NETPORE
Network on porous semiconductors and oxides

PRESENTER INFORMATION

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BIOGRAPHICAL SKETCH

Abel Santos studied chemical engineering at the Jaume I University in Castellon de la Plana (Spain), where he graduated in 2005. In 2007 and 2011 he was awarded his MEng and PhD in electronic engineering by the Rovira i Virgili University in Tarragona (Spain), respectively. He is currently associate professor at the School of Chemical Engineering of The University of Adelaide (Australia). His research focuses on electrochemical engineering of nanoporous anodic alumina structures and their integration in photonic and optoelectronic technologies such as sensors, lasers, photonic crystals, iontronics, and photocatalysts and photo-electrocatalysts. He has published 115 research articles in top international journals, and a strong track-record of competitive research grants (> $6.6M). Internationally, he has been recognised as one of world's 2% researchers by Stanford University (since 2018), and an emerging investigator by the editorials of Journal of Materials Chemistry C (2017) and ACS Applied Materials and Interfaces (2021). His publications have generated > 4,600 cites, with an h-index of 42.

TITLE: Tailor-Engineered Nanoporous Anodic Alumina: A Downunder Overview

ABSTRACT

Nanoporous anodic alumina (NAA) produced by electrochemical oxidation—anodisation—of aluminium is a highly versatile nanomaterial with broad transdisciplinary applicability because of its unique chemical and physical properties, and tailorable nanoporous structure. NAA is a matrix of anodic aluminium oxide featuring extended arrays of straight, cylindrical, nanometric pores homogeneously distributed across its surface in a honeycomb fashion. This characteristic self-organised porous structure results from an electric field-driven mechano-electrochemical growth mechanism. Our team has been pushing the boundaries of the fundamental mechanisms behind anodisation to further expand the applicability of this ideal platform material across photonic and iontronic technologies. In this presentation, I will introduce our recent advances in NAA technology—with a particular focus on the development of high-quality forms of NAA-based photonic crystals and their application in optical sensing, lasing, and photocatalysis—and our vision for future advances in this highly dynamic and exciting field of research.