D. Defense, October 2012)
Stefan Moldovan (Mechanical Engineering, Ph.D. Defense, February 2013)
Andrew Guarendi (Mechanical Engineering, M. Sc. Defense, January 2013)
Sarfaraz Patel (Chemical Engineering, M.Sc. Defense, 2013)
Frank Horvat (Mechanical Engineering, Ph.D. Defense, May 2012)
Dipin Kalapurakal (Mechanical Engineering, M.Sc. Defense, June 2012)
Nicholas Garafolo (Mechanical Engineering, Ph.D. Defense, March 2010)
Joshua Johnson (Engineering Applied Math PhD program, Ph.D. Thesis Defense, October 2010)
Yan Zhang (Civil Eng, Ph.D. Thesis Defense, November 2010)
Lauren Brubaker (Engineering Applied Math PhD program, Thesis Proposal Defense, October 2010)
Bharath Kumar (Chemical Engineering, Ph.D. Defense, July 2010)
Anil Bhari (Mechanical Engineering, M.Sc. Defense, November 2010)
Zhenpeng Qin (Mechanical Engineering, M.Sc. Defense, April 2009)
Changhu Xing (Mechanical Engineering, Ph.D. Defense, June 2009)
Jianhua Dai (Electrical Engineering, Ph.D. Defense, April 2009)
Dingfeng Deng (Mechanical Engineering, Ph.D. Defense, January 2007)
Song Liu (Mechanical Engineering, M. Sc. Defense, April 2007)
Mohammad Faizan (Mechanical Engineering, Ph.D. Defense, October, 2007)
Sun Feng (Mechanical Engineering, Ph.D. Defense, October 2007)
Joe Mandi (Mechanical Engineering, M. Sc. Thesis Defense, April 2005)
Peter (Zheng) Zhang (Mechanical Engineering, M. Sc. Thesis Defense, October 2005)
Atanas Gagov (Polymer Engineering, Ph.D. Defense, October 2007)

List of Publications

ALEX POVITSKY

(August 2019)

Research topics:

A-interactions of shock waves, laser ablation and hypersonic ablation

B-high-order schemes, vorticity confinement, aeroacoustics, wave propagation in drilling mud, and unsteady aerodynamics of micro air vehicles

C-combined molecular and continuum method for micro- and nano- flows, synthesis of nanotubes and combustion

D-parallel algorithms for CFD

Status of co-author:

(*) graduate student under my advice

(**) postdoctoral fellow under my advice

(u) undergraduate student under my advice

Journal Publications

1. M. Golbabaei-Asl (**), A. Povitsky and Lev Ring, Modeling of Wave Propagation in Drilling Fluid, ASME Journal of Offshore Mechanics Vol. 140(4), p. 041304, Apr 2018.
2. N. Mullenix(*) and A. Povitsky, Hypersonic Ablation of Graphite Thermal Protection Systems with Surface Defects, AIAA J. of Spacecraft and Rockets, Vol. 53, Issue 5, pp, 912-929, 2016. Published online July 18th 2016. Research Topics: A,D.
3. M. Mikhaylenko(*) and A. Povitsky, Combined Boundary Singularity Method and Finite Volume Method with Application to Viscous Deformation of Polymer Film in Synthesis of sub-Micron Fibers, Engineering Analysis with Boundary Elements (EABE), Vol. 83, 2017, pp. 265-274. Research topic: C. Role: the corresponding author.
4. A. Povitsky, Three-dimensional flow with elevated helicity in driven cavity by parallel walls moving in perpendicular directions, Physics of Fluids 29, 083601 (2017); <http://doi.org/10.1063/1.4996179>.
5. T. Snyder(*) and A. Povitsky Far-field Induced Drag Prediction Using Vorticity Confinement Technique, AIAA J. of Aircraft, Vol. 51, issue 6, pp. 1953-1958, 2014 <http://arc.aiaa.org/doi/abs/10.2514/1.C032719>, Role: the corresponding author. Research topic: B.
6. M. Mikhaylenko(*) and A. Povitsky, Optimal Allocation of Boundary Singularities for Stokes Flows about Pairs of Particles, Engineering Analysis with Boundary Elements (EABE), Vol. 41, pp. 122-138, 2014. Role: the corresponding author. Research topic: C.
7. S. Zhao(*) and A. Povitsky, Coupled Continuum and Molecular Model of Flow through Fibrous Filter, Physics of Fluids, Vol.25, Issue #11, 112002, November 2013. Role: the corresponding author. Research topics: C and D.

8. S. Zhao(*) and A. Povitsky, Hybrid Continuum-molecular Modeling of Fibrous Filtration Flows in the Transition Flow Regime, Journal of Coupled Systems and Multiscale Dynamics, Issue 2, Vol. 1, 2013, pp. 251-264, Role: the corresponding author. Research topics: C and D, <http://www.aspbs.com/jcsmd/>
9. S. Zhao(*) and A. Povitsky, Three-dimensional boundary singularity method for partial slip flows, Engineering Analysis with Boundary Elements, 2011, **35**(1), p.114-122. Role: the corresponding author. Research topic: C.
10. H. Gopalan(*) and A. Povitsky, Lift Enhancement of Flapping Airfoils by Generalized Pitching Motion, AIAA J. of Aircraft, Vol. 47, No. 6, pp. 1884-1994, November–December 2010. Research Topic: B
11. A. Povitsky, K. Pathak(*), and D. Gaitonde, Dynamics of Plumes Generated by Local Injection of Ablated material, AIAA Journal, Vol. 47, No. 3, pp. 655-668, 2009. Role: the corresponding author. Research topic: A.
12. S. Zhao(*) and A. Povitsky, Boundary Singularity Method for Partial Slip Flows, Int. Journal for Numerical Methods in Fluids, Vol. 61, 2009, pp. 255-274. Role: the corresponding author. Research topic: C.
13. H. Gopalan(*) and A. Povitsky, Stream Function-Potential Function Coordinates for Aeroacoustics and Unsteady Aerodynamics, Int. Journal of Computational Fluid Dynamics, Vol. 23, No. 3, pp. 285-290, 2009. Role: The corresponding author. Research topics: B and D.
14. S. Zhao(*) and A. Povitsky, A hybrid molecular and continuum method for low-Reynolds-number flows, Nonlinear Analysis: Theory, Methods & Applications, Vol. 71, Issue 12, 2009, pp. e2551-e2564 Web: doi:10.1016/j.na.2009.05.069, Role: the corresponding author. Research topic: C.
15. T. Zheng(*), A. Povitsky, and G. Vatistas, Vortex-generated Sound in Flow about Spinning Cylinders, Journal of Computational Acoustics, Vol. 16, No. 4, 2008, pp. 577-599. Role: the corresponding author. Research topic: B.
16. S. Zhao(*) and A. Povitsky, Method of Submerged Stokeslets for Slip Flow about Ensembles of Particles, J. of Nanoscience and Nanotechnology, Vol. 8, N. 7, July 2008, pp. 3790-3801. Role: the corresponding author. Research topic: C.
17. K. Pathak(*) and A. Povitsky, Multi-time Step Modeling of Plume Dynamics in Carbon Ablation Journal of Nanoscience and Nanotechnology, 8, 6075–6081 (2008). Role: the corresponding author. Research topic: A.
18. K. Pathak(*) and A. Povitsky, Plume Dynamics and Shielding Characteristics of Nano-second Scale Multiple Laser Pulse in Carbon Ablation, Journal of Applied Physics, Volume 104, Issue 11, pp. 113108-113108-10 (2008). Role: the corresponding author. Research topic: A.
19. T. Zheng(*), G. Vatistas and A. Povitsky, Sound Generation by Street of Vortices in a Non-uniform Flow, Physics of Fluids, Vol. 19, 037103, March 2007. Role: the corresponding author. Research topic: B.

20. I. Zinovik(**) and A. Povitsky, Modeling of vapor-droplet plumes ablated from multiple spots, Applied Surface Science Journal, Vol. 253, No. 15, May 2007, pp. 6371-6377. Role: co-author. Research topic: A
21. N. Mullenix(*) and A. Povitsky, Exploration of Pulse Timing for Multiple Laser Hits within a Combined Heat Transfer, Phase Change, and Gas Dynamics Model for Laser Ablation, Applied Surface Science Journal, Vol. 253, No. 15, May 2007, pp. 6366-6371. Role: the corresponding author. Research topic: A
22. K. Pathak(*) and A. Povitsky, Modeling of plume dynamics with shielding in laser ablation of carbon, Applied Surface Science Journal, Vol. 253, No. 15, May 2007, pp. 6359-6366. Role: the corresponding author. Research topic: A
23. I. Zinovik(**) and A. Povitsky, Dynamics of multiple plumes in laser ablation: modeling of the shielding effect, Journal of Applied Physics, Vol. 100, 024911 (2006) (13 pages) Role: the corresponding author. Research topic: A
24. T. Zheng (*), A. Povitsky, and G. Vattistas, Sound Generation by one-cell and two-cell vortices in a non-uniform flow, Journal of Computational Acoustics, Vol. 14, No. 3, 2006, Role: the corresponding author. Research topic: B
25. N. Mullenix(*) and A. Povitsky, Comparison of 1D and 2D coupled models of gas dynamics and heat transfer for the laser ablation of carbon, Journal of Computational and Theoretical Nanoscience, 3, 513–524 (2006). Role: the corresponding author. Research topic: A
26. K. Pathak(*) and A. Povitsky, Inviscid, viscous and turbulent models of plume dynamics for laser ablation of carbon, Journal of Computational and Theoretical Nanoscience, J. Comput. Theor. Nanosci. 3, 565–578 (2006). Role: the corresponding author. Research topic: A.
27. K. Pathak(*), N. Mullenix(*) and A. Povitsky, Combined Thermal and Gas Dynamics Numerical Model for Laser Ablation of Carbon, Journal of Nanoscience and Nanotechnology, Vol. 6, No. 5, pp.1271-1280, 2006. Role: the corresponding author. Research topic: A.
28. D. Lobao(**) and A. Povitsky, Single and Multiple Plume Dynamics in Laser Ablation for Nanotube Synthesis, AIAA Journal, Vol. 43, No 3, 2005, pp. 595-608. Role: the corresponding author. Research topic: A.
29. A. Povitsky, Three-dimensional Flow in Cavity at Yaw, Journal of Nonlinear Analysis (Elsevier), Volume 63, Issues 5-7, 2005, Pages 1573-1584. Research topic: B.
30. A. Povitsky, Fluid dynamics issues in synthesis of carbon nanotubes, International Journal of Nanoscience, Vol. 4, No 1, pp. 73-98, 2005. Research topic: C.
31. Zheng TH(*), Vattistas GH, Povitsky A, Effects of non-linearity on sound generation and propagation in a non-uniform flow, Transactions of the Canadian Society for Mechanical Engineering, 29 (1): 57-65, 2005. Role: co-author. Research topic: B.

32. A. Povitsky and M. Salas, Trajectory-based Approach to Jet Mixing and Optimization of the Reactor for Production of Carbon Nanotubes, AIAA Journal, Vol. 41, No. 11, November 2003, pp. 2130-2143. Role: the corresponding author. Research topic: C.
33. A. Povitsky, T. Zheng (*), and G. Vatistas, Effect of Vortex Profile on Sound Generation in a Non-uniform Flow , Mathematics & Computers in Simulation, Vol. 65, N 4-5, pp 447-469, 2004. Role: the corresponding author. Research topic: B.
34. D. Lobao (**) and A. Povitsky, Furnace Geometry Effects on Plume Dynamics in Laser Ablation, Mathematics & Computers in Simulation, Vol. 65, N 4-5, pp 365-385, 2004. Role: the corresponding author. Research topic: A.
35. C. Scott, A. Povitsky, C. Dateo, T. Gokcen, P. Willis and R.E. Smalley, Iron Catalyst Chemistry in Modeling a High Pressure Carbon Monoxide Nanotube Reactor, Journal of Nanoscience and Nanotechnology, Vol. 3, 2003, pp. 63-73. Role: co-author. Research topic: C
36. A. Povitsky, Parallel ADI Solver Based on Processor Scheduling, Applied Mathematics and Computations, Vol. 133, No. 1, November 2002, preliminary version: ICASE Report 98-45. Research topic: D
37. A. Povitsky, Numerical Study of Wave Propagation in a Compressible Non-uniform Flow, Physics of Fluids, Vol. 14, No 8, August 2002, preliminary version: ICASE Report 2000-35. Research topic: B.
38. A. Povitsky, Improving Jet Reactor Configuration for Production of Carbon Nanotubes, Computers and Fluids, Vol. 31, No. 8, April 2002, preliminary version: ICASE Report 2000-18. Research topic: C.
39. A. Povitsky, Wave front cache-friendly algorithm for compact numerical schemes, Applied Mathematics Letters, Vol. 14, No. 4, pp. 449-454, 2001, preliminary version ICASE Report 99-40. Research topics: B, D.
40. A. Povitsky and P. Morris, Parallel Compact Multi-Dimensional Numerical Algorithm with Application to Aeroacoustics, Journal of Computational Physics, Vol. 161, pp. 182-203, 2000, preliminary version ICASE Report 99-34. Role: the corresponding author. Research topic: B, D.
41. A. Povitsky, On Aeroacoustics of a Stagnation Flow Near a Rigid Wall, Physics of Fluids, Vol. 12, No 10, 2000, see also ICASE Report 99-48. Research topic: B
42. A. Chatterjee (**) and A. Povitsky, Computational Study of Curved Shock-Vortex Interactions, International Journal for Numerical Methods in Fluids, Vol. 30, pp. 257-277, 1999. Role: co-author. Research topic: B
43. A. Povitsky and D. Ofengeim, Numerical Study of Interaction of a Vortical Density Inhomogeneity with Shock and Expansion Waves, International Journal of Computational Fluid Dynamics (IJCFD), Vol. 12, pp. 165-176, 1999, preliminary version ICASE Report 98-10. Role: the corresponding author. Research topic: B

44. A. Povitsky, Parallelization of Pipelined Algorithms for Sets of Linear Banded Systems, Journal of Parallel and Distributed Computing, Vol. 59, pp 68-97, 1999. Research topic: D.
45. A. Povitsky, Efficient Parallelization of a Parabolized Flow Solver, Computers and Fluids, Vol. 27, No. 8, pp. 985-1000, 1998. Research topic: D.
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