

Press release

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<http://www.efce.org>

CAPE Excellence Award presented to Francesco Destro for models and algorithms for pharmaceutical development and manufacturing

Dr. Francesco Destro is the winner of the Federation's Excellence Award in Recognition of an Outstanding PhD Thesis on CAPE 2024.

He was selected by the jury of the EFCE Working Party on Computer Aided Process Engineering for his excellent PhD thesis on *"Digitalizing pharmaceutical development and manufacturing: advanced mathematical modeling for operation design, process monitoring and process control"*, completed at the University of Padova, Italy, under the supervision of Prof. Massimiliano Barolo. Besides the high quality of the work, the jury emphasized the impressive number of publications and the societal and industrial relevance of the work.



In his thesis Francesco developed novel process systems engineering tools to enhance the efficiency of pharmaceutical development and manufacturing. This included a monitoring system for continuous manufacturing of pharmaceutical tablets and a novel algorithm for hybrid data-driven/knowledge-driven process monitoring. Furthermore, he developed a digital twin for a novel carousel for continuous integrated filtration-drying of crystallization slurries. He validated his modeling results with experimental data and demonstrated closed-loop control of this novel unit. These results are pivotal for achieving more efficient continuous pharmaceutical processes, which are recognized by regulators, industry, and academia, as critical technologies to achieve the next generation of smart pharmaceutical manufacturing. Francesco released the digital twin that he developed as an open-source simulator (ContCarSim), which can be used by practitioners in the pharmaceutical domain.

Recommending him for the award, Professor Zoltan Nagy, Purdue University, USA, said: "Very importantly he is also always interested to develop tools that enable users to access and apply the methods that he has developed. This has a high potential to increase the impact of his research and provide a broader impact to the CAPE community. He is exceptionally self-driven, motivated, highly productive and has an excellent publication record with very high impact works that resulted from his PhD thesis."

Francesco Destro obtained his PhD in Chemical Engineering from the University of Padova in March 2022. His PhD studies included stays at Siemens Process Systems Engineering, London, UK, and the Davidson School of Chemical Engineering, Purdue University, West Lafayette, IN, USA. Currently, he holds the position of Postdoctoral Research Associate at the Department of Chemical Engineering, Massachusetts Institute of Technology (MIT) in Cambridge, MA, USA. In spring 2024 he was appointed instructor at MIT's Systems Engineering graduate course. This is a very prestigious role that was, until recent years, undertaken by Prof. Paul I. Barton, an extremely renowned leader of the PSE community.

The Award is conferred to Francesco Destro on Monday afternoon, 3 June 2024 during the ESCAPE34 - PSE2024 conference which is held in Florence, Italy, on 2-6 June 2024. Furthermore, he has been invited by the organisers of ESCAPE34 - PSE24 to submit a full paper on the theme of your PhD thesis which will be published as a guest paper in the journal 'Computers and Chemical Engineering' together with selected papers from the ESCAPE34 - PSE24 conference.

The Award is generously sponsored by **AVEVA Software LLC**.



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

EFCE Working Party on Computer Aided Process Engineering (<https://www.wpc-cape.eu/>)

34th European Symposium on Computer Aided Process Engineering and International Symposium on Process Systems Engineering 2024 - ESCAPE34-PSE24 (<https://www.aidic.it/escape34-pse24/>)

Notes to media:

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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