Prof. Seán Barry

(Carleton University, Canada)

Seán was trained in inorganic synthetic chemistry by Darrin Richeson (PhD, University of Ottawa, 1996), and spent three years working on chemical vapour deposition (CVD) and ALD precursors in the group of Roy Gordon (PDF, Harvard University, 1998 – 2000, 2002 -2003). He was instrumental in the design and synthesis of the well-known copper amidinate dimers that are presently used for copper CVD/ALD.

He started in Carleton University in 2003 working on guanidinates of the group 13 metals (Al, Ga, In), and has recently studied guanidinates, iminopyrrolidinates and carbenes of the coinage metals (Cu, Ag, Au) for depositing thin films of these metals. His group works mainly on the mechanisms of thermal decomposition and thin film deposition and have invented several novel characterization methods to better understand mechanism.

He was previously the founder and Senior Scientific Advisor for Precision Molecular Design, a start-up company with GreenCentre Canada to commercialize precursors for atomic layer deposition. Seán is also the director of the Facility for Nanoscience, Surfaces, and Sensor Interfaces (FANSSI), which was commissioned in 2015 by a $1.9M Canadian infrastructure grant to study surface chemistry and ALD.

He is recognized as a world expert in metal ALD and precursor design with over 100 papers and 14 patents or patent applications:6 of these were established while an independent researcher at Carleton. He has long-standing and extensive industrial collaborations in ALD, including Intel, LAM Research, ASM, and SK hynix, to name a few.

He is on the advisory board for the ACS journal Chemistry of Materials. He has served as a scientific advisor for the AVS ALD, Baltic ALD and EuroCVD meetings, and is presently a co-organiser of the joint EuroCVD/Baltic ALD meeting in Linköping, Sweden in 2017. He will be chaired the AVS ALD 2021 meeting (virtual), and was the co-chair of the Surface Science division of the 2015 CSC conference in Ottawa. He will Chair the upcoming AVS ALD 2023 meeting in Bellevue, WA, and the ASD 2024 meeting in Montreal.

In 2012, he was awarded a Marie Curie Fellowship as part of the EU-funded European Research Training Network ENHANCE to undertake metal ALD at the University of Helsinki, and in 2015 he was awarded a $295k Vinnova VINNMER Mobility grant to undertake CVD/ALD research in Sweden.

He recently wrote a textbook entitled “The Chemistry of Atomic Layer Deposition”, published in 2022.