



Ahmed Amine Hachicha

Curriculum Vitae

Education

Oct2008–
Sep2013 **PhD degree in thermal engineering with the highest academic degree awarded (Cum Laude)**, *Polytechnic University of Catalonia UPC*, Barcelona (Spain).

Title Modelling and numerical simulation of a parabolic trough solar collector

- Implementation of a new optical model to accurately calculate the solar distribution around the heat collector element taking into account the solar angle.
- Development of a general thermal model to predict accurately the heat losses and thermal performances of a parabolic trough solar collector.
- The study of the wind flow around a parabolic trough solar collector and its effect on the stability and the heat transfer around the solar receiver using Large-Eddy Simulations techniques.

Oct2008–
Jul2010 **Master degree in energy engineering** , *Polytechnic University of Catalonia UPC*, Barcelona (Spain).

The use of CFD in the numerical simulation of thermal process (solar application: modelling and numerical simulation of a parabolic trough solar collector)

Sep2006–
Oct2008 **Master degree in energy engineering**, *National School of Engineering of Tunis ENIT*, Tunis (Tunisia).

Numerical simulation of conduction, convection and fluid flow using Computational Fluids Dynamics (CFD) techniques (application to solar water storage tank).

Sep2004–
Jun2007 **Industrial engineer**, *National School of Engineering of Tunis ENIT*, Tunis (Tunisia).

Final project of engineering studies: Development of a new Computerized Management of Maintenance System CMSS and FMEA Process in Valeo Ezzahra.

Awards: **Special doctoral award for the most outstanding doctoral thesis** , *Polytechnic University of Catalonia UPC*, Barcelona (Spain).

Publications-Referred Journal

- S.M.A. Rahman, A.A. Hachicha, C. Ghenai, S. Rahman, Z. Saidur. Performance and life cycle analysis of a novel portable solar thermoelectric refrigerator. Accepted in Case Studies in Thermal Engineering 2020.
- A. Allagui, H. Alnaqbi, A. S. Elwakil, Z. Said, A.A. Hachicha, C. Wang and M.A. Abdelkareem. Fractional order electric double layer capacitors with tunable low frequency impedance phase angle and energy storage capabilities. Applied Physics Letters 2020, 116 (1), 013902.
- Z. Said, M. Ghodbane, A.A Hachicha, and B. Boumeddane. Performance assessment of linear Fresnel solar reflector using MWCNTs/DW nanofluids. Accepted in Renewable Energy journal, <https://doi.org/10.1016/j.renene.2019.10.137>.
- Z. Said, M. Ghodbane, A.A Hachicha, and B. Boumeddane. Optical performance assessment of a small experimental prototype of linear Fresnel reflector. Case Studies in Thermal Engineering, 2019, 16, 100541.
- A.A Hachicha, B.A.A Yousef, Z. Said, I. Rodríguez. A review study on the modeling of high-temperature solar thermal collector systems. Renewable and Sustainable Energy Reviews 2019, 112, 280-298.
- Z. Said, M. El Haj Assad, A.A Hachicha, E. Bellos, M. Ali. Abdelkareem, D. Zeyad, B. Yousef. Enhancing the performance of automotive radiators using nanofluids. Renewable and Sustainable Energy Reviews, 2019, 112, 183-194.
- M.A. Ehyaei, A. Ahmadi, M. El Haj Assad, A.A. Hachicha, Z. Said. Energy, exergy and economic analyses for the selection of working fluid and metal oxide nanofluids in a parabolic trough collector. Solar Energy 2019, 187, 175-184.
- A.A. Hachicha, I. Al-Sawafta, D. Ben Hamadou. Numerical and experimental investigations of dust effect on CSP performance under United Arab Emirates weather conditions. Renewable Energy 2019, 143, 263-276.
- A.A.Hachicha, I. Al-Sawafta, Z. Said. Impact of dust on the performance of solar photovoltaic (PV) systems under United Arab Emirates weather conditions. Renewable Energy 2019, 141, 287-297.
- E.W Bitam, Y. Demagh, A. A. Hachicha, H. Benmoussa, and Y. Kabar. Numerical investigation of a novel sinusoidal tube receiver for parabolic trough technology. Applied Energy, 218, 494-510, 2018.
- A.A. Hachicha, I. Rodríguez, and C. Ghenai. Thermo-hydraulic analysis and numerical simulation of a parabolic trough solar collector for direct steam generation. Applied Energy, 2018, vol. 214, p. 152-165.
- A.A. Hachicha. Thermo-hydraulic modelling for Direct Steam Generation. Energy Procedia, 143, 705-712, 2017.
- A.A. Hachicha and M. Tawalbeh. Design of a new concentrated photovoltaic system under UAE conditions. In AIP Conference Proceedings 2017, 1850, No. 1, p. 110004, AIP Publishing, 2017.
- C. Ghenai and A.A. Hachicha. Thermal Performance of Biomass-Fired Steam Power Plant. Journal of Thermal Science and Engineering Applications ASME 2107; 9; 3; 031002 .
- E. Al-Sarairah, C. Ghenai, and A.A. Hachicha. Multiplicity of premixed flames under the effect of heat loss. Journal of Thermal Science and Engineering Applications ASME 2107; 9; 3; 031001 .
- E. Al-Sarairah, B. Al-Hasanat, and A.A. Hachicha. On the stability of planar premixed flames under non adiabatic conditions and preferential diffusion. Journal of Thermal Science and Engineering Applications ASME 2107; 9; 3; 031010 .
- A.A. Hachicha. Numerical simulation of a parabolic trough solar collector for hot water and

- steam generation. AIP Conference Proceedings. Vol. 1734. No. 1. AIP Publishing, 2016.
- A.A. Hachicha, C.Ghenai, A-K Hamid, Enhancing the Performance of a Photovoltaic Module using Different Cooling Methods. International Science Index, Energy and Power Engineering Vol:9, No:9, 2015 waset.org/Publication/10002519.
 - K. Thakkar, C. Ghenai, A.A. Hachicha. Integrated modeling approach for energy planning and climate change mitigation assessment in the state of Florida. International Science Index, Energy and Power Engineering Vol:9, No:9, 2015 waset.org/Publication/10002680.
 - A.A. Hachicha, I. Rodríguez and A.Oliva. Wind speed effect on the flow field and heat transfer around a parabolic trough solar collector. Applied Energy 2014; 130, pp 200-211.
 - A.A. Hachicha, I. Rodríguez, O. Lehmkuhl and A. Oliva. On the CFD and HT of the flow around a parabolic trough solar collector under real working conditions. Energy Procedia 2014; 49, pp 1397-1390.
 - A.A. Hachicha, I. Rodríguez, R. Capdevila and A. Oliva. Heat transfer analysis and numerical simulation of a parabolic trough solar collector. Applied Energy 2013; 111: 582-592.
 - A.A. Hachicha, I. Rodríguez, J. Castro and A. Oliva. Numerical simulation of wind flow around a parabolic trough solar collector. Applied Energy 2013; 107 , pp. 426-437.

Publications-Conferences

- A.A. Hachicha, B. Youssef, Z. Said. A review study on the modeling of high temperature solar thermal collector systems. In ICREGA2018, Sousse Tunisia 2018 (Accepted in ICREGA partner journal)
- Z. Said, M. El Haj Assad, A.A. Hachicha, E. Bellos, M.A. Abdelkareem, D. Alazaizeh, Ph.D, B. Youssef. Performance Enhancement of an Automotive Radiator Using Nanofluids. In ICREGA2018, Sousse Tunisia 2018 (Accepted in ICREGA partner journal)
- B. Youssef. A.A. Hachicha, Z. Said, M. Abid. A review study on the modeling of low temperature solar thermal collector systems. In ICREGA2018, Sousse Tunisia 2018.
- Y. Demagh and A.A. Hachicha. Key aspects of a novel undulated receiver for parabolic trough collectors. In Solar World congress Abu Dhabi 2017.
- A.A. Hachicha. Thermo-hydraulic modelling for Direct Steam Generation. In the World Engineers Summit – Applied Energy Symposium and Forum: Low Carbon Cities and Urban Energy Joint Conference, WES-CUE 2017, 19–21 July 2017, Singapore.
- A.A. Hachicha and M. Tawalbeh. Design and modeling of a novel integrated CSP membrane distillation desalination system. The Fifth International Conference on Water, Energy and Environment (ICWEE/5), Sharjah, UAE, February 28- March 2 ,2017.
- A.A. Hachicha. Numerical simulation of a parabolic trough solar collector for hot water and steam generation. In SolarPaces 2016 conference, Abu Dhabi.
- S.M.A.Rahman, S. Akhor, A. Hachicha, F. M. Alyassi, H. K. Alshamsi, A. M. Alowais. Smart Greenhouse for plantation in UAE climate. 9th International Conference on Sustainable Energy and Environmental Protection, Talas, Kayseri, Turkey, September 22-25, 2016.
- A.A. Hachicha. Numerical modelling of fluid flow and heat transfer around bluff bodies.9th International Conference on Thermal Engineering Abu Dhabi 2016.
- A.A. Hachicha. Fluid-structure interactions around a parabolic trough solar collector using Large Eddy Simulations. In Flucome conference, Doha 2015.
- A.A.Hachicha, I. Rodríguez, R. Capdevila and A. Oliva. Large-eddy simulations of fluid flow and heat transfer around a parabolic trough solar collector In Eurosun conference, Rijeka, Croatia 2012

- A.A. Hachicha, I. Rodríguez, O. Lehmkuhl and A. Oliva. On the CFD and HT of the flow around a parabolic trough solar collector under real working conditions In SolarPACES conference, Las Vegas, USA 2013.
- A.A. Hachicha, I. Rodríguez, R. Capdevila and A. Oliva. Numerical simulation of a parabolic trough solar collector considering the concentrated energy flux distribution In 30th ISES World congress, Kassel, Germany 2011, SWC 2011, (5), pp. 3976-3987.

Research Projects

- Competitive research project at the University of Sharjah: “Demand Response and Renewable Energy Integration in Institutional Buildings: A case study of a university of sharjah campus-UAE” (80000 AED).
- Targeted research project “Numerical and experimental study of an innovative solar absorber-parabolic trough collectors case” (200000 AED).
- External research project with collaboration of Sharjah Electricity and Water Authority: “Hybrid solar PV-thermal System” (95000 AED).
- External Research project with collaboration of Sharjah Electricity and Water Authority Solar: “Powered air conditioning system” (95000 AED).
- External Research project with collaboration of Sharjah Electricity and Water Authority: “Demand Side Management using Stand-Alone Hybrid Power Systems” (95000 AED).
- Competitive research project at the University of Sharjah: “3KW PV/T Hybrid System with Front and Back Cooling” (80000AED).
- Competitive research project at the University of Sharjah: “Study on a novel approach of atmospheric freeze drying system using vortex tube” (80000AED).
- Seed research project at the University of Sharjah: “Design, test and modelling of direct steam generation process using parabolic trough solar” (20000AED).
- REELCOOP EU/FP7 funded project: “Design of a 6 kW hybrid solar/biomass micro-cogeneration ORC system” at the National School of Engineering of Tunis.
- The effect of dust on solar systems and dust mitigation methods developed in University of Sharjah.
- A new design of a small parabolic trough solar collector developed in University of Sharjah.
- Design of a new inflated concentrated photovoltaic system under UAE conditions developed in University of Sharjah.
- Design of a novel integrated CSP membrane distillation desalination system developed in University of Sharjah.
- Design of Heat Exchanger for Thermal Energy Storage Using High Temperature Phase Change Material.
- Manufacturing and Testing of Dye Sensitized Solar Cells developed in University of Sharjah
- Design of a solar ice maker in University of Sharjah.
- Design of a small prototype of air cooling/heating using solar absorption cycle developed in University of Sharjah.
- Design of a new self-cleaning system for PV panels based on EDS technology

Teaching and Curriculum Development

- Teaching interests

- Solar thermal energy systems (developing the content of this course at University of Sharjah).
 - Heat transfer.
 - Thermodynamics.
 - Fluid Mechanics.
 - Introduction to energy science and technology.
 - Numerical Methods.
 - Design for energy efficiency.
 - Solar PV systems.
 - Wind energy systems.
- Teaching experience
 - Assistant professor, University of Sharjah, UAE.
 - Spring 18/19: Solar thermal energy systems, Fluid Mechanics.
 - Fall 17/18: Fluid Mechanics.
 - Spring 17/18: Solar thermal energy systems.
 - Fall 17/18: Heat transfer, Intro to energy science and tech.
 - Spring 16/17: Heat transfer, Solar thermal energy systems.
 - Fall 16/17: Heat transfer, Intro to energy science and tech.
 - Spring 15/16: Fluid Mechanics, Solar thermal energy systems.
 - Fall 15/16: Solar thermal energy systems, Intro to energy science and tech.
 - Spring 14/15: Solar thermal energy systems, PV technology and Manufacturing, Intro to energy science and tech.
 - Fall 14/15: Thermodynamics.
 - Substitute Professor, National School of Engineering of Tunis, Tunisia.
 - Spring 13/14 : Numerical methods, Heat transfer.

Work Experience

- Sep2014- Present **Assistant Professor**, *Sustainable and Renewable Energy Engineering department, College of Engineering*, University of Sharjah, United Arab Emirates.
 Teaching: Thermodynamics, Fluid Mechanics, Heat Transfer, Introduction to energy sciences and technologies, Solar thermal energy systems, PV technology and Manufacturing, Heat transfer lab, Fluid Mechanics lab Solar PV systems lab.
 Supervising and research work on renewable energy systems.
 Teaching and learning committee chair and participation in ABET accreditation preparation.
- Feb2014- Aug2014 **Postdoctoral position / Assistant researcher**, *National School of Engineering of Tunis, ENIT*, Tunisia.
 Teaching heat transfer and numerical methods for mechanical and industrial engineering students. Postdoctoral fellow in the research project REELCOOP for installing a 60 kW parabolic trough solar plant at ENIT. Modelling and simulation of parabolic trough solar collector for direct steam generation DSG.
- Nov2012- **Consultant** , *NurEnergie*, United Kingdom.
- Mar2013 Supporting the new solar plant project TuNur in the desert of Tunisia. Preparing technical description and technological solutions for the TuNur project

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5/8

- Feb2007- **Maintenance assistant**, *Valeo* , EZZAHRA STC, Tunisia.
- Nov2007 Development and setting of a new Computerized Management of Maintenance System CMSS and involving indifferent problems of maintenance department.
- Aug2006- **Summer training** , *IT-Government* , Tunisia.
- Sep2006 Development of a new software for management of an accountant office with Windev 10.
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- Mar2006- **Engineering training**, *BG « British Gas »* , Tunisia.
- Apr2006 Setting of a level transmitter and development of a new data base « Cause and effect ».
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- July2005- **Worker training** , *SOCOMENIN* , Tunisia.
- Aug2005 Analysis of unrolling of the project: great made men river of Libya

Services and Public Outreach

- Peer reviewing for:
 - Applied energy journal.
 - Applied thermal engineering.
 - Energy conversion and management.
 - Renewable and Sustainable Energy Reviews.
 - Journal of solar energy engineering journal –ASME.
 - Energies.
- 2015 Talk on “Numerical Modeling of Fluid Flow and Heat Transfer around bluff bodies”, University of Sharjah , UAE.
- 2016 Judging in think science competition 2016
- 2017 Participation in the ABET accreditation process and preparation of the self-study report for SREE department.
- 2018 Participation in Know House team representing the University of Sharjah in Solar Decathlon 2018 competition.
- 2018 Organizing a Workshop on PV syst software titled “Design and simulation of a PV system using PV syst software ”, University of Sharjah, UAE.
- 2018 Judging in think science competition 2018.
- 2019 Participation in the industry event and the seminar “SREE Research activities and collaborations toward the new strategy (2019-2024)”.
- 2019 Participation in Master Engineering Accreditation committee to prepare self-study report for new master program.
- 2019 SREE representative in college Accreditation committee and reviewing CAA report.
- 2019 Member of Energy and climate change sustainability circle at UOS.
- 2019 Evaluator in think science competition 2019.
- 2019 Member of Organizational Committee of SREE International Conference (SEEP2019).
- 2019 Evaluator and judging panel in Explore Mars competition organized by Mohamed Ben Rashid Space Center.
- 2019 Participation in the training workshop “Technology-Enhanced Teaching and Learning – Changing Your Teaching To Match The Learning Needs of Students” at the Institute of Leadership in Higher Education.

Computer skills

Operating Systems : Windows| MS-DOS|Linux.

Programming Languages: C,C++,Pascal, Maple, Matlab, Visual Basic, Windev10, Python.

DataBase management system : Access| Oracle | MySQL.

Applications : MS-Office, LINDO, PSPICE, AUTOCAD, PÉrlude, AMC Designer, MFG-PRO, SLAM, Tecplot, Paraview, ANSYS ICEM CFD, Gambit, Fluent, Comsol, TRNSYS, Epsilon, PVSyst, HOMER, CES Edupack.

Languages

Arabic **Mothertongue**
English **Excellent**
French **Excellent**
Spanish **Excellent**

Interests

- Experiences abroad: lived in Spain for more than 5 years and travelled independently in Europe
- Chess: competed and awarded throughout Tunisia, Spain and UAE in various tournaments