

Press release

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Excellence Award in Process Intensification presented to Matteo Antognoli

Dr. Matteo Antognoli is the winner of the 2023 Excellence Award in Process Intensification of the European Federation of Chemical Engineering (EFCE). The Award recognizes his outstanding PhD thesis on "*Mixing and chemical reactions in microchannels: experimental and numerical analysis*", completed at the University of Pisa, Italy, under the supervision of Prof. Elisabetta Brunazzi and Prof. Chiara Galletti. Part of the activity has been carried out the University of California, Los Angeles (UCLA), USA, under the supervision of Prof. Dino Di Carlo. Matteo Antognoli currently holds the position of research fellow at the University of Pisa.



Against the background of constantly growing demands for resource- and climate-friendly process control, micro-process engineering is becoming increasingly important, as it enables very defined chemical reactions with high yields and selectivity.

Dr. Antognoli's thesis reports an experimental study combined with numerical modelling of passive microreactors, where mixing is promoted without the help of external energy sources. The aim of the thesis was to understand how the flow regimes can influence the mixing and the reaction yield in simple geometries at different operating conditions related to working fluids, reaction and flow rate.

Dr. Antognoli's work greatly contributed to the knowledge on CFD methodology and how the most accurate results can and must be achieved and, secondly, to novel micromixer/microreactor design. He finally presented the design optimisation of microchannels with pillars for mixing processes using the opensource FlowSculpt software and through this has demonstrated a valuable engineering approach for rapidly assessing the global performance of (pillar) microchannels for mixing operations.

The jury described the candidate's thesis as an excellent piece of research work, which has made a truly outstanding contribution to process intensification – particularly miniaturization and microreactors – in terms of numerical (CFD) and experimental methods required for accurate data acquisition. "His methods are rigorous and allow outstanding data sets to be achieved, thereby offering the possibility to further the understanding of underlying physical and chemical phenomena occurring in miniaturized devices. "

Nominating him for the Award, Prof. Brunazzi wrote: "Dr. Antognoli's soft skills – such as collaboration, teamwork, and determination – and his deep understanding of the mixing-reaction relationship coupled with the new-concept design method of microfluidic reactors are undoubtedly recognized by the researchers of UCLA and the Ph.D. thesis referees."

The award will be presented on 31 May 2023 at the opening ceremony of the 8th European Process Intensification Conference -EPIC 8 , held in Warsaw Poland on 31 May - 2 June 2023. He is invited to give a scientific presentation on his doctoral work on 1 June 2023.

The 2023 Excellence Award in Process Intensification is generously sponsored by **Microinnova Engineering GmbH**.



Ends

Related links

EFCE media centre (<http://www.efce.info/News>)

EFCE Working Party on Process Intensification (https://efce.info/WP_PI.html)

8th European Process Intensification Conference -EPIC 8
(<https://epic2023.pw.edu.pl/>)

Notes to media

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About chemical engineers

Chemical, biochemical and process engineering is the application of science, maths and economics to the process of turning raw materials into everyday products. Professional chemical engineers design, construct and manage process operations all over the world. Oil and gas, pharmaceuticals, food and drink, synthetic fibres and clean drinking water are just some of the products where chemical engineering plays a central role.

About EFCE

Founded in 1953, The European Federation of Chemical Engineering (EFCE) is a non-profit-making association, whose object is to promote co-operation in Europe between non-profit-making professional scientific and technical societies in 30 countries for the general advancement of chemical engineering and as a means of furthering the development of chemical engineering. See www.efce.org

About the sponsor

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