

## Press release

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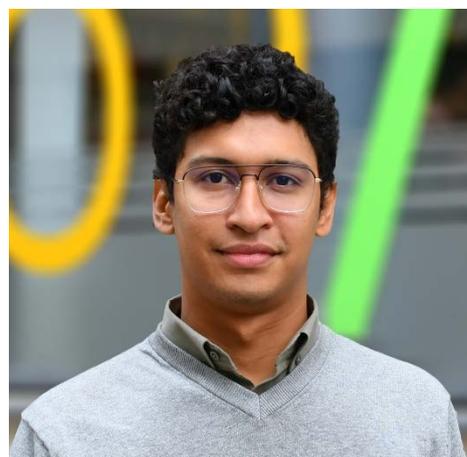
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<http://www.efce.org>

### **EFCE presents Thermodynamics and Transport Properties Award to Dr. Andrés Piña-Martinez for his study of cubic and SAFT-type equations for industrial energy conversion applications**

**Dr. Andrés Piña-Martinez** has been named this year's winner of the EFCE Excellence Award in Thermodynamics and Transport Properties for an outstanding PhD thesis in *"Cubic and higher order equations of state for fluid mixtures: Development, parameterization and validation through industrial energy conversion applications"*.



His thesis, performed at Université de Lorraine, France, under the supervision of Professor Jean-Noël Jaubert, aimed at developing a methodology to determine the most appropriate working fluid for energy conversion machines with complex architecture that simultaneously produce cooling, heating and electric power. The use of such energy systems, which can be powered by renewable energy sources, should make it possible to achieve the objectives set by the European Union in terms of industry decarbonisation, and thus achieve carbon neutrality by 2050.

The thesis included a comprehensive assessment of the accuracy of various equations of state (EoS) and different mixing rules for the calculation of phase equilibria and other properties of binary fluid mixtures. Dr. Piña-Martinez investigated several mixing rules that nicely integrate activity coefficient models (including Wilson, UNIQUAC and NRTL) within the cubic EoS. This work resulted in a large comprehensive set of cubic EoS with various mixing rules. Dr. Piña-Martinez developed all the necessary algorithms, codes and optimization techniques to perform the needed calculations. Based on his work, important conclusions were reached regarding the accuracy of the models and specific recommendations were developed for the use of these models for different classes of chemical mixtures. All the results obtained from the study of cubic and SAFT-type equations of state (EoS) could be used in the future in energy-related applications and in computer-aided process design.

The judging committee of EFCE's Thermodynamics and Transport Properties Working Party selected Andrés Piña-Martinez for the Award based on the innovative approach to cubic equations of state, the extremely wide assessment of equation of state models and their modifications and the application of these models to energy technology applications, together with a high quality of the related publications.

Nominating him for the Award Jean-Noël Jaubert wrote: "... Andrés Piña-Martinez demonstrated he was a researcher brimming with ideas and tireless. The motivation he has shown and his outstanding abilities make him a scientist with a great future." He also emphasized the excellent preparation and presentation of the doctoral thesis.

The Excellence Award consists of a cash prize of €1500 plus the opportunity to attend the International Conference on Properties and Phase Equilibria for Product and Process Design – PPEPPD 2023 in Tarragona, Spain, on 21-25 May 2023, where the award will be presented. The Award lecture is scheduled for 23 May 2023.

The Excellence Award is generously sponsored by **Bayer AG**.



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### **Related links**

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

EFCE Working Party on Thermodynamics and Transport Properties  
([https://efce.info/WP\\_TTP.html/](https://efce.info/WP_TTP.html/))

International Conference on Properties and Phase Equilibria for Product and Process Design – PPEPPD 2023 (<https://ppeppd.org/ppeppd2023/>)

### **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](http://www.efce.org)

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