3D printing in the separation science:
Researching innovative ideas with Lego Serious Play 3D models

Abstract

Ever wondered how 3D printing is impacting the separation sciences, and how you and your team could directly benefit from it?

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 both analytical and preparative separations.

While all this sounds exciting, 3D printing risks to remain a dry exercise if not applied directly in your own daily tasks, whether in the industry or the academia, research or practice.

This workshop will provide you with a toolbox for creative exploration of 3D printing potential in separation science. The workshop will present an introduction to 3D printing, its techniques, and original research in the field. This will be combined with a Lego Serious Play interactive session, where you will be challenged to build your own 3D models using Lego bricks. This inclusive, visual and engaging exercise will facilitate scientific discussion and explore contradictions, unknowns and new directions of how 3D printing can revolutionize separations.

This workshop is designed to deliver a tangible output for you to follow up after the HPLC 2023 conference, an output tailored to your personal experience, needs, and objectives. You will gain an understanding of the current challenges and future opportunities of 3D printing in the separation science, as well as unlock new ideas for applying this technology to benefit your own research.

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 CO_2 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.