

MOSTAFA KAHANI

1. Personal Information

- **Name:** Mostafa Kahani
- **Birth date:** 15/06/1983
- **Nationality:** Iranian
- **Gender:** Male
- **E-mail address:** mostafa.khn2004@gmail.com ; mostafa.kahani@shahroodut.ac.ir

2. Summary:

I am an Assistant Professor of Chemical Engineering at Shahrood University of Technology, one of the reputable technical universities in Iran. Since 2015, I have been actively engaged in educational and research activities. As one of the 2% most influential scientist of the world on Stanford Databases, my research primarily focuses on nanofluids (a new generation of heat transfer fluid) and energy system. I explore the application of material and energy principles to enhance the performance of energy systems including PhotoVoltaic/Thermal (PV/T) solar collectors, Poly-generation systems for Heat/power/fresh water/H₂ production, and desalination units based on clean methods. The objective is to generate power, heat, and fresh water while minimizing environmental impact. I have contributed to optimizing energy systems and providing environmentally friendly solutions to reduce greenhouse gas emissions.

3. Education

- **2009 – 2013**
PhD in Chemical Engineering
Iran (18.62 / 20 GPA tantamount to 3.72 / 4)
Thesis: “Experimental and Numerical Investigation on Forced Convective Heat Transfer of Nanofluids through Helical Coiled Tubes” (19.83 out of 20)
- **2007 – 2009**
Master of Science in Chemical Engineering,
(17.73 / 20 GPA tantamount to 3.55 / 4)
Thesis: “Experimental Investigation on Thermal Performance of a Two-Phase Closed Thermosyphon Using Nanofluid” (20 out of 20)
- **2002 – 2006**
Bachelor of Science in Chemical Engineering
(17.02 / 20 GPA tantamount to 3.40 / 4)
Thesis: “Solar Heat Pipe collectors, Design and Construction” (19 out of 20)

4. Achievement & Awards

- ✓ 2% most influential scientist of the world on Stanford Databases, for two consecutive years [2021](#) and [2022](#).
- ✓ Research fellowship winner for outstanding young foreign researchers by the Republic of Turkey, 2013.
- ✓ Best Paper Award at the Eurotherm Seminar 102: Thermal Management of Electronic Systems, University of Limerick, Ireland, 2013.
- ✓ Among best researchers of the engineering faculty in FUM University, 2009 and 2013.
- ✓ Winner of internal scholarship of the Ministry of Science, Research, and Technology of Iran, 2010.
- ✓ Best Thesis award at the 7th Ferdowsi Festival, 2009.
- ✓ Top ranked in PhD entrance exam in FUM University: 1st out of 53 candidate, 2009.
- ✓ Winner of Research award for Master’s program from received special financial support from the Iran Fuel Consumption Optimization Organization (IFCO), 2007.
- ✓ Top ranked in national entrance exam for the Master's program: 27th out of 834. candidates, 2006.

5. Industry Experience

- ✓ **July 2020- November 2023**
Employer: Niroo Research Institute
Position: Project Manager (Industrial contract)
Project Title: Application of heat pipe heat exchangers instead of Ljungstrom for preheating of required combustion air in boiler of steam power plants
Duties: Planning and developing the project idea, creating and leading the research team, and evaluating the project performance.

- ✓ **June 2020- March 2023**
Employer: Vice Presidency for Science and Technology
Position: Main co-researcher
Project Title: Development of HD desalination technologies with air-to-air condenser in MAKRAN coast
Duties: Performing the techno-economic analysis, monitoring project progress and setting deadlines plan

- ✓ **May 2019- November 2020**
Employer: Agricultural Research, Education and Extension Organization (AREEO)
Position: Main co-researcher
Project Title: Studies, modeling and simulation of different scenarios and design of freshwater production system from seawater based on the superior scenario for a pilot marine greenhouse
Duties: Conducting the technical analysis, and preparation of technical drawings

6. Academic Experience

- ✓ **February 2015- Present**
Employer: Shahrood University of Technology, Iran.
Position: Assistant Professor of Chemical Engineering
Duties: Teaching courses, conducting research, supervision, management
 - ✓ Supervision of postgraduate thesis:
 - *Ali Mirshafiee:* Technical analysis and performance optimization of a multi-generation system including thermal-photovoltaic panel cooled by nanofluid, desalination, ORC and electrolyzer system, **2024**.
 - *Neda Mehtari:* Modeling of multi stage flash desalination (MSF) to generate fresh water from Iranshahr steam power plant wastewaters, **2023**.
 - *Mahdi Taherpour:* Technical and economic analysis for investigation the potential of thermal recovery of waste streams in a steel factory by application of a hybrid poly-generation system to generate power and hydrogen, **2023**.
 - *Ehsan Pourhasan:* Technical and economic evaluation of desalination of Iranshahr steam power plant effluents by means of heat losses of different units using MED desalination system, **2023**.
 - *Hossein Eshghi:* Experimental study of photovoltaic panel cooling using different of Heat Pipes, **2022**.
 - *Bashir Zare:* Modeling and experimental analysis of a single heat pipe for high temperature applications, **2022**.

- *Kaveh Sadeghi*: Modeling performance of thermosyphon heat exchangers for high temperature applications, **2022**.
- ✓ Planning, designing, setting up, and management of heat transfer laboratory
- ✓ Courses:
 - Applied Statistics and Design of Experiments
 - Advanced Engineering Mathematics
 - Advanced Numerical Methods in Engineering
 - Environmental Engineering
 - Natural Gas processing
 - Heat Transfer
 - Fluid Mechanics
 - Material and Energy Balances
 - Fuels and Combustions
 - Introduction to Chemical Engineering
 - General Chemistry

✓ **March 2014- March 2015**

Employer: Middle East Technical University, Ankara, Turkey.

Position: Post-Doctoral Research

Duties: Conducting research on “Numerical and experimental properties on physical properties of carbon nanotube nanofluid”

7. Publications: (Citations: 1634, h-index: 18)

[\(GOOGLE SCHOLAR LINK\)](#)

7.1 Journal Papers

- M Taheripour, **M Kahani**, MH Ahmadi, “A Hybrid Poly-Generation System for Power and Hydrogen Production by Thermal Recovery from Waste Streams in a Steel Plant: Techno-Economic Analysis”, *Energy Reports* 11 (2024) 2921-2934.
<https://doi.org/10.1016/j.egy.2024.02.039>
- N Mehtari, **M Kahani**, M Zamen, “Simulation of a low-capacity solar MSF desalination unit for a steam power plant by Thermoflow software”, *Renewable Energy Research and Applications* 5 (2024) 259-268.
[10.22044/rera.2023.13347.1231](https://doi.org/10.22044/rera.2023.13347.1231)

- N Mehtari, **M Kahani**, M Zamen, “Simulation of a low-capacity solar MSF desalination unit for a steam power plant by ThermoFlow software”, *Renewable Energy Research and Applications* 5 (2024) 259-268.
[10.22044/rera.2023.13347.1231](https://doi.org/10.22044/rera.2023.13347.1231)
- B Zare, **M Kahani**, M Zamen, F Salek, “Application of moderate-temperature heat pipe instead of Ljungstrom in steam power plant: Parametric and Experimental study”, *Energy Reports* 10 (2023) 637-647.
<https://doi.org/10.1016/j.egy.2023.07.011>
- N Mehtari, **M Kahani**, M Zamen, “Energy, environmental, and economic analysis of a new configuration multi-stage flash distillation unit coupled with steam power plant”, *Case Studies in Thermal Engineering* 50 (2023) 103456.
<https://doi.org/10.1016/j.csite.2023.103456>
- H Eshghi, , M Zamen, **M Kahani**, “Energy and environmental investigation on photovoltaic system performance by application of square cross-sectional two-phase closed thermosyphon”, *Environmental Science and Pollution Research*, (2023)
<https://doi.org/10.1007/s11356-023-27865-7>
- M Zamen, **M Kahani**, J Yazdanpanahi, R Abedini, “Modeling of a direct-contact humidification-dehumidification desalination unit in a 256 MW steam power plant using effluent streams: Case study”, *Case Studies in Thermal Engineering* 45 (2023) 102966.
<https://doi.org/10.1016/j.csite.2023.102966>
- M Zamen, **M Kahani**, G Zarei, “Seawater Greenhouse Equipped with a Novel Solar Humidification-Dehumidification Desalination Unit in MAKRAN Coast: Fabrication and Experimental Study”, *Water* 15 (2023) 539.
<https://doi.org/10.3390/w15030539>
- K Sadeghi, **M Kahani**, MH Ahmadi, M Zamen, “CFD Modelling and Visual Analysis of Heat Transfer and Flow Pattern in a Vertical Two-Phase Closed Thermosyphon for Moderate-Temperature Application”, *Energies* 15 (2022) 8955.
<https://doi.org/10.3390/en15238955>
- **M Kahani**, M Zamen, B Rostami, “Modeling and empirical study of TiO₂/water nanofluid flows in a modified configuration with new layer arrangement of a photovoltaic/thermal system”, *Sustainable Energy Technologies and Assessments* 51 (2022) 101932.
<https://doi.org/10.1016/j.seta.2021.101932>
- H Eshghi, **M Kahani**, M Zamen, “Cooling of photovoltaic panel equipped with single circular heat pipe: Experimental study”, *Renewable Energy Research and Applications* 3 (2022) 229-235.

<https://doi.org/10.22044/rera.2022.11523.1097>

- M Zamen, **M Kahani**, B Rostami, M Bargahi, “Application of Al₂O₃/water nanofluid as the coolant in a new design of photovoltaic/thermal system: An experimental study”, *Energy Science and Engineering* 10 (2022) 4273–4285.
<https://doi.org/10.1002/ese3.1067>
- MH Ahmadi, M Ghazvini, H Maddah, **M Kahani**, S Pourfarhang, A Pourfarhang, S zeinali Heris, “Prediction of the pressure drop for CuO/(Ethylene glycol-water) nanofluid flows in the car radiator by means of Artificial Neural Networks analysis integrated with genetic algorithm”, *Physica A: Statistical Mechanics and its Applications* 546 (2020) 124008.
<https://doi.org/10.1016/j.physa.2019.124008>
- **M Kahani**, “Simulation of nanofluid flow through rectangular microchannel by modified thermal dispersion model”, *Heat Transfer Engineering*, 41 (2019) 377-392.
<https://doi.org/10.1080/01457632.2018.1540464>
- A Hajji, M Chahartaghi, **M Kahani**, “Thermodynamic analysis of natural gas liquefaction process with propane pre-cooled mixed refrigerant process (C3MR)”, *Cryogenics* 103 (2019) 102978.
<https://doi.org/10.1016/j.cryogenics.2019.102978>
- M Sadeghzadeh, MH Ahmadi, **M Kahani**, H Sakhaeinia, H Chaji, L Chen, “Smart modeling by using artificial intelligent techniques on thermal performance of flat-plate solar collector using nanofluid”, *Energy Science & Engineering* 7 (2019) 1649-1658.
<https://doi.org/10.1002/ese3.381>
- **M Kahani**, G Vatankhah, “Thermal performance prediction of wickless heat pipe with Al₂O₃/water nanofluid using artificial neural network”, *Chemical Engineering Communications* 206 (2019) 509-523.
<https://doi.org/10.1080/00986445.2018.1505614>
- A Baghban, **M Kahani**, MA Nazari, MH Ahmadi, WM Yan, “Sensitivity analysis and application of machine learning methods to predict the heat transfer performance of CNT/water nanofluid flows through coils”, *International Journal of Heat and Mass Transfer* 128 (2019) 825-835.
<https://doi.org/10.1016/j.ijheatmasstransfer.2018.09.041>
- **M Kahani**, MH Ahmadi, A Tatar, M Sadeghzadeh, “Development of multilayer perceptron artificial neural network (MLP-ANN) and least square support vector machine (LSSVM) models to predict Nusselt number and pressure drop of TiO₂/water nanofluid flows through non-straight

pathways”, *Numerical Heat Transfer, Part A: Applications* 74 (2018) 1190-1206.

<https://doi.org/10.1080/10407782.2018.1523597>

- **M Kahani**, M Zamen, M Farrokhi, “Thermal evaluation of using thermosyphon heat exchangers instead of Ljungstrom in boiler of Mashhad steam power plant”, *NSMSI journal* 2018 (Persian).
https://www.nsmsi.ir/article_34182_en.html?lang=en
- GH Vatankhah, M Ebrahimi, **M Kahani**, “Determination of Trace Amount of Lead (11) and Cadmium (11) Ions in Real Water and Real Samples by Flame Atomic Absorption Spectrometry After Cloud Point Extraction Using Selective Synthesis Ligand2-(3-indolyl)-4, 5 di phynyl imidazole”, *Eurasian Journal of Analytical Chemistry* 12 (2017).
[10.12973/ejac.2017.00227a](https://doi.org/10.12973/ejac.2017.00227a)
- **M Kahani**, RG Jackson, G Rosengarten, “Experimental investigation of TiO₂/Water nanofluid droplet impingement on nanostructured Surfaces”, *Industrial and Engineering Chemistry Research* 55 (2016) 2230-2241.
<https://doi.org/10.1021/acs.iecr.5b04465>
- Z Taghizadeh-Tabari, S Zeinali Heris, M Moradi, **M Kahani**, “The study on application of TiO₂/water nanofluid in plate heat exchanger of milk pasteurization industries”, *Renewable and Sustainable Energy Reviews* 58 (2016) 1318-1326.
<https://doi.org/10.1016/j.rser.2015.12.292>
- S Pourfarhang, S Zeinali Heris, M Shokrgozar, **M Kahani**, “Pressure drop and thermal performance of CuO/Ethylene Glycol-Water (60/40) nanofluid in car radiator”, *Korean Journal of Chemical Engineering* 34 (2015) 609-616.
<https://doi.org/10.1007/s11814-014-0244-7>
- **M Kahani**, S Zeinali Heris, SM Mousavi, “Experimental investigation of TiO₂/water nanofluid laminar forced convective heat transfer through helical coiled tube”, *Journal of Heat and Mass transfer* 50 (2014) 1563–1573.
<https://doi.org/10.1007/s00231-014-1367-4>
- **M Kahani**, S Zeinali Heris, SM Mousavi, “Curvature ratio and pitch spacing effect of helical coiled tube on pressure drop and heat transfer behavior of TiO₂/water nanofluid laminar flow”, *Journal of Applied and Computational Sciences in Mechanics* 25 (2014) 77-94 (Persian).
[10.22067/FUM-MECH.V25I1.34864](https://doi.org/10.22067/FUM-MECH.V25I1.34864)
- **M Kahani**, S Zeinali Heris, SM Mousavi, “Multiwalled carbon nanotube/water nanofluid or helical coiling technique, which of them is

more effective?”, *Industrial and Engineering Chemistry Research* 52 (2013) 13183-13191.

<https://doi.org/10.1021/ie4010942>

- **M Kahani**, S Zeinali Heris, SM Mousavi, “Effects of curvature ratio and coil pitch spacing on heat transfer performance of Al₂O₃/Water nanofluid laminar flow through helical coils”, *Journal of Dispersion Science and Technology* 34 (2013) 1704-1712.
<https://doi.org/10.1080/01932691.2013.764485>
- H Chaji, Y Ajabshirchi, E Esmaeilzadeh, S Zeinali Heris, M Hedayatizadeh, **M Kahani**, “Experimental study on thermal efficiency of flat plate solar collector using TiO₂/water nanofluid”, *Modern Applied Science* 7 (2013) 60-69.
[10.5539/mas.v7n10p60](https://doi.org/10.5539/mas.v7n10p60)
- **M Kahani**, S Zeinali Heris, SM Mousavi, “Comparative study between metal oxide nanopowders on thermal characteristics of nanofluid flow through helical coils”, *Powder Technology* 246 (2013) 82-92.
<https://doi.org/10.1016/j.powtec.2013.05.010>
- **M Kahani**, SH Noie, S Zeinali Heris, “The comparison of thermal performance on a two-phase closed thermosyphon using metal oxide nanofluids”, *Journal of Separation and Transport Phenomena* 21 (2011) 43-58 (Persian).
[Link](#)
- SH Noie, S Zeinali Heris, **M Kahani** and SM Nowee, “Heat transfer enhancement using Al₂O₃/water nanofluid in a two-phase closed thermosyphon”, *International Journal of Heat and Fluid Flow* 30 (2009) 700–705.
<https://doi.org/10.1016/j.ijheatfluidflow.2009.03.001>

7.2 Conferences

- **M Kahani**, A Taheri, “Simulation of nanofluid flows in domestic air condition systems”, *The 3rd national conference of heat and mass transfer*, Babol Noshirvani University of Technology, 2017.
- A Hajji, **M Kahani**, M Chahartaghi, “Heat transfer recovery of natural gas liquefaction process with propane pre-cooled mixed refrigerant process”, *5th national conference of modern research in chemistry, chemical engineering & petroleum*, Mahshahr, 2016.

- E Dursunkaya, **M Kahani**, T Okutucu Özyurt, “Measurement of thermal conductivity of nanofluids with carbon nanotubes using transient hot wire method”, *20th conference of thermal science and technology*, Turkey, September 2015.
- M. Farrokhi, **M. Kahani**, S. Zeinali Heris, “Numerical Investigation of Al₂O₃/water Nanofluid Laminar Convective Heat Transfer through a Helical Pipe”, *The 9th International Chemical Engineering Congress & Exhibition (IChEC)*, Shiraz University, December 2015.
- **M Kahani**, M Farrokhi, “Power Generation from Waste Heat Using the Trilateral Flash Cycle”, *The 9th International Chemical Engineering Congress & Exhibition (IChEC)*, Shiraz University, December 2015.
- M Farrokhi, **M Kahani**, “Optimization of energy consumption by CHP”, *The International Conference of Science, Engineering and Environmental Technologies*, University of Tehran, May 2015 (Persian).
- RG Jackson, **M Kahani**, N Karwa, A Wu, R Lamb, R Taylor, G Rosengarten, “Effect of surface wettability on carbon nanotube water-based nanofluid droplet impingement heat transfer”, *Eurotherm Seminar 102: Thermal Management of Electronic Systems* (University of Limerick, Ireland). *Journal of Physics: Conference Series* 525 (2014) 012024.
 - ✓ Best paper award in Eurotherm 102.
- **M Kahani**, S Zeinali Heris, SM Mousavi, “Heat transfer enhancement in helical coiled tubes using Al₂O₃/Water Nanofluid”, *The 2nd Conference on Emerging Trends in Energy Conservation-ETEC*, Tehran University, Iran, March 2013.
- **M Kahani**, S Zeinali Heris , SH Noie, “Experimental investigation of thermal performance on a two-phase closed thermosyphon using CuO/Water nanofluid”, *The 13th National Iranian Chemical Engineering Congress & The 1st Regional Oil & Chemical Engineering Congress (IChEC13)*, Razi University Kermanshah, Iran, October 2010.
- **M Kahani**, SH Noie, S Zeinali Heris, “Investigation on thermal performance of a two-phase closed thermosyphon using nanofluid”, *The 15th Nanotechnology Students Conference*, Tehran Medical Sciences University, Iran, June 2009.
- **M Kahani**, SH Noie, S Zeinali Heris, “Effect of Alumina-water nanofluid as working fluid on efficiency improvement of a two-phase closed

thermosyphon”, *The 12th International Conference of Fluid Dynamics, Babol Noshirvani University of Technology, Iran, May 2010* (Persian).

8. Reviewer

<i>Journal Title</i>	<i>Number of Reviews</i>
▪ Applied Thermal Engineering	17
▪ Journal of Cleaner Production	13
▪ Energy Conversion and Management	10
▪ International Journal of Thermal Sciences	8
▪ Journal of Energy Storage	6
▪ AUT journal of Mechanical Engineering	15
▪ Journal of Thermal Analysis and Calorimetry	4
▪ Journal of Solid and Fluid Mechanics (Persian)	13
▪ International Journal of Heat and Mass Transfer	3
▪ International Communications of Heat and Mass Transfer	5
▪ Measurement	3
▪ Engineering Applications of Artificial Intelligence	2
▪ Engineering Science and Technology, an International Journal	1
▪ Physica E: Low-dimensional Systems and Nanostructures	1
▪ Case studies in Thermal Engineering	2

9. Memberships

- ✓ National Elites Foundation of Iran
- ✓ Iranian Association of Chemical Engineering

10. Skills

- ✓ Technical Software
 - **ASPEN PLUS** (S.S & Dynamic Process/Amine Package)
 - **Aspen HYSYS** | Process Simulation Software
 - **Aspen B-JAC**
 - **THERMOFLOW**
 - **DESIGN- EXPERT**
 - **MATLAB**
 - **Minitab**| Data Analysis, Statistical & Process Improvement Tools
 - **Ansys Fluent** | Fluid Simulation Software
 - **EES**| Engineering Equation Solver

- ✓ Technical Abilities
 - Modeling and technical design of industrial units
 - Energy enhancement techniques
 - Green production: power/heat/cooling/fresh water/ H₂ gas
 - Simulation of two-phase fluid flows
 - Nanofluids preparation
 - Control structure design for complete chemical plants
 - Pipeline simulation and design
 - Shell & tube heat exchangers thermal design & optimization
 - General process engineering calculations

11. Research Interests

- ✓ Nanofluids: new generation of heat transfer fluid
- ✓ Water Engineering and Desalination units: MSF/MED/RO
- ✓ Heat transfer enhancement
- ✓ PhotoVoltaic/thermal (PV/T) solar collectors
- ✓ Energy Recovery
- ✓ Renewable Energy
- ✓ Energy optimization
- ✓ Poly-generation systems for Heat/power/fresh water/H₂ production
- ✓ Thermal heat exchangers/ Heat pipe Heat exchanger