

Unit Name

pi-Conjugated Polymers Unit
Professor Christine K Luscombe

Collaborations

Lilo Pozzo, University of Washington, Seattle, USA, Use of Neutron and X-Ray Scattering to Elucidate the Structure of Conjugated Polymers

Alberto Salleo, Stanford University, USA, Understanding the performance of donor-acceptor semiconducting polymers

Natalie Stingelin, Georgia Tech, USA, Understanding the performance of donor-acceptor semiconducting polymers

Xiaodan Gu, University of Southern Mississippi, USA, Understanding the performance of donor-acceptor semiconducting polymers

Patrick Théato, Karlsruhe Institute of Technology, Germany, Polymerization Terminology

Christopher M. Fellows, University of New England, Australia, Polymerization Terminology

John Matson, Virginia Tech, USA, Polymerization Terminology

Graeme Moad, CSIRO, Australia, Polymerization Terminology

Roger Hiorns, CNRS, France, Polymerization Terminology

Itaru Osaka, Hiroshima University, Japan, Understanding charge mobility and conductivity of semiconducting polymers

Helen Tran, University of Toronto, Canada, Study of degradable and stretchable semiconducting polymers

Jiří Vohlídal, Charles University, Czech Republic, Polymerization Terminology

Michael Hess, University of North Texas, USA, Polymerization Terminology

Research Personnel

Wissem Khelifi, Postdoctoral Scholar

Baitan Chakraborty, Postdoctoral Scholar

Nadege Bonnet, Research Unit Technician

Yuan-Qiu-Qiang Yi, Postdoctoral Scholar

Robin Troiville Cazilhac, Postdoctoral Scholar

Charis Winder, Research Unit Technician

Fathy Hassan, Postdoctoral Scholar

Preeti Yadav, Postdoctoral Scholar

Isha Sanskriti, Postdoctoral Scholar

Samantha Phan, Postdoctoral Scholar

Makiko Emori, PhD Student

Holly Elaine Gill, PhD Student

Abdulrahman Ibrahim Abdulrahman Abdallah Bakry, PhD Student

Shuk Ying Kwan, PhD Student

Ian Christopher Johnson, PhD Student

Syeda Bakhtawar Zahra, PhD Student

Nivedha Velmurugan, PhD Student

Tom Tassilo Wilfling, PhD Student

Ainhoa Hermida Amado, Research Intern

Edward Christopher Neville, Research Intern

Yifei He, Visiting Research Student

Jonathan Josh Ramtahal, Visiting Research Student

Scholarly Contributions and Creative Productions (by Faculty)

Book Chapter

1. He, Y.; Sanskriti, I.; Velmurugan, N.; Wilfling, T.; Luscombe, C. K.
Conjugated Polymers and Their Applications in Organic Field Transistors, Organic Electrochemical Transistors, and Organic Thermoelectrics. In *Conjugated Polymer Synthesis and Materials Applications*; Wiley, 2025; pp 257–298.
<https://doi.org/10.1002/9783527849451.ch10>Digital Object Identifier (DOI)

Journal Article

1. Hiorns, R. C.; Vohlídal, J.; Boucher, R.; Chan, C. H.; Fellows, C. M.; Hess, M.; Jones, R. G.; Kratochvíl, P.; Luscombe, C. K.; Matson, J. B.; Moad, G.; Philippova, O. E.; Slomkowski, S.; Stingelin, N.; Théato, P.; Vairon, J.-P.; Vert, M.
A Brief Guide to Polymer Terminology (IUPAC Technical Report). *Pure and Applied Chemistry* 2026, 98, 1–8.
<https://www.degruyterbrill.com/document/doi/10.1515/pac-2023-0304/html>
2. Guio, L.; Sommerville, P.; Pozzo, L. D.; Luscombe, C. K.
Solvent-Tuned Aggregation and Its Limited Functional Impact in a Rigid-Rod Indacenodithiophene-Benzothiadiazole Copolymer. *ACS Polymers Au* 2026, 6, 388–398.
<https://pubs.acs.org/doi/full/10.1021/acspolymersau.5c00155>
3. Bakry, A.; Yadav, P.; Khelifi, W.; Khusnutdinova, J.; Luscombe, C. K.
Uncovering a Radical-Mediated Mechanism in the Kumada Catalyst Transfer Polymerization of Glycolated Polythiophenes. *Polymer Chemistry* 2026, 17, 584–592.
<https://doi.org/10.1039/D5PY01139F>
4. Yi, Y.-Q.-Q.; Yamanaka, K.; Lei, K.; Magni, A.; Salleo, A.; Osaka, I.; Luscombe, C. K.
Additive-Induced Morphology Change of Polymer Film Enables Enhanced Charge Mobility and Faster Organic Electrochemical Transistor Switching. *ACS Applied Polymer Materials* 2026, 8, 2077–2085.
<https://pubs.acs.org/doi/10.1021/acsapm.5c04176>
5. Yadav, P.; Yamamoto, S.; Yamanaka, K.; Wang, H.; Bonnet, N.; Qi, Y.; Osaka, I.; Luscombe, C. K.
Chloroform Outperforms Chlorobenzene for Enhanced Mobility in Amphiphilic Polymer OFETs. *RSC Applied Polymers* 2026, 4, 716–724.
<https://pubs.rsc.org/en/content/articlehtml/2026/lp/d5lp00320b>
6. Sanskriti, I.; Luscombe, C. K.
Evolution of Catalyst Transfer Polymerization toward Complex Conjugated Polymer Architectures. *Polymer Journal* 2026.

<https://doi.org/10.1038/s41428-026-01146-9>

- Ramtahal, J.; Sugimoto, K.; Phan, S.; Patouittet, Y.; Troublé, R.; Luscombe, C. K.; Agostini, S.
An Integrated Assessment of Microplastic Pollution in Coastal Surface Water and sediment of Japan. *Environmental Science and Technology* 2025, 59, 17746–17759.
<https://pubs.acs.org/doi/10.1021/acs.est.5c02645>
- Spring, M.; Schroder, P.; Popovici, A.; O’Meara, N.; Corsi, I.; Aliani, S.; Boodhoo, K.; Gobin, J.; Godoy-Faundez, A.; Kahru, A.; Luscombe, C. K.; Mangala Praveena, S.; Mustapha Olaitan, A.; Wang, P.; Al Bakain, R.; Sakellariadou, F.
Effective Progress and Implementation of the INC-5 Plastics Treaty through Scientific Guidance. *Nature Sustainability* 2025, 8, 728–730.
- Sanskriti, I.; Luscombe, C. K.
Advancements in Polymer-Based Systems for New-Age Organic Electronics. *Koubunshi* 2025, 74, 437.
https://www.jstage.jst.go.jp/article/kobunshi/74/8/74_437/article/-char/ja/
- Lin, A.; LeCroy, G.; Lo, S.; Sharif, A.; Wang, Y.; Salleo, A.; Gu, X.; Luscombe, C. K.; Tran, H.
Soft and Stretchable Thienopyrroledione-Based Polymers via Direct Arylation. *Advanced Electronic Materials* 2025, 11, 2400756.
<http://doi.org/10.1002/aelm.202400756>

Other Scholarly Work

- Luscombe, C. K.
IUPAC 通信: 第6回IUPACの未来 : 変革と科学絵の再焦点. *化学と工業* 2026, 79, 049–050.
- Luscombe, C. K.; Hasegawa, M.
IUPAC 通信. *化学と工業* 2025, 78, 644.
- Luscombe, C. K.; Southall, M. E.
Fifteen Years of Polymer Chemistry. *Polymer Chemistry* 2025, 16, 7–10.
- Luscombe, C. K.
仕事と私事の交差点. *Koubunshi* 2025, 74, 436.
https://doi.org/10.1295/kobunshi.74.8_436

Poster Presentation at Conference

- Yi, Y.-Q.-Q.; Su, W.; Luscombe, C. K.
Nondestructive Direct Patterning of Both Hole Transport and Emissive Layers for Pixelated Quantum-Dot Light-Emitting Diodes. The 13th International Symposium on Dynamic Exciton (ISDyEx) 2025.
- Velmurugan, N.; Hassan, F.; Yamane, Y.; Luscombe, C. K.
One-Step Palladium-Catalyzed Heterocyclic Ring-Closure of Benzofurans with Aryl Iodides through a Heck-Type Pathway. The 13th International Symposium on Dynamic Exciton (ISDyEx) 2025.

Presentation at Conference

- Luscombe, C. K.
Molecular Control of 1D Polaron Delocalization Driving High Mobility in Indacenodithiophene Copolymers. CEMS International Symposium on Supramolecular Chemistry and Functional Materials 2026.
- Luscombe, C. K.
Advancing the Frontiers of Organic Electronics Through Precision Synthesis and Molecular Design. 17th Annual International Workshop on Advanced Materials 2026.
- Luscombe, C. K.

- The Role of Monomer Purity over Stereochemistry in Dictating the Morphology and Optoelectronic Properties of a Chiral Conjugated Polymer. ACS Spring National Meeting 2026.
4. Radical-Mediated Polymerizations for the Synthesis of Conjugated Polymers. Japan Belgium Polymer Symposium 2025.
 5. Luscombe, C. K.
How Precise Synthesis Can Reveal Unexpected Behavior in Semiconducting Polymers. Beilstein Organic Chemistry Symposium: Organic Semiconductor Materials: Challenges and Opportunities 2025.
 6. Luscombe, C. K.
The Development of Intrinsic Stretchable Semiconducting Polymers. SPSJ 74th Symposium on Macromolecules 2025.
 7. Luscombe, C. K.
Probing the Unique Charge Transport Pathways in Indacenodithiophene (IDT)-Based Copolymers. The 9th International Symposium on Polymer Chemistry 2025.
 8. Luscombe, C. K.
A Post-Processing Approach to Unlock Mixed Conduction in Organic Semiconductors. The 17th Asian Conference on Organic Electronics 2025.
 9. Luscombe, C. K.
Trials and Tribulations in Semiconducting Polymer Syntheses. Royal Society of Chemistry (RSC) and European Materials Research Society (E-MRS) Joint Conference 2025.
 10. Luscombe, C. K.
Exploring Polaron and Exciton Delocalization through the Control over Polymer Structure. NPG Asia Materials Symposium 2025.
 11. Luscombe, C. K.
Synthesis as a Tool for Expanding the Scope of Semiconducting Polymers. 39th Australasian Polymer Symposium 2025.
 12. Luscombe, C. K.
In Situ Strategies for Achieving Organic Mixed Ionic and Electronic Conductors. MRS Fall National Meeting 2025.
 13. Luscombe, C. K.
Exploring Polaron and Exciton Delocalization through the Control over Polymer Structure. Pacificchem 2025.
 14. Luscombe, C. K.
Unraveling the Polymerization Mechanism of Glycolated Polythiophenes. Pacificchem 2025.
A Post-Processing Approach to Unlock Mixed Conduction in Organic Semiconductors. MRS Spring National Meeting 2025.
 15. Luscombe, C. K.
Designing Conjugated Polymers for Mixed Ionic-Electronic Transport. 2nd OIST-OU Joint Symposium on Emergent Functional Materials and Reactions 2025.
 16. Luscombe, C. K.
A Post-Processing Approach to Unlock Mixed Conduction in Organic Semiconductors. The 16th International Symposium on Functional pi-Electron Systems 2025.
 17. Luscombe, C. K.
Exploring Semiconducting Polymers: Molecular Design and Fundamental Insights. Polymers Gordon Research Conference 2025.
 18. Luscombe, C. K.
Advancing the Frontiers of Semiconducting Polymers through Precision Synthesis. IUPAC World Chemistry Congress 2025.
 19. Luscombe, C. K.

- Exploring Semiconducting Polymers: Molecular Design and Fundamental Insights. Advances in Organic Mixed Ionic-Electronic Conductors: Novel Materials to Devices 2025.
20. Luscombe, C. K.
Unraveling Ribbon-like Semiconducting Polymers. Pacific Polymer Conference 2025.
 21. Luscombe, C. K.
Mechanistic Insight as a Tool for Advancing Conjugated Polymer Synthesis. ACS Fall National Meeting 2025.
 22. Luscombe, C. K.
Investigating Polaron Delocalization in Semiconducting Polymers. Symposium on Dynamic Excitons 2025.
 23. Luscombe, C. K.
A Post-Processing Approach to Unlock Mixed Conduction in Organic Semiconductors. 10th International Winterschool on Bioelectronics (BioEI2025) 2025.
 24. Luscombe, C. K.
Indacenodithiophene Polymers: Tuning Properties for next Generation Electronics. Spring Meeting of the Polymer Society of Korea 2025.
 25. Luscombe, C. K.
The Unexpected Behavior during the Synthesis of Glycolated Polythiophenes. 74th SPSJ Annual Meeting 2025.

Seminars

1. Luscombe, C. K.
Advancing the Frontiers of Semiconducting Polymers through Precision Synthesis. South China University of Technology. 2025.
2. Luscombe, C. K.
Advancing the Frontiers of Semiconducting Polymers through Precision Synthesis. University of Science and Technology of China. 2025.
3. Luscombe, C. K.
Advancing the Frontiers of Semiconducting Polymers through Precision Synthesis. Peking University, China. 2025.
4. Luscombe, C. K.
Elucidating Charge Transport in Semiconducting Polymers. Tokyo Institute of Science. 2025.

Scholarly Contributions (by Unit Members)

Name of Unit Member	Type	Title	Outlet	Publisher	Year Pub
Fathy Hassan	Journal Article	Tuning the Circularly Polarized Reflection from Cholesteric Hydroxypropyl Cellulose Using Molecular Photoswitches	Angewandte Chemie International Edition	Wiley	2025
Fathy Hassan	Journal Article	Macrocyclic Covalent Encapsulation of a Multi-Resonant Emitter: Understanding and Controlling Interactions in Highly Efficient Deep-Blue OLEDs	Journal of the American Chemical Society	ACS	2026
Syeda Bakhtawar Zahra	Journal Article	Versatile biological activities of thiosemicarbazones and their metal complexes	Journal of Molecular Structure		2025
Holly Gill	Poster Presentation at Conference	Photochromic Conjugated Polymers for Organic Electrochemical Devices	39th Australasian Polymer Symposium, Canberra, Australia		2025

Name of Unit Member	Type	Title	Outlet	Publisher	Year Pub
Nivedha Velmurugan	Poster Presentation at Conference	One-Step Palladium-Catalyzed Ring Closure of Benzofurans: A Mild Route towards Oxygen-Fused Ladder π -Conjugated Polymers for Optoelectronics	Beilstein Symposium on Organic Semiconductor		
Makiko Emori	Presentation at Conference	Development of Semiconducting Polymers Based on Fused Heteroacenes via Direct Arylation Polymerization	APEC Young Chemistry Leaders' Forum		
Robin Troiville Cazilhac	Seminars	Designing efficient light-emissive polymers: from macromolecular structure to optical gain	Sorbonne University Paris		2025

Honors, Awards & Fellowships

Term 2 2026 - Term 2 2026	Dresselhaus Memorial Lecturer Award, 2026, Ras Al Khamiah Center for Advanced Materials [Fiscal Year: 2025]
Term 2 2024 - Ongoing	Elected Member of the IUPAC's Executive Board, IUPAC (国際純正・応用化学連合) 理事就任, 2024, International Union of Pure and Applied Chemistry (IUPAC) [Fiscal Year: 2024-01-01]
Term 2 2024 - Ongoing	Elected Member of the Board of Directors for the Materials Research Society, 材料研究学会の理事に選出されたメンバー, 2024, Materials Research Society [Fiscal Year: 2024-01-01]

External Service

Term 2 2026 - Ongoing	Chair of the Science Board, IUPAC [Fiscal Year: 2025]
Term 2 2026 - Ongoing	Vice President of IUPAC, IUPAC [Fiscal Year: 2025]
Term 2 2025 - Term 2 2025	Reviewer for PMSE Early Investigator Award, ACS PMSE [Fiscal Year: 2024]
Term 3 2024 - Ongoing	Editor-in-Chief, Polymer Chemistry, Royal Society of Chemistry [Fiscal Year: 2024]
Term 3 2024 - Ongoing	External Search Committee member for Professor in Macromolecular Chemistry, Uppsala University [Fiscal Year: 2024]
Term 2 2024 - Term 1 2025	IUPAC Polymer Division Past President, IUPAC [Fiscal Year: 2024]
Term 2 2024 - Term 1 2025	[University-Led SDGs] Planning Committee for Coordinated Commissioned Work, University of Ryukyu [Fiscal Year: 2024]
Term 2 2024 - Ongoing	Executive Board Member, IUPAC [Fiscal Year: 2024]
Term 2 2024 - Ongoing	Board of Directors, Materials Research Society [Fiscal Year: 2024]
Term 3 2022 - Ongoing	Board member for the Society of Polymer Science Japan, Society of Polymer Science Japan [Fiscal Year: 2022]
Term 1 2021 - Ongoing	Reviewer, Regular reviewer for funding agencies (National Science Foundation, Department of Energy, Hong Kong Research Grants Council, National Science Center (Poland), European Research Council, National Sciences and Engineering Research Council of Canada, Swiss National Science Foundation) [Fiscal Year: 2021]
Term 1 2021 - Ongoing	Reviewer, Regular reviewer for many journals, reviewing >100 papers a year [Fiscal Year: 2021]
Term 2 2021 - Ongoing	Editorial Advisory Board for Synthetic Metals, Synthetic Metals [Fiscal Year: 2021]
Term 2 2021 - Ongoing	Editorial Advisory Board for Chemical Reviews, ACS [Fiscal Year: 2021]

Term 2 2020 - Ongoing	Editorial Advisory Board, ACS Applied Polymer Materials, ACS [Fiscal Year: 2021]
Term 2 2020 - Ongoing	Editorial Board, Polymer Journal, Society of Polymer Science Japan [Fiscal Year: 2021]
Term 2 2019 - Ongoing	Editorial Advisory Board, Annual Reviews of Materials Research, Annual Reviews of Materials Research [Fiscal Year: 2021]
Term 2 2019 - Ongoing	Editorial Advisory Board, Advanced Functional Materials, Advanced Functional Materials, Wiley [Fiscal Year: 2021]
Term 2 2016 - Ongoing	Editorial Advisory Board, Journal of Applied Physics, Journal of Applied Physics, American Institute of Physics [Fiscal Year: 2021]
Term 2 2014 - Ongoing	International Advisory Board for Advanced Electronic Materials, Advanced Electronic Materials, Wiley [Fiscal Year: 2021]
Term 2 2014 - Ongoing	Editorial Advisory Board for Polymer International, Polymer International [Fiscal Year: 2021]
Term 3 2013 - Ongoing	Member of IUPAC Polymer Division Subcommittee on Polymer Education, IUPAC [Fiscal Year: 2021]
Term 3 2012 - Ongoing	Member of IUPAC Polymer Division Subcommittee of Polymer Terminology, IUPAC [Fiscal Year: 2021]

Other Institutional Service

Term 3 2025 - Term 3 2025	Presentation about research unit research to University of Groningen students [Fiscal Year: 2025]
Term 2 2025 - Term 2 2025	2025 IUPAC GWB at OIST: Accelerating Diversity in Science, OIST [Fiscal Year: 2024]
Term 1 2022 - Ongoing	Research Staff Appointment Committee, OIST [Fiscal Year: 2022]

Outreach Activities [For Unit Members Only]

Term 2 2026	Shuk Ying Kwan, Outreach Program Assistant, Yokkaichi High School [Fiscal Year: 2025]
Term 1 2025	Fathy Hassan, Poster evaluation for SEED Event, Super Science High School [Fiscal Year: 2025]
Term 1 2025	Shuk Ying Kwan, Outreach Program Assistant, Kyoto Prefectural Momoyama High School [Fiscal Year: 2025]
Term 1 2025	Robin Troiville Cazilhac, Career Talk, Okinawan International Schools [Fiscal Year: 2025]
Term 3 2025	Syeda Bakhtawar Zahra, Mentor, Keio University [Fiscal Year: 2025]
Term 3 2025	Abdulrahman Ibrahim Abdulrahman Abdallah Bakry, Mentor, Keio University [Fiscal Year: 2025]
Term 3 2025	Nivedha Velmurugan, Science Outreach Event, Tokyo Yamawaki High School [Fiscal Year: 2025]
Term 2 2025	Holly Gill, Chess classes for primary school children, OIST School Aged Program [Fiscal Year: 2025]
Term 2 2025	Nivedha Velmurugan, Gave a public presentation for the Okinawa Electric Power Company's (Okiden's) 47th Youth Science Exhibition [Fiscal Year: 2025-02-16]

Workshops and Seminars [Organized and Hosted by Faculty/Units]

Speaker Name(s)	Title	Location	Date
Marina Freitag	Professor	OIST	2026
Izumi Fukunaga	GWB 2026: Many Voices, One Science	OIST	2026
Mircea Dinca	Professor	OIST	2026
Lydia Sosa Vargas	Professor	OIST	2025
Louisa De Cola	Professor	OIST	2025
Quan Li	Professor	OIST	2025
Bob Schroeder	Professor	OIST	2025
Joost Kimpel		OIST	2025
Tomonaga Okabe	Professor	OIST	2025
Thuc-Quyen Nguyen	Professor	OIST	2025