

## Michael S. Inkpen

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### Employment

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<b>Assistant Professor of Chemistry</b> , Department of Chemistry, University of Southern California, CA, USA	2019-
<b>Marie Skłodowska-Curie Fellow</b> , Departments of Applied Physics and Chemistry, Columbia University, USA <i>and</i> University of Rennes 1, France	2015-2018
<b>Research Associate</b> , Department of Chemistry, Imperial College London, UK	2013-2015

### Education

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<b>Imperial College London, UK</b> Ph.D. in Organometallic Chemistry (Advisors: <a href="#">Nicholas J. Long</a> , <a href="#">Tim Albrecht</a> ) <i>Thesis title</i> : "Branched organometallic complexes for molecular electronics"	2008-2013
<b>Durham University, UK</b> M.Chem. w/ Industrial Project, 1 <sup>st</sup> class Honours <i>Thesis title</i> : "The controlled release of volatile organic molecules from dry paint films"	2004-2008

### Research Experience

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<b>Marie Skłodowska-Curie Fellow</b> , Departments of Applied Physics and Chemistry, Columbia University, USA <i>and</i> University of Rennes 1, France Advisors: <a href="#">Latha Venkataraman</a> , <a href="#">Philippe Hapiot</a> <i>scanning tunnelling microscope-based break junction (STM-BJ), single-molecule electronics, self-assembled monolayers (Au, Ag), x-ray photoelectron spectroscopy, surface chemistry (thiols, N-heterocyclic carbenes), programming/data analysis (Igor)</i>	2015-2018
<b>Research Associate</b> , Department of Chemistry, Imperial College London, UK Advisors: <a href="#">Nicholas J. Long</a> , <a href="#">Tim Albrecht</a> (now at University of Birmingham) <i>organometallic and coordination chemistry (synthesis, catalysis), surface and solution electrochemistry, mixed valence complexes, STM (imaging, current-distance spectroscopy), programming and data analysis (MATLAB, Macro Scheduler)</i>	2013-2015
<b>Ph.D. Student</b> , Department of Chemistry, Imperial College London, UK Advisors: <a href="#">Nicholas J. Long</a> , <a href="#">Tim Albrecht</a> (now at University of Birmingham)	2008-2013
<b>Research Student</b> , ICI Paints/AkzoNobel, Slough, UK Advisors: Tom Munhoven, Manish Sarker <i>heterogenous polymerization, paint and supramolecular (host-guest) chemistry</i>	2007-2008

### Funding and Awards

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<b>ACS Postdoc to Faculty (P2F) Workshop</b> , Washington, DC (1 of 40 selected participants out of ~120 applicants, to help prepare for an academic career)	2017
<b>MRSEC Three-Minute Pitch</b> , Columbia University, USA (winning proposal to harness/exploit giant piezoelectricity in 2D metal monochalcogenides)	2016
<b>Marie Skłodowska-Curie Global Fellowship</b> , European Research Council (€246,668.40 awarded for 3-year research project <i>Molecular 'Click-tronics'</i> , ID: 657247)	2015
<b>Travel Grant</b> , Faraday Division, Royal Society of Chemistry (£800 awarded to attend 15 <sup>th</sup> Topical Meeting of the ISE in Niagara Falls, Canada)	2014
<b>Imperial Postdoc Sandpit Challenge</b> , Imperial College London, UK (winning proposal for a bioinspired route to carbon nanomaterials from waste chemicals)	2013
<b>GlaxoSmithKline Book Prize</b> , Durham University, UK	2005

(in recognition of 1<sup>st</sup> class results on formative 1<sup>st</sup> year undergraduate exams)

## Research and Teaching Interests

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- Syntheses of atypical organic and organometallic materials for applications in single-molecule electronics, materials science, catalysis, and beyond.
- Fundamental charge transfer processes on the nanoscale (using scanning probe, surface/solution electrochemical techniques), with a focus on *hopping* transport.
- New design strategies in self-assembled monolayers, including the use of *in situ* chemical reactions, to engineer functional surfaces with single-molecule precision.
- Applying and developing modern scientific methods (backwards design, active learning) to teach organometallic/physical chemistry courses at undergraduate and graduate levels.

## Publications – Refereed Journal Articles

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- 14) H. Li, T. A. Su, M. Camarasa-Gómez, D. Hernangómez-Pérez, S. E. Henn, V. Pokorný, C. D. Caniglia, **M. S. Inkpen**, R. Korytár, M. L. Steigerwald\*, C. Nuckolls\*, F. Evers\*, L. Venkataraman\*, “Silver Makes Better Electrical Contacts to Thiol Terminated Silanes than Gold”, *Angew. Chem. Int. Ed.*, 2017, **56**, 14145
- 13) R. Leber, L. E. Wilson, P. Robaschik, **M. S. Inkpen**, D. Payne, N. J. Long, T. Albrecht, C. F. Hirjibehedin and Sandrine Heutz\*, “High vacuum deposition of biferrocene thin films on room temperature substrates”, *Chem. Mater.*, 2017, **29**, 8663
- 12) H. Li, M. H. Garner, T. A. Su, A. Jensen, **M. S. Inkpen**, M. L. Steigerwald\*, L. Venkataraman\*, G. C. Solomon\*, C. Nuckolls\*, “Extreme Conductance Suppression in Molecular Siloxanes”, *J. Am. Chem. Soc.*, 2017, **139**, 10212
  - “1D nanowire is world’s worst conductor”, *Chemistry World*
  - “Siloxane nanowires are world’s worst conductor”, *Compound Interest*
- 11) O. A. Al-Owaedi, S. Bock, D. Costa-Milan, M. Oerthel, **M. S. Inkpen**, D. S. Yufit, A. N. Sobolev, N. J. Long, T. Albrecht, S. Higgins, M. R. Bryce, R. J. Nichols\*, C. Lambert\* and P. Low\*, “Insulated molecular wires: inhibiting orthogonal contacts in metal complex based molecular junctions”, *Nanoscale*, 2017, **9**, 9902
- 10) **M. S. Inkpen**\*, Y. R. Leroux, P. Hapiot, L. M. Campos and L. Venkataraman\*, “Reversible on-surface wiring of resistive circuits”, *Chem. Sci.*, 2017, **8**, 4340
- 9) M. Lemmer, **M. S. Inkpen**, K. Kornysheva, N. J. Long and T. Albrecht\*, “Unsupervised vector-based classification of single-molecule charge transport data”, *Nature Commun.*, 2016, **7**, 12922
- 8) **M. S. Inkpen**, S. Scheerer, M. Linseis, A. J. P. White, R. F. Winter, T. Albrecht\* and N. J. Long\*, “Oligomeric ferrocene rings”, *Nature Chem.*, 2016, **8**, 825
  - “Molecule of the Year”, the cyclic hexamer was one of seven molecules nominated by *C&EN*, coming third in their online poll (print issue: 2016-12-19)
  - *Journal front cover* (*Nature Chem.*, **8**(9), 2016)
  - *News and Views* (R. A. Musgrave and I. Manners, 2016, *Nature Chem.*, **8**, 819)
  - “Presenting a ferrocene Ferris wheel”, *C&EN* (print issue: 2016-07-04)
  - “Bringing ferrocene full circle”, *Chemistry World* (print issue: 2016-08)
- 7) **M. S. Inkpen**, A. J. P. White, T. Albrecht\* and N. J. Long\*, “Complexes comprising ‘dangling’ phosphorous arms and tri(hetero)metallic butenyryl moieties”, *J. Organomet. Chem.*, 2016, 812, 145
- 6) **M. S. Inkpen**†, S. Du†, M. Hildebrand, A. J. P. White, N. M. Harrison, T. Albrecht\* and N. J. Long\*, “The unusual redox properties of fluoroferrocenes revealed through a comprehensive study of the haloferrocenes”, *Organometallics*, 2015, **34**, 5461

- 5) **M. S. Inkpen\***, M. Lemmer, N. Fitzpatrick, D. Costa-Milan, R. J. Nichols, N. J. Long\* and T. Albrecht\*, "New insights into single-molecule junctions using a robust, unsupervised approach to data collection and analysis", *J. Am. Chem. Soc.*, 2015, **137**, 9971
- 4) **M. S. Inkpen**, A. J. P. White, T. Albrecht\* and N. J. Long\*, "Avoiding problem reactions at the ferrocenyl-alkyne motif: a convenient synthesis of model, redox-active complexes for molecular electronics", *Dalton Trans.*, 2014, **43**, 15287
- 3) **M. S. Inkpen**, T. Albrecht\* and N. J. Long\*, "Branched redox-active complexes for the study of novel charge transport processes", *Organometallics*, 2013, **32**, 6053
- 2) **M. S. Inkpen**, A. J. P. White, T. Albrecht\* and N. J. Long\*, "Rapid Sonogashira cross-coupling of iodoferrocenes and the unexpected cyclo-oligomerization of 4-ethynylphenylthioacetate", *Chem. Commun.*, 2013, **49**, 5663
- 1) **M. S. Inkpen**, S. Du, M. Driver, T. Albrecht\* and N. J. Long\*, "Oxidative purification of halogenated ferrocenes", *Dalton Trans.*, 2013, **42**, 2813

\* indicates corresponding author(s), † indicates co-first authors (equal contribution).

### Other Publications – Non-Refereed Journal Articles and Book Chapters

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- 2) **M. S. Inkpen** and N. J. Long\*, "Metal  $\sigma$ -alkynyl complexes as molecular wires: a comparative study of electron density and delocalisation" in *Molecular Design and Applications of Photofunctional Polymers and Materials*, eds. W. -Y. Wong and A. S. Abd-El-Aziz, Royal Society of Chemistry, 2012 (book chapter)
- 1) **M. S. Inkpen** and T. Albrecht\*, "Probing electron transport in proteins at room temperature with single-molecule precision", *ACS Nano*, 2012, **6**, 13 (perspective article)

### Conferences

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#### Invited Oral Presentations

- 1) *Minisymposium on Molecular Electronics*, Universität Regensburg, Germany; July 19-20, 2018

#### Contributed Oral Presentations

- 11) *ElecNano*<sup>8</sup>, Université de Lorraine, Nancy, France; May 29-31, 2018
- 10) *255<sup>th</sup> American Chemical Society National Meeting*, New Orleans, LA, USA; March 20, 2018
- 9) *254<sup>th</sup> American Chemical Society National Meeting*, Washington, DC, USA; August 24, 2017
- 8) *Quantum Transport in Nanoscale Molecular Systems* (Telluride Science Research Center Workshop), Telluride, CO, USA; August 1, 2017
- 7) *252<sup>nd</sup> American Chemical Society National Meeting*, Philadelphia, PA, USA; August 15, 2016
- 6) *42<sup>nd</sup> International Conference on Coordination Chemistry*, Brest, France; July 4, 2016
- 5) *ElecNano*<sup>6</sup>, Université Paris Diderot, Paris, France; May 28, 2014
- 4) *15<sup>th</sup> Topical Meeting of the International Society of Electrochemistry*, Niagara Falls, Canada; April 28, 2014
- 3) *12<sup>th</sup> Ferrocene Colloquium*, Universität Innsbruck, Austria; February 18, 2014
- 2) *10<sup>th</sup> Ferrocene Colloquium*, TU Braunschweig, Germany; February 15, 2012
- 1) *ASPIC*, University College London, UK; July 13, 2011

#### Poster Presentations

- 5) *EuCheMS International Organometallic Conference XXII*, Amsterdam, Netherlands; July 10, 2017
- 4) *13<sup>th</sup> Ferrocene Colloquium*, Universität Leipzig, Germany; February 22, 2015
- 3) *11<sup>th</sup> Ferrocene Colloquium*, Leibniz Universität Hannover, Germany; February 7, 2013
- 2) *London / SE Region Postgraduate Electrochemistry Symposium*, University College London, UK; May 17, 2011
- 1) *1st EuCheMS Inorganic Chemistry Conference (EICC-1)*, University of Manchester, UK; April 12, 2011

## Teaching and Mentoring Experience

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**Guest Lecturer**, Department of Chemistry, Columbia University 2016

- Co-designed and lectured classes comprised of >25 undergraduate/graduate students.
- Materials Chem. I: *Marcus theory* (1 lecture); Inorg. Chem.: *Arene complexes* (1 lecture).

**“Fundamentals of Teaching” Course** (10 weeks), Columbia University 2016

- Obtained a firm theoretical background in the foundational principles of teaching.
- Co-designed and co-presented a short (10 min) teachable unit on UV-vis spectroscopy.

**Tutoring, Marking, Laboratory Demonstrating**, Imperial College London 2009-2014

- Led inorganic chemistry tutorials; demonstrated computational workshops, synthetic labs.

**Mentoring/Supervision**, Imperial College London and Columbia University 2010-2016

- ≥15 Ph.D., and undergraduate students, including project design (T. Haywood, M. Driver, P. Loxq, G. Fateh-Iravani, M. Balkenhohl, S. Leung, I. Kramberger, N. Rotthowe, M. Lemmer, L. E. Wilson, I. Zulkifly, N. Fitzpatrick, M. Hildebrand, C. Liang, C. D. Caniglia).
- 4 co-authored on recent publications; ≥8 continued to further studies/research.

## Academic Service

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**Manuscript Peer Reviewer:** *Nano Lett.*; *Eur. J. Inorg. Chem.*; *J. Phys. Chem.*; *Curr. Opin. Electrochem.* (<https://publons.com/a/1475443>)

**Symposium Organization** 2018

- “The Chemistry of Molecular Electronics”, 4 sessions at the 255<sup>th</sup> National Meeting of the ACS in New Orleans, LA, USA (with [Latha Venkataraman](#), [Gemma C. Solomon](#)).

**Laboratory Specification Advisor**, Imperial College London 2014-2015

- Advising architects, engineers, departmental administrators on specifications for future low vibrational/electric noise laboratories at new chemistry building on ‘Imperial West’ campus.

**Academic Interviewing**, Imperial College London 2013, 2015

- 17-18 year old Universities and Colleges Admissions Service (UCAS) applicants
- Participated on mock interview panel for a Royal Society University Research Fellowship.

**Outreach Activities** 2011-present

- Multiple talks/experiment demonstrations, e.g. at Harlem Children's Zone Promise Academy and PhD for a Day (2016, 2017) in New York, Highgate School in London (2011).

**Professional Affiliations**

- Member of the American Chemical Society (2016-present), Royal Society of Chemistry (2013-present), International Society of Electrochemistry (2014-present).