

KAITLYN E CRAWFORD

ASSOCIATE PROFESSOR

CONTACT

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EDUCATION

2011 - 2015

UMD, COLLEGE PARK

- Ph.D., Chemistry

2009 - 2011

NC STATE UNIVERSITY

- M.S., Chemistry

2003 - 2009

UNC, CHARLOTTE

- B.S., Chemistry
- B.S., Psychology

EXPERIENCE

2017 - current

U. OF CENTRAL FL

- Associate Professor MSE, 2024 -
- Assistant Professor MSE, 2017 - 2024
- Bionix Cluster Member, 2017 -

Courtesy Appointments

- Biomedical Eng. Program, 2023 -
- Chemistry, 2019 -
- Nano Sci. & Tech. Center, 2019 -

MY VISION

Lead multidisciplinary human sustainability research that nucleates transformations of soft materials to create next-generation materials that minimize pollution while advancing our modern societal needs.

CV SUMMARY METRICS

Research

Funding as PI: \$1.4M
Publications: 26
Citations: 2,000
H-index: 18
Awards/ honors: 12

Cumulative Mentoring

Ph.D. students graduated: 1
Ph.D. students: 7
Postdocs: 3
Undergrad. researchers: 17
Student awards/ honors: 21
Ph.D. committee member: 8

Teaching

Materials Science at UCF

Unique courses taught: 5
of courses taught: 13
of students taught: ~500
Avg. SPoI Score: 3.98/5.0
High SPoI Score: 5.0/5.0

Chemistry at UMD & NCSU

Unique labs taught: 3
of labs taught: 23
of students in labs: 800
Received teaching award

Service

Chaired the development of UCF's new BS-MSE degree
Faculty search committees: 4
Grad. admissions Committees: 1
Grad. qualifying exam committees: 1
NSF and ACS PRF reviewer: 5
Peer-reviewer for: 7 journals
Workshops co-organized: 4
Journal guest editor experience: 2
See page 6 for outreach activities

POSTDOCTORAL EXPERIENCE

Northwestern University; Evanston, IL Nov 2016 - Jul 2017
Postdoctoral Associate, Center for Biointegrated Electronics; Mentor: John A. Rogers

University of Illinois, Urbana-Champaign (UIUC); Urbana, IL Aug 2015 - Jul 2017
Postdoctoral Associate, Materials Science and Engineering; Mentor: John A. Rogers

FUNDING

CURRENT; PI share: \$1,425,999

Title: On Wireless Physiological Monitoring for Assessing Heat Stress Over Extended Periods.

Role: PI (Co-PI: K. Mukhopadhyay at UCF; subrecipients: UIUC and Northwestern)

\$1,500,000; 2022 – 2025; Department of Homeland Security

Title: Electro-Optic Polymer Development and Performance Measurements for Telecommunication and Quantum Applications. Role: PI; \$99,999; 2021 – 2023; imec-USA / UCF Seed Grant

Title: Electro-Optic Polymers for Photonic Applications. Role: PI \$53,000; 2019 – 2020; imec-USA

Title: Scientific Communication & Patent Writing Skills through STEM Undergraduate Research.

Role: Co-PI 50% (PI: K. Mukhopadhyay at UCF) \$10,000; 2018 – 2020; UCF Seed Grant

HONORS and AWARDS (since at UCF, 2017 - current; 14 awards before UCF)

- American Chemical Society, PMSE Early Investigator Award 2024
Received by nomination for outstanding scholarship for pre-tenure faculty
- Nominated for a Mentor of the Year Award; UCF. 2022
Nominations are by undergraduate researchers for outstanding student mentoring.
- Faculty Fellowship Program in Israel; Funded by the Jewish National Fund. 2021
Prestigious invitation to meet and interact with faculty in Israel.
- Faculty Excellence Honoree, Women's History Month; UCF. 2021
Women faculty at UCF are acknowledged for their contributions to supporting education and professional development of women.
- Undergraduate Research Program Mentor (5 students; \$2,995 in awarded funds); UCF 2018 –
Student initiated and ran research projects under the PI guidance and mentoring support

PUBLICATIONS (since at UCF, 2017 - current) *joint co-author, *corresponding author

Mohammad-Pour, G.; Maan, A.; **Crawford, K. E.*** "Synthesis and Characterization of Hydrolysable Fluorene and Sulfone Polyesters with High Refractive Index and Thermal Stability" *Revising* 2024.

Manero, A.; Rivera, V.; Fu, Q.; Schwartzman, J. D.; Proc-Gibbs, H.; Shah, N.; Gandhi, D.; White, E.; **Crawford, K. E.**; Coathup, M.* "Emerging Medical Technologies and their use in Bionic Repair and Human Augmentation" *Bioengineering*, 2024, 11, 695. DOI: [10.3390/bioengineering11070695](https://doi.org/10.3390/bioengineering11070695)

Dwivedi, P.; Li, J.; Ashree, D.; **Crawford, K. E.**; Thomas, J.* “Hybrid Perovskite Quantum Dot-MWCNTs Gas Sensor for Selective Ethanol Sensing.” *MRS Commun.* **2023**, *13*, 1156. DOI: [10.1557/s43579-023-00416-4](https://doi.org/10.1557/s43579-023-00416-4)

Manero, A.; **Crawford, K. E.**; Prock-Gibbs, H.; Shah, N.; Gandhi, D.; Coathup, M. J.* “Improving Disease Prevention, Diagnosis, and Treatment Using Novel Bionic Technologies.” *Bioengineering and Translational Medicine* **2022**, e10359, 1. DOI: [10.1002/btm2.10359](https://doi.org/10.1002/btm2.10359)

Mohammad-Pour, G.; de Coene, Y.; Wiratmo, M.; Maan, A.; Clays, K.; Masunov, A. E.; **Crawford, K. E.*** “Modular Synthesis of Zwitterionic, Xanthene Bridged, Low Twist Angle Chromophores with High Hyperpolarizability.” *Materials Advances* **2022**, *3*, 7520. DOI: [10.1039/D2MA00721E](https://doi.org/10.1039/D2MA00721E)

Shultz, L. R.; Preradovic, K.; Ghimire, S.; Hadley, H. M.; Xie, S.; Kashyap, V.; Beazley, M. J.; **Crawford, K. E.**; Liu, F.*; Mukhopadhyay, K.*; Jurca, T.* “Nickel Foam Supported Porous Copper Oxide Catalysts with Noble Metal-like Activity for Aqueous Phase Reactions.” *Catalysis Science and Technology* **2022**, *12*, 3804. DOI: [10.1039/d1cy02313f](https://doi.org/10.1039/d1cy02313f)

Ghimire, S.; Sarkar, P.; Rigby, K.; Maan, A.; Mukherjee, S.; **Crawford, K. E.*** Mukhopadhyay, K.* “Polymeric Materials for Hemostatic Wound Healing.” *Pharmaceutics* **2021**, *13*, 1. DOI: [10.3390/pharmaceutics13122127](https://doi.org/10.3390/pharmaceutics13122127)

Ross, E.*; Tigno-Aranjuez, J.; Miller, M.; Willenberg, A.; **Crawford K. E.** “Xyloglucan Administration Reduces Disease Severity in the Dextral Sodium Sulfate Model of Mouse Colitis.” *Clinical and Experimental Gastroenterology* **2021**, *14*, 429. DOI: [10.2147/CEG.S325945](https://doi.org/10.2147/CEG.S325945)

Li, J.†; Dwivedi, P.†; Kumar, K.; Roy, T.; **Crawford, K. E.***; Thomas, J.* “Growing Perovskite Quantum Dots on Carbon Nanotubes for Neuromorphic Optoelectronic Computing.” *Advanced Electronic Materials* **2021**, *7*, 2000535. DOI: [10.1002/aelm.202000535](https://doi.org/10.1002/aelm.202000535)

Mickle, A. D.; Won, S. M.; Noh, K. N.; Yoon, J.; Meacham, K. W.; Xue, Y.; McIlvried, L. A.; Copits, B. A.; Samineni, V. K.; **Crawford, K. E.**; Kim, D. H.; Srivastava, P.; Kim, B. H.; Min, S.; Shiuan, Y.; Yun, Y.; Payne, M. A.; Zhang, J.; Jang, H.; Li, Y.; Lai, H. H.; Huang, Y.; Park, S.-I.; Gereau, R. W.*; Rogers, J. A.* “A Wireless Closed-Loop System for Optogenetic Peripheral Neuromodulation.” *Nature* **2019**, *565*, 361. DOI: [10.103/s41586-018-0823-6](https://doi.org/10.103/s41586-018-0823-6)

Won, S. M.; Wang, H.; Kim, B. H.; Lee, K.; Jang, H.; Kwon, K.; Han, M.; **Crawford, K. E.**; Li, H.; Lee, Y.; Yuan, X.; Kim, S. B.; Oh, Y. S.; Jang, W. J.; Lee, J. Y.; Hang, S.; Kim, J.; Wang, X.; Xie, Z.; Zhang, Y.; Huang, Y.*; Rogers, J.A.* “Multimodal Sensing with a Three-Dimensional Piezoresistive Structure.” *ACS Nano* **2019**, *13*, 10972. DOI: [10.1021/acsnano.9b02030](https://doi.org/10.1021/acsnano.9b02030)

Crawford, K. E.*; Ma, Y.†; Wang, X.; Capua, D.; Krishnan, S.; Li, Y.; Huang, Y.; Rogers, J. A.* “Advanced Approaches for Quantitative Characterization of Thermal Transport Properties in Soft Materials Using Thin, Conformable Resistive Sensors.” *Extreme Mechanics Letters* **2018**, *22*, 27. DOI: [10.1016/j.eml.2018.04.002](https://doi.org/10.1016/j.eml.2018.04.002)

Li, Y.; Ma, Y.; Wei, C.; Luan, H.; Xu, S.; Han, M.; Zhao, H.; Liang, C.; Yang, Q.; Yang, Y.; **Crawford, K. E.**; Feng, X.; Huang, Y.; Rogers, J. A.* “Thin, Millimeter Scale Fingernail Sensors for Thermal Characterization of Nail Bed Tissue.” *Advanced Functional Materials* **2018**, 1801380.

DOI: [10.1002/adfm.201801380](https://doi.org/10.1002/adfm.201801380)

Won, S. M.[†]; Koo, J.[†]; **Crawford, K. E.[†]**; Mickle, A. D.; Xue, Y.; Min, S.; Mcllvred, L. A.; Yan, Y.; Kim, S. B.; Lee, S. M.; Kim, B. H.; Jang, H.; MacEwan, M. R.; Huang, Y.; Gereau, R. W. IV; Rogers, J. A.* “Natural Wax for Transient Electronics.” *Advanced Functional Materials* **2018**, 1801819.

Novel Polymers for Use in Total Joint Arthroplasty. Seal S, Singh S, **Crawford K**, Brisbois E, Coathup M. *Advanced Materials and Processing* **2018**, 176, 30-33. Link: <https://tinyurl.com/pzdwtcza>

Samineni, V. K.; Mickle, A. D.; Yoon, J.; Grajales-Reyes, J. G.; Pullen, M.; **Crawford, K. E.**; Noh, K. N.; Gereau, G. B.; Vogt, S.; Lai, H. H.; Rogers, J. A.; Gereau, R. W.* “Optogenetic Silencing of Primary Afferents Reduces Evoked and Ongoing Bladder Pain.” *Scientific Reports* **2017**, 7, 15865.

DOI: [10.1038/s41598-017-16129-3](https://doi.org/10.1038/s41598-017-16129-3)

PATENTS

Mohammad-Pour, G.; **Crawford, K. E.*** “Zwitterionic Compounds for Non-Linear Optics, Sensors, and Spectroscopy.” 2024; #11905465. Link: <https://patents.justia.com/inventor/kaitlyn-e-crawford>

TEACHING ACTIVITIES

Graduate Student Courses

EMA 5060: Polymer Science and Engineering (33 students)

EMA 5937: Biomedical Sensor Fabrication, Characterization and Applications (8 students); *Redesigned course*

Undergraduate Student Courses

EGN 3365: Structure and Properties of Materials (332 students)

EMA 4506: Emerging Materials (70 students); *Redesigned course*

EMA 3000: Engineering Polymeric Materials (54 students); *Redesigned course*

EMA 4602C: Materials Processing Lab; Role: Co-design polymer crystallization kinetics experiment

Average student evaluation score over 7 semesters: 4.4 / 5.0

(UCF Departmental, College, and University averages typically range between 3.9-4.1 / 5.0)

STUDENT MENTORING

Ph.D. Dissertation (Role: Committee Chair)

- | | |
|--|-------------------------|
| ▪ David Giordano, Biomedical Engineering | Joined Summer 2024 |
| ▪ Kareem Abdelrahman, Materials Science and Engineering | Joined Spring 2024 |
| ▪ Aditya Maan, Materials Science and Engineering (defending spring 2025) | Joined Summer 2020 |
| ▪ Tamar Yishay, Biomedical Engineering (on leave) | Fall 2022 – Spring 2024 |
| ▪ Zi Wang, Materials Science & Engineering (at BioMatrix) | Defended Fall 2021 |
| ▪ Wei Zhang, Materials Science and Engineering (at Adv. Mater.) | Fall 2018 – Spring 2020 |
| ▪ Nadia Aboutaleb, Materials Science and Engineering (at ZimVie) | Fall 2018 – Spring 2020 |

Post-Doctoral Fellows, Research Associates, and Visitors (Role: Primary Host)

- Gitanjali Swain, Ph.D. in Chemistry from CSIR-NCL, Pune, India May 2024 – Current
- Gavin Pour, Ph.D. in Chemistry from UCF Aug 2019 – May 2022
- Priyanka Dwivedi, Ph.D. in Electrical Engineering; IIT Delhi Feb 2019 – Feb 2020

Undergraduate Researchers (Role: Primary Faculty Mentor)

- Nickolas Rose, Biomedical Sciences (3 research awards) Jun 2023 – Current
- Alek Ramos-Davila, Materials Science and Engineering Feb 2024 – Current
- Lozier Mackey, Materials Science and Engineering Aug 2023 – Dec 2023
- Frances Morales, Materials Science and Engineering Aug 2023 – Dec 2023
- Jeremiah Nicholson, Materials Science and Engineering Sep 2023 – May 2024
- Erin Watson, Materials Science and Engineering (2 awards; at Wolfram) Sep 2021 – May 2023
- Samantha Williams, Materials Science and Engineering (now at Bacardi) Feb 2022 – Mar 2023
- Meryl Wiratmo, Materials Science and Engineering (2 awards; at UMD) Dec 2020 – May 2023
- Luis Andres Acosta Mejia, Computer Science and Engineering (now at HP) Jan 2021 – Dec 2022
- Brandon Ortiz, Materials Science and Engineering (1 research award) Dec 2020 – Dec 2021
- Arielle Myerson, Materials Science and Engineering Feb 2022 – Dec 2022
- Ryann Valmonte, Materials Science and Engineering (1 research award) May 2021 – Dec 2021
- Derek Lucas, Mechanical Engineering May 2021 – May 2022
- Ashley Santana, Biomedical Sciences (5 research awards; now at NYU) Fall 2018 – Fall 2019
- Andrew Phillips, Mechanical Engineering (employed at Siemens) Fall 2019 – Fall 2020
- Stephanie Schreiner, Biomedical Sciences (5 awards; at UPenn) Fall 2017 – Summer 2019
- Hassan Haidar, Biomedical Sciences (2 research awards) Fall 2017 – Fall 2018

SERVICE ACTIVITIES

Service to the Field

- Co-organized Advancing Polymer Materials for Biotechnology symposium at the American Chemical Society's annual spring 2024 meeting in New Orleans, LA. 2024
- Journal Reviewer (IF = Impact Factor) 2016 -
Small (IF: 15.2), ACS Applied Materials and Interfaces (IF: 9.5), Polymer Chemistry (IF: 4.6),
RCS Advances (IF: 3.9), Applied Physics Letters (IF: 4.0), and Macromolecules (IF: 5.5).
- Proposal Reviewer, NSF ad hoc (3), NSF panel (1) Petroleum Research Fund (1)
- Workshops
 - Invited Faculty Mentor, NSF Future Faculty Workshop, Princeton U. Princeton, NJ Jul 2019
 - Co-organized, Kavli Foundation Bioelectronics workshop Rice U. Houston, TX Dec 2018
 - Invited Faculty Mentor, NSF Future Faculty Workshop, U. Delaware. Dover, DE Jul 2018

Service to the Department and University

- Mentor underrepresented engineering majors; Office of Diversity & Inclusion, UCF Spring 2020 -
- Bionix Cluster faculty search; Committee Member 2018, 2021, 2022
- Graduate student qualifying exam update; Committee Member 2019

- Graduate admissions; Committee Member Spring 2018
- BS-MSE Program development; Committee Chair 2017-2019
 - Led degree program at all stages of development from college to board of trustees
 - Managed work distribution across 5 faculty committee members
 - Wrote BS-MSE degree program proposal
 - Communicated with administrator across UCF
 - Created Syllabi for 13 new courses

Service to the Community

- American Chemical Society, Symposium co-Chair, New Orleans, LA Mar 2024
- American Chemical Society, Chemistry Week Volunteer (elementary age), FL Oct 2019
- Presentation Judge: SEMI High Tech U workshop for 'Entrepreneur Kids', UCF Jul 2018
- Lab demo 'Fun with Plastics': ASM AeroMat Mini-Camp (middle school), FL May 2018
- Poster Judge: Graduate Research Forum, UCF Apr 2018
- Poster Judge: Dr. Nelson Ying Orange County Science Expo (middle school), FL Feb 2018
- Poster Judge: BRIDG Workshop (graduate students from local Central FL area) Aug 2017
- Chemical Society of Washington (CSW) Board of Managers; Washington, D.C. 2014 - 2015
- Project Judge: MD Science Olympiad, (middle school); Hyattsville, MD 2012, 2013 & 2015
- Lab supervisor and exam proctor: 44th International Science Olympiad; College Park, MD 2012

INVITED TALKS (since at UCF, 2017 - current)

- American Chemical Society (PMSE Early Investigator Symposium); Denver, CO Aug 2024
- Florida Annual Meeting and Exposition, Palm Harbor, FL May 2024
- James Madison University, Harrisonburg, VA Mar 2024
- University of Florida, Gainesville, FL Sep 2023
- KAUST, Thurwal, The Kingdom of Saudi Arabia Feb 2023
- University of Tennessee, Knoxville; Knoxville, TN Nov 2022
- Asilomar Bioelectronics workshop, Pacific Grove, CA Sep 2022
- University of Arizona, Tuscan, Tuscan, AZ Aug 2022
- American Chemical Society (Analytical Chemistry); Chicago, IL Aug 2022
- Materials Research Society (Bioelectronics); Boston, MA; virtual Dec 2021
- American Chemical Society (Analytical Chemistry); virtual Aug 2021
- Materials Research Society (Bioelectronics); virtual Apr 2021
- North Carolina State University (Electrical Engineering); virtual Oct 2020
- University of South Florida (Chemical Engineering); Tampa, FL Feb 2020
- Polymers for Advanced Technologies (PAT) 2019; College Station, TX Aug 2019
- Tosoh Gel Permeation Chromatography (GPC) workshop; New Orleans, LA Jul 2019
- Automation, AI and Robotics workshop; Houston, TX Mar 2019
- Kavli Foundation Bioelectronics workshop series 1 of 3; Rice U. Houston, TX May 2018