Curriculum Vitae: Iain McCulloch

Professor of Polymer Chemistry, Department of Chemistry, University of Oxford, UK
iain.mcculloch@chem.ox.ac.uk,
Adjunct Professor, KAUST, KSA, Visiting Professor, Imperial College, UK
ORCID: 0000-0002-6340-7217 scholar.google.com/citations?user=wBsRdUYAAAAJ

Higher Education

1986 – 1989 PhD Polymer – Chemistry, University of Strathclyde, UK
1982 – 1986 B.Sc. - First Class Honors – Chemistry, University of Strathclyde, UK

Professional Employment

2020-present Professor of Polymer Chemistry, Department of Chemistry, University of Oxford, UK.
2016-2021 Director of the KAUST Solar Center (part-time), King Abdullah University of Science and Technology, KSA
2014-2021 Professor of Chemical Science, King Abdullah University of Science and Technology, KSA
2020-present Visiting Professor of Polymer Chemistry, Department of Chemistry, Imperial College London, UK
2014-2015 Head of Nanomaterials and Devices Research Section, Department of Chemistry, Imperial College London, UK
2007-2020 Professor of Polymer Materials, Department of Chemistry, Imperial College London, UK
2000-2007 Technology Platform Manager, Merck Chemicals, Chilworth Technical Centre, UK
1998-2000 Technical Manager, Polymer Science, International Specialty Products, Research Division, Wayne, NJ, USA
1990-1998 Group Leader, Electronic Materials Hoechst Celanese Corporation, Research and Technology, Summit, NJ, USA
1989 – 1990 Post Doctoral Fellow - Electronic Materials, Hoechst Celanese Corporation, USA

Research Output (Google Scholar and WoS data, Nov 2022)

- 468 peer-reviewed papers published, including 40 publications in Nature family journals since 2012 (18 in Nat. Commun., 12 in Nat. Mater., 2 in Nat. Energy, 1 in Nature, Nat. Phys, Nat. Chem, Nat. Electron., Nat. Chem. Rev., Nat. Rev. Mater, Nat. Biomed. Eng. Nat Rev Methods Primers, 5 Science Advances and 1 Science paper, 130 publications in Advanced Materials Family.
- 67 patents filed, 1 book edited, 6 book chapters co-authored. Over 210 invited and keynote presentations delivered at international conferences and at universities and companies in over 20 countries.
- h-index: 116. >55000 citations and >360 papers with at least 10 citations in the last 5 years.

Research Summary

Iain McCulloch's research involves the design, synthesis and development of semiconducting small molecules and polymers for use as transistors for display, solar cells and most recently biological sensing. His efforts have focused on the understanding and control of microstructure and energy levels in conjugated aromatic semiconducting polymers and the subsequent impact on device properties. This has resulted in several commercial products including lithographic formulations and printable semiconducting inks. His research continues to broaden in scope, including making important contributions in organic photovoltaics, where he is exploring new electron acceptor materials, doping effects, and fundamental optical absorption phenomena. In addition, he is developing biological sensing and electrochemical devices, which have resulted in the first demonstration of solid-state optical

semiconducting sensors for measurement of cations, as well as fundamental molecular design rules of semiconducting polymers for organic electrochemical transistors.

Elected Fellowships and Awards

2022	Royal Society Armourers and Brasiers Prize
2020	The European Academy of Sciences 2020 Blaise Pascal Medal for Materials Science.
2020	Elected Fellow of the Royal Society
2020	Royal Society of Chemistry, 2020 Interdisciplinary Prize
2020	Selected as Member of Wiley's Advanced Materials "Hall of Fame"
2020	Elected Fellow, Academia Europaea
2019	Guest professor, Southeast University, China
2016	Elected Fellow, European Academy of Sciences
2014 -	Clarivate Highly Cited Researcher, (Materials Science 2014 - 18: Chemistry 2017, 2018: Crossfield 2019,2020)
2014	Royal Society of Chemistry - Tilden Prize for Advances in Chemistry
2014	Elected Fellow of the Royal Society of Chemistry
2014	Royal Society - Wolfson Merit Award
2012	Thomson Reuters ISI Global Top 100 Materials Scientists, 2000-10, by Citation Impact, ranked number 35
2009	Royal Society of Chemistry Creativity in Industry Award
2007	RSC Teamwork in Innovation Award – Highly Commended
2007	IDTechEx Award for Printed Electronics Best Technical Development – Materials
2006	Alfred Woodhead Award presented by the Society for Information Display (SID)
1997	Hoechst Innovation Award
1985	British Telecom Scholarship (Chemistry) U. Strathclyde
1983	Robert Hart Scholarship (Top Student in Science/Engineering) U. Strathclyde, UK

Editorial Positions,

2020	International Advisory Board Member - Advanced Materials
2020	Associate Editor - Science Advances
2020	Advisory Board Member - Journal of Materials Chemistry C
2020	Executive Advisory Board Member - Advanced Energy and Sustainability Research
2014	Editorial Advisory Board Member, Flexible and Printed Electronics
2011	Editorial Advisory Board Member - Chemistry of Materials
2008	Associate Editor: Materials Science and Engineering R: Reports

Commercialisation

- Co-Founder and Director, Flexink Ltd (Specialty Chemicals Company) (www.flexink.co.uk)
- Co-Founder of Solar Press, an organic solar cell start-up funded by the Carbon Trust (2009-2013).
- Partner in C-Change LLP (2008-2014), a technology consultancy partnership.

Advisory Positions

- Advisory Board Member, Max Planck Institute for Polymer Research (2020 – date)
- Member of Plextronics Technical Advisory Board (2010 - 2015)
- Samsung CORE Advisor (2011 - 2013)

- Sumitomo Scientific Advisory Board (2008 - 2011)
- Appointed Member of RSC Organic Division Council (2011 - 2014)
- Appointed Member of RSC Macro Division Council (2003 - 2006)
- Guest Editor of 2 Special Edition of Advanced Materials (2010 - 2012)
- CSIRO Australia Energy Review Panel Invited Member (2009)
- Visiting Scientist, ITRI, Taiwan (2008)
- Guest Editor of Special Edition of MRS Bulletin (2008)
- UK Government Technology Strategy Board Project Monitoring Officer (2009 - date)
- European Commission Independent Expert and Project Officer for ICT Framework 7 (2012- date)

Mentorship and Supervision

2007 - 2020 19 Postdocs, 17 PhD students, 21 MSci students, Imperial College
2014 - 2021 16 Postdocs, 3 PhD students, 7 Masters students, KAUST
2021 - 9 Postdocs, 7 PhD students, 3 Masters students, Oxford
Since 2012, ten former post-doctoral fellows have gone to academic positions, in the UK (U. Cambridge, Queen Mary University of London, U. Sheffield), Sweden (Chalmers U.) US (U. Kentucky), China (Sun Yat-sen University (1000 Talents Plan), Guangxi University for Nationalities, Great Bay University), France (U. Strasbourg) and Saudi Arabia (KAUST), as well as two former PhD students (University College London, American University of Cairo). Many former PhD students have taken up postdoctoral fellowships. Several former PhD students have won prizes including: Springer Thesis Prize 2016 (Sarah Holliday), Reaxys PhD prize finalist 2016 (Sarah Holliday), Skinner Poster Prize at RSC Faraday Discussion 174, 2014 (Sarah Holliday), Fonds National de la Recherche Luxembourg (FRN) prize for outstanding PhD thesis 2014 (Bob Schroeder), 63rd Lindau Nobel Laureate Meeting Invited Attendee 2013 (Bob Schroeder, Jan Kosco), Reaxys PhD prize shortlisted finalist 2017 in Shanghai (one of 10 global shortlisted finalists) (Alexander Giovannitti), EMRS Poster Prize 2017 (Alexander Giovannitti), Salters Centenary Award Winner 2017 (one of only 4 PhD students in the UK in Chemistry and Chemical Engineering) (Andrew Wadsworth), Imperial College Governor's Prize, Alfred Bader Prize (Max Moser), the 2021 MacroGroup UK Jon Weaver PhD Prize (Max Moser). Two Merck UK industrial research group members were appointed to academic positions in the UK (Imperial College and University of Surrey respectively).

Commitment to EDI

It is a privilege, as an educator, researcher, principal investigator, and citizen, to ensure a more equitable future society. I greatly value different identities, perspectives, and experiences, as it leads to more creative solutions to solving complicated problems that we deal with on a regular basis in my laboratory. Toward these goals, I take actions independently as well as contribute toward existing programs that promote such outcomes. These include actions related to dissemination, education, hiring, and training. Some specific examples of actions and initiatives that I have undertaken are described below:

- From 1991-1998, weekend volunteer teaching and mentoring high school science students at the Manhattan Center of Science and Mathematics, New York. These students were from disadvantaged backgrounds from all across NYC, but predominantly Latino and African Americans from the Upper East Side.
- Responsible for hiring two female assistant professors at KAUST during my tenure as KAUST Solar Center Director, out of a total of 4 female hired throughout the division of 75 faculty.
- Responsible for increasing the female ratio of student recruitment at KAUST Solar Center from 19% to over 40% (above STEM average and well above Saudi Arabia average) during my tenure as Director.
- 50% of my former group members that have been hired at Assistant Professor level have been female.

- Participant and advocate for “Foundation Oxford” – a program aimed at students from more disadvantaged socio-economic backgrounds within the UK.

Professional Leadership

McCulloch was elected as a Member of the Royal Society of Chemistry Macro (2003-2006) and Organic (2011-2014) Division Committees. He has served as a Member of EU FP7 Projects (MACMES, NAIMO, X10D) and Network (SupraNED) Management Boards and was an invited member of UK DTI steering committee (Flexynet). Furthermore, he has served as director of Imperial College Centre for Plastic Electronics (2010-date). He was also an invited Member of UK Government DTI Industrial Review Panel (2004-2007), and the MRS and ACS Symposium Organiser and Chair (1997, 2007, 2009, 2015).

Industrial Engagement

McCulloch has been appointed as a consultant for many chemical, materials and electronic companies globally. Those where confidentiality has expired are: Sumitomo (broad consultancy in the field of organic electronics in Japan and the UK), Cabot (reviewer of their innovation pipeline in the US); Logystyx (optics in the UK), BASF (polymer chemistry and internal project evaluation in Germany), Bayer Materials Science (research project evaluation in Germany), Corning (organic electronics in the US) Samsung (advisor to Advanced Technology unit, in the field of electronics), Plextronics (technical advisory board member, advising on research strategy).

Research Funding

McCulloch has been awarded 32 research project grants since his return to academia in 2008, including 13 EU (ERC, FP7 and H2020), 9 EPSRC and 7 industry (Samsung, Solvay and BASF) awards, as well as grants from overseas governments (Korea, Netherlands). His cumulative third-party funding at Imperial College over this period is now over GBP £6.4 million.

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3. McCulloch, I.; Man, H.-T.; Marr, B.; Teng, C. C.; Song, K., Synthesis and Electrooptic Characterization of a Novel Highly Active Indoline Nitroazobenzene Methacrylate Copolymer. *Chem. Mater.* **1994,** *6* (Copyright (C) 2012 American Chemical Society (ACS). All Rights Reserved.), 611-13.
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5. McCulloch, I. A., Novel Photoactive Nonlinear Optical Polymers for Use in Optical Waveguides. *Macromolecules* **1994,** *27* (Copyright (C) 2012 American Chemical Society (ACS). All Rights Reserved.), 1697-702.
6. McCulloch, I.; Boudoughian, G.; Man, H. T., Photochemical fabrication of nonlinear optical polymer waveguides. *Adv. Mater. (Weinheim, Ger.)* **1995,** *7* (Copyright (C) 2012 American Chemical Society (ACS). All Rights Reserved.), 715-18.
7. McCulloch, I.; Yoon, H., Fluorinated NLO polymers with improved optical transparency in the near infrared. *J. Polym. Sci., Part A: Polym. Chem.* **1995,** *33* (Copyright (C) 2012 American Chemical Society (ACS). All Rights Reserved.), 1177-93.
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10. McCulloch, I.; Lu, P.; Kang, M., Water-soluble chromophore containing copolymers for bottom antireflection coating applications in lithography. *J. Appl. Polym. Sci.* **1999,** *74* (Copyright (C) 2012 American Chemical Society (ACS). All Rights Reserved.), 1304-1316.
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