

Curriculum Vitae

Personal

Name: Andrey V. Kuznetsov

Address

Dept. of Mechanical & Aerospace Engineering
North Carolina State University
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Education

Ph.D., Mechanical Engineering, 1992, Mechanical Engineering Research Institute, Russian Academy of Sciences, Moscow, Russia

M.S. Hons., Applied Mathematics, 1990, Moscow State University, Mechanical-Mathematical Department, Moscow, Russia

M.S. Hons., Mechanical Engineering, 1988, Bauman State Technical University, Moscow, Russia

Ph.D. Thesis

Development of a Metal Hydride Power System for a Space Station

Areas of Expertise

Numerical and analytical modeling of heat and mass transfer processes; transport processes in porous media; reacting multiphase flows; flows in coating processes; phase change processes; flow, heat, and mass transfer in casting and welding; transport processes in biological tissues; heat and mass transfer in fire fighter protective garment; flows in bacterial suspensions

Membership in Professional Organizations

Member of the ASME, 1998-present

Associate Member of the American Society of Mechanical Engineers (ASME), 1997-1998

Member of the Metallurgical and Materials Transactions B Review Committee, 2003-2005

Member of the American Society for Engineering Education (ASEE), 2003-present

Academic Employment Record

Associate Professor, August 2002–present, NC State University, Dept. of Mechanical and Aerospace Engineering, NC

Associate Member of BME Faculty, December 2005-present, UNC/NCSU Joint Dept. of Biomedical Engineering, NC

Assistant Professor, January 1998–July 2002, NC State University, Dept. of Mechanical and Aerospace Engineering, NC

Research Scientist, January 1992-December 1997, Mechanical Engineering Research Institute, Russian Academy of Sciences, Moscow, Russia

Senior Research Scientist, April 1995-December 1997, Technical University of Vienna, Institute of Fluid Mechanics and Heat Transfer, Vienna, Austria

University Postdoctoral Fellow, January 1994-December 1994, Ohio State University, Department of Mechanical Engineering, Columbus, OH

Alexander von Humboldt Foundation Research Fellow, June 1993-December 1993, Ruhr-University Bochum, Institute of Power Engineering, Bochum, Germany
 Senior Visiting Scholar, March 1993-April 1993, Korea Institute of Science and Technology, Seoul, Korea
 Visiting Scholar, January 1993-February 1993, Technical University Vienna, Institute of Fluid Mechanics and Heat Transfer, Vienna, Austria

Academic Honors and Awards

Alcoa Foundation Engineering Research Achievement Award, NC State, 2005
 Panelist on "Fundamentals of Modeling Transport in Porous Media: from Micro- to Macroscale" panel (35th Nat HT Conference, Anaheim, CA, 10-12 June, 2001), 2001
 Japan Society for the Promotion of Science (JSPS) Research Fellowship, 1997
 Invited Speaker at the 15th Oji International Seminar (Tomakomai City, Hokkaido, Japan, September 16-19, 1997), 1997
 Best paper award (2nd European Thermal Sciences Conference), 1996
 Ohio State University Postdoctoral Fellowship, 1994
 Alexander von Humboldt Foundation Research Fellowship, 1993

Citations of Dr. Kuznetsov's Work

A recent reference book by D.A. Nield and A. Bejan, *Convection in Porous Media*, 3rd ed., Springer, New York, 2006 references 76 of Dr. Kuznetsov's research papers. A recent review of 2003 heat transfer literature (R.J. Goldstein, W.E. Ibele, S.V. Patankar, T.W. Simon, T.H. Kuehn, P.J. Strykowski, K.K. Tamma, J.V.R. Heberlein, J.H. Davidson, J. Bischof, F.A. Kulacki, U. Kortshagen, S Garrick, and V. Srinivasan, "Heat Transfer – A Review of 2003 Literature," *Int. J. Heat Mass Transfer*, vol. 49, pp. 451-534, 2006) references eight of Dr. Kuznetsov's research papers.

Membership in Editorial Boards

2003-2004 - Co-editor of the *International Journal of Fluid Mechanics Research* (published by Begell House)
 2005-present – Member of the Editorial Board of the *International Journal of Fluid Mechanics Research* (published by Begell House)
 2003-2005 – Key Reader (member of the Board of Review) of *Metallurgical and Materials Transactions B*, first term
 2006-2008 – Key Reader (member of the Board of Review) of *Metallurgical and Materials Transactions B*, second term

Listed In

Who'sWho in America, 56th–61th eds., 2002–2007
 Who'sWho in Science and Engineering, 7th–10th eds., 2003–2009
 Who'sWho in American Education, 6th–8th eds., 2003–2007
 Who's Who in Fluids and Flow Engineering (at <http://www.efluids.com>)
 Who'sWho in the World, 24th ed., 2007

University Courses Taught

Spring 2008	MAE 310 Heat Transfer Fundamentals, 73 students
Spring 2008	MAE 708 Advanced Convection Heat Transfer, 19 students
Fall 2007	MAE 505 Heat Transfer, Theory and Applications, 24 students
Spring 2007	MAE 310 Heat Transfer Fundamentals, 67 students
Spring 2007	MAE 708 Advanced Convection Heat Transfer, 4 students
Fall 2006	MAE 505 Heat Transfer, Theory and Applications, 7 students
Spring 2006	MAE 310 Heat Transfer Fundamentals, 101 students
Spring 2006	MAE 708 Advanced Convection Heat Transfer, 7 students
Fall 2005	MAE 505 Heat Transfer, Theory and Applications, 12 students completed

Spring 2005	MAE 310 Heat Transfer Fundamentals, 66 students completed
Fall 2004	MAE 505 Heat Transfer, Theory and Applications, 25 students completed
Spring 2004	MAE 308 Fluid Mechanics, 41 students completed
Fall 2003	MAE 308 Fluid Mechanics, 60 students completed
Fall 2003	MAE 505 Heat Transfer, Theory and Applications, 25 students completed
Spring 2003	MAE 708 Advanced Convection Heat Transfer, 8 students completed
Fall 2002	MAE 308 Fluid Mechanics (2 sections), 118 students completed in both sections
Spring 2002	MAE 708 Advanced Convection Heat Transfer, 8 students completed
Fall 2001	MAE 557 Dynamics of Internal Fluid Flow, 12 students completed
Fall 2001	MAE 310 Conduction and Radiation Heat Transfer, 36 students completed
Spring 2001	MAE 708 Advanced Convection Heat Transfer, 8 students completed
Fall 2000	MAE 310 Conduction and Radiation Heat Transfer, 47 students completed
Fall 2000	MAE 703 Dynamics of Internal Fluid Flow, 11 students completed
Spring 2000	MAE 708 Advanced Convection Heat Transfer, 8 students completed
Fall 1999	MAE 703 Dynamics of Internal Fluid Flow, 6 students completed
Fall 1999	MAE 310 Conduction and Radiation Heat Transfer, 29 students completed
Spring 1999	MAE 708 Advanced Convection Heat Transfer, 7 students completed
Fall 1998	MAE 703 Dynamics of Internal Fluid Flow, 6 students completed
Spring 1998	MAE 301 Engineering Thermodynamics, 53 students completed

Master's and Doctoral Thesis Directed

MS thesis directed: 4, current: 2

PhD thesis directed: 10, current: 2

1. Ming Xiong, Ph.D.

Title: Investigation of Transport Phenomena in the Presence of Interfaces: Forced Convection in Composite Porous/Fluid Domains, Solidification with a Mushy Region, and Meniscus Formation in Advanced Coating Processing

Graduated 12/2001

2. Deming Mao, Ph.D. (co-chair with Dr. J.R. Edwards)

Title: Particle Flow, Agglomeration, Mixing, Physical and Chemical Adsorption in Circulating Fluidized Bed Adsorbers

Graduated 5/2003

3. Qun Wan, Ph.D.

Title: Numerical and Theoretical Analysis of Beam Vibration Induced Acoustic Streaming and the Associated Heat Transfer

Graduated 12/2003

4. Sid Becker, M.S.

Numerical Modeling of a Falling Bioconvection Plume in a Porous Medium

Graduated 12/2003

5. Liping Cheng, Ph.D.

Title: Mathematical Modeling of Laminar and Turbulent Single-Phase and Two-Phase Flows in Straight and Helical Ducts

Graduated: 12/2004

6. Patirop Chitrphiromsri, Ph.D.

Title: Modeling of Thermal Performance of Firefighter Protective Clothing During the High Intense Heat Exposure

Graduated: 12/2004

7. Peng Geng, Ph.D.

Title: Numerical and Theoretical Analysis of a Falling Plume Caused by Bioconvection of Microorganisms and Its Applications

Graduated: 12/2005

8. Sid Becker, Ph.D.

Title: In Vivo Electroporation of Skin and Biological Tissue: Theoretical Model Development and Numerical Investigation of Associated Thermo-Electrical and Structural Responses and Enhanced Mass Transport

Graduated: 5/2007

9. Jianxi Zhu, Ph.D.

Title: Mathematical Modeling of Single Phase Flow and Particulate Flow Subjected to Microwave Heating

Graduated: 5/2007

10. Ping Xiang, Ph.D. (co-chair with Dr. Abdelfattah Seyam fro College of Textiles)

Title: Numerical Modeling and Experimental Investigation of the Hydroentanglement Process

Graduated: 12/2007

11. Tao Geng, Ph.D.

Title: Numerical Simulation of Pulsejets (co-chair with Dr. W.L. Roberts)

Graduated: 5/2008

12. Fei Zheng, Ph.D.

Title: Computational Investigation of High-Speed Pulsejets (co-chair with Dr. W.L. Roberts)

Prelim (unconditionally passed): 12/12/07, Expected Graduation: 12/2008

13. Michael Schaen, M.S. (co-chair with Dr. W.L. Roberts)

Title: Experimental Investigations in 15 Centimeter Class Pulsejet Engines

Graduated: 8/2005

14. Robert Ordon, M.S. (co-chair with Dr. W.L. Roberts)

Title: Experimental Investigation of 50cm Class Valveless Pulsejet Engines

Graduated: 5/2006

15. Francisco Diaz, Ph.D.

Title: Determination of the Non-dimensional Forms of the Equations that Govern Printability and Runnability for Coated Free Sheets Running in Lithographic Presses

Expected Graduation: 12/2008

16. A.K. Ranjith Kumar, M.S. (co-chair with Dr. W.L. Roberts)

Title: Experimental Investigations on Pulsejet Engines

Graduated: 5/2008

17. Ankit Lad, M.S.

Title: Numerical Modeling of Transmission of Viral Infections by Forced Convection

Expected Graduation: 5/2009

18. Mitesh P. Ghelani, M.S.

Title: Modeling of Transmission of Viral Infections by Natural Convection using CFX

Expected Graduation: 5/2009

Service as a Reviewer

Reviewer for: National Science Foundation
National Research Council (COBASE program)
Petroleum Research Fund
United States-Israel Binational Science Foundation

Journal of Fluid Mechanics
 International Journal of Heat and Mass Transfer
 ASME Journal of Heat Transfer
 Physics of Fluids
 Numerical Heat Transfer
 AIAA Journal of Thermophysics and Heat Transfer
 Journal of Porous Media
 International Journal of Engineering Science
 ZAMP - Journal of Applied Mathematics and Physics
 Fluid Dynamics Research
 ASME Journal of Fluids Engineering
 International Journal of Numerical Methods for Heat and Fluid Flow
 Computer Methods in Applied Mechanics and Engineering
 International Journal of Transport Phenomena
 Microscale Thermophysical Engineering
 ZAMM – Journal of Applied Mathematics and Mechanics
 Journal of the Acoustical Society of America
 Journal of Computational and Applied Mathematics
 European Journal of Physics B
 Acta Mechanica
 Continuum Mechanics and Thermodynamics
 Experiments in Fluids
 Canadian Journal of Chemical Engineering
 Metallurgical and Materials Transactions
 International Journal of Fluid Mechanics Research
 International Journal of Thermal Sciences
 Canadian Journal of Chemical Engineering
 Bioprocess and Biosystems Engineering
 Canadian Journal of Physics
 Transport in Porous Media
 Handbook of Porous Media (1st edition)
 Handbook of Porous Media (2nd edition)
 Elsevier Science (reviewed a book proposal for them)
 ASME National Heat Transfer Conferences
 ASME Fluid Engineering Division Summer Meetings
 ASME International Congresses and Exhibitions

Research Grants

1. Modeling of Flow Containing Nanoparticles Through Electrostatically Charged Monolith Filters, Defense Threat Reduction Agency, 2008-2010, \$772,607 (co-PI), funded
2. Enhancing Mixing in Micro Volumes of Fluid by Utilizing Bioconvection, NATO Programme for Security through Science, 2003-2006, \$12,923 (PI)
3. Development and Demonstration of a Micro-PulseJet, DARPA, 2004-2005, \$350,000 (co-PI)
4. Mechanics of High-Speed Hydroentanglement, Nonwovens Cooperative Research Center, 2004-2007, \$149,368 (co-PI)
5. Mathematical Modeling and Experimental Validation of Continuous Flow Microwave Heating of Liquid Foods, USDA, 2003-2006, \$169,000 (co-PI)
6. Investigation of Interaction Between Dendritic Crystal Growth, Microporosity Formation, and Melt Convection on Micro and Macroscales, NSF, 2003-2004, \$84,353 (PI)

7. Initiating Research Collaboration with the Institute of Engineering Thermophysics (Kiev, Ukraine) on Bioconvection in Porous Media, NCSU Internationalization Seed Grant, 2003-2004, \$2,500 (PI)
8. Computational Investigation of Heat Transfer and Fluid Flow in Acoustic Streaming, Solidification of Binary Alloys, Multiphase Flow in Holding Tubes, Firefighter Protective Clothing during Intensive Fire Exposures, and Bioconvection, North Carolina Supercomputing Center, 2003-2004, \$230,000 (PI)
9. Investigation of Interactions between Bioconvection and Natural Convection and Biofilm Growth in Porous Media, NASA, 2002-2007, \$125,516 (PI)
10. A Novel Ultrasonic Cooling Concept for Microelectronics, National Science Foundation, 2000-2003, \$232,000 (co-PI)
11. Mathematical Modeling of Two-Phase Non-Newtonian Flow in Four Configurations of Holding Tubes, US Department of Agriculture, 2001-2004, \$180,000 (co-PI)
12. Three Dimensional Simulation of Circulating Fluidized Bed Reactors for Multi-Pollutant Control, EPA, 2001-2002, \$70,000 (co-PI)
13. Modeling of Thermal Protection Outfits for Fire Exposures in Firefighter Turnout Suits and Forest Fire Protective Clothing, National Textile Center, 2001-2002, \$205,116 (co-PI)
14. Momentum-Based Modeling of Particulate Matter Agglomeration in Circulating Fluidized Bed Adsorber Devices, EPA, 2001, \$15,000 (co-PI)
15. Research Experiences for Undergraduates, Supplement to NSF-0000026, National Science Foundation, 2001, \$12,000 (co-PI)
16. Modeling of Mercury Capture in Circulating Fluidized Bed Adsorber, EPA, 2001, \$30,000 (co-PI)
17. Foreign Travel Supplement to NSF-0000026, National Science Foundation, 2000-2003, \$30,000 (co-PI)
18. Computational Modeling of Heat Transfer Enhancement by Ultrasonic Acoustic Streaming for Cooling Microelectronics, North Carolina Supercomputing Center, 2001-2003, \$150,000 (PI)
19. ORAU Faculty Travel Grant, Oak Ridge National Laboratory, 2001, \$1,000 (PI)
20. Investigation of Microporosity Formation in Aluminum-Copper Alloys during Solidification in Microgravity Conditions, 2001, NASA, \$10,000 (PI)
21. Modeling of Sulfur Dioxide Capture in Circulating Fluidized Bed Adsorber Devices, EPA, 2001, \$15,000 (co-PI)
22. Minimizing the Effects of a Biological Terrorist Attack by Using Specifically Engineered Cells-Antibodies, United Engineering Foundation, 2001, \$25,000 (PI)
23. Investigation and Modeling of Spin and Dip Coating Processes Utilizing CO_2 as an Environmentally Friendly Solvent, Kenan Center for the Utilization CO_2 in Manufacturing, 2000-2001, \$28,696 (PI)
24. Investigation of Symmetrical Properties of Nonlinear Thermofluid Systems, NATO Science Program, 1999-2001, \$2,170 (PI)
25. Computational Modeling of Microporosity Formation in Aluminum-Copper Alloys during Solidification in Microgravity Conditions, North Carolina Supercomputing Center, 2000-2001, \$130,500 (PI)

26. Modeling and Simulation of a Circulating Fluidized Bed Reactor for Multi-Pollutant Control, Environmental Protection Agency, 2000-2001, \$47,000 (co-PI)
27. Hydrodynamic and Heat Transfer Affected by Instabilities of Different Nature, NATO Science Program, 1999-2001, \$25,000 (PI)
28. Modeling of Coupled Fluid Flow, Heat Transfer and Macro-segregation during Turbulent Flow Regime in Horizontal Strip Casting Process, North Carolina Supercomputing Center, 1999-2000, \$90,000 (PI)
29. Modeling of the Strip Casting Process, North Carolina State University, 1999, \$10,000 (PI)
30. Computational Modeling of the Horizontal Strip Casting Process, North Carolina Supercomputing Center, 1998-1999, \$61,750 (PI)
31. Modeling of Fluid Flow in Continuous Steel Casting, UES Software, Inc., 1998-1999, \$17,000 (donation of the ProCAST commercial software package)
32. Using of Mathematical Software in Educational Process, MathSoft, 1999, \$1,500 (donation of the Mathcad 8 Professional software package)
33. Travel grant for attending the 15th IMACS World Congress on Scientific Computation, Modeling and Applied Mathematics, Alexander von Humboldt Foundation, 1997, \$1,500
34. Travel grant for attending the 11th World Hydrogen Conference, Alexander von Humboldt Foundation, 1996, \$1,500

Major Publications

Publications in Archival Journals

Papers Published

1. S.M. Becker and A.V. Kuznetsov, Thermal *in-vivo* Skin Electroporation Pore Development and Charged Macromolecule Transdermal Delivery: A numerical Study of the Influence of Chemically Enhanced Lower Lipid Phase Transition Temperatures, *International Journal of Heat and Mass Transfer*, vol. 51, pp. 2060-2074, 2008.
2. A.V. Kuznetsov and A.A. Avramenko, Generalized Fourier Series Solution of Equations Governing Molecular-motor-assisted Transport of Adenoviral Vectors in a Spherical Cell, *International Communications in Heat and Mass Transfer*, vol. 35, pp. 395-403, 2008.
3. J. Zhu, A.V. Kuznetsov, and K.P. Sandeep, Investigation of a Particulate Flow Containing Spherical Particles Subjected to Microwave Heating, *Heat and Mass Transfer*, vol. 44, pp. 481-493, 2008.
4. P. Xiang, A.V. Kuznetsov, and A.M. Seyam, A Porous Medium Model of the Hydroentanglement Process, *Journal of Porous Media*, vol. 11, pp. 35-49, 2008.
5. A.A. Avramenko and A.V. Kuznetsov, Flow in a Curved Porous Channel with a Rectangular Cross-Section, *Journal of Porous Media*, vol. 11, pp. 241-246, 2008.
6. A.A. Avramenko, B.I. Basok, A.V. Kuznetsov, and A.I. Tyrinov, Turbulent Bioconvection, *Reports of the National Academy of Sciences of Ukraine*, No. 1, pp. 76-82, 2008 - in Russian.
7. D.A. Nield and A.V. Kuznetsov, The Onset of Convection in a Porous Medium Occupying an Enclosure of Variable Width or Height, *ASME Journal of Heat Transfer*, vol. 129, pp. 1714-1718, 2007.

8. S.M. Becker and A.V. Kuznetsov, Local Temperature Rises Influence *in Vivo* Electroporation Pore Development: A Numerical Stratum Corneum Lipid Phase Transition Model, *ASME Journal of Biomechanical Engineering*, vol. 129, pp. 712-721, 2007.
9. D.A. Nield and A.V. Kuznetsov, The Effects of Combined Horizontal and Vertical Heterogeneity and Anisotropy on the Onset of Convection in a Porous Medium, *International Journal of Thermal Sciences*, vol. 46, pp. 1211-1218, 2007.
10. T. Geng, F. Zheng, A.P. Kiker, A.V. Kuznetsov, and W.L. Roberts, Experimental and Numerical Investigation of an 8-centimeter Valveless Pulsejet, *Experimental Thermal and Fluid Science*, vol. 31, pp. 641-647, 2007.
11. J. Zhu, A.V. Kuznetsov, and K.P. Sandeep, Numerical Modeling of a Moving Particle in a Continuous Flow Subjected to Microwave Heating, *Numerical Heat Transfer A*, vol. 52, pp. 417-439, 2007.
12. S.M. Becker and A.V. Kuznetsov, Numerical Assessment of Thermal Response Associated with *in Vivo* Skin Electroporation: The Importance of the Composite Skin Model, *ASME Journal of Biomechanical Engineering*, vol. 129, pp. 330-340, 2007.
13. A.A. Avramenko, A.V. Kuznetsov, and D.A. Nield, Instability of Slip Flow in a Channel Occupied by a Hyperporous Medium, *Journal of Porous Media*, vol. 10, pp. 435-442, 2007.
14. D.A. Nield and A.V. Kuznetsov, The Effect of Combined Vertical and Horizontal Heterogeneity on the Onset of Convection in a Bidisperse Porous Medium, *International Journal of Heat and Mass Transfer*, vol. 50, pp. 3329-3339, 2007.
15. P. Xiang, A.V. Kuznetsov, and A.M. Seyam, Simulation of Fiber Entanglement by Modeling Vorticity in Water Flow Field, *Textile Research Journal*, vol. 77, pp. 312-329, 2007.
16. A.V. Kuznetsov, Analytical Solution of Equations Governing Molecular-Motor-Assisted Transport of Intracellular Particles, *International Communications in Heat and Mass Transfer*, vol. 34, pp. 391-398, 2007.
17. D.A. Nield and A.V. Kuznetsov, The Onset of Convection in a Shallow Box Occupied by a Heterogeneous Porous Medium with Constant Flux Boundaries, *Transport in Porous Media*, vol. 67, pp. 441-451, 2007.
18. D.A. Nield and A.V. Kuznetsov, Forced Convection with Laminar Pulsating Flow in a Channel or Tube, *International Journal of Thermal Sciences*, vol. 46, pp. 551-560, 2007.
19. D.A. Nield and A.V. Kuznetsov, The Effects of Combined Horizontal and Vertical Heterogeneity on the Onset of Convection in a Porous Medium, *International Journal of Heat and Mass Transfer*, vol. 50, pp. 1909-1915, 2007. Erratum: *International Journal of Heat and Mass Transfer*, vol. 50, p. 4512, 2007.
20. T. Geng, A. Kiker, Jr., R. Ordon, A.V. Kuznetsov, T.F. Zeng, and W.L. Roberts, Combined Numerical and Experimental Investigation of a Hobby-Scale Pulsejet, *Journal of Propulsion and Power*, vol. 23, No. 1, pp. 186-193, 2007.
21. J. Zhu, A.V. Kuznetsov, and K.P. Sandeep, Mathematical Modeling of Continuous Flow Microwave Heating of Liquids (Effects of Dielectric Properties and Design Parameters), *International Journal of Thermal Sciences*, vol. 46, pp. 328-341, 2007.
22. P. Geng and A.V. Kuznetsov, Dynamics of Large Solid Particles in Bioconvective Sedimentation, *International Journal for Numerical Methods in Fluids*, vol. 53, pp. 713-733, 2007.
23. F. Zheng, C. Basciano, J. Li, and A.V. Kuznetsov, Fluid Dynamics of Cell Cytokinesis – Numerical Analysis of Intracellular Flow During Cell Division, *International Communications in Heat and Mass Transfer*, vol. 34, pp. 1-7, 2007.

24. A.A. Avramenko and A.V. Kuznetsov, Flow Instability in a Curved Porous Channel Formed by Two Concentric Cylindrical Surfaces, *Transport in Porous Media*, vol. 69, pp. 373–381, 2007.
25. J. Zhu, A.V. Kuznetsov, and K.P. Sandeep, Numerical Simulation of Forced Convection in a Duct Subjected to Microwave Heating, *Heat and Mass Transfer*, vol. 43, pp. 255–264, 2007.
26. S.M. Becker and A.V. Kuznetsov, Thermal Damage Reduction Associated with *in Vivo* Skin Electroporation: A Numerical Investigation Justifying Aggressive Pre-Cooling, *International Journal of Heat and Mass Transfer*, vol. 50, pp. 105–116, 2007.
27. T. Geng, M.A. Schoen, A.V. Kuznetsov, and W.L. Roberts, Combined Numerical and Experimental Investigation of a 15-cm Valveless Pulsejet, *Flow, Turbulence and Combustion*, vol. 78, pp. 17–33, 2007.
28. D.A. Nield and A.V. Kuznetsov, Reply to comments on ‘Forced convection with slip-flow in a channel or duct occupied by a hyper-porous medium saturated by a rarefied gas’, *Transport in Porous Media*, vol. 67, pp. 169–170, 2007.
29. A.A. Avramenko, B.I. Basok, and A.V. Kuznetsov, Determination of von Karman’s Constant Using Group Theoretic Methods, *International Journal of Applied Mechanics and Engineering*, vol. 12, No. 2, pp. 329–335, 2007.
30. A.A. Avramenko, B.I. Basok, A.I. Tyrinov, and A.V. Kuznetsov, Effect of Negative Turbulent Viscosity, *Industrial Heat Engineering (Promyshlennaja Teplotekhnika)*, vol. 29, No. 1, pp. 12–14, 2007 – in Russian.
31. P. Xiang, A.V. Kuznetsov, and A.M. Seyam, Modeling of the Hydroentanglement Process, *Journal of Engineered Fibers and Fabrics*, vol. 1, issue 2, pp. 1–14, 2006.
32. A.V. Kuznetsov and D.A. Nield, Thermally Developing Forced Convection in a Bidisperse Porous Medium, *Journal of Porous Media*, vol. 9, pp. 393–402, 2006.
33. A.V. Kuznetsov, Linear Stability Analysis of the Effect of Vertical Vibration on Bioconvection in a Horizontal Porous Layer of Finite Depth, *Journal of Porous Media*, vol. 9, pp. 597–608, 2006.
34. A.V. Kuznetsov, Thermo-Bio-Convection in Porous Media, *Journal of Porous Media*, vol. 9, pp. 581–589, 2006.
35. A.V. Kuznetsov and D.A. Nield, A Boundary Layer Treatment of Forced Convection over a Wedge with an Attached Porous Substrate, *Journal of Porous Media*, vol. 9, pp. 683–694, 2006.
36. A.V. Kuznetsov and D.A. Nield, Forced Convection with Laminar Pulsating Flow in a Saturated Porous Channel or Tube, *Transport in Porous Media*, vol. 65, pp. 505–523, 2006.
37. A.A. Avramenko and A.V. Kuznetsov, The Onset of Convection in a Suspension of Gyrotactic Microorganisms in Superimposed Fluid and Porous Layers: Effect of Vertical Throughflow, *Transport in Porous Media*, vol. 65, pp. 159–176, 2006.
38. A.V. Kuznetsov and P. Xiang, Numerical Investigation of Thinning of the Intercellular Bridge During Cell Cytokinesis, *International Communications in Heat and Mass Transfer*, vol. 33, pp. 1071–1078, 2006.
39. D.A. Nield and A.V. Kuznetsov, The Onset of Bio-Thermal Convection in a Suspension of Gyrotactic Microorganisms in a Fluid Layer: Oscillatory Convection, *International Journal of Thermal Sciences*, vol. 45, pp. 990–997, 2006.
40. D.A. Nield and A.V. Kuznetsov, The onset of convection in a bidisperse porous medium, *International Journal of Heat and Mass Transfer*, vol. 49, pp. 3068–3074, 2006.

41. D.A. Nield and A.V. Kuznetsov, Forced Convection with Slip–flow in a Channel or Duct Occupied by a Hyper–porous Medium Saturated by a Rarefied Gas, *Transport in Porous Media*, vol. 64, pp. 161–170, 2006.
42. A.V. Kuznetsov, Optimization Problems for Bioheat Equation, *International Communications in Heat and Mass Transfer*, vol. 33, pp. 537–543, 2006.
43. P. Geng and A.V. Kuznetsov, Direct Numerical Simulation of Settling of a Large Solid Particle During Bioconvection, *International Journal for Numerical Methods in Fluids*, vol. 51, pp. 511–530, 2006.
44. A.A. Avramenko and A.V. Kuznetsov, Renormalization Group Model of Large–Scale Turbulence in Porous Media, *Transport in Porous Media*, vol. 63, pp. 175–193, 2006.
45. P. Chitrphimsri, A.V. Kuznetsov, G. Song, and R.L. Barker, Investigation of Feasibility of Developing Intelligent Firefighter Protective Garments Based on the Utilization of a Water–Injection System, *Numerical Heat Transfer A*, vol. 49, pp. 427–450, 2006.
46. A.V. Kuznetsov, Investigation of the Onset of Bioconvection in a Suspension of Oxytactic Microorganisms Subjected to High–Frequency Vertical Vibration, *Theoretical and Computational Fluid Dynamics*, vol. 20, pp. 73–87, 2006.
47. A.V. Kuznetsov, The Onset of Thermo–Bioconvection in a Shallow Fluid Saturated Porous Layer Heated From Below in a Suspension of Oxytactic Microorganisms, *European Journal of Mechanics B/Fluids*, vol. 25, pp. 223–233, 2006.
48. S.M. Becker and A.V. Kuznetsov, Numerical Modeling of *in vivo* Plate Electroporation Thermal Dose Assessment, *ASME Journal of Biomechanical Engineering*, vol. 128, pp. 76–84, 2006.
49. A.V. Kuznetsov and P. Xiang, Heat Transfer in a Turbulent Channel Flow with a Permeable Wall, *International Journal of Applied Mechanics and Engineering*, vol. 11, No. 3, pp. 705–713, 2006.
50. D.A. Nield and A.V. Kuznetsov, Thermal Development of Forced Convection in a Channel or Duct Partly Occupied by a Porous Medium, *Journal of Porous Media*, vol. 8, pp. 627–638, 2005.
51. P. Geng and A.V. Kuznetsov, Introducing the Concept of Effective Diffusivity to Evaluate the Effect of Bioconvection on Small Solid Particles, *International Journal of Transport Phenomena*, vol. 7, pp. 321–338, 2005.
52. A.V. Kuznetsov, The Onset of Bioconvection in a Suspension of Negatively Geotactic Microorganisms with High–Frequency Vertical Vibration, *International Communications in Heat and Mass Transfer*, vol. 32, pp. 1119–1127, 2005.
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55. A.V. Kuznetsov, Mathematical Modeling of a Metal Hydride Refrigerating System, *Proceedings of the 15th Oji International Seminar "New Approach Towards Low-Temperature Thermal Engineering Without Fluorocarbon Refrigerators"* (Tomakomai city, Hokkaido, Japan, September 16–19, 1997), pp. 111–117
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61. A.V. Kuznetsov, Analysis of the Coupled Heat Transfer, Fluid Flow and the Solute Transport in the Formation of Thin Strips, *Proceedings of the ICHMT Symposium on Molecular and Microscale Heat Transfer in Material Processing and Other Applications* (Yokohama, Japan, December 1–4, 1996), vol. 2, pp. 181–192
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65. A.V. Kuznetsov, Investigation of Heating a Two-Dimensional Porous Packed Bed by a Non-Thermal Equilibrium Fluid Flow, *Proceedings of the 30th 1995 National Heat Transfer Conference* (Portland, Oregon, USA, August 6–8, 1995) – Vol. 7 "Heat Transfer in Porous Media", HTD–Vol. 309, pp. 3–9, ASME 1995
66. A.V. Kuznetsov, Simulation of Transport Processes in Metal Hydride Composites for Power Plant and Energy Storage Applications, *Proceedings of the International Conference on Composite Materials and Energy "Enercomp 95"* (Montreal, Quebec, Canada, May 8–10, 1995), pp. 521–528
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68. V.M. Liventsov, A.V. Kuznetsov, Approximate Methods for Solving Heat and Mass Transfer Problems, *Proceedings of the conference "Actual Problems of Gas–Dynamics and Heat Exchange and Ways for Increasing Efficiency of Power Machines"*. Moscow, 1991, vol. 2. pp. 13–14 – in Russian
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70. V.M. Liventsov, A.V. Kuznetsov, An Approximate Method for Simplification of a Three–Dimensional Heat Problem for the Two–Phase Flow, *Proceedings of the conference "Two–Phase Stream in Power Machines and Installations"*. Leningrad, 1990, vol. 2. pp. 215–216 – in Russian
71. V.M. Liventsov, A.V. Kuznetsov, E.V. Slivaeva, An Investigation of the Stable Oscillations of a Pendulum in the Alternating Electromagnetic Field, *Proceedings of the conference "Non–Linear Oscillations in Mechanical Systems"*. Nizhnii Novgorod, 1990, vol. 2. pp. 167–168 – in Russian
72. A.V. Kuznetsov, Mathematical Modeling of the Steady–State Regime of Directional Solidification, *Proceedings of the conference "Actual Problems in Engineering"*. Moscow, 1989, vol. 1. pp. 24–25 – in Russian
73. A.V. Kuznetsov, V.D. Vinokurov, V.A. Vasil'ev, A Method for Computation of a Modification Reaction, *Proceedings of the conference "Developments and Applications of Advanced Technologies"*. Vladimir, 1987, pp. 26–27 – in Russian

Invited Research Presentations

1. Bioconvective Sedimentation and Acoustic Streaming, Department of Electrical Engineering, North Carolina State University, Raleigh, NC, September 2006
2. Laws of Bioconvective Sedimentation and Principles of Acoustic Streaming, Department of Mechanical and Aerospace Engineering, Utah State University, Logan, Utah, USA, May 2006
3. Utilization of Acoustic Streaming and Bioconvective Sedimentation for Enhancing Mass Transfer in Microfluidic Systems, Department of Mechanical and Aerospace Engineering, Arizona State University, Tempe, AZ, USA, February 2006
4. Acoustic Streaming and Bioconvective Sedimentation, Joint UNC/NC State Department of Biomedical Engineering, Raleigh, NC, USA, February 2006
5. Investigation of Microporosity Formation in an Al-4.1%Cu Alloy Casting in Microgravity and Standard Gravity, Oak Ridge National Laboratory, Oak Ridge, TN, USA, May 2001
6. Transport Phenomena in Steel Casting, Ohio State University, Department of Mechanical Engineering, Columbus, OH, USA, April 1999
7. Modeling of Macrosegregation in Continuous Casting, National Institute of Standards and Technology, Gaithersburg, MD, USA, October 1998
8. Numerical Simulation of Sorizontal Strip Casting and Conventional Continuous Casting, Technical University of Chemnitz-Zwickau, Department of Technical Thermodynamics, Chemnitz, Germany, September 1997
9. Analysis of Transport Phenomena in Continuous Casting, Kyoto University, Institute of Advanced Energy, Kyoto, Japan, September 1997

10. Invited speaker at the 15th Oji International Seminar "New Approach Towards Low-Temperature Thermal Engineering Without Fluorocarbon Refrigerators", Tomakomai City, Hokkaido, Japan, September 1997
11. Numerical Analysis of Internal Flow and Shell Solidification in Horizontal Continuous Casting Processes, RWTH Aachen, Foundry Institute, Aachen, Germany, June 1997
12. Investigation of Coupled Heat Transfer, Fluid Flow and Solute Transport in the Continuous Casting of Steel, North Carolina State University, Department of Mechanical and Aerospace Engineering, Raleigh, North Carolina, USA, April 1997
13. Mathematical Modeling of Fluid Flow during Strip Casting, University of Cluj-Napoca, Faculty of Mathematics and Computer Science, Romania, March 1997
14. Invited Speaker and Session Chairman at the ICHMT Symposium on Molecular and Microscale Heat Transfer in Material Processing and Other Applications, Yokohama, Japan, December 1996
15. Analysis of a Thermal Nonequilibrium Fluid Flow in a Three-Dimensional Packed Bed and in a Concentric Tube Annulus Filled with a Porous Medium, RWTH Aachen, Institute of Heat Transfer and Air Conditioning, Aachen, Germany, May 1996
16. Investigation of the Working Cycle of a Metal Hydride Heat Transformer for the Upgrading of Waste Heat - University of Stuttgart, Institute of Technical Thermodynamics, Stuttgart, Germany, May 1996
17. Reduction of PDEs with Oscillating Coefficients for Periodic Structures - Invited lecture at the DFG Workshop "Reduction of PDE's - Qualitative Analysis and Numerical Methods" - Tübingen, Germany, November 1995
18. Comparison of Volume Averaging and Perturbation Approaches in the Modeling of Transport Processes in Porous Media - Ohio State University, Department of Mechanical Engineering, Columbus, Ohio, USA, May 1994
19. Investigation of Thermal Nonequilibrium Hydrogen Flow through a Metal Hydride Packed Bed - Ruhr-University Bochum, Institute of Power Engineering, Bochum, Germany, December 1993
20. Mathematical Modeling of a Hot (Cold) Reacting Gas Flow through a Porous Packed Bed - RWTH Aachen, Institute of Heat Transfer and Air Conditioning, Aachen, Germany, November 1993
21. Investigation of the Working Cycle of a Metal Hydride Refrigerator and Optimization of Its COP - University of Stuttgart, Institute of Technical Thermodynamics, Stuttgart, Germany, November 1993
22. Asymptotic Approach to the Formulation of Equations Governing Transport in Porous Media - Ruhr-University Bochum, Institute of Fluid Mechanics, Bochum, Germany, October 1993
23. Investigation of Heat Transport Processes in the Mushy Zone during Directional Solidification - Korea Institute of Science and Technology, Seoul, Korea, March 1993
24. Modeling of a Small Space Power Installation Based on Metal Hydrides - Samsung Electronics, Seoul, Korea, March 1993
25. Analysis of Heat and Mass Transfer Processes in Cylindrical Metal Hydride Elements - Korea Institute of Science and Technology, Seoul, Korea, March 1993
26. Mathematical Modeling of Porosity Formation in a Two-Phase Region of Castings - Technical University of Vienna, Institute of Fluid Mechanics and Heat Transfer, Vienna, Austria, February 1993