Dr. Alexander Giovannitti

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Qualifications

10/2014-01/2018	**Ph.D. in Polymer Chemistry – Centre for Doctoral Training in Plastic Electronics**, Department of Physics, *Imperial College London, United Kingdom* 'The development of organic semiconductors for p- and n-type accumulation mode organic electrochemical transistors (OECTs)' - Design and implementation of a new class of materials which paved the way for novel applications.
09/2013-11/2014	**MRes in Plastic Electronics Materials,** *Imperial College London, United Kingdom* 'Conducting polymers and their applications in organic electrochemical transistors (OECT)'
10/2007-11/2012	**Graduate in Chemistry (diploma),** *Karlsruhe Institute of Technology, Germany* 'Optimized Synthesis of (Bis(benzo)methano)-fullerene compounds and their application towards Hexakis-substituted products'

Employment

Since 03/2019	**Postdoc (TomKat Postdoctoral Fellows in Sustainable Energy),** *Stanford University, United States of America* 'Recyclable batteries – Towards sustainable and safe energy storage' Development of recyclable energy storage devices based on solution-processable conjugated polymers Co-instructor for the graduate course Organic Semiconductors for Electronics and Photonics at Stanford University.
01/2019-09/2017	**Postdoc (EPSRC Doctoral Prize Fellow and Research Associate)** Department of Physics**,** *Imperial College London, United Kingdom* 'Water-based polymer batteries' Development of **energy storage devices** based on conjugated polymers in environmentally friendly, non-toxic and **safe electrolytes**.

Academic Awards

04/2020	**StorageX Initiative Seed-Funding: Recyclable polymer batteries**, *Stanford University* (40.000 $)
03/2019-02/2021	**TomKat Postdoctoral Fellowship in Sustainable Energy,** *Stanford University* (24 months).
10/2017-09/2018	**EPSRC Doctoral Prize Fellowship**, *Imperial College* (12 months, including funding for travel and consumables)
03/2018	Winner of the **Outstanding PhD award 2017/2018**, Department of Chemistry, *Imperial College*. Best written PhD thesis and performance during the PhD viva, awarded to two PhD students graduating from the Department of Chemistry in 2017.
10/2017	Finalist **REAXYS Chemistry PhD Prize Award**, one of the 10 finalists shortlisted from >450 candidates to give a talk at the REAXYS symposium 2017, *Shanghai*.
05/2017	**Graduate Student Award EMRS**, *Strasbourg* – Best presented paper in the organic bioelectronics symposium
09/2014	**Prize for the best M.Res. Project** in Plastic Electronics, *Imperial College*.
Since 01/2017	**RSC Travel Grant Awards for PhD Students and Early Career Scientists** (Conferences: EMRS, *Strasbourg,* France (2017), MRS, *Phoenix*, USA (2018), MRS, *Boston*, USA (2019)

Teaching & Supervision

03/2019 – 09/2020	**Postdoc Teaching Certificate (accomplished after 100 h of teaching practice and teaching training)** Teaching practice: Co-instructor for Organic Semiconductors for Electronics and Photonics at *Stanford University* and guest lecturer for graduate courses in the Department of Material Science and Engineering and the Department of Chemistry, *Stanford University*. Teaching training: Teaching workshops, completion of the course Topics in Human-Computer Interaction at the department of Computer Science and Inclusive and Effective Teaching, , *Stanford University*.
04/2020 – 06/2020	**Organic Semiconductors for Electronics and Photonics** at *Stanford University*. Co-instructor (online course) for 15 graduate students (Spring term 2020), course design including 10 lectures, developing of course materials (problem sets/exams) as well as grading of exams.
03/2019 – present	**Supervision of graduate students (2 PhD students),** *Stanford University* Project planning, co-supervision and training in the laboratory.
10/2014 – 01/2019	**Supervision of junior research students (2 PhD, 1 MSc, 2 UROP and 2 BSc students),** *Imperial College London* Project planning and training of established methods in the laboratory. Published two papers in the field of bioelectronics with students working on my proposed ideas and projects.
2016	**Tutor in Organic Chemistry,** *Imperial College London, United Kingdom* Problem workshop in organic chemistry (first-year students) Working in teams of 3-6 students to learn and understand the concept of organic chemistry.
2010- 2011	**Tutor in Organic Chemistry,** *Karlsruhe Institute of Technology, Germany* Problem workshop in organic chemistry (second and third-year students) Learn and understand the basics of organic chemistry (group of 20 students)

Invited presentations

06/2020	Invited talk 'Processable Energy Storage Materials – From Batteries to Sustainable Fuels', *Imperial College London,* UK
12/2019	Stanford Polymer Collective seminar, *Stanford University*, USA
02/2019	Invited talk and seminar, *Max-Planck Institute for Polymer Research*, Germany
06/2018	Invited talk at the CPE Annual Symposium, *Imperial College,* UK.
07/2018	Invited poster presentation at the EPSRC Council meeting, *Imperial College*, UK.
10/2017	Invited talk at the REAXYS PhD Prize Symposium, *Shanghai,* China.

Outreach and public engagement

Member of the organizing team for the Imperial Science Festival Plastic Electronics stall (2014 to 2018) with more than 20.000 festival visitors per year (children and adults). Preparation of a demonstrator for electrical energy production and storage as well as solar and fuel cells and extracting natural indicators from vegetables for optical detection of acids and bases.

References

Prof. Iain McCulloch
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Prof. Alberto Salleo
Department of Materials Science and Engineering Stanford University
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Dissemination (Google Scholar data, June 2020)

- Published >25 **peer-reviewed articles** (eight first-author papers, corresponding author for six papers)
- Filled **three patent applications** based on developed materials and ideas.
- Delivered **> 10 presentations** at international conferences.
- h-index: 14, >850 citations

Patent applications

3) **Alexander Giovannitti**, Anna-Maria Pappa and Sahika Inal, An n-type polymer for enzymatic metabolite sensing, 2018 (U.S. provisional application (no. 62618794)).
2) **Alexander Giovannitti**, Davide Moia, Piers Barnes and Iain McCulloch, Jenny Nelson, *Water-based electrochemical device*, 2017 (no. P114737GB)
1) **Alexander Giovannitti**, Iuliana P. Maria**,** Iain McCulloch, *N-type conjugated polymers***,** 2017 (no. P111470GB).

Publications (corresponding author marked with *)

1. Maximilian Moser, Tania Cecilia Hidalgo, Jokubas Surgailis, Johannes Gladisch, Sarbani Ghos, Rajendar Sheelamanthula Quentin Thiburce, **Alexander Giovannitti**, Alberto Salleo, Nicola Gasparini, Andrew Wadsworth, Igor Zozoulenko, Magnus Berggren, Eleni Stavrinidou, Sahika Inal, and Iain McCulloch, *Side Chain Redistribution as a Strategy to Boost Organic Electrochemical Transistor Performance and Stability*, Adv. Mater. 2020, 32, 2002748 [10.1002/adma.202002748]
2. Armantas Melianas*, Tyler. J. Quill1, Garrett. LeCroy, Yaakov. Tuchman, Hilbert v. Loo, Scott. T. Keene, **Alexander Giovannitti**, Hye R. Lee, Iuliana. P. Maria, Iain. McCulloch, Alberto Salleo*, *Temperature-resilient solid-state organic artificial synapses for neuromorphic computing*, Science Advances, 2020, 6, 27 [10.1126/sciadv.abb2958].
3. Siew Ting Melissa Tan, **Alexander Giovannitti***, Armantas Melianas, Maximillian Moser, Benjamin L. Cotts, Devan Singh, Iain McCulloch, Alberto Salleo *Chemical to Electrical Transduction using Floating-Gate Organic Electrochemical Transistors*, manuscript under review ,2020 ((pre-print version ChemrXiv, link).
4. **Alexander Giovannitti***, Reem B. Rashid, Quentin Thiburce, Bryan Paulsen, Camila Cendra, Karl Thorley, Davide Moia, J. Tyler Mefford, David Hanifi, Du Weiyuan, Max Moser, Alberto Salleo, Jenny Nelson, Iain McCulloch, and Jonathan Rivnay, *Energetic control of redox-active polymers towards safe organic bioelectronic materials*, Adv. Mater. 2020, 32, 1908047. [10.1002/adma.201908047] ((pre-print version ChemrXiv, link).
5. Achilleas Savva, Rawad Hallani, Camila Cendra, Jokubas Surgailis, Tania C Hidalgo, Shofarul Wustoni, Rajendar Sheelamanthula, Xingxing Chen, Mindaugas Kirkus, **Alexander Giovannitti**, Alberto Salleo, Iain McCulloch, Sahika Inal, *Balancing Ionic and Electronic Conduction for High-Performance Organic Electrochemical Transistors*, Adv. Funct. Mater. 2020, 30, 1907657 [10.1002/adfm.201907657]
6. Johannes Gladisch, Eleni Stavrinidou,* Sarbani Ghosh, **Alexander Giovannitti**, Maximilian Moser, Igor Zozoulenko, Iain McCulloch, and Magnus Berggren, *Reversible Electronic Solid–Gel Switching of a Conjugated Polymer*, Adv. Sci. 2019, 1901144 [10.1002/advs.201901144]
7. Maximilian Moser, James F. Ponder Jr., Andrew Wadsworth, **Alexander Giovannitti**, Iain McCulloch, *Materials in Organic Electrochemical Transistors for Bioelectronic Applications: Past, Present, and Future, Adv. Funct. Mater.2019, 29, 180703.* [10.1002/adfm.201807033]
8. Maximilian Moser, Karl J Thorley, Floriana Moruzzi, James F Ponder, Iuliana P Maria, **Alexander Giovannitti**, Sahika Inal, Iain McCulloch*, Highly selective chromoionophores for ratiometric Na+ sensing based on an oligoethyleneglycol bridged bithiophene detection unit*, J. Mater. Chem. C, 2019, 7, 5359—5365. [10.1039/c8tc06000b]
9. Davide Moia*(1), **Alexander Giovannitti***(1), Anna A. Szumska, Martin Schnurr, Elham Rezasoltani, Iuliana P. Maria, Piers R.F. Barnes, Iain McCulloch and Jenny Nelson*, *A salt water battery with high stability and charging rates made from solution processed conjugated polymers with polar side chains*, *Energy Environ. Sci.*, 2019, 12, 1349-1357 (open access journal, arXiv:1711.10457), (1) the first two authors contributed equally to the work.
10. Camila Cendra, **Alexander Giovannitti**, Achilleas Savva, Vishak Venkatraman, Iain McCulloch, Alberto Salleo, Sahika Inal, Jonathan Rivnay, *Role of the Anion on the Transport and Structure of Organic Mixed Conductors*, Adv. Funct. Mater. 2019, 29, 1807034. [10.1002/adfm.201807034]
11. Achilleas Savva, Camila Cendra, Andrea Giugni, Bruno Torre, Jokubas Surgailis, David Ohayon, **Alexander Giovannitti**, Iain McCulloch, Enzo Di Fabrizio, Alberto Salleo, Jonathan Rivnay, and Sahika Inal, *Influence of Water on the Performance of Organic Electrochemical Transistors*, Chem. Mater. 2019, 31, 927−937. [10.1021/acs.chemmater.8b04335]

12. Quentin Thiburce, **Alexander Giovannitti**, Iain McCulloch, and Alasdair J. Campbell, *Absence of short-channel effects in sub-100 nm ion-doped polymer transistors*, *Nano Lett*., 2019 [10.1021/acs.nanolett.8b04717]

13. Vishak Venkatraman, Jacob T. Friedlein, **Alexander Giovannitti**, Iuliana P. Maria, Iain McCulloch, Robert R. McLeod, and Jonathan Rivnay, *Subthreshold operation of organic electrochemical transistors for bio-amplification*, Adv. Sci., 2018, 1800453 [10.1002/advs.201800453].

14. David Kiefer, Renee Kroon, Anna I. Hofmann, Hengda Sun, Xianjie Liu, **Alexander Giovannitti**, Dominik Stegerer, Alexander Cano, Jonna Hynynen, Liyang Yu, Yadong Zhang, Michael Sommer, Seth R. Marder, Adam J. Moulé, Iain McCulloch, Mats Fahlman, Simone Fabiano and Christian Müller, *Two for One: Double Doping of Conjugated Polymers with Monomer Molecular Dopants*, Nat. Mater., 2018, Nat. Mater. 2019, 18, 149 [10.1038/s41563-018-0263-6]

15. Yi Zhang, Shofarul Wustoni, **Alexander Giovannitti**, Iain McCulloch and Sahika Inal*, *Lipid Bilayer Formation on Organic Electronic Materials,* J. Mater. Chem. C, 2018 [10.1039/C8TC00370J]

16. **Alexander Giovannitti***, Iuliana P. Maria, David Hanifi, Mary J. Donahue, Daniel Bryant, Katrina J. Barth, Beatrice E. Makdah, Achilleas Savva, Davide Moia, Matyáš Zetek, Piers Barnes, Obadiah G. Reid, Sahika Inal, Garry Rumbles, George G. Malliaras, Jenny Nelson, Jonathan Rivnay,* and Iain McCulloch, *The role of the side chain on the performance of n-type conjugated polymers in aqueous electrolytes*, Chem. Mater**.**, 2018, 30, 9, 2945–2953 [10.1021/acs.chemmater.8b00321]

17. Anna-Maria Pappa(1), David Ohayon(1), **Alexander Giovannitti**(1), Iuliana Petruta Maria, Achilleas Savva, Ilke Uguz, Jonathan Rivnay, Iain McCulloch, Rosin M. Owens and Sahika Inal, *Direct metabolite detection with an n-type accumulation mode organic electrochemical transistor* Sci. Adv. 4, 2018, (1) the first three authors contributed equally to the work. [10.1126/sciadv.aat0911]

18. **Alexander Giovannitti***, Karl J. Thorley, Christian B. Nielsen, Jun Li, Mary J. Donahue, George G. Malliaras, Jonathan Rivnay and Iain McCulloch, *Redox-stability of alkoxy-BDT copolymers and their use for organic bioelectronic devices*, Adv. Funct. Mater. 2018, 1706325 [10.1002/adfm.20170632]

19. David Kiefer, **Alexander Giovannitti**, Hengda Sun, Till Biskup, Anna Hofmann, Marten Koopmans, Camila Cendra, Stefan Weber, L Jan Anton Koster, Eva Olsson, Jonathan Rivnay, Simone Fabiano, Iain McCulloch, Christian Müller, *Enhanced n-Doping Efficiency of a Naphthalenediimide-Based Copolymer through Polar Side Chains for Organic Thermoelectrics,* ACS Energy Lett.,2018, 3, 278-285. [10.1021/acsenergylett.7b01146]

20. Yu Zhang, Jun Li, Rui Li, Dan-Tiberiu Sbircea, **Alexander Giovannitti**, Junling Xu, Huihua Xu, Guodong Zhou, Liming Bian, Iain McCulloch, Ni Zhao, *Liquid–Solid Dual-Gate Organic Transistors with Tunable Threshold Voltage for Cell Sensing*, ACS Appl. Mater. Interfaces, 2017, 9, 38687 [10.1021/acsami.7b09384]

21. **Alexander Giovannitti**, Dan-Tiberiu Sbircea, Sahika Inal, Christian B. Nielsen, Enrico Bandiello, David A. Hanifi, Michele Sessolo, George G. Malliaras, Iain McCulloch and Jonathan Rivnay*. *Controlling the mode of operation of organic transistors through side chain engineering*, Proc. Nat. Acad. Sci., 2016, *113*, 12017-12022 [10.1073/pnas.1608780113]

22. **Alexander Giovannitti***, Christian B. Nielsen, Dan-Tiberiu Sbircea, Sahika Inal, Mary Donahue, Muhammad R. Niazi, David A. Hanifi, Aram Amassian, George G. Malliaras, Jonathan Rivnay and Iain McCulloch. *N-type organic electrochemical transistors with stability in water*, Nat. Commun. 2016, *7*, 13066-13075. [10.1038/ncomms13066]

23. Christian B. Nielsen*, **Alexander Giovannitti**, Dan-Tiberiu Sbircea, Enrico Bandiello, Muhammad R. Niazi, David A. Hanifi, Michele Sessolo, Aram Amassian, George G. Malliaras, Jonathan Rivnay and Iain McCulloch. *Molecular Design of Semiconducting Polymers for High-Performance Organic Electrochemical Transistors* J. Am. Chem. Soc., 2016, *138*, 10252–10259 [10.1021/jacs.6b05280]

24. **Alexander Giovannitti***, Christian B. Nielsen, Jonathan Rivnay, Mindaugas Kirkus, David J. Harkin, Andrew J.P. White, Henning Sirringhaus, George G. Malliaras and Iain McCulloch. *Sodium and Potassium Ion Selective Conjugated Polymers for Optical Ion Detection in Solution and Solid State*, Adv. Funct. Mater., 2016, *26*, 514–523. [10.1002/adfm.201503791]

25. **Alexander Giovannitti**, Stefan M. Seifermann, Angela Bihlmeier, Thierry Muller, Filip Topic, Kari Rissanen, Martin Nieger, Wim Klopper, Stefan Bräse*. *Single and Multiple Additions of Dibenzoylmethane onto Buckminsterfullerene*. Eur. J. Org. Chem**.**, 2013, 7907–7913. [10.1002/ejoc.201301146]

Oral presentations and posters

1. CPE online symposium, Processable Energy Storage Materials – From Batteries to Sustainable Fuels, *Imperial College*, 06/2020, UK 'Organic Mixed Ionic/Electronic Conductors and their use in Energy Storage Applications' (invited talk)
2. MRS Fall Meeting 12/2019, *Boston*, USA 12/2019 'Energetic control of redox active polymers towards safe organic bioelectronic materials' (Talk #1) and 'Development of zinc-polymer-air batteries for energy storage in safe and environmentally friendly electrolytes' (Talk #2)
3. SPIE meeting, *San Diego*, USA, 08/2019 'The design of air-stable, redox active conjugated polymers and their applications in accumulation mode OECTs' (Talk)
4. MRS Fall Meeting, *Boston*, USA, 12/2018 'A concept for fast charging of polymer electrodes in water based electrolytes' (Talk #1) and 'The design of air-stable, redox active conjugated polymers and their applications in accumulation mode OECTs' (Talk #2)
5. EPSRC council meeting, *Imperial College*, UK, 07/2018 'A concept for fast charging of polymer electrodes in safe electrolytes' (Poster)
6. CPE Annual Symposium, *Imperial College*, UK, 06/2018 'Impact of polar side chains on the performance of n-type OECTs' (Invited talk)
7. MRS Spring Meeting *Phoenix*, USA, 04/2018: Conjugated copolymers with polar side chains for energy storage in aqueous electrolytes'' (Talk)
8. BioEl 2018, *Kirchberg*, Austria, 03/2018, ''Impact of polar side chains on the performance of n-type OECTs''(Talk)
9. REAXYS PhD Prize Symposium, *Shanghai,* China, 10/1017 "Novel Materials for Organic Electrochemical Transistors (OECTs) and their Applications in Organic Bioelectronics'' (Invited talk and poster)
10. EMRS Spring, *Strasbourg*, France, 05/2017 "The influence of side chain engineering on the performance of n-type polymers in Organic Electrochemical Transistors (OECTs)'' (Talk)
11. MRS Fall Meeting, *Boston*, USA, 11/2016: 'N-type organic electrochemical transistors with stability in water' (Talk)
12. CPE Annual Lecture & Symposium, *Imperial College*, UK, 09/2016, 'N-type organic electrochemical transistors with stability in water' (Talk)
13. CPE Annual Lecture & Symposium, *Imperial College*, UK, 09/2015, 'Ion selective conjugated Polymers for Bioelectronic Applications' (Talk)
14. London Polymer Group Symposium *Queen Mary University*, UK, 04/2015 'Sodium and potassium ion-selective conjugated polymers for optical ion detection' (Talk)
15. MRS Spring Meeting 2015, *San Francisco*, USA, 04/ 2015: "Ion Selective Polymers for Bioelectronic Applications" (Talk)