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Short Curriculum Vitae
Prof. Sara Rainieri, Ph.D

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Education, qualifications and academic positions

graduated summa cum laude in Physics at the University of Parma. PhD in Applied Physics (1997), University Researcher (1999), Associate Professor (2002) and Full Professor (2015) in Applied Physics at the Department of Engineering and Architecture of the University of Parma.
Since November 2017 she is Pro-Rector for Teaching and Student Affairs at the University of Parma, Italy.

Reserach activity

The research activity is focused mainly on these main following topics:

-**Energy efficiency in heat exchangers design.** The research work, based both an advanced experimental ad numerical approaches, has been mainly focused on the study of both active and passive heat transfer enhancement techniques. Significant research work has been directed to the study of forced convection in corrugated and curved tubes for fluids showing complex rheological behavior, with particular attention to the problems of the food industry. The Ph.D. thesis work, centered on this subject, obtained an Honourable Mention within the EUROTHERM Young Scientist Prize and Awards 2000.

- **Solution Techniques of the Inverse Heat Conduction Problem**. Her research activity has been focused on both a theoretical and experimental study on the solution of the Inverse Heat Conduction Problem and on the validation of innovative data processing techniques applied to the estimation of the local convective heat transfer coefficient both in single and in two-phase heat transfer modality. The same approach has been successfully applied for the estimation of other relevant engineering parameters.

- Energy analisys. The research activity mainly concerned the use of cogeneration (heat and power) and trigeneration (heat, cold and power) techniques in complex systems, as university campuses and hospitals. It also concerned the estimation of short-term energy consumption of buildings, starting from the monthly bill, and the use of low-enthalpy geothermal energy, carried out through ground heat exchanger coupled heat pump. The thermal comfort in semi-outdoor spaces and its achievement by efficient cooling has also been addressed in the research work.

Scientific production and scientific projects and memberships

She is author and/or coauthor of about 130 scientific publications at both national and international level and she is frequent reviewer for several International Scientific Journals.

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The bibliometric parameters available on the Scopus data base are (July 30th 2020)
Documents by author:67
Total citations: 1026 by 659 documents
h-index: 18

She has been national coordinator of the project "Innovative techniques for the enhancement of forced convection" founded by the Italian Ministry in year 2007.

She is Scientist-in-Charge and PhD mentor for the University of Parma of the project ”Establishing a strong and lasting international training network for innovation in food and juice industries: a 4D-research approach for fruit juice processing”, HiStabJuice, proposal 956257, Innovative Training Networks (ITN) Call: H2020-MSCA-ITN-2019, MARIE SKŁODOWSKA-CURIE ACTIONS.

She is Associate Editor of the ASME Journal of Heat Transfer.

Member of the ASME

Member of the Steering Committee of the Italian Union of Thermo Fluid Dynamics

Member of the Scientific Committee of ICHMT, International Centre of Heat and Mass Transfer

Conferences

Keynote speaker of the 32nd UIT Heat Transfer Conference 23–5 June 2014, Pisa, Italy – Invited lecture on “Passive techniques for the enhancement of convective heat transfer in single phase duct flow”

Keynote speaker of the 9th e World Conferences on Experimental Heat Transfer, Fluid Mechanics and Thermodynamics, 11-15 June 2017, Foz do Iguaçu – Paraná Brazil – Invited lecture on “Inverse Problems Approach to the Experimental Assessment of Heat Transfer Enhancement Techniques”.

Teaching experience

She teaches:
Applied Thermo-Fluid Dynamics at the Master’s Degree in Mechanical Engineering (Master of Science level)

Heat Transfer Applied to the Processes of the Food Industry at the Master’s Degree in Food Science and Technology (Master of Science level)

Fire safety Engineering at the Master’s Degree in Civil Engineering (Master of Science level)

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Relevant scientific publications

Vocale P., Mocerino A., Bozzoli F., Rainieri S. (2020). Analysis of convective heat transfer in non-Newtonian fluids by applying the field synergy principle approach. HEAT TRANSFER RESEARCH, vol. 51, p. 193-206, ISSN: 1064-2285, doi: 10.1615/HeatTransRes.2019030200

Vocale P., Bozzoli F., Mocerino A., Navickaite K., Rainieri S. (2020). Application of an improved parameter estimation approach to characterize enhanced heat exchangers. INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, vol. 147, ISSN: 0017-9310, doi: 10.1016/j.ijheatmasstransfer.2019.118886

Bozzoli F., Cattani L., Rainieri S. (2020). Cross-helix corrugation: The optimal geometry for effective food thermal processing. INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, vol. 147, ISSN: 0017-9310, doi: 10.1016/j.ijheatmasstransfer.2019.118874

Bozzoli F., Cattani L., Mocerino A., Rainieri S., Bazan F. S. V. (2019). A novel method for estimating the distribution of convective heat flux in ducts: Gaussian filtered singular value decomposition. INVERSE PROBLEMS IN SCIENCE & ENGINEERING, vol. 27, p. 1595-1607, ISSN: 1741-5977, doi: 10.1080/17415977.2018.1540615

Cattani L., Mangini D., Bozzoli F., Pietrasanta L., Miche N., MAMELI, MAURO, Filippeschi S., Rainieri S., MARENGO, MARCO (2019). An original look into pulsating heat pipes: Inverse heat conduction approach for assessing the thermal behaviour. THERMAL SCIENCE AND ENGINEERING PROGRESS, vol. 10, p. 317-326, ISSN: 2451-9049, doi: 10.1016/j.tsep.2019.02.007

Bozzoli, F., Cattani, L., Mocerino, A., Rainieri, S., Tougri, I., Colaço, M. J. (2019). Characterisation of the heat transfer in displaced enhancement devices by means of inverse problem approach applied to IR images. QUANTITATIVE INFRA RED THERMOGRAPHY JOURNAL, p. 1-19, ISSN: 1768-6733, doi: 10.1080/17686733.2019.1700696

Vocale P., Bozzoli F., Mocerino A., Rainieri S. (2019). Direct numerical simulation applied to the analysis of the convective heat transfer enhancement in an arc-shaped wall corrugated tube. COMPUTATIONAL THERMAL SCIENCES, vol. 11, p. 315-325, ISSN: 1940-2503, doi: 10.1615/ComputThermalScien.2019021298

Bozzoli F., Cattani L., Mocerino A., Rainieri S., Pagliarini G. (2019). Experimental investigation on the convective heat transfer enhancement in tubes with twisted-tape inserts. JOURNAL OF PHYSICS. CONFERENCE SERIES, vol. 1224, ISSN: 1742-6588, doi: 10.1088/1742-6596/1224/1/012046

Vocale P., Abbenante M., Bozzoli F., Rainieri S., Pagliarini G. (2019). Experimental validation of numerical model for evaluation of local heat transfer coefficient in coiled tubes. JOURNAL OF PHYSICS. CONFERENCE SERIES, vol. 1224, ISSN: 1742-6588, doi: 10.1088/1742-6596/1224/1/012012

Vocale P., Bozzoli F., Rainieri S., Pagliarini G. (2019). Influence of thermal boundary conditions on local convective heat transfer in coiled tubes. INTERNATIONAL JOURNAL OF THERMAL SCIENCES, vol. 145, ISSN: 1290-0729, doi: 10.1016/j.ijthermalsci.2019.106039

Mocerino A., Colaço M. J., Bozzoli F., Rainieri S. (2018). Filtered reciprocity functional approach to estimate internal heat transfer coefficients in 2D cylindrical domains using infrared thermography. INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, vol. 125, p. 1181-1195, ISSN: 0017-9310, doi: 10.1016/j.ijheatmasstransfer.2018.04.089

Bozzoli F., Mocerino A., Rainieri S., Vocale P. (2018). Inverse heat transfer modeling applied to the estimation of the apparent thermal conductivity of an intumescent fire retardant paint. EXPERIMENTAL THERMAL AND FLUID SCIENCE, vol. 90, p. 143-152, ISSN: 0894-1777, doi: 10.1016/j.expthermflusci.2017.09.006

BOZZOLI, Fabio, CATTANI, Luca, MOCERINO, ANDREA, RAINIERI, Sara (2018). Turbulent flow regime in coiled tubes: local heat-transfer coefficient. HEAT AND MASS TRANSFER, p. 1-11, ISSN: 0947-7411, doi: 10.1007/s00231-017-2127-z

Serventi, A., Bozzoli, F., Rainieri, S. (2017). Analytical models of Ohmic heating and conventional heating in food processing. JOURNAL OF PHYSICS. CONFERENCE SERIES, vol. 923, ISSN: 1742-6588, doi: 10.1088/1742-6596/923/1/012050

BOZZOLI, Fabio, CATTANI, Luca, RAINIERI, Sara, Bazán, Fermín S. V., Borges, Leonardo S. (2017). Estimation of the local heat transfer coefficient in coiled tubes: Comparison between Tikhonov regularization method and Gaussian filtering technique. INTERNATIONAL JOURNAL OF NUMERICAL METHODS FOR HEAT & FLUID FLOW, vol. 27, p. 575-586, ISSN: 0961-5539, doi: 10.1108/HFF-03-2016-0097

CATTANI, Luca, BOZZOLI, Fabio, RAINIERI, Sara, PAGLIARINI, Giorgio (2017). Experimental investigation on the convective heat transfer enhancement in tubes with cross-helix profile wall corrugation. JOURNAL OF PHYSICS. CONFERENCE SERIES, vol. 796, ISSN: 1742-6588, doi: 10.1088/1742-6596/796/1/012010

CATTANI, Luca, BOZZOLI, Fabio, RAINIERI, Sara (2017). Experimental study of the transitional flow regime in coiled tubes by the estimation of local convective heat transfer coefficient. INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, vol. 112, p. 825-836, ISSN: 0017-9310, doi: 10.1016/j.ijheatmasstransfer.2017.05.003

Vocale, P., Mocerino, A., Bozzoli, F., Rainieri, S. (2017). Investigation of the effect of cylindrical insert devices on laminar convective heat transfer in channel flow by applying the Field Synergy Principle. JOURNAL OF PHYSICS. CONFERENCE SERIES, vol. 923, ISSN: 1742-6588, doi: 10.1088/1742-6596/923/1/012032

Rossi, R., Cattani, L., Mocerino, A., Bozzoli, F., Rainieri, S., Caminati, R., Pagliarini, G. (2017). Numerical analysis of flow resistance and heat transfer in the transitional regime of pipe flow

with twisted-tape turbulators. JOURNAL OF PHYSICS. CONFERENCE SERIES, vol. 923, ISSN: 1742-6588, doi: 10.1088/1742-6596/923/1/012033

Pagliarini G., Vocale P., Mocerino A., Rainieri S. (2017). Second principle approach to the analysis of unsteady flow and heat transfer in a tube with arc-shaped corrugation. JOURNAL OF PHYSICS. CONFERENCE SERIES, vol. 796, ISSN: 1742-6588, doi: 10.1088/1742-6596/796/1/012014

Bozzoli Fabio, Cattani Luca, Rainieri Sara (2016). Effect of wall corrugation on local convective heat transfer in coiled tubes. INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, vol. 101, p. 76-90, ISSN: 0017-9310, doi: 10.1016/j.ijheatmasstransfer.2016.04.106

BOZZOLI, Fabio, CATTANI, Luca, MOCERINO, ANDREA, RAINIERI, Sara (2016). Experimental estimation of the local heat-transfer coefficient in coiled tubes in turbulent flow regime. JOURNAL OF PHYSICS. CONFERENCE SERIES, vol. 745, ISSN: 1742-6588, doi: 10.1088/1742-6596/745/3/032034

VOCALE, Pamela, MOCERINO, ANDREA, BOZZOLI, Fabio, RAINIERI, Sara (2016). Numerical analysis of the laminar forced convective heat transfer in coiled tubes with periodic ring-type corrugation. JOURNAL OF PHYSICS. CONFERENCE SERIES, vol. 745, ISSN: 1742-6588, doi: 10.1088/1742-6596/745/3/032072

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F. Bozzoli, L. Cattani, G. Pagliarini, S. Rainieri (2015). INFRARED IMAGING OF THE CONVECTIVE HEAT TRANSFER COEFFICIENT DISTRIBUTION IN COILED TUBES. OPTO-ELECTRONICS REVIEW, vol. 23, p. 107-115, ISSN: 1230-3402, doi: 10.1515/oere-2015-0004

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F. Bozzoli, L. Cattani, S. Rainieri, G. Pagliarini (2014). Estimation of local heat transfer coefficient in coiled tubes under inverse heat conduction problem approach. EXPERIMENTAL THERMAL AND FLUID SCIENCE, vol. 59, p. 246-251, ISSN: 0894-1777, doi: 10.1016/j.expthermflusci.2013.11.024

F. Bozzoli, L. Cattani, S. Rainieri, F.S. Viloche Bazán, L.S. Borges (2014). Estimation of the local heat-transfer coefficient in the laminar flow regime in coiled tubes by the Tikhonov regularisation method. INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, vol. 72, p. 352-361, ISSN: 0017-9310, doi: 10.1016/j.ijheatmasstransfer.2014.01.019

BOZZOLI, Fabio, CATTANI, Luca, CORRADI, Carlo, MORDACCI, Marco, RAINIERI, Sara (2014). Inverse estimation of the local heat transfer coefficient in curved tubes: a numerical validation. JOURNAL OF PHYSICS. CONFERENCE SERIES, p. 1-10, ISSN: 1742-6588, doi: doi:10.1088/1742-6596/501/1/012002

S. Rainieri, F. Bozzoli, L. Cattani, P. Vocale (2014). PARAMETER ESTIMATION APPLIED TO THE HEAT TRANSFER CHARACTERISATION OF SCRAPED SURFACE HEAT EXCHANGERS FOR FOOD APPLICATIONS. JOURNAL OF FOOD ENGINEERING, vol. 125, p. 147-156, ISSN: 0260-8774, doi: 10.1016/j.jfoodeng.2013.10.031

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Rainieri S, Bozzoli F, Cattani L, Pagliarini G. (2013). Compound convective heat transfer enhancement in helically coiled wall corrugated tubes. INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, vol. 59, p. 353-362, ISSN: 0017-9310, doi: 10.1016/j.ijheatmasstransfer.2012.12.037

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Pagliarini G., Corradi C., Rainieri S. (2012). HOSPITAL CHCP SYSTEM OPTIMIZATION ASSISTED BY TRNSYS BUILDING ENERGY SIMULATION TOOL. APPLIED THERMAL ENGINEERING, vol. 44, p. 150-158, ISSN: 1359-4311, doi: 10.1016/j.applthermaleng.2012.04.001

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G. Pagliarini, S. Rainieri (2012). RESTORATION OF THE BUILDING HOURLY SPACE HEATING AND COOLING LOADS FROM THE MONTHLY ENERGY CONSUMPTION. ENERGY AND BUILDINGS, vol. 49, p. 348-355, ISSN: 0378-7788, doi: 10.1016/j.enbuild.2012.02.030

F. Bozzoli, G. Pagliarini, S. Rainieri, L. Schiavi (2012). Short-time thermal response test based on a 3-D numerical model. JOURNAL OF PHYSICS. CONFERENCE SERIES, vol. 395, p. 1-7, ISSN: 1742-6596, doi: 10.1088/1742-6596/395/1/012056

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