

3D printing in the separation science

Abstract

This short course aims to offer an overview of how 3D printing is impacting the separation sciences in general, and chromatography in particular. 3D printing can seamlessly create bespoke models with complex shapes, using a range of materials, and with resolutions that can reach the submicron-scale. This capability opened a new way to fabricate stationary phases, column housings, filtration elements, extraction units and other devices of relevance to the separation science.

This short course will open with a short introduction on 3D printing and the main printing techniques of relevance to us. Then, a selection of original research pieces will be presented, demonstrating how separation science is benefitting from 3D printers. Finally, current challenges as well as future opportunities will be discussed. This course should spur additional interest in the area and promote new ideas on how to employ 3D printers in our research.

This short course might include interactive elements with the participants to set personal targets for use of 3D printing in your lab.

Biography

Dr. Dimartino is a Senior Lecturer at the Institute for Bioengineering at the University of Edinburgh, UK. He received his PhD from the University of Bologna (Italy, 2009) followed by a Post Doc at the University of Canterbury (New Zealand).

In 2012 he pioneered 3D printing for the fabrication of porous media with perfectly ordered morphology, focusing on the design of new three-dimensional lattices and the development of materials compatible with chromatographic separations. Dr. Dimartino's research group is currently transferring methods to other operations in the biotechnology industry (e.g. biocatalysis and bioreactors) and in chemical engineering (e.g. recovery of heavy metals and CO₂ capture).

To date, Dr. Dimartino raised a total of £ 2 million research income with projects bridging the industry and government sectors. His research has granted him a number of international awards, including the Csaba Horvath Young Scientist Award at HPLC 2016, the best contribution at the XIX Recovery of Biological Products Conference in 2022, and 3 best poster awards in 3 continuous years at the PREP conference series.

To know more about his research watch:

- Fun Science Communication video ([here](#)), awarded 1st prize at HPLC 2019.
- Interview on the future of 3D printing and chromatography [here](#).