


Stanford



Alexander Giovannitti

Postdoctoral Scholar, Materials Science and Engineering

 Curriculum Vitae available Online

Bio

HONORS AND AWARDS

- REAXYS Chemistry PhD Prize Award, REAXYS (2017)
- Outstanding PhD award 2017/2018, Imperial College London

PROFESSIONAL EDUCATION

- Diplom, Universitat Karlsruhe (2012)
- Master of Science, Imperial College of Science, Technology & Medicine (2014)
- Doctor of Philosophy, Imperial College of Science, Technology & Medicine (2018)

LINKS

- TomKat Center for Sustainable Energy: <https://tomkat.stanford.edu/postdoc/alexander-giovannitti>
- Personal Webpage: <https://www.gio-research.com/>

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

I am a material chemist with strong expertise in synthesizing high-performing polymeric organic semiconductors for electrochemical devices. My research mission is to design novel polymers to pave the way for sustainable electrocatalysts for energy/chemical conversion technologies. I thrive in collaborative, diverse, and open-minded research atmospheres, working along with colleagues in interdisciplinary settings to tackle global challenges.

Teaching

COURSES

2020-21

- Organic Semiconductors for Electronics and Photonics: MATSCI 343 (Spr)

2019-20

- Organic Semiconductors for Electronics and Photonics: MATSCI 343 (Spr)

Publications

PUBLICATIONS

- **Impact of Side Chain Hydrophilicity on Packing, Swelling and Ion Interactions in Oxy-bithiophene Semiconductors.** *Advanced materials* (Deerfield Beach, Fla.)

- Siemons, N., Pearce, D., Cendra, C., Yu, H., Tuladhar, S. M., Hallani, R. K., Sheelamanthula, R., LeCroy, G. S., Siemons, L., White, A. J., McCulloch, I., Salleo, A., Frost, et al
2022: e2204258
- **Redox-Active Polymers Designed for the Circular Economy of Energy Storage Devices** *ACS ENERGY LETTERS*
Tan, S., Quill, T. J., Moser, M., LeCroy, G., Chen, X., Wu, Y., Takacs, C. J., Salleo, A., Giovannitti, A.
2021; 6 (10): 3450-3457
 - **High-Gain Chemically Gated Organic Electrochemical Transistor** *ADVANCED FUNCTIONAL MATERIALS*
Tan, S., Giovannitti, A., Melianas, A., Moser, M., Cotts, B. L., Singh, D., McCulloch, I., Salleo, A.
2021
 - **Reversible Electrochemical Charging of n-Type Conjugated Polymer Electrodes in Aqueous Electrolytes.** *Journal of the American Chemical Society*
Szumska, A. A., Maria, I. P., Flagg, L. Q., Savva, A., Surgailis, J., Paulsen, B. D., Moia, D., Chen, X., Griggs, S., Mefford, J. T., Rashid, R. B., Marks, A., Inal, et al
2021
 - **Energetic Control of Redox-Active Polymers toward Safe Organic Bioelectronic Materials.** *Advanced materials (Deerfield Beach, Fla.)*
Giovannitti, A., Rashid, R. B., Thiburce, Q., Paulsen, B. D., Cendra, C., Thorley, K., Moia, D., Mefford, J. T., Hanifi, D., Weiyuan, D., Moser, M., Salleo, A., Nelson, et al
2020: e1908047
 - **Design and evaluation of conjugated polymers with polar side chains as electrode materials for electrochemical energy storage in aqueous electrolytes** *ENERGY & ENVIRONMENTAL SCIENCE*
Moia, D., Giovannitti, A., Szumska, A. A., Maria, I. P., Rezasoltani, E., Sachs, M., Schnurr, M., Barnes, P. F., McCulloch, I., Nelson, J.
2019; 12 (4): 1349–57
 - **The Role of the Side Chain on the Performance of N-type Conjugated Polymers in Aqueous Electrolytes** *CHEMISTRY OF MATERIALS*
Giovannitti, A., Maria, I. P., Hanifi, D., Donahue, M. J., Bryant, D., Barth, K. J., Makdah, B. E., Savva, A., Moia, D., Zetek, M., Barnes, P. F., Reid, O. G., Inal, et al
2018; 39 (9): 2945–53
 - **Redox-Stability of Alkoxy-BDT Copolymers and their Use for Organic Bioelectronic Devices** *ADVANCED FUNCTIONAL MATERIALS*
Giovannitti, A., Thorley, K. J., Nielsen, C. B., Li, J., Donahue, M. J., Malliaras, G. G., Rivnay, J., McCulloch, I.
2018; 28 (17)
 - **Controlling the mode of operation of organic transistors through side-chain engineering.** *Proceedings of the National Academy of Sciences of the United States of America*
Giovannitti, A., Sbircea, D., Inal, S., Nielsen, C. B., Bandiello, E., Hanifi, D. A., Sessolo, M., Malliaras, G. G., McCulloch, I., Rivnay, J.
2016; 113 (43): 12017-12022
 - **N-type organic electrochemical transistors with stability in water** *NATURE COMMUNICATIONS*
Giovannitti, A., Nielsen, C. B., Sbircea, D., Inal, S., Donahue, M., Niazi, M. R., Hanifi, D. A., Amassian, A., Malliaras, G. G., Rivnay, J., McCulloch, I.
2016; 7
 - **Molecular Design of Semiconducting Polymers for High-Performance Organic Electrochemical Transistors.** *Journal of the American Chemical Society*
Nielsen, C. B., Giovannitti, A., Sbircea, D., Bandiello, E., Niazi, M. R., Hanifi, D. A., Sessolo, M., Amassian, A., Malliaras, G. G., Rivnay, J., McCulloch, I.
2016; 138 (32): 10252-10259
 - **Enhancing the Backbone Coplanarity of n-Type Copolymers for Higher Electron Mobility and Stability in Organic Electrochemical Transistors.** *Chemistry of materials : a publication of the American Chemical Society*
Maria, I. P., Griggs, S., Rashid, R. B., Paulsen, B. D., Surgailis, J., Thorley, K., Le, V. N., Harrison, G. T., Combe, C., Hallani, R., Giovannitti, A., Paterson, A. F., Inal, et al
2022; 34 (19): 8593-8602
 - **Conjugated polymers for microwave applications: untethered sensing platforms and multifunctional devices.** *Advanced materials (Deerfield Beach, Fla.)*
Tan, S. T., Giovannitti, A., Marks, A., Moser, M., Quill, T. J., McCulloch, I., Salleo, A., Bonacchini, G. E.
2022: e2202994
 - **Tuning Organic Electrochemical Transistor Threshold Voltage using Chemically Doped Polymer Gates.** *Advanced materials (Deerfield Beach, Fla.)*
Tan, S. T., Lee, G., Denti, I., LeCroy, G., Rozyłowicz, K., Marks, A., Griggs, S., McCulloch, I., Giovannitti, A., Salleo, A.

2022: e2202359

- **Efficient Electronic Tunneling Governs Transport in Conducting Polymer-Insulator Blends.** *Journal of the American Chemical Society*
Keene, S. T., Michaels, W., Melianas, A., Quill, T. J., Fuller, E. J., Giovannitti, A., McCulloch, I., Talin, A. A., Tassone, C. J., Qin, J., Troisi, A., Salleo, A.
2022
- **Critical analysis of self-doping and water-soluble n-type organic semiconductors: structures and mechanisms** *JOURNAL OF MATERIALS CHEMISTRY C*
Cowen, L. M., Gilhooly-Finn, P. A., Giovannitti, A., LeCroy, G., Demetriou, H., Neal, W., Dong, Y., Westwood, M., Luong, S., Fenwick, O., Salleo, A., Heutz, S., Nielsen, et al
2022
- **Organic neuromorphic electronics for sensorimotor integration and learning in robotics.** *Science advances*
Krauhausen, I., Koutsouras, D. A., Melianas, A., Keene, S. T., Lieberth, K., Ledansour, H., Sheelamanthula, R., Giovannitti, A., Torricelli, F., McCulloch, I., Blom, P. W., Salleo, A., van de Burgt, et al
2021; 7 (50): eabl5068
- **Electrochemistry of Thin Films with In Situ/Operando Grazing Incidence X-Ray Scattering: Bypassing Electrolyte Scattering for High Fidelity Time Resolved Studies.** *Small (Weinheim an der Bergstrasse, Germany)*
Paulsen, B. D., Giovannitti, A., Wu, R., Strzalka, J., Zhang, Q., Rivnay, J., Takacs, C. J.
2021: e2103213
- **Operation mechanism of organic electrochemical transistors as redox chemical transducers** *JOURNAL OF MATERIALS CHEMISTRY C*
Tan, S., Keene, S., Giovannitti, A., Melianas, A., Moser, M., McCulloch, I., Salleo, A.
2021
- **The Effect of Alkyl Spacers on the Mixed Ionic-Electronic Conduction Properties of N-Type Polymers** *ADVANCED FUNCTIONAL MATERIALS*
Maria, I. P., Paulsen, B. D., Savva, A., Ohayon, D., Wu, R., Hallani, R., Basu, A., Du, W., Anthopoulos, T. D., Inal, S., Rivnay, J., McCulloch, I., Giovannitti, et al
2021
- **Side Chain Redistribution as a Strategy to Boost Organic Electrochemical Transistor Performance and Stability.** *Advanced materials (Deerfield Beach, Fla.)*
Moser, M., Hidalgo, T. C., Surgailis, J., Gladisch, J., Ghosh, S., Sheelamanthula, R., Thiburce, Q., Giovannitti, A., Salleo, A., Gasparini, N., Wadsworth, A., Zozoulenko, I., Berggren, et al
2020: e2002748
- **Temperature-resilient solid-state organic artificial synapses for neuromorphic computing** *SCIENCE ADVANCES*
Melianas, A., Quill, T. J., LeCroy, G., Tuchman, Y., v Loo, H., Keene, S. T., Giovannitti, A., Lee, H. R., Maria, I. P., McCulloch, Salleo, A.
2020; 6 (27)
- **Balancing Ionic and Electronic Conduction for High-Performance Organic Electrochemical Transistors** *ADVANCED FUNCTIONAL MATERIALS*
Savva, A., Hallani, R., Cendra, C., Surgailis, J., Hidalgo, T. C., Wustoni, S., Sheelamanthula, R., Chen, X., Kirkus, M., Giovannitti, A., Salleo, A., McCulloch, I., Inal, et al
2020
- **Polaron Delocalization in Donor-Acceptor Polymers and its Impact on Organic Electrochemical Transistor Performance.** *Angewandte Chemie (International ed. in English)*
Moser, M. n., Savva, A. n., Thorley, K. n., Paulsen, B. D., Hidalgo, T. C., Ohayon, D. n., Chen, H. n., Giovannitti, A. n., Marks, A. n., Gasparini, N. n., Wadsworth, A. n., Rivnay, J. n., Inal, et al
2020
- **Reversible Electronic Solid-Gel Switching of a Conjugated Polymer** *ADVANCED SCIENCE*
Gladisch, J., Stavrinidou, E., Ghosh, S., Giovannitti, A., Moser, M., Zozoulenko, I., McCulloch, I., Berggren, M.
2020; 7 (2): 1901144
- **Highly selective chromoionophores for ratiometric Na⁺ sensing based on an oligoethyleneglycol bridged bithiophene detection unit** *JOURNAL OF MATERIALS CHEMISTRY C*
Moser, M., Thorley, K. J., Moruzzi, F., Ponder, J. F., Maria, I. P., Giovannitti, A., Inal, S., McCulloch, I.
2019; 7 (18): 5359–65
- **Materials in Organic Electrochemical Transistors for Bioelectronic Applications: Past, Present, and Future** *ADVANCED FUNCTIONAL MATERIALS*
Moser, M., Ponder, J. F., Wadsworth, A., Giovannitti, A., McCulloch, I.

2019; 29 (21)

- **Nanoscale Ion-Doped Polymer Transistors** *NANO LETTERS*
Thiburce, Q., Giovannitti, A., McCulloch, I., Campbell, A. J.
2019; 19 (3): 1712–18
- **Nanoscale Ion-Doped Polymer Transistors.** *Nano letters*
Thiburce, Q., Giovannitti, A., McCulloch, I., Campbell, A. J.
2019
- **Influence of Water on the Performance of Organic Electrochemical Transistors** *CHEMISTRY OF MATERIALS*
Savva, A., Cendra, C., Giugni, A., Torre, B., Surgailis, J., Ohayon, D., Giovannitti, A., McCulloch, I., Di Fabrizio, E., Salleo, A., Rivnay, J., Inal, S.
2019; 31 (3): 927–37
- **Role of the Anion on the Transport and Structure of Organic Mixed Conductors** *ADVANCED FUNCTIONAL MATERIALS*
Cendra, C., Giovannitti, A., Savva, A., Venkatraman, V., McCulloch, I., Salleo, A., Inal, S., Rivnay, J.
2019; 29 (5)
- **Double doping of conjugated polymers with monomer molecular dopants** *NATURE MATERIALS*
Kiefer, D., Kroon, R., Hofmann, A. I., Sun, H., Liu, X., Giovannitti, A., Stegerer, D., Cano, A., Hynynen, J., Yu, L., Zhang, Y., Nai, D., Harrelson, et al
2019; 18 (2): 149–+
- **Subthreshold Operation of Organic Electrochemical Transistors for Biosignal Amplification** *ADVANCED SCIENCE*
Venkatraman, V., Friedlein, J. T., Giovannitti, A., Maria, I. P., McCulloch, I., McLeod, R. R., Rivnay, J.
2018; 5 (8): 1800453
- **Direct metabolite detection with an n-type accumulation mode organic electrochemical transistor** *SCIENCE ADVANCES*
Pappa, A., Ohayon, D., Giovannitti, A., Maria, L., Savva, A., Uguz, I., Rivnay, J., McCulloch, L., Owens, R. M., Inal, S.
2018; 4 (6): eaat0911
- **Lipid bilayer formation on organic electronic materials** *JOURNAL OF MATERIALS CHEMISTRY C*
Zhang, Y., Wustoni, S., Savva, A., Giovannitti, A., McCulloch, I., Inal, S.
2018; 6 (19): 5218–27
- **Enhanced n-Doping Efficiency of a Naphthalenediimide-Based Copolymer through Polar Side Chains for Organic Thermoelectrics** *ACS ENERGY LETTERS*
Kiefer, D., Giovannitti, A., Sun, H., Biskup, T., Hofmann, A., Koopmans, M., Cendra, C., Weber, S., Koster, L., Olsson, E., Rivnay, J., Fabiano, S., McCulloch, et al
2018; 3 (2): 278–85
- **Liquid-Solid Dual-Gate Organic Transistors with Tunable Threshold Voltage for Cell Sensing** *ACS APPLIED MATERIALS & INTERFACES*
Zhang, Y., Li, J., Li, R., Shircea, D., Giovannitti, A., Xu, J., Xu, H., Zhou, G., Bian, L., McCulloch, I., Zhao, N.
2017; 9 (44): 38687–94
- **Sodium and Potassium Ion Selective Conjugated Polymers for Optical Ion Detection in Solution and Solid State** *ADVANCED FUNCTIONAL MATERIALS*
Giovannitti, A., Nielsen, C. B., Rivnay, J., Kirkus, M., Harkin, D. J., White, A. P., Sirringhaus, H., Malliaras, G. G., McCulloch, I.
2016; 26 (4): 514–23
- **Single and Multiple Additions of Dibenzoylmethane onto Buckminsterfullerene** *EUROPEAN JOURNAL OF ORGANIC CHEMISTRY*
Giovannitti, A., Seifermann, S. M., Bihlmeier, A., Muller, T., Topic, F., Rissanen, K., Nieger, M., Kloppe, W., Braese, S.
2013; 2013 (35): 7907–13