

RESUME

MOSTAFA KAHANI, Ph.D.

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 Associate Professor of Chemical Engineering/Energy Systems at Shahrood University of Technology (SUT), one of Iran's most reputable technical universities. Since 2015, I have been actively engaged in educational and research activities. As one of the 2% most influential scientists in the world on Stanford Databases, my research primarily focuses on energy systems and clean technology. I explore applying 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 green methods. The objective is to generate power, heat, and fresh water while minimising environmental impact. I have contributed to optimising 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)
Sabbatical: RMIT university, Melbourne, Australia (2013)
Research title: Nanofluid Droplet Impact Heat Transfer over Nano-structured Superhydrophobic and Superhydrophilic Surfaces

- 2007 – 2009

Master of Science in Chemical Engineering
Iran (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
Iran (17.02 / 20 GPA tantamount to 3.40 / 4)
Thesis: “Solar Heat Pipe collectors, Design and Construction” (19 out of 20)

4. Achievement & Awards

- ✓ The 2% most influential scientist in the world on Stanford Databases for two consecutive years, [2022](#) and [2023](#).
- ✓ Top Faculty member of Chemical & Material Engineering of SUT, 2022.
- ✓ Best Paper Award at the Eurotherm Seminar 102: Thermal Management of Electronic Systems, University of Limerick, Ireland, 2013.
- ✓ Research fellowship winner for outstanding young foreign researchers by the Republic of Turkey, 2013.
- ✓ Among the best researchers of the engineering faculty at 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 the PhD entrance exam in FUM University: 1st out of 53 candidates, 2009.
- ✓ The winner of the Research award for the Master’s program received special financial support from the Iran Fuel Consumption Optimization Organization (IFCO) in 2007.
- ✓ Top-ranked in the national entrance exam for the Master's program, 27th out of 834 candidates, in 2006.

5. Academic Experience

- ✓ **Date:** February 2024 – To date
Employer: Shahrood University of Technology, Iran.
Position: Associate Professor of Chemical Engineering
Duties: Teaching courses, conducting research, supervision, management
 - ✓ Supervision of postgraduate thesis:
 - *MT Rezaei:* Techno-economic evaluation of a new configuration of poly-generation system with a hydrogen production unit and a solar system, **2024**.
 - *A Mirshafiee:* Technical analysis and performance optimization of a multi-generation system including thermal-photovoltaic panel cooled by nanofluid, desalination, ORC and electrolyzer system, **2024**.
 - ✓ Planning, designing, setting up, and management of **heat transfer laboratory**

- ✓ **Date:** February 2015- January 2024
Employer: Shahrood University of Technology, Iran.
Position: Assistant Professor of Chemical Engineering
Duties: Teaching courses, conducting research, supervision
 - ✓ Supervision of postgraduate thesis:
 - *N Mehtari:* Modeling of multi stage flash desalination (MSF) to generate fresh water from Iranshahr steam power plant wastewaters, **2023**.
 - *M 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**.
 - *E 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**.
 - *H Eshghi:* Experimental study of photovoltaic panel cooling using different of Heat Pipes, **2022**.
 - *B Zare:* Modeling and experimental analysis of a single heat pipe for high temperature applications, **2022**.

- *K Sadeghi*: Modeling performance of thermosyphon heat exchangers for high temperature applications, **2022**.
- *A Hajji*: Analysis pinch and exergy and improve process performance propane precooled mixed refrigerant (C3MR) precooled, **2016**.

✓ Teaching courses:

- Environmental Engineering
- Fuel and Combustion
- Heat Transfer
- Fluid Mechanics
- Materials and Energy Balances
- Introduction to Chemical Engineering
- Natural Gas processing
- Applied Statistics and Design of Experiments (DOE)
- Advanced Engineering Mathematics
- Advanced Numerical Methods in Engineering

✓ **Date:** March 2014- March 2015

Employer: Middle East Technical University, Ankara, Turkey.

Position: Post-Doctoral Researcher

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

6. Industry Experience

✓ **Date:** March 2023- To date (*current industrial contract*)

Employer: National Iranian Gas Company-Southern Pars Gas Complex Company

Position: Computational Fluid Dynamics (CFD) developer

Project Title: The Feasibility study of implementation of the methods to reduce the CO emission of SGT600, Unit C8, and SGT400, Unit 107, turbines of 4th South Pars refinery

Duties: Create and maintain simulation models and data sets, prediction of CO concentration in SGT turbines, analyze and interpret simulation results and provide recommendations to project teams.

✓ **Date:** March 2022- September 2024

Employer: Niroo Research Institute/ IRANSHAHR steam power plant

Position: Main researcher (Industrial contract)

Project Title: Techno-economic analysis of using evaporative water desalination by solar energy in Iranshahr steam power plant

Duties: Conducting the technical analysis of MSF and MED desalination system with novel configuration

- ✓ **Date:** 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 boilers of steam power plants
Duties: Planning and developing the project idea, creating and leading the research team, and evaluating the project performance.

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

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

- ✓ **Date:** Summer 2005
Employer: Khorasan Petrochemical Company, Iran
Position: Process engineer
Project Title: BSc graduation program 2
Duties: Familiarity with the production process of petrochemicals products, generation of steam in power plant

- ✓ **Date:** Summer 2004
Employer: Mashhad Cement Company, Iran
Position: Process engineer
Project Title: BSc graduation program 1
Duties: Check production process of all types of cement, determination of fineness of cement by dry sieving, determination of setting times of cement, determination of compressive strength of cement, determination of specific gravity of cement, and tests for determination of flexural strength of concrete.

7. Publications: (Citations: 1770, h-index: 19)

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

7.1 Journal Papers

- **M Kahani**, M Zamen, MH Ahmadi and S Sadri, “Techno-economic assessment of indirect-contact HDH desalination unit driven by boiler blowdown of steam power plant”, *Energy Science and Engineering* 12 (2024) 3437-3452.
<https://doi.org/10.1002/ese3.1827>
- 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>
- E Pourhasan, M Zamen , **M Kahani**, “Evaluation of MED system for desalination of Iranshahr steam power plant effluents using waste heat from boilers”, *Solid and Fluid Mechanics*, 13 (2024) 89-102 (Persian).
[10.22044/JSFM.2024.13667.3798](https://doi.org/10.22044/JSFM.2024.13667.3798)
- 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 MAKHRAN 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>

- **M Kahani**, M Ghazvini, B Mohseni-Gharyehsafa, MH Ahmadi, A Pourfarhang, S Zeinali Heris, “Application of M5 tree regression, MARS, and artificial neural network methods to predict the Nusselt number and output temperature of CuO based nanofluid flows in a car radiator”, *International Communications in Heat and Mass Transfer* 116 (2020) 104667.
<https://doi.org/10.1016/j.icheatmasstransfer.2020.104667>

- 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 Ligand 2-(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 History

<i>Journal Title</i>	<i>Number of Reviews</i>
▪ Applied Thermal Engineering	17
▪ AUT journal of Mechanical Engineering	15
▪ Journal of Cleaner Production	13
▪ Journal of Solid and Fluid Mechanics (Persian)	13
▪ Energy Conversion and Management	11
▪ International Journal of Thermal Sciences	8
▪ Case studies in Thermal Engineering	10
▪ Journal of Energy Storage	6
▪ International Communications of Heat and Mass Transfer	6
▪ Journal of Thermal Analysis and Calorimetry	4
▪ Process Safety and Environmental protection	5
▪ International Journal of Heat and Mass Transfer	3
▪ Measurement	3
▪ Engineering Applications of Artificial Intelligence	4
▪ Engineering Science and Technology	1
▪ Chemical Engineering Research and Design	2
▪ Physica E: Low-dimensional Systems and Nanostructures	1
▪ Desalination	1
▪ Heliyon	1
▪ Scientific Reports	1

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

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