

EunBi Oh, Ph. D.

Austin, TX | eunbio.com

SUMMARY

Researcher specializing in soft robotic actuators and sensors, functional polymer composites, and advanced manufacturing. Experienced in evaluating how material formulation, processing, and structural architecture affect mechanical, electrical, and actuation performance.

EDUCATION

Ph.D. in Chemistry , <i>Northwestern University</i>	2021
B.S. in Chemistry (Honors) , <i>University of North Carolina at Chapel Hill</i>	2015

PROFESSIONAL & RESEARCH EXPERIENCE

Senior Materials Scientist, Elysium Robotics	<i>Austin, Texas</i>
<i>Deep Tech Start-up</i>	<i>October 2025-Present</i>

- Develop dielectric polymer and electrode materials for dielectric elastomer actuators (DEAs), improving actuation strain and energy density for robotics applications
- Advance 3D printing processes for DEA fabrication toward consistent and scalable production by tuning material rheology, curing behavior, and printing conditions
- Build a composition-to-performance modeling platform integrating physics-informed analytical equations, RDKit-based molecular descriptors, and random forest regression to predict DEA performance from formulation and processing parameters

AI Fellow, Handshake	<i>Austin, Texas</i>
<i>Chemistry/Materials Science Division</i>	<i>Summer 2025-Fall 2026</i>

- Evaluate large language models (LLMs) on reasoning, data synthesis, and problem-solving in chemistry and materials science in collaboration with one of the top 5 AI research labs

Postdoctoral Scholar, Robotic Matter Lab	<i>Northwestern University</i>
<i>Department of Materials Science & Engineering (Advisor: Ryan L. Truby)</i>	<i>Fall 2021-Summer 2025</i>

- Characterized compressive and tensile failure behavior and electrical properties of 3D-printed architected lattices composed of poly(ionic liquid) structural electrolytes for soft sensors
- Programmed shape-morphing and tuned electrical properties of 3D-printed composites by controlling flow-induced alignment of liquid crystals and 2D particles
- Developed electro- and photo-active polymer composites and analyzed their rheological properties to enable 3D printing of micro- to macro-scale multifunctional iontronics for soft robotics

Ph.D. Candidate, Mirkin Research Lab	<i>Northwestern University</i>
<i>Department of Chemistry (Advisor: Chad A. Mirkin)</i>	<i>Fall 2015-Summer 2021</i>

- Established a new electrochemical lithographic platform for site-selectively patterning >10,000 nanometallic structures, enabling high-throughput compositional screening of novel electrocatalysts
- Probed the relationship between the mechanical variations (stiffness and topography) in photo-responsive hydrogel matrices and cellular migratory behavior using statistical analysis

Undergraduate Researcher, Cahoon Research Lab	<i>University of North Carolina at Chapel Hill</i>
<i>Department of Chemistry (Advisor: James F. Cahoon)</i>	<i>Fall 2012-Summer 2015</i>

- Analyzed the morphology of NiO platelets and their effect on the electrical mobility in solar cells

AWARD, HONOR, & RECOGNITION

2025	NextProf Nexus 2025 — UC Berkeley, University of Michigan, and Georgia Tech
2025	Handshake Model Validation Expert (MOVE) Fellowship — Handshake
2024	IIN 3 Minute Thesis Competition Visionary Award — Northwestern University
2024	IIN Outstanding Researcher Award — Northwestern University
2024	ACS CAS Future Leaders Top 100 — American Chemical Society CAS Division
2023	ACS PMSE Future Faculty Scholar — American Chemical Society PMSE Division
2013	James Maguire Memorial Award — University of North Carolina at Chapel Hill
2013	Thurman Freeze Research Scholarship — University of North Carolina at Chapel Hill

PUBLICATION

* = equal contributions; † = equal contributions, alphabetical order

1. P. Kaarthik, M. E. Bayer, **E. Oh**, A. Q. Kane, R. L. Truby. "Rapid, Voxel-Based 3D Printing with Yield-Stress Fluid Inks." *Science Advances Accepted* (2026)
2. G. Kumbhojkar*, E. Yang*, A. Moussavi, **E. Oh**, H. Kim, W. Chen, J. Kim, S. Keten, R. L. Truby. "Increasing inter-micellar connectivity toughens and Imparts Cooling-Induced Shape Memory in Micellar Hydrogels." *Adv. Funct. Mater.* 36:e7744 (2026)
3. **E. Oh**, E. Yang, T. Kim, A. Q. Kane, R. L. Truby. "Direct-write Printing of Multifunctional Iontronic Composites that Sense, Rectify, and Actuate." *ACS Nano* 20, 2200 (2026)
4. **E. Oh***, T. Kim*, P. Kaarthik*, R. L. Truby. "Architected Materials for Soft Robotics." *J. Mater. Res.* 41, 446 (2026)
5. D. Shin, Y. Shin, D. D. Xu, M. I. Utama, T. Cai, Z. Ye, **E. Oh**, J. Li, D. Choi, M. Hersam, J. Rondinelli, C. A. Mirkin. "A-Cation-Dependent Structure-Optical Property Relationship of Halide Perovskite Heterostructures with Complex Interfaces." *J. Am. Chem. Soc.* 147, 38225 (2025)
6. **E. Oh***, A. Q. Kane*, R. L. Truby. "Architected Poly(ionic liquid) Composites with Spatially Programmable Mechanical Properties and Mixed Conductivity." *ACS Appl. Mater. Interfaces* 16, 10736-10745 (2024)
7. N. Ramani, C. A. Figg, A. J. Anderson, P. H. Winegar, **E. Oh**, S. B. Ebrahimi, D. Samanta, C. A. Mirkin. "Spatially-Encoding Hydrogels with DNA to Control Cell Signaling." *Adv. Mater.* 35, 2301086 (2023)
8. A. L. Evenchik*†, A. Q. Kane*†, **E. Oh***†, R. L. Truby. "Electrically Controllable Materials for Soft, Bioinspired Machines." *Annu. Rev. Mater. Res.* 53, 225-251 (2023)
9. S. Lee*, H. A. Calcaterra*, S. Lee*, W. Hadibrata, B. Lee, **E. Oh**, K. Aydin, S. C. Glotzer, C. A. Mirkin. "Shape memory in self-adapting colloidal crystals." *Nature* 610, 674-679 (2022)
10. **E. Oh***, B. Meckes*, J. Chang, D. Shin, C. A. Mirkin. "Controlled Glioma Cell Migration and Confinement Using Biomimetic-Patterned Hydrogels." *Adv. NanoBiomed Res.* 2, 2100131 (2022)
11. **E. Oh***, R. Golnabi*, D. A. Walker, C. A. Mirkin. "Electrochemical Polymer Pen Lithography." *Small* 17, 2100662 (2021)
12. P. A. Gabrys*, S. E. Seo*, M. X. Wang*, **E. Oh**, R. J. Macfarlane, C. A. Mirkin. "Lattice Mismatch in Crystalline Nanoparticle Thin Films." *Nano Lett.* 18, 579-585 (2018)

13. C. J. Flynn, S. M. McCullough, **E. Oh**, L. Li, C. C. Mercado, B. H. Farnum, W. Li, C. L. Donley, W. You, A. J. Nozik, J. R. McBride, T. J. Meyer, Y. Kanai, J. F. Cahoon. "Site-Selective Passivation of Defects in NiO Solar Photocathodes by Targeted Atomic Deposition." *ACS Appl. Mater. Interfaces* 8, 4754–4761 (2016)
14. C. J. Flynn, **E. Oh**, S. M. McCullough, R. W. Call, C. L. Donley, R. Lopez, J. F. Cahoon. "Hierarchically-Structured NiO Nanoplatelets as Mesoscale p-Type Photocathodes for Dye-Sensitized Solar Cells." *J. Phys. Chem. C* 118, 14177-14184 (2014)

PATENT & INVENTION DISCLOSURE

Awarded Patents

1. C.A. Mirkin, R. Golnabi, **E. Oh**, D. A. Walker. "Electrochemical Polymer Pen Lithography" United States Patent No. 11,747,723 B2, September 05, 2023.

Filed Patent Applications & Invention Disclosures

1. R.L. Truby, **E. Oh**, A.Q. Kane. "3D Printed Poly(Ionic Liquid) Composites" U.S. Provisional Patent Application, 63/650,601 Filed May 22, 2024.
2. R.L. Truby, A.L. Evenchik, **E. Oh**, A.Q. Kane. "Artificial Muscles and Muscle Tissues from Photoresponsive Fibers" U.S. Provisional Patent Application, 63/604,151 Filed November 29, 2023.

PRESENTATION

Conference Presentations

1. "Direct-Write Printing of Multifunctional Iontronic Composites that Sense, Rectify, and Actuate," **Multifunctional Materials and Structures Gordon Research Conference**, Poster Presentation, January 25-30, 2026, Ventura, CA.
2. "Multi-scale Functional Structure Engineering with Soft Materials," **American Institute of Chemical Engineers (AIChE)**, Meet the Faculty Candidates Poster Session, October 27, 2024, San Diego, CA.
3. "Architected Poly(ionic liquid) Composites with Spatially Programmable Mechanical Properties and Mixed Conductivity," **Additive Manufacturing of Soft Materials Gordon Research Conference**, Poster Presentation, August 11-16, 2024, Smithfield, RI.
4. "Toward 3D printing Bio-programmable Materials Containing Artificial Cells," **Northwestern MRSEC Annual Meeting Presentation**, Poster Presentation, January 17, 2024, Evanston, IL.
5. "Embedded 3D Printing of Mechanically Robust Ionogel Composites," **2nd Northwestern-Münster Symposium on Smart Materials**, Poster Presentation, August 30-31, 2023, Evanston, IL.
6. "Printing Multiscale Structures in Polymers with Independently Tunable Properties," **Fall 2023 Meeting of the American Chemical Society (ACS)**, Oral Presentation, August 13-17, 2023, San Francisco, CA.
7. "Embedded 3D Printing of Mechanically-robust Ionogel Composites," **Spring 2023 Meeting of the American Chemical Society (ACS)**, Oral Presentation, March 26-30, 2023, Indianapolis, IN.
8. "Electrochemical Polymer Pen Lithography," **Fall 2021 Meeting of the American Chemical Society (ACS)**, Oral Presentation, August 22-26, 2021, Virtual.

9. "Mesoscale NiO Platelets as Wide Bandgap Metal Oxide Films," **KSEA Ygnite Conference**, Poster Presentation, January 22-26, 2015, Orlando, FL.
10. "Mesoscale NiO Platelets as Wide Bandgap Metal Oxide Films for p-Type Dye Sensitized Solar Cells," **128th Local Meeting of the American Chemical Society (ACS)**, Poster Presentation, November 7, 2014, Durham, NC.

Invited Seminars

1. "Fabrication of Multiscale Structures with Independently Tunable Properties," **Pohang University of Science and Technology (POSTECH)**, Chemistry Department, December 18, 2023.

PROFESSIONAL SERVICE

- Organizer, **IEEE International Conference on Soft Robotics (RoboSoft)**, Frontiers of Physically Intelligent Robots with Architected Soft Materials. April 11, 2026
- Participant, **Advanced Research and Invention Agency (ARIA) Smarter Robot Bodies Annual Meeting**. Derby, UK, April 14-16, 2026
- Panelist, **MSUS Postdoc Panel**, Northwestern Materials Science Umbrella Society. January 19, 2024

TEACHING EXPERIENCE

Lecturer

- Guest Lecture "99% Water and 1% Matter" *MAT_SCI 331: Soft Materials, NU* *Winter 2023*
- Guest Lecture "Hydro+Gels" *MAT_SCI 331: Soft Materials, NU* *Fall 2021*

Teaching Assistant

Kellogg MBA Course: Leadership in Organizations, Northwestern University *Summer 2019*

- Instructed a recitation class where students learned essential elements of high performing teams
- Designed an Excel macro for bulk grade processing and report generation for departmental use

Organic Chemistry Labs and Courses, Northwestern University *Fall 2015-Winter 2017*

- Instructed lab sessions of 10-12 students and taught basic laboratory skills and chemistry concepts
- CHEM 210-2 & 230-2 – Synthesis and characterization of aromatic and nitrogen compounds
- CHEM 230-3 – Reaction involving amide, aldol condensation, Robinson annulation, and Diels-Alder
- CHEM 232-1 – Modern chemical reactions of alkanes, alkenes, alkyl halides, alcohols, and carbonyls

Instructor

Chemistry Course: Special Problems, University of North Carolina at Chapel Hill *Fall 2013-Winter 2015*

- Taught general chemistry topics to non-chemistry major students

MENTORING EXPERIENCE

Ph.D. Candidates: Eric Yang (Materials Science and Engineering (MSE), Northwestern (NU)); Pranav Kaarthik (ME, NU); Alexander Evenchik (MSE, NU); Alexander Kane (MSE, NU); Namrata Ramani (MSE, NU); Liban Jibril (MSE, NU); Donghoon Shin (MSE, NU); Sangyoon Paik (MSE, Yonsei University, Korea, Visiting Scholar); Alexa Wong (Chemistry, NU, Summer Intern)

Undergraduates: Cooper Hanley (Chemistry, NU); Pranav Addepalli (MSE/Chemistry, University of Cambridge); Jinyoung Chang (Biological Sciences, NU)

LEADERSHIP AND COMMUNITY ENGAGEMENT

Northwestern University Research Program for High Schoolers (NURPH)

Evanston, Illinois

Mentorship Coordinator

December 2022-September 2023

- Trained Ph.D. students as mentors, organizing mini courses on strong team building and positive mentor-mentee relationships

Women in Science and Engineering Research (WISER) at Northwestern University

Evanston, Illinois

Treasurer

Fall 2018-Summer 2019

- Maintained detailed records of financial transactions totaling \$2K for a group of over 500 members
- Collaborated with 6 executives and 8 board members to organize faculty seminars and outreach events for students from diverse socioeconomic backgrounds

Northwestern Memorial Hospital

Evanston, Illinois

Volunteer (Emergency Department)

May 2018-December 2018

- Supported service to patients and emergency department (ED) nurses; addressed patients' non-medical needs, assisted with transportation, and provided directions to rooms and departments

Korean Student Association (KSA) at Northwestern University

Evanston, Illinois

President/Secretary

Fall 2015-Summer 2017

- Raised \$2K to fund networking events and seminars for over 200 Korean graduate students and postdocs at Northwestern
- Developed relationships with chemical, pharmaceutical, and consulting companies in Korea to organize recruiting events
- Facilitated establishment of KSA as an official Northwestern organization

OUTREACH AND VOLUNTEER SERVICE

- 'RAMP in the Research Lab' ACS Chemical Health and Safety Workshop—Online, November 13, 2022
- Proctor for KSEA National Math & Science Competition, Chicagoland—Online, December 5, 2020
- Proctor and grader for KSEA National Math & Science Competition, Chicagoland—Northwestern University, April 7, 2018
- Volunteer for 'Her Story' Outreach Event—Museum of Science and Industry at Chicago, May 21, 2016
- Chemistry Ph.D. Visitation Weekend Host—Northwestern University, March 10-12, 2016

OTHER INFORMATION

- Languages: English, Korean
- Interests: Tennis, Violin, Painting, Running