

## Press release

Presse-Information • Information de presse

12/2017  
05 October 2017

<http://www.efce.org>

### EFCE Excellence Award in Product Design and Engineering presented



**Assistant Professor Arab Belkadi** has been awarded the 2017 Excellence Award in Product Design and Engineering of the European Federation of Chemical Engineering (EFCE) for his outstanding PhD thesis on “Experimental study of liquid-liquid fractionation in microchannels for the continuous production of emulsified biodiesel”.

Arab Belkadi, who obtained his Master's degree in energy and sustainable development from the École des Mines de Nantes, France, and the Université M'hamed Bougara, Algeria, completed his PhD thesis at the LTeN and GEPEA Laboratories, University of Nantes, France, under the supervision of Prof. Jérôme Belletire, Prof. Agnès Montillet and Assistant Prof. Dominique Tarle.

Since December 2016, he holds the position of Assistant Professor at the Department of Mechanical Engineering, Mouloud Mammeri University, Tizi-Ouzou, Algeria.

Arab Belkadi designed a micro-fluidic mixer which continuously emulsifies water in liquid biofuel and integrated this system in the combustion process. The dispersed water phase helps to optimize combustion, which reduces the number of emitted particles. Also water reduces combustion temperature and therefore minimises NO<sub>x</sub>-emissions. The developed mixer acts as an impact and elbow jet micro-system. The microchannels are specifically designed depending on the flow rates of the components and the physical properties of the dispersed and continuous phase. Arab Belkadi compared various micro-channels under controlled experimental conditions and used a high frequency visualization technique to demonstrate the hydrodynamic structure of the flow for further optimization.

The Award jury stated: "Dr. Belkadi's contribution to the important field of alternative fuels, sustainability and emission reduction considers the emulsification of water in various fuels such as conventional diesel, heavy fuel oil or lipid waste. The scientific quality of the work is demonstrated by two high impact publications, three papers and presentations in important conferences. It includes a detailed understanding of emulsification technology and the development of a microsystem for continuous emulsification of fuel substitutes (biofuels)."

The award, which comprised of a €1,500 cash prize and certificate, was presented to Arab Belkadi at the sixth European Symposium on Product Design and Engineering, which was held as a joint event of the 10<sup>th</sup> World Congress of Chemical Engineering (WCCE10) Barcelona, Spain, from 1 to 5 October 2017.

The 2017 Excellence Award in Product Design and Engineering is generously sponsored by Beiersdorf AG.



Ends

### Related links

EFCE media centre (<http://www.efce.info/Media+Centre.html>)

EFCE Excellence Award in Product Design and Engineering (<http://efce.info/ExcellenceAwardProductDesign.html>)

10<sup>th</sup> World Congress of Chemical Engineering (<http://www.wcce10.org>)

**Photograph caption (L-R):** Professor Jean-Marc Le Lann, EFCE Scientific Vice-President; Dr. Stefan Kaufmann, Beiersdorf AG; Assistant Professor Arab Belkadi; Dr. Jens Uhlemann, Chairman of EFCE Section on Product Design and Engineering. (photography by Alicia Garcia)

### Notes to media

For further information, please contact:

Claudia Flavell-While  
tel: +44 (0)1788 534422  
email: [Claudia@icheme.org](mailto:Claudia@icheme.org)

### 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)

## **About Beiersdorf AG**

Beiersdorf AG is a leading provider of innovative, high-quality skin care products and has over 130 years of experience in this market segment. The Hamburg-based company has over 17,000 employees worldwide and is listed on the DAX, the German benchmark equities index. Beiersdorf generated sales of €6.7 billion in financial year 2015. NIVEA is the cornerstone of the company's brand portfolio, which also includes brands such as Eucerin, La Prairie, Labello, and Hansaplast/Elastoplast. Beiersdorf's wholly owned affiliate Tesa SE, another globally leading manufacturer in its field, supplies self-adhesive products and system solutions to industry, craft businesses, and consumers.