**Laure V. Kayser, Ph.D.**
Assistant Professor
Department of Materials Science and Engineering
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Google Scholar Citations

## ACADEMIC POSITIONS

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|---|---|
| Assistant Professor, Materials Science and Engineering (MSEG), University of Delaware, | August 2019 – present |
| Assistant Professor, Chemistry and Biochemistry (CBC), University of Delaware | August 2019 – present |
| Co-director of professional development, Computing and Data Science Training for Materials Innovation, Discovery, AnalyticS (NRT: CDST-MIDAS) | September 2021– present |
| Affiliated faculty, Center for Plastics Innovation (CPI) | January 2021 – present |
| Affiliated faculty, Center for Research in Soft Matter and Polymers (CRiSP) | August 2019 – present |
| Affiliated faculty, Chemistry-Biology Interface (CBI) program | August 2019 – present |
| Affiliated faculty, Delaware Energy Institute (DEI) | August 2019 – present |
| Post-Doctoral Researcher in NanoEngineering, University of California San Diego, USA, *with Prof. Darren Lipomi* | October 2016 – May 2019 |

## EDUCATION

**Ph.D. in Chemistry, McGill University, Montreal, Canada, *with Prof. Bruce Arndtsen*** January 2010 – April 2016
Dissertation: New Multicomponent Polymerization Approaches to Conjugated Poly(heterocycles) and Poly(1,3-dipoles)

**M.Sc. in Molecular and Supramolecular Chemistry, University of Strasbourg, France,** September 2007 – June 2009
***with Prof. Pierre Braunstein***
Dissertation: Multinuclear Nickel Complexes Bearing N,O-Chelating Ligands for Application as Single Molecular Magnets

**B.Sc. in Chemistry *with honors,* University of Strasbourg, France** September 2004 – June 2007

## PAST and CURRENT FUNDING

- PI: University of Delaware Research Foundation (UDRF) award, $50,000, June 2022 to May 2024
- Affiliated: NRT: CDST-MIDAS, National Science Foundation (NSF), $2,999,452, September 2021 to August 2026
- PI: NIH COBRE, Discovery of Chemical Probes and Therapeutic Leads, seed funding, $391800, July 2021 to June 2022
- PI: Center for Plastics Innovation, seed funding, $50,000, January 2021 to June 2021
- PI: University of Delaware-Argonne National Laboratories, seed funding, $110,000, June 2020 to May 2022
- PI: HensWEAR pilot project funding, $50,000, University of Delaware, December 2019 to June 2020

## SELECTED HONORS

- University of Delaware Research Foundation (UDRF) award, 2022
- Discussion leader, Bioelectronics Gordon Research Conference, 1st Edition, 2019
- Best post-doc award, Department of NanoEngineering, UC San Diego, 2019
- Emerging Materials Researcher, Canadian Society for Chemistry, Edmonton, AB, 2018
- Best white paper at the Marcus Wallenberg Young Researcher Symposium, Stockholm, Sweden, 2015
- Robert Zamboni chemistry prize, Department of Chemistry, McGill University, 2015
- NSERC CREATE in Green Chemistry fellowship (2014 – 2015)
- Marcus Wallenberg Young Researcher Award, 2014
- T. Sterry Hunt award for excellence in demonstrating in the undergraduate organic laboratories, Department of Chemistry, McGill University, 2012

**PUBLICATIONS** ***(23 peer-reviewed publications, 1003 citations, h-index: 15)***

**Since joining the University of Delaware**

23. D.M. Nguyen, Y. Wu, A. Nolin, C.-Y. Lo, T. Guo, C. Dhong, L.V. Kayser*, "General Strategy to Synthesize Electronically-Conductive Hydrogels by in-situ Polymerization of a Water-Soluble EDOT-Derived Monomer" invited article, *Advanced Engineering Materials*, "Women in Engineering" special feature. *Adv. Eng. Mater.* **2022**, 2200280.
22. A. Nolin, K. Pierson, R. Hlibok, C.-Y. Lo, L.V. Kayser, C. Dhong*, "Controlling fine touch sensation with polymer crystallinity". *Soft Matter,* **2022,** *18,* 3928.
21. C.-Y. Lo, Yuhang Wu, E. Awuyah, D. Meli, D.M. Nguyen, R. Wu, B. Xu, J. Strzalka, J. Rivnay, D.C. Martin, L.V. Kayser*, "Influence of the Molecular Weight and Size Distribution of PSS on Mixed Ionic-Electronic Transport in PEDOT:PSS"*, Submitted February 2022,* invited article and cover, *Polymer Chemistry*, "Tailoring dispersity and shape of molecular weight distributions" themed collection. *Polym. Chem.* **2022**, *13*, 2707.
20. A. Nolin, A. Licht, K. Pierson, C.-Y. Lo, L. V. Kayser, C. Dhong, "Predicting Human Touch Sensitivity to Single Atom Substitutions in Surface Monolayers" *Soft Matter*, **2021**, *17*, 5050.
19. L. K. G. Ackerman-Biegasiewicz, D. M. Arias-Rotondo, K. F. Biegasiewicz, E. Elacqua, M. R. Golder, L. V. Kayser, J. R. Lamb, C. M. Le, N. A. Romero, S. M. Wilkerson-Hill, D. A. Williams, "Organic Chemistry: A Retrosynthetic Approach to a Diverse Field" *ACS Cent. Sci.* **2020**, *6*, 1845.

**Prior to joining the University of Delaware**

18. C. V. Keef, **L. V. Kayser**, S. Stronbol, C. W. Carpenter, N. B. Root, M. Finn III, T. F. O'Connor, S. N. Abuhamdieh, D. M. Davies, R. Runser, Y. S. Meng, V. S. Ramachandran, and D. J. Lipomi,* "Virtual Texture Generated Using Elastomeric Conductive Block Copolymer in a Wireless Multimodal Haptic Glove" *Adv. Intelligent Syst.* **2020**, 202000018.
17. C. Dhong,* R. Miller, N. B. Root, S. Gupta, L**. V. Kayser**, C. W. Carpenter, K. J. Loh, V. S. Ramachandran, D. J. Lipomi,* "Role of Indentation Depth and Contact Area on Human Perception of Softness for Haptic Interfaces" Science Advances, **2019**, *5*, eaaw8845.
16. **L. V. Kayser** and D. J. Lipomi,* "Stretchable Conductive Polymers and Composites Based on PEDOT and PEDOT:PSS" *Advanced Materials*, **2019**, 1806133.
15. **L. V. Kayser**, M. D. Russell, D. Rodriquez, S. N. Abuhamdieh, C. Dhong, S. Khan, A. N. Stein, J. Ramírez, and D. J. Lipomi,* "RAFT Polymerization of an Intrinsically Stretchable Water-Soluble Block Copolymer Scaffold for PEDOT" *Chem. Mater.* **2018**, *30*, 4459.
14. F. Sugiyama, A. T. Kleinschmidt, **L. V. Kayser**, M. A. Alkhadra, J. M.-H. Wan, A. S.-C. Chiang, D. Rodriquez, S. E. Root, S. Savagatrup, D. J. Lipomi,* "Stretchable and Degradable Semiconducting Block Copolymers" *Macromolecules*, **2018**, *51*, 5944.
13. F. Sugiyama, A. T. Kleinschmidt, **L. V. Kayser**, D. Rodriquez, M. Finn III, M. A. Alkhadra, J. M.-H. Wan, J. Ramirez, A. S.-C. Chiang, S. E. Root, S. Savagatrup, D. J. Lipomi,* "Effects of Flexibility and Branching of Side Chains on the Mechanical Properties of Low-Bandgap Conjugated Polymers" *Polym. Chem.* **2018**, *9*, 4354.
12. C. Dhong,* **L. V. Kayser**, A. Shin, R. Arroyo, M. Finn III, A. T. Kleinschmidt, and D. J. Lipomi,* "Role of Fingerprint-Inspired Relief Structures in Elastomeric Slabs for Detecting Frictional Differences Arising from Surface Monolayers" *Soft Matter,* **2018**, *14*, 7483.
11. C. Dhong, S. Edmunds, J. Ramirez, **L. V. Kayser**, F. Chen, J. Jokerst, D. J. Lipomi,* "Optics-Free, Non-Contact Measurements of Fluids, Bubbles and Particles in Microchannels using Metallic Nanoislands on Graphene" *Nano Lett.* **2018**, *18*, 5308.
10. Y. Shi, H. Tang, S. Jiang, **L. V. Kayser**, M. Li, F. Liu, F. Ji, D. J. Lipomi,* S. P. Ong,* and Z. Chen,* "Understanding the Electrochemical Properties of Naphthalene Diimide: Implication for Stable and High-Rate Lithium-Ion Battery Electrodes" *Chem. Mater.* **2018**, *30*, 3508.
9. S. E. Root, C. W. Carpenter, **L. V. Kayser**, D. Rodriquez, D. Davies, S. Wang, Y. Meng,* and D. J. Lipomi,* "Ionotactile Stimulation: Nonvolatile Ionic Gels for Human-Machine Interfaces" *ACS Omega* **2018**, *3*, 662.
8. **L. V. Kayser**, E. M. Hartigan, and B. A. Arndtsen,* "Multicomponent Coupling Approach to Cross-Conjugated Polymers from Vanillin-Based Monomers" *ACS Sus. Chem. Eng.* **2016**, *4*, 6263.

7. **L. V. Kayser**, M. Vollmer, M. Welnhofer, H. Krikcziokat, K. Meerholz,* and B. A. Arndtsen,* "Metal-Free, Multicomponent Synthesis of Pyrrole-Based π-Conjugated Polymers from Imines, Acid Chlorides and Alkynes" *J. Am. Chem. Soc.* **2016**, *138*, 10516.
6. D. C. Leitch,† **L. V. Kayser**,† Z.-Y. Han,† A. R. Siamaki, E. N. Keyzer, A. Gefen, and B. A. Arndtsen,* "A Palladium-Catalyzed Multicomponent Coupling Approach to Conjugated Poly(1,3-Dipoles) and Polyheterocycles" *Nature Commun.* **2015**, *6*, 7411, † Authors contributed equally.
5. J. S. Quesnel, **L. V. Kayser**, A. Fabrikant, and B. A. Arndtsen,* "Acid Chloride Synthesis via the Palladium-Catalyzed Chlorocarbonylation of Aryl Bromides" *Chem. Eur. J.* **2015**, *21*, 9550.
4. S. Hameury, **L. V. Kayser**, R. Pattacini, P. Rosa, A.-L. Barra, and P. Braunstein,* "Synthesis, Structures and Single Molecule Magnet Behaviour of High Nuclearity Ni(II) Dicubane-type Complexes with Pyridyl-Alcohol Ligands" *Chem. Plus Chem.* **2015**, *14*, 1312.
3. S. Hameury, **L. V. Kayser**, R. Pattacini, G. Rogez,* W. Wernsdorfer,* and P. Braunstein,* "Synthesis of Cubane-Type Ni(II) Complexes from Pyridyl-Alcohol Ligands; Their Single-Molecule Magnet Behavior" *Dalton Trans.* **2013**, *42*, 5013.
2. H. Staub, R. Guillet-Nicolas, N. Even, **L. V. Kayser**, F. Kleitz,* and F.-G. Fontaine,* "Substantiating the Influence of Pore Surface Functionalities on the Stability of Grubbs Catalyst in Mesoporous SBA-15 Silica" *Chem. Eur. J.* **2011**, *17*, 4254.
1. **L. V. Kayser**, R. Pattacini, G. Rogez,* and P. Braunstein,* "Nuclearity of Nickel and Mixed Sodium-Nickel Complexes: Dependence on the Spacer in Chelating Pyridine-Alcoholate Ligands" *Chem. Commun.* **2010**, *46*, 6461.

## PATENTS and INVENTION DISCLOSURES

**Invention disclosure**: UD22-07, *Phospholipid-functionalized thiophene monomers and polymers,* David Martin, Laure Kayser, Quintin Baugh, and Chun-Yuan Lo (2022)

**Provisional Patent**: *Reversibly Gellable Conductive Polymer Based on PEDOT:PSS,* Laure Kayser, and Vidhika Damani (2022)

## TEACHING

Materials Chemistry and Kinetics, core sophomore undergraduate class, MSEG 212 (UD) — Spring 2021 & 2022

Undergraduate Laboratory I (MSEG 305), Polymer Lab, content development, testing, and consulting — Summer & Fall 2021

Principles of Polymerization, core graduate class (2 CBC, 4 MSEG, 1 CBE and 1 ME students, and 2 CBC auditing students), virtual, MSEG 832 (UD) — Fall 2020

Organic Electronics, graduate elective, (students from MSEG, CBC, CBE and ECE), in person and virtual, MSEG 667 (UD) — Spring 2020 & Fall 2021

Guest lecturer for NANO 134 at UC San Diego: Polymeric materials — May 2018
RAFT polymerization, GPC, stretchable electronics – 1 lesson

Guest lecturer for NANO 101 at UC San Diego: Introduction to NanoEngineering — January 2018
Introduction to Organic Chemistry – 2 lessons (available on YouTube)

Teaching assistant, McGill University — 2010 – 2013
- First and second year undergraduate organic chemistry laboratories
- Third year undergraduate advanced organic chemistry laboratory course for biochemistry majors
- Third year undergraduate integrated organic-inorganic laboratories

## LEADERSHIP, MENTORING, AND SERVICE

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| **PhD graduate students currently advised**: Vidhika Damani (Y3, PhD candidate, MSEG), Chun-Yuan Lo (Y3, PhD candidate, CBC), Dan My Nguyen (Y3, PhD candidate, CBC), Elorm Awuyah (Y3, CBC and CBI), Tulaja Shrestha (Y2, CBC), Allison Koopman (Y2, MSEG), Peter Osazuwa (Y1, MSEG), Ai Nin Yang (Y1, CBC) | 2019 – Present |
| **MSc graduate students currently co-advised**: Destiny King (Delaware State University, Chem) | 2022 – Present |
| **Undergraduate students (past and present)**: Ethan Mackey (Y1, CBC), Julian Alberto (Y3, CBE), Marina Hastings (Y3, MSE), Harrison Goehrig (Y2, CPI REU) | 2021 – Present |
| **Thesis committees:** Kyle Korman (CBC), Yuhang Wu (MSEG), Junghyun Lee (MSEG), Madison Anonick (CBC), Joshua Watson (undergraduate senior thesis, CBE), Arjita Kulshreshtha (CBE) | 2019 - Present |
| **Reviewer for peer-reviewed publications**: ACS Applied Materials and Interfaces, Advanced Materials, Soft Matter, ACS Applied Bio Materials, Chemical Science, Nature Chemistry, Matter, Nature Communications, ACS Polymers Au, J. Mater. Chem. C, Macromolecules, Journal of Applied Physics, Macromol. Chem. Phys., ACS Biomater. Sci. Eng., Science Advances<br>**Reviewer for grants/awards**: National Science Foundation, MRSEC | 2017 – Present |
| **Mentor for:** Friends of Friends mentoring network for Black students, and Chemistry Women Mentorship Network (Chem WMN) | 2020 – Present |
| **Invited workshop organizer**, Discussion on diversity in organic chemistry, Empowering women in organic chemistry annual meeting | May 2021 |
| **Symposium chair**, Diversity in Polymer Chemistry and Engineering, Mid-Atlantic Regional ACS Meeting (MARM), University of Delaware (virtual meeting) | June 2021 |
| **Discussion leader** at ACID book club on "Organic Chemistry: A Retrosynthetic Approach to a Diverse Field", Department of Chemistry and Biochemistry, UD | February 2021 |
| **Culturally-Aware Mentoring (CAM) workshop participant** | January 2021 |
| **Steering committee**, Chemistry-Biology Interface program, University of Delaware | 2021 – Present |
| **Diversity, Equity and Inclusion committee**, Materials Science and Engineering Department | 2021 – Present |
| **Undergraduate curriculum committee**, Materials Science and Engineering Department | 2021 – Present |
| **Co-chair of the Materials Science and Engineering Seminar series**, University of Delaware | 2020 – Present |
| **Volunteer Blue and Golden Days** | 2020 – Present |
| **Social media (Twitter) account manager** for the Materials Science and Engineering Department | 2020 – Present |
| **Discussion Leader** - Bioelectronics Gordon Research Conference | June 2019 |
| **Organizing member** of the Association for Women in Science (AWIS) San Diego Outreach Committee<br>• Organized AWIS activities for Chem Expo 2017 at Miramar College.<br>• Organized the 2018 AWIS STEM career conference for high school and community college women. | 2017 – 2019 |
| **Panelist** for the IDEA (Inclusion - Diversity - Excellence - Achievement) Engineering Student Center at UC San Diego "Working with your PI and getting the kind of mentorship you want" | November 2016 |
| **Graduate student representative** of the Chemical Institute of Canada – Montreal Section<br>• Helped organizing and promoted activities for the CIC Montreal section. | 2015 – 2016 |

**PRESENTATIONS SINCE JOINING UD**

*Tailoring Polystyrene Sulfonate to Control the Electronic Properties of Conducting Polyelectrolyte Complexes,* invited talk, **Annual MACRO IUPAC Meeting**, Winnipeg, Canada, July 19, 2022

*Tuning the performance and functionality of mixed ionic-electronic conductors with block polyelectrolyte complexes,* contributed talk, **Spring ACS Meeting**, San Diego, CA, March 23, 2022

*Tuning the properties and functionality of mixed ionic-electronic conductors,* invited talk, **Fall MRS Meeting** – Symposium Bioelectronics-Materials and interfaces, Boston, MA, December 2, 2021

*A General Strategy to Impart Electronic Conductivity to Hydrogels,* invited talk, **Fall MRS Meeting** – Symposium Soft Matter Materials and Mechanics for Haptic Interfaces, Boston, MA, November 30, 2021

*Block copolymers to control the properties and functionality of organic mixed ionic-electronic conductors,* invited talk, **Fall ACS Meeting** – Symposium: Advancements in Implantable and Wearable Technologies, August 25, 2021.

*Leveraging precision in sulfonated polymers to control the properties of mixed ionic-electronic conductors,* invited talk, **Telluride Science Research Center, Hierarchical Assembly and Function of Organic and Hybrid Materials workshop**, July 22, 2021

*Organic Chemistry: A Retrosynthetic Approach to a Diverse Field*, invited workshop presentation**, Empowering women in organic chemistry annual meeting**, May 19, 2021

*Controlling the Properties of Organic Mixed Ionic-Electronic Conductors Using Living Radical Polymerization,* invited talk, virtual, **Spring MRS Meeting**, April 21, 2021

*Soft and Stretchable Organic Electronics for Human-Machine Interfaces,* invited lecture, **University of Alabama**, Department of Chemical and Biological Engineering, Virtual, March 30, 2021

*Organic Chemistry: A Retrosynthetic Approach to a Diverse Field,* invited workshop presentation, **Kenyon College**, Department of Chemistry, March 23, 2021

*Conductive Polymers as Electro-Active Materials for Haptics,* invited speaker and panelist, **MRS Fall Meeting,** Virtual, November 2020.

*Soft and Stretchable Organic Electronics for Human-Machine Interfaces*, invited lecture, **University of Ottawa**, Department of Chemical and Biological Engineering, November 12, 2020.

*My Journey from Chemistry to Materials Science and Engineering,* invited talk, Women in Engineering, **University of Delaware**, Newark, DE, October 20, 2020.

*Stretchable organic electronics for biological interfaces,* invited seminar, Chemistry-Biology Interface Program, **University of Delaware**, Newark, DE, April 8, 2020.

*Block copolymers for organic mixed ionic-electronic conductors,* invited talk, **ACS National Meeting, Philadelphia**, PA, March 26, 2020 (cancelled due to COVID-19).

*Mechanically-Adaptive Materials for Wearable Soft Robotics,* invited talk, **HensWEAR Symposium**, Newark, DE, February 21, 2020.

*Stretchable organic electronics for tactile interfaces,* invited talk, **ACS Poly, Next Generation Smart Materials**, Savannah, GA, December 16, 2019.

**SELECTED PRESENTATIONS PRIOR TO JOINING UD**

*Stretchable and conductive block copolymers for biocompatible electronics,* **Bioelectronics Gordon Research Conference**, Andover, June 17-21, 2019 (also discussion leader).

*Molecular engineering of stretchable organic electronics using block copolymers*, **MRS Spring meeting**, Phoenix, AZ, April 26, 2019.

*Intrinsically Stretchable and Conductive Polyelectrolyte Complex for Wearable Organic Electronics*, invited lecture, **Emerging Materials Researcher Symposium, Canadian Chemistry Conference**, Edmonton, AB, May 2018.