Biographical Sketch - David A. Leigh (University of Manchester, UK; www.catenane.net)

Education and Employment Summary: David Leigh was born in Birmingham, England, on May 31, 1963. He received his BSc degree in Chemistry in 1984 from the University of Sheffield (UK) followed by a PhD in 1987 under the supervision of J. Fraser Stoddart. From 1987-1989 he was a postdoctoral fellow at the National Research Council of Canada in Ottawa, Canada, studying carbohydrate-protein interactions with David R. Bundle. In 1989 he returned to the UK as a Lecturer (Assistant Professor) at the University of Manchester Institute of Science and Technology (since 2004 part of the University of Manchester). He moved to become Professor of Synthetic Chemistry at the University of Warwick (1998-2001) and then Forbes Chair of Organic Chemistry at the University of Edinburgh (2001-2012) before returning to Manchester in 2012 where he is now the Sir Samuel Hall Chair of Chemistry, the only named chair in the Department of Chemistry at the University of Manchester (UK), a historic center for the physical sciences (Dalton, Joule, Rutherford, Bragg, Perkin, Robinson, Haworth, Turing, Geim, etc). Since 2016 Leigh has been a Royal Society Research Professor, a position held by a small number of Fellows of the Royal Society, the UK's National Academy of Science and Letters. Since 2018 he is also a Distinguished Professor at East China Normal University, Shanghai. Leigh is a member of the ACS (since 1987), a Fellow of the Royal Society (FRS), a Fellow of the Royal Society of Edinburgh (FRSE), and a Fellow of the American Academy of Arts and Sciences (International Honorary Member).

Research Area: Leigh is a leading pioneer of nonequilibrium molecular-level dynamics and molecular nanotopology (molecular knots and links). Landmark examples from Leigh's laboratory include the first synthetic Brownian ratchets (2003), the first artificial nanomachines able to perform macroscopic work (2005), the invention of catalytic routes to rotaxanes, catenanes and knots ('active template synthesis' 2006; 'metal-free active template synthesis' 2017), the first artificial small-molecules that, like motor proteins, 'walk' along tracks (2010) or build other molecules, including an acclaimed synthetic ribosome mimic (2013), and the first artificial examples of the transduction of chemical energy through catalysis (2022), the process that powers all of biology. In the last few years his group have reported the first examples of autonomous chemically fueled molecular motors and pumps (2016, 2021, 2022), used knotting in a molecule to induce allosteric catalysis (2017), synthesized the most complex molecular knots to date (2012-), introduced small-molecule robotics (2016) and 2D molecular weaving (2020), developed programable 'molecular assemblers' (2017) and demonstrated how chemical energy can be transduced through catalysis to do endergonic synthesis (2024) and mechanical work (2025). In a 2017 News & Views perspective in Nature, T. Ross Kelly and Marc Snapper call the Leigh group molecular assembler 'Science fiction becomes fact'; the laudation [https://tinyurl.com/7zyz9nd9] for Leigh's 2024 August Wilhelm von Hofmann Gold Medal from the GDCh notes: 'If the evolution of life on earth would have needed a competent consultant, he would have been the number one choice.'

Metrics (OrcidID orcid.org/0000-0002-1202-4507; GoogleScholar (GooSch) https://goo.gl/RFvrGi): Leigh has authored 320 publications to date, including Nature (11), Science (9), Nat. Chem. (10), PNAS (7), JACS (68) and Angew. Chem. (54). These have accrued >40000 citations, with an h index of 105 (GooSch 31 Dec 2024). Over half of Leigh publications have been highlighted in the scientific press or wider media. More than 36 (>1-in-10) of Leigh's primary research papers have been the subject of independent published perspectives ('News & Views' articles).

Public Engagement: Leigh is also known for merging art with science (video, music, magic, www, public lectures). 'Nanobot' [https://bit.ly/2Qw8qRn], a video he commissioned in 2018, has generated >1M views. Social media show Leigh's videos being widely used by teachers in high schools [https://bit.ly/36t1nyr], in university courses [https://bit.ly/2MXkzg0], and by the general public. Leigh's molecular 8₁₉ knot (Science 2017) appears in the Guinness Book of World Records as 'the world's tightest knot'; his 2D molecularly woven material (Nature 2020) appears in the Guinness Book of World Records as 'the finest woven fabric'.

Honors and Awards: The Leigh group's research contributions have been recognized with a number of scientific awards, including the Royal Society of Chemistry (RSC) Prizes for Supramolecular Chemistry (2003), Nanotechnology (2005) and the RSC Merck (2009), Tilden (2010), Pedler (2014), Perkin (2017) & Horizon (2023) Prizes, the Spanish Chemical Society (RSEQ) Prize for Chemistry (2007), the Institute of Chemistry of Ireland Award for Chemistry (2005), Feynman Prize for Nanotechnology (2007), the International Izatt-Christensen Award in Macrocyclic Chemistry (2007), the EU Descartes Prize for Transnational Research (2007), the ISNSCE (International Society for Nanoscale Science, Computation and Engineering) Nanoscience Prize (2019), a Royal Medal from the Royal Society of Edinburgh (2021), and the GDCh August Wilhelm von Hofmann Gold Medal (2024). Leigh is an honorary member of the Israel Chemical Society, an International Honorary Member of the American Academy of Arts and Sciences, a Clarivate Analytics Highly-Cited Researcher, and is listed in Academic Influence's 'Top Influential Chemists 2010-2020'.