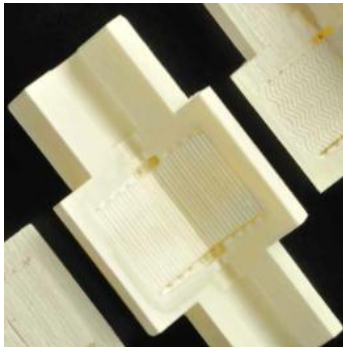


Chemical Engineering at the frontier with 3D printing and bioengineering

Simone Dimartino

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In my talk I will present recent research advances from my research group at the University of Canterbury, New Zealand. The topics covered have significance in everyday life and a strong commercial focus. I will offer an easy to follow and understand speech at the undergraduate level. No prior knowledge of the topic is required, just genuine curiosity!

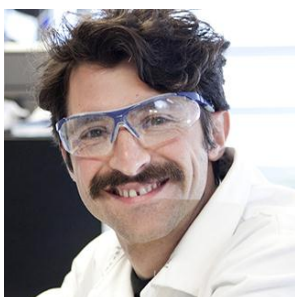
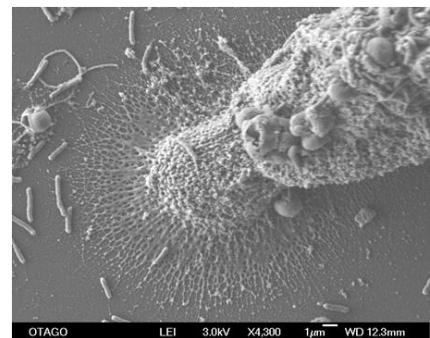


3D printing of porous media and packed columns

The advent of 3D printing is revolutionizing the world as we see it. 3D printing is not only about plastic ware. Today concrete homes, sugar cakes and even human organs can be 3D printed. We are using 3D printing (and building a new 3D printer too!) to create perfectly ordered porous media for a myriad of uses in separations, catalysis and filtration. I will present the opportunities that precise control of pore size, orientation and shape offer to produce geometries with superior performances.

Water-resistant adhesives inspired by marine organisms

Nature offers a vast inspiration source to many engineering problems. Did you know that self-cleaning surfaces, Kevlar armors and wall climbing robots are inspired by Lotus leaves, spider silk and gecko feet? In my research, I study marine seaweed to develop durable wet-resistant adhesives for uses in surgery and biomedicine. I will present the engineering principles I use to determine the clues that drive such strong under-water adhesion.



Biography: Simone Dimartino is a lecturer in the Department of Chemical and Process Engineering and Principal Investigator in the Biomolecular Interaction Centre. He obtained his PhD in Chemical Engineering from the University of Bologna, Italy, and moved to New Zealand in 2010 to take up a postdoc position. His research interests lie in the areas of bio-separations and bio-mimicry.