



EBRAHIM SHIRANI

EDUCATION

Ph.D. Thermo-Sciences Division, Mechanical Engineering Department, **Stanford University**, June, 1981, Stanford, Ca., USA

Major: Turbulence, CFD. Dissertation: "Mixing of a Passive Scalar in Isotropic and Sheared Homogeneous Turbulence"

M.Sc. Thermo-Sciences Division, Mechanical Engineering Department, **Stanford University**, Sept., 1977, Stanford, Ca., USA

B.Sc. Mechanical Engineering Department, **Sharif University of Technology**, Jan., 1976, Tehran, Iran

SCIENTIFIC ACTIVITIES AND HONORS

Outstanding Faculty Member of Universities in Iran, Honored by Ministry of Higher Education, 2000

Outstanding Research Administrator in Iran, Honored by Ministry of Higher Education, 2007

Outstanding Faculty Member of Mechanical Engineering Departments in Iran, Iranian Society of Mechanical Engineering, Iran, 2008

Outstanding Researcher at Isfahan Province in 2017, Honored by Isfahan Province Governor General, 2017

Outstanding Figure of 30 years of IUT Activities, 2008

Outstanding Faculty Member of Isfahan University of Technology, in Academic activities, 2006

Outstanding Faculty Member of Isfahan University of Technology, in Research activities, 2008

Outstanding Faculty Member of Isfahan University of Technology, for producing hottest research paper, 2008

Best Author of the Book, Tehran University, Year 2005

Outstanding Translator of the Books, Isfahan Province, Year 2005

Outstanding Translator of the Books, Isfahan Province, Year 2007

Outstanding Translator of the Books, Isfahan Province, Year 2016

Fellow of Iranian Academy of Science, 2004-present

One of the founders of Isfahan Science and Tech. Town, Isfahan, Iran, 1995

One of the founders of Foolad Institute of Technology, Isfahan, Iran, 2005

Editor of Journal of Applied Fluid Mechanics, 2018-present
Director, Founder and Editor, Journal of Applied Fluid Mechanics, 2006-2018
Associate Editor of African Review of Physics, Italy, 2014-present
Editor-in-Chief, Isteghlal Journal, IUT, Isfahan, Iran, 2004-2004
Regional Editor, Journal of Applied Sciences, 2000-2003

International Scientific Activities

Associate Member of International Center for Theoretical Physics, Trieste, Italy, 1998-2004
Member of Asian Fluid Mechanics Committee, Asia, 1997-2011
The Emerging Nations Science Foundation, Member of Prize Committee for M.A.B. Bég Prize in Physics, Italy, <http://www.ensf-ngo.org/>, 2009-2016
Senior Associate Member of Int. Center for Theoretical Physics, Trieste, Italy, 2005-2012 and 2014-2019
Chairman of the Ninth Asian Congress of Fluid mechanics, Isfahan, Iran, 2002

EXPERIENCES AND ADMINISTRATION WORKS

Employment History

Visiting Professor, University of Valenciennes, Valenciennes, France, 2017
Visiting Professor, University of Valenciennes, Valenciennes, France, 2013
Professor, Foolad Institute of Technology, Fooladshahr, Isfahan, Iran, 2012-2023
Professor, Isfahan University of Technology (IUT), Isfahan, Iran, 2000-2011
Visiting Professor, University of Toronto, Toronto, Canada, 2002, 2003
Associate Professor, Isfahan University of Technology (IUT), Isfahan, Iran, 1990-2000
Visiting Scientist, Univ. of California, Davis, Mech. Eng. Dept., Davis, Ca., USA , 1989-1990
Assistant Professor, IUT, Mechanical Engineering Department, Isfahan, Iran, 1981-1989
Research Assistant, Stanford University, M.E. Dept., Stanford, Ca., USA, 1977-1981

Administration

Member of Board of Trustees, Electricity Distribution Network Co., Isfahan, Iran, 2016-Present
Vice-President for Academic Affairs, Foolad Institute of Tech., Fooladshahr, Iran, 2019-2023
Vice-President for Research, Foolad Institute of Tech., Fooladshahr, Iran, 2012-2019
Head of Mechanical Engineering Department, IUT, Isfahan, Iran, 2008-2010
Vice-President for Research, Isfahan University of Technology, Isfahan, Iran, 2004-2005
Vice-Chancellor for Research, Isfahan University of Technology, Isfahan, Iran, 1998-2002
Head of Mechanical Engineering Department, IUT, Isfahan, Iran, 1992-1996
Head of Mechanical Engineering Department, IUT, Isfahan, Iran, 1985-1987
Executive Head of Nano-Technology Council, Isfahan Province, 2005-2005
Head of Center of Excellence for Environmental Nano-Technology, Isfahan University of Technology, Isfahan, Iran, 2005-2007

Director of Planning of Science and Technology Corridor, Isfahan Province, 2006-2010
 Head of Engineering Section of Promotion Committee, IUT, Isfahan, Iran, 2003-2010
 Head of Mechanical Engineering Branch, Iranian Academy of science, 2012-2014
 Head of Energy Group, Isfahan Science and Technology Town, Isfahan, Iran, 1996-1998
 Vice Chairman for Research, Mechanical Engineering Dept., IUT, Isfahan, Iran. 1984-1986
 Head of R&D and Training Center for Ministry of Power in Isfahan, Iran, 1981-1983
 Head of Technology Transfer of Erection of Thermal Power Plant Group, Isfahan, Iran, 1981-1983
 Chairman of Second Fluid Mechanics Conference, Iran, 1993

Membership

Member of Board of Trustees, Foolad Institute of Tech., Fooladshahr, Iran, 2005- 2023
 Member of Board of Trustees, Isfahan Science and Tech. Town, Isfahan, Iran, 1998-2010
 Member of Seikhbahaee Scientific Festival, Isfahan, Iran, 1999-2002
 Member of Promotion Committee of IUT, 1997-2010
 Member of Board of Trustees of Foolad Institute of Tech., Fooladshahr, Iran, 2007-2023
 Member of Nano-Technology Council, Isfahan Province, 2005-2007
 Member of Research and Technology Committee, Isfahan Province, Isfahan, Iran, 2000-2002
 Head of Organizing Committee, Isfahan Science and Tech. Town, Isfahan, Iran, 1996-1998
 Member of Organizing committee, Isfahan Science and Tech. Town, Isfahan, Iran, 1994-1996
 Member of M.E. Committee, Scientific and Tech. Org., Isfahan Branch, 1993- 1998
 Member of Applied Statistics Research Center, Isfahan University of Technology, 2007- 2010
 Member of Editorial Board, Eureka: Physics and Engineering, Azerbaijan, 2015-present.
 Member of Editorial Board of Applied Energy Conversion, Iran, 2020-present
 Member of International Advisory Board of International Journal of Manufacturing Technology and Research, India, 2004-2009
 Member of Editorial Board, J. of Eng. Education, Academy of Science of Iran, 2017 -present
 Member of Editorial Board, Esteghlal Journal, 2001-2010
 Member of Editorial Board, J. of Numerical Methods in Mechanical Engineering, 2009-present
 Member of Editorial Board, Journal of Numerical Methods, 2009-present
 Member of Editorial Board of Fani-Mohandesi Journal, Mazandaran University, 2004-present
 Member of Editorial Board, Scientia Iranica, Trans. B: Mechanical Engineering, 2009-present
 Member of Advisory Board, J. of Eng. Education, Academy of Science of Iran, 2009 -۲۰۱۷
 Member of Editorial Advisory Board, Amirkabir Journal, 1994-present
 Member of Editorial Advisory Board, J. of Iranian society of ME. Farsi, 2000-present
 Member of Editorial Advisory Board, J. of Iranian society of M.E. English, 2000-present
 Member of Organizing Committee of Engineering Education Conf. Iran, 2008
 Member of Organizing and Scientific Committee of Fluid Dynamics Conf. Iran, 1991-present
 Member of Organizing and Scientific Committee of International Conference in Nano-Technology, 2000

Member of Organizing and Scientific Committee of the First Conference in Nano-Technology in Environment, IUT, Iran, 2007

Member of Scientific Committee of the First Conference on Rotating Equipment in Oil and Power Industries, Tehran, Iran, 2008

Member of Scientific Advisory Committee of the Second International Conference on Energy conversion and Conservation, Tunisia, 2009

Member of Scientific Committee of the Second Conference on Rotating Equipment in Oil and Power Industries, Tehran, Iran, 2010.

Member of Scientific Committee of the 5th BSME International Conference on Thermal Engineering Dhaka, Bangladesh, 21 – 23 December, 2012

Member of Scientific Advisory Committee of the 8th International Conference and 24th Annual Conference of Gwalior Academy of Mathematical Sciences (GAMS) on “Mathematical and Computational Data Science with Application” ICGAMS 2K19, VIT University, Bhopal, India, 13-15th December 2019.

Member of Iranian Society of Mechanical Engineers, Iran, 1994 -present

Member of Physical Society of Iran, 1991-present

Member of Combustion Society of Iran, 1999 -present

Associate Member of Iranian Hydraulic Association, Iran, 1994 -present

Honored Member of Iranian Society of Iron and Steel, 2003-present

Associate Member of Society Engineering Education, Academy of Science of Iran, 2009 -present

Member of Higher Committee of International Congress in 1997-2000

Member of Board of Trustees of Alumni Association of Isfahan University of Technology, 2005-2009

Member of Alumni Association of Sharif University of Technology, Isfahan Branch, 2005-present

CONTACTS

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Publications: see google scholar under e. shirani

RECENT PUBLICATIONS: I. Journal Papers (*resent papers*)

Published Papers (recent papers)

Shumal, M., Saghafian, M., Shirani, E., and Nili Ahmad Abadi, M., “Association of Murray’s Law with Atherosclerosis Risk: Numerical Validation of a General Scaling Law of Arterial Tree,” *Computers in Biology and Medicine*, V186, doi.org/10.1016/j.compbiomed.2025.109741, 2025.

Shumal, M., Saghafian, M., Shirani, E., “A General Scaling Law of Vascular Tree: Optimal Principle of Bifurcations in Pulsatile Flow,” *Journal of Applied Fluid Mechanics*, V17, No. 10, pp. 2203-2214, doi.org/10.47176/jafm.17.10.2370, 2024.

Shumal, M., Saghafian, M., Shirani, E., and Nili Ahmad Abadi, M., “A Novel Description for Optimality Principle of Cerebral Arteries within the Circle of Willis,” Accepted for Publication in *Zeitschrift für angewandte Mathematik und Physik*, 75:117, doi.org/10.1007/s00033-024-02257-0, 2024.

Karimian, R., Saghafian, M., Shirani, E., “Numerical investigation of LDL nanoparticle collision in coronary artery grafts with porous wall

and different implantation angles and two state of inlet velocity,” PLOS-ONE, 19(4), <https://doi.org/10.1371/journal.pone.03003262024>, 2024.

Ali Akbari, O., Shirani, E., and Saghafian, M., “Investigating the temperature distribution behavior and flow parameters of argon fluid in a nanochannel with changing dimensions of the obstacle using the molecular dynamics (MD) method,” Heliyon Journal, 10, pp. 1-17, doi.org/10.1016/j.heliyon.2024.e24065, 2024.

Modaresi, M.A., Shirani, E., “Developing a novel mucociliary clearance boundary condition (MCBC) to simulate micro-scale particle transfers inside the respiratory tract system without generating extra computational cells,” Accepted for Publication in Chaos, Solitons and Fractals Journal, V179, <https://doi.org/10.1016/j.chaos.2024.114463>, 2024.

Modaresi, M.A., Shirani, E., “Effect of mucociliary clearance on the particulate airflow inside the nasal sinus and its role in increasing the residence time and absorption of drugs inside the upper respiratory pathway,” Accepted for Publication in Drug Delivery and Translational Research, 2023.

Somaye Yaghoubi, S., Karimipour, A., Shahgholian, G., Shirani, E., Nguyen Le, B. and Fathollahi, A., “Representing Fluid Particle Model (FPM) to incorporate two non-central cut-off components for dissipation forces associated with random forces via fluctuation-dissipation theory: A new integral algorithm in modified Dissipative Particle Dynamics (DPD) method,” Journal of Engineering Analysis with Boundary Elements, 152, 496-503, 2023.

Ali Akbari, O., Saghafian, M. and Shirani, E., “Investigating the Effect of Obstacle Presence on Argon Fluid Flow Characteristics in Rough Nanochannels Using Molecular Dynamics Method,” Journal of Molecular Liquids, V386, pp. 1-16, [Doi.org/10.1016/j.molliq.2023.122462](https://doi.org/10.1016/j.molliq.2023.122462), 2023.

Modaresi, M.A., Shirani, E., “Mucociliary clearance affected by mucus-periciliary interface stimulations using analytical solution during cough and sneeze,” The European Physical Journal Plus, 138:201, doi.org/10.1140/epjp/s13360-023-03796-7, 2023.

Modaresi, M.A., Shirani, E., “Characterization of transition phenomenon inside a simple nasal cavity using a range of transition coefficients, to Biomechanics and Modeling in Mechanobiology,” Arabian Journal for Science and Engineering, 48(3), 3631-3645, 3631-3645, doi.org/10.1007/s13369-022-07227-0, 2023.

Akbarnataj, K., Hamidpour, MR., Shiarni, E. and Salimpour, MR., “Optimization of Porous Finned Heat Exchanger Configuration Using the Comprehensive Performance Methodology,” Int. Comm. on Heat & Mass Transfer, Vol. 138, doi.org/10.1016/j.icheatmasstransfer.106318, 2022.

Modaresi, M.A., Shirani, E., “Effects of continuous and discrete boundary conditions on the movement of Upper Convected Maxwell and Newtonian mucus layers in coughing and sneezing,” The European Physical Journal Plus, Vol. 137, Issue 7, Article 846, <https://doi.org/10.1140/epjp/s13360-022-03067-x>, 2022.

Jafari Nivlouei, S., Soltani, M., Shirani, E., Salimpour, MR., Travasso, R., Carvalho, J., “A multiscale cell-based model of tumor growth for chemotherapy assessment and tumor-targeted therapy through a 3D computational approach,” Cell Proliferation, [DOI: 10.1111/cpr.13187](https://doi.org/10.1111/cpr.13187), 2022.

Modaresi, M.A., Shirani, E., “A coefficient adapted shear stress turbulence model to numerically simulate the internal transition phenomena on a case study of the nasal,” Acta Mechanica, 233(12), 5163-5181, 2022.

Rousta, M., Shirani, E., Habibi, Z., “A comprehensive study on the characterization of chaotic advection flow and heat transfer in a twisted pipe with elliptical cross-section,” Results in Engineering, 13, doi.org/10.1016/j.rineng.2021.100323, 2022.

Nafar-Sefiddashti, M., Nili-Ahmadabadi, M., Saeedi-Rizi, B., Shirani, E. and Kyung Chun Kim, “A novel optimization approach for axial turbine blade cascade via combination of a continuous-curvature parameterization method and genetic algorithm,” Journal of Mechanical Science and Technology, 35 (9), 3989-4000, 2021.

Mahmoudirad, S., Shirani, E., Aloui, F., "Study of Couette flow, Taylor vortex and wavy vortex regimes in Couette-Taylor Flows with Transient Periodic Oscillation of the Inner Cylinder – A Computational Fluid Dynamics Analysis," Journal of the

- Brazilian Society of Mechanical Sciences and Engineering, 43:559, doi.org/10.1007/s40430-021-03265-1, 2021.
- Kazemi Esfeh, M., Sohankar, A., Shirani, E., "Influence of rounding corners and aspect ratio on the flow structure of a finite-length cylinder: an experimental study," International Journal of Heat and Fluid Flow, 91, doi.org/10.1016/j.ijheatfluidflow.2021.108854, 2021.
- Jafari Nivlouei, S., Carvalho, J., Travasso, R., Soltani, M., Salimpour, MR., Shirani, E., "3D Multiscale Modeling of Chemotherapeutic Drug Delivery to Malignant Tumors," European Journal of Clinical Investigation, V. 51, pp. 164-165, 2021.
- Abedi, A., Mohammadi, A., Shirani, E., "Numerical Simulation and experimental studies of Flow Velocity in a Transparent Cylinder Head of EF7 Engine Using PIV," Journal of Engine Research, Vol. 36, pp. 61-67, 2021.
- Freidooni, F., Sohankar, A., Rastan, M. R., Shirani, E. "Flow patterns and geometric consideration of turbulent flows around two non-identical-height square buildings," International Journal of Building Science and its Applications, Building and Environment, 201, pp. 1, 17, doi.org/10.1016/j.buildenv.2021.107985, 2021.
- Jafari, S., Soltani, M., Carvalho, J., Travasso, R., Salimpour, MR., Shirani, E, "Multiscale modeling of tumor growth and angiogenesis: Evaluation of tumor-targeted therapy," Accepted for Publication in PLOS Computational Biology, 2021.
- Shasavari, A., Nili-Ahmadabadi, M., Shirani, E., "Design of an axial transonic fan by a modified span-wise loading distribution," V. 14, No. 1, Journal of Applied Fluid Mechanics
- Nafar-Sefiddashti, M., Nili-Ahmadabadi, M., Saeedi-Rizi, B., Shirani, E., Chun Kim, K., " A novel optimization approach for axial turbine blade cascade via combination of a continuous-curvature parameterization method and genetic algorithm," Journal of Mechanical Science and Technology, 2021.
- Mohammadzade, K., Khaleghi, H., Maddahian, R., Shirani, E., "Numerical Investigation of Anode Channel Clogging of a PEMFC with a Realistic Droplet Size Distribution," Journal of the Brazilian Society of Mechanical Sciences and Engineering (BMSE), 42:204, doi.org/10.1007/s40430-020-02283-9, 2020.
- Fallahi, H., Shirani, E., Zohravi, E., "Hemodynamic analysis of coronary artery bypass grafting with elastic Walls and different stenosis," [doi: 10.24200/sci.2020.53378.3211](https://doi.org/10.24200/sci.2020.53378.3211), Scientia Iranica, 2020.
- Shahriarinasab, P., Moallem, M, Shirani, E., Carlos, "Predicting Temperature Profile on the Surface of a Switched Reluctance Motor Using a Fast and Accurate Magneto-Thermal," Journal of IEEE Transactions on Energy Conversion, V. 35, Issue 3, pp. 1394-1401, [10.1109/TEC.2020.2974789](https://doi.org/10.1109/TEC.2020.2974789), 2020.
- Rabani, R., Heidarinejad, G., Harting J., Shirani, E., "Effect of wall stiffness, mass and potential interaction strength on heat transfer characteristics of nanoscale-confined gas," International Journal of Heat and Mass Transfer, Vol. 147, pp. 1-14, <https://doi.org/10.1016/j.ijheatmasstransfer.2019.118929>, 2020.
- Rabani, R., Heidarinejad, Shirani, E., "Thermally induced stress in the a nano-confined fluid medium," Journal of Molecular Modeling, 26:180, pp.1-16, <https://doi.org/10.1007/s00894-020-04443-z>, 2020.
- Dadsetani, R., Salimpour, MR., Tavakoli, R., Shirani, E., "Thermal and Mechanical Design of Reverting Microchannels for Cooling Disk-Shaped Electronic Parts Using Constructal Theory," International Journal of Numerical Methods for Heat & Fluid Flow, 2020.
- Mohammadzadeh, K., Jahani Kaldehi, B, Jazmi, R., Khaleghi, H., Maddahian, R., Shirani, E., "A Numerical Model for Estimation of Water Droplet Size in the Anode Channel of a Proton Exchange Membrane Fuel Cell," Accepted for Publication in Journal of Energy Storage, V. 27, 101137, 2020
- Rabani, R., Heidarinejad, G., Harting J., Shirani, E., "Interplay of Wall Force Field and Wall Physical Characteristics on Interfacial Phenomena of Nano-Confined Gas Medium," International Journal of Thermal Sciences, V. 153, p. 106394, 2020.

Roohani, N., Shirani, E., Salimpour, MR., "Numerical Study and sensitivity analysis on convective heat transfer enhancement in heat pipe partially filled with porous material using LTE and LTNE methods," Heat Transfer-Asian Research, V. 48, V. 8, pp. 4342-4353, 2019.

Rabani, R., Heidarinejad, G., Harting, J. and Shirani, E., "Heat Conduction Characteristic of Rarefied Gas in Nanochannel," Journal of Applied Fluid Mechanics, Vol. 13, No. 1, pp. 1-13, DOI: [10.29252/jafm.13.01.30075](https://doi.org/10.29252/jafm.13.01.30075), 2020.

Yaghoubi, S., Shirani, E. and Pischevar, AR., "Improvement of dissipative particle dynamics method by taking into account the particle size," Scientia Iranica. Transaction B, Mechanical Engineering, Vol. 26, Iss. 3, pp. 1438-1445, DOI: [10.24200/sci.2018.21042](https://doi.org/10.24200/sci.2018.21042), 2019.

Shirani, E., Zohoor, H., Yaghoubi, M., Amirzade, S., Tashakori, S., "Analysis of development of higher education in engineering discipline during the fourth and fifth development program," V. 21, No. 81, pp. 19-44, Iranian Journal of Engineering Education, 2019.

Khoeini, D. and Shirani E., "Influences of diffuser vanes parameters and impeller micro grooves depth on a submersible centrifugal pump performance," Journal of Mechanics, V. 35, Issue 5, pp. 735-746, 2019.

Rastan, M., Sohankar, A., Doolan, C., Moreau, D., Shirani, E., "Controlled flow over a finite square cylinder using suction and blowing," Accepted for Publication in International Journal of Mechanical Sciences, V156, pp 410-434, DOI information: [10.1016/j.ijmecsci.2019.04.013](https://doi.org/10.1016/j.ijmecsci.2019.04.013), 2019.

Rabani, R., Heidarinejad, G., Harting, J., Shirani, E., "Effect of temperature difference between channel walls on the heat transfer characteristics of nanoscale-confined gas," International Journal of Thermal Sciences V137, pp 13-25, doi.org/10.1016/j.ijthermalsci.2018.11.015, 2019.

Sohankar, A., Riahi, M., Shirani, E., "Numerical study of water/ Al_2O_3 nanofluid forced convection in a rotating hydrophilic and hydrophobic microchannels," Journal of Applied Fluid Mechanics, Vol. 12, No. 1, pp. 219-231, DOI: [10.29252/jafm.75.253.29143](https://doi.org/10.29252/jafm.75.253.29143), 2019.

Fallahi, A., Shirani, E. and Salimpour, MR., "Numerical Analysis Temperature Distribution in a Three-Dimensional of Human Finger Model Using MRI Output in Sever Cold Conditions," V. 51, No. 4, pp1-12, Amirkabir Journal, [10.22060/MEJ.2017.13298.5593](https://doi.org/10.22060/MEJ.2017.13298.5593), 2019.

Modaresi, MA., Shirani, E., Charmiyan M., Aloui, F., "Numerical and Experimental investigation of impinging turbulent flow of twin jets against a wall," Scientia Iranica, V. 26, N. 6, 2019.

Yaghoubi, S., Alafzadeh, M., Shirani, E., Rahmani, M., "Simulation of RBC dynamics using combined low dimension, immersed boundary and lattice Boltzmann methods" Molecular Simulation, pp. 1-6, 2019.

Khoeini, D. and Shirani, E., M. Joghataei, "Improvement of centrifugal pump performance by using different impeller diffuser angle with and without vanes," Journal of Mechanics, 34, pp. 1-13, DOI: <https://doi.org/10.1017/jmech.2018.39>, 2018.

Rabani, R., Heidarinejad, G., Shirani, E., "Interplay of confinement and density on the heat transfer characteristics of nanoscale-confined gas," International Journal of Heat and Mass Transfer V126, 331-341, doi.org/10.1016/j.jheatmasstransfer.2018.05.028, 2018.

Razavi, M.S., Kassab, G.S. and Shirani, E., "Scaling laws of number of coronary capillaries with coronary blood volume, length, flow and mean transit time," Frontiers in Physiology, doi.org/10.3389/fphys.2018.00581, May 2018.

Khoeini, D. and Shirani E., "Enhancement of a centrifugal pump performance by simultaneous use of splitter blades and impeller diffuser," International Journal of Fluid Machinery and Systems, V. 11, Issue 2, pp. 191-204, 2018.

Meghdadi, AH., Nasehi, R. and Shirani, E., Mixing Enhancement in Microchannels Using Thermo-Viscous Expansion by Oscillating Temperature Wave," Chemical Engineering & Processing: Process Intensification, V 126, pp. 123-131,

<https://doi.org/10.1016/j.cep.2018.02.020>, 2018.

Khoeini, D., Abbasi, B. and Shirani E., "Influences of impeller splitter blades on the performance of a centrifugal pump with viscous fluids," *International Journal of Fluid Machinery and Systems*, Vol. 11, No. 4, pp. 400-411, DOI: <http://dx.doi.org/10.5293/IJFMS.2018.11.4.400>, 2018.

Zohravi, E., Shirani, E. and Pischevar, AR., Hossein Karimpour, "Dissipative Particle Dynamics Study of Velocity Autocorrelation Function and Self-diffusion Coefficient in terms of Interaction Potential Strength," *Molecular Physics*, Volume 116 Issue 13, DOI: [10.1080/00268976.2018.1441463](https://doi.org/10.1080/00268976.2018.1441463), 2018.

Hosseini, A., Meghdadi Isfahani, AH. and Shirani, E. "Experimental investigation of surface vibration effects on increasing the stability and heat transfer coefficient of MWCNTs-water nanofluid in a flexible double pipe heat exchanger," *Experimental Thermal and Fluid Science*, V. 90, pp. 275-285, <http://dx.doi.org/10.1016/j.expthermflusci.2017.09.018>, 2018.

Zohravi, E., Shirani, E. and Pischevar, AR., "Influence of the Conservative Force on Transport Coefficients in the DPD method," *Molecular Simulation/Journal of Experimental Nanoscience*, 44:3, pp. 254-261, DOI: [10.1080/08927022.2017.1373193](https://doi.org/10.1080/08927022.2017.1373193), 2018

Nasehi, R., Shirani, E., "Evolution of Thin Liquid Film for Newtonian and Power-Law Non-Newtonian Fluids," *Scientia Iranica B*, 25(1), 266-279, 2018.

Habibi, Z., Karami, M., Jarrahi, M., Shirani, E., Peerhossaini, H., "Some observations on the spatiotemporal orbits structure and heat transfer enhancement in pulsating flow," *International J. thermal Sciences*, Volume 125, pp. 428-439, 2018.

Fathi A.R., Jalilvand R., Shirani E., Forouzan M.R., "A New Analytical Relation for Performance of Small Regenerative Turbine Pumps," In: Aloui F., Dincer I. (eds) *Exergy for A Better Environment and Improved Sustainability 1. Green Energy and Technology*. pp. 613-630, Springer, Cham, 2018

Fathi A.R., Jalilvand R., Shirani E. , "Quantitative Evaluation of Influential Coefficients of Regenerative Pumps," In: Aloui F., Dincer I. (eds) *Exergy for A Better Environment and Improved Sustainability 1. Green Energy and Technology*. pp. 631-643, Springer, Cham, 2018.

Alafzadeh, M., Shirani, E., Yahaghi, E. and Fatourae, N., "Effects of Stenosis and RBC Motion on Mass Transfer in the Microvessels Using Immersed Boundary-Lattice Boltzmann Method," *Scientia Iranica*, V. 25, No. 5, pp. 2557-2561, 2018.

Rahmati, A.R., Ashrafizaadeh, M. and Shirani, E., "APPLICATION OF A NOVEL LATTICE BOLTZMANN METHOD FOR NUMERICAL SIMULATION OF THREE-DIMENSIONAL TURBULENT NATURAL CONVECTION FLOWS," *Heat Transfer Research* 48(4), 291–307, 2017.

Fallahi, A., Shirani, E. and Salimpour, MR., "Analytical Expressions for Estimating Endurance Time and Glove Thermal Resistance Related to Human Finger under Cold Conditions," *Journal of Thermal Biology*, V. 69 pp. 334 –340, <https://doi.org/10.1016/j.jtherbio.2017.09.006>, 2017.

Charmiyan, M., Azimian, MR., SHIRANI, E., Aloui, F., DEGOUE, C. and MICHAELIS, D., "3D Tomographic PIV, POD and vortex identification of turbulent slot jet flow impinging on a flat plate," *Journal of Mechanical Science and Technology*, JMEST, V. 31 No. 11, PP. 5347-5357, DOI 10.1007/s12206-017-1029-9, 2017.

Fallahi, A., Shirani, E. and Salimpour, MR., "A 3D Thermal Model to Analyze the Temperature Changes of Digits during Cold Stress and Predict the Danger of Frostbite in Human Fingers," Accepted for publication in *Journal of Thermal Biology*, 2017.

Riahi, M., Sohankar, A., Shirani, E., "Numerical investigation of heat transfer and pressure drop in a rotating U-shaped hydrophobic microchannel with slip flow and temperature jump boundary conditions," Accepted for publication in *J. Applied Thermal Engineering*, 117 pp. 308–321, 2017.

Alafzadeh, M., Shirani, E., Yahaghi, E. and Fatourae, N., "A novel model for effective diffusion coefficient in brain

- capillary," *Journal of Mechanical Science and Technology*, Volume 31, Issue 6, pp 3101–3106, DOI 10.1007/s12206-017-0554-x, 2017.
- Golozar, M., Razavi, M.S. and Shirani, E., "Optimal architecture of vascular system and its effect on energy loss and flow resistance," *Scientia Iranica B*, 24(5), 2387-2395, 2017.
- Rabani, R., Heidarinejad, G., Shirani, E., "The wall spring constant variation effect on distribution of Lennard-Jones fluid in nanochannel by molecular dynamic simulation," *Modares Journal of Mechanics*, V17, No. 9, pp185-194, 2017
- Heydarinejad, G., Rabani, R., Shirani, E., "The effect of wall force field on temperature distribution in nanochannel containing Lennard-Jones fluid by molecular dynamic simulation," *Modares Journal of Mechanics*, V17, No. 6, pp23-31, 2017.
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Kashan University, Interfacial Flows; Numerical Simulations and Turbulence Modeling, Iran, 2004

International Conference in Micro and Nanotechnology, Application of Lattice Boltzmann Method in Simulation of Flow in Micro-Channels and in Micro and Nano Porous Media, ICTP external activity, Algeria, 2006

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COURSES TAUGHT

Graduate Courses

Nano and Micro Fluid Flows
Advanced Fluid Mechanics
Boundary Layers
Gas Dynamics
Advance Numerical Methods
Turbulence
Advanced Mathematics
Numerical Methods in Water Engineering
CFD

Undergraduate courses

Fluid Mechanics I & II
Thermodynamics
Heat Transfer
Thermal Power Plants
Introduction to CFD
Turbomachinery

Ph. D. Students

- **Ataee- Mohammadbagher**, on going

- **Akbari, Omid**, 2023
- **Shumal, Mohammad**, 2023
- **Sahar Jafari**,
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- **Rabani, Reza**, Investigation of Wall Effect on Heat Conduction characteristic of Nanoconfined Gas in Transition Regime by Molecular Dynamics Method, 2018.
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- **Shariarinasab, Padram**,
- **Rastan, Mahammadreza**,
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- **Fallahi, Amir**, Modelling of the Anatomy of Fingers together with Numerical Simulation and Parametric Study of Fingers Frosbite, 2017.
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- **Monfared-Mosghani**, Mostafa, Experimental and Numerical Investigation of Unsteady Turbulent Couette-Taylor Flow, 2016.
- **Yaghoobi**, Somaye, Improve the DPD method, promote it to Low-Dimensional model and simulate Red Blood Cells numerically, 2015.
- **Reisi**, Mehdi, Study of morphological evolution of equiaxed dendrites using a clear substance, 2012.
- **Meghdadi**, Amir Homayoon, Numerical and experimental study of thermohydraulic flow in a microchannel filled with nano porous media by lattice Boltzmann method, 2012.
- **Gadrai**, Fatomeh, Numerical Simulation of Droplet Deformation including the Effects of Surface Tension, 2012.
- **Karimipour**, Arash, Simulation of Mixed Convection Heat Transfer in Macro, Micro and Nano Fluid Flow Using Lattice Boltzmann Method, 2012.
- **Sadeghi**, Hamid-Reza, Experimental and numerical investigation of pulsatile flow through the models of stenotic arteries, 2012.
- **Maarooft**, Seyed Kazem, "Aerodynamics and Heat Transfer Analysis of Turbulent Flow within the Gas Turbine Blades, 2011.
- **Rahmati**, Ahmad Reza, Numerical Instability Analysis of the Lattice Boltzmann Equation Method Using Different Schemes, 2010.
- **Alaee**, A.R, Optimization of melted Steel in Tandish for reduction of Aluminum Particles, 2010.
- **Ahmadi**, Afshin, Study of interfacial incompressible flows using LES technique: Surface tension and turbulence modeling, 2009.
- **Talebi**, Mansoor, Parallel Computing of Large Eddy Simulation for Turbulent Flow around Tube Bundles, 2005
- **Talebi**, Shahram, Numerical Simulation of supersonic plums, 2001
- **Ahmadikia**, Hossain, A Turbulence Model Based on Length Scale for Compressible High Speed Flows, 2000
- **Ameri**, Mehran, The Combination of Adaptive-Grid Redistribution and Embedding Methods, 1999
- **Zirak**, Saadat, Numerical Solution of Compressible Flows in Turbomachinery, 1999.