**S. Eileen Seo**

Arizona State University

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**Professional Appointments**

Arizona State University, Tempe Campus **2021 – present**

**Assistant Professor** of Chemical Engineering

**Faculty** of Biodesign Center for Sustainable Macromolecular Materials and Manufacturing

**Graduate Faculty** of School of Molecular Sciences (Chemistry)

**Graduate Faculty** of Materials Science and Engineering

University of California, Santa Barbara **2018 – 2021  
Postdoctoral Fellow** (Advisor: Craig J. Hawker)

Research focus: 2- and 3D polymeric materials using light-mediated radical polymerization reactions

**Education**

Northwestern University **2012 – 2018**

**Ph.D.** in Chemistry (Advisor: Chad A. Mirkin)

Thesis: Single Crystal Engineering with DNA

University of California, Berkeley  **2008 – 2011**  **B.S.** in Chemical Biology in College of Chemistry (Advisor: Jamie H. D. Cate)

**Research Interests**

Polymer nanocomposites; stimuli-responsive polymeric and composite materials; photo-mediated 3D printing of chemically reprocessable polymers; self-assembly of kinetically controlled nanoparticle superlattices; macromolecule sustainability.

**Awards**

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| ORAU Ralph E. Powe Junior Faculty Enhancement Award | **2023** |
| ASU Engineering for One Planet (EOP) Faculty Fellowship | **2023** |
| Dow MI/MRL Travel Fellowship Award, UCSB | **2020** |
| Outstanding Oral Presentation Award, Polymers for Advanced Technologies | **2019** |
| International Institute for Nanotechnology (IIN) Outstanding Researcher Award, IIN | **2018** |
| Fellowship in Center of Computation and Theory of Soft Materials, Northwestern University | **2016** |
| NUANCE Image Gallery Award, Northwestern University | **2015** |
| Fellowship in Center for Bio-Inspired Energy Science, Northwestern University | **2015** |
| Presidential Fellowship Semi-Finalist, Northwestern University | **2015** |

**Scientific Publications** (\*designates equal contribution)

1. Hawkins, K., Gonzalez Calvo, T., Seo. S. E. Rapid Water Tolerant Cationic RAFT Photopolymerization for 3D Printing, Submitted.
2. Kwon, Y., Seo, S. E., Lee, J., Berezvai, S., Read de Alaniz, J., Eisenbach, C. D., McMeeking, R. M., Hawker, C. J., Valentine, M. T. 3D-Printed Polymer Foams Maintain Stiffness and Energy Dissipation under Repeated Loading, *Compos. Commun.* **2023,** *37*, 101453 [[doi.org/10.1016/j.coco.2022.101453](https://doi.org/10.1016/j.coco.2022.101453)].
3. Seo, S. E., Kwon, Y., Dolinski, N. D., Sample, C. S., Self, J., Bates, C. M., Valentine, M. T., Hawker, C. J. Three-Dimensional Photochemical Printing of Thermally Activated Polymer Foams, *ACS Appl. Polym. Mater.* **2021,** *3*, 4984-4991 [[doi:10.1021/acsapm.1c00726](https://pubs.acs.org/doi/abs/10.1021/acsapm.1c00726)].
4. Seo, S. E., Hawker, C. J. The Beauty of Branching in Polymer Science, *Macromolecules* **2020,** *53,* 3257-3261 [[doi: 10.1021/acs.macromol.0c00286](https://pubs.acs.org/doi/pdf/10.1021/acs.macromol.0c00286)].
5. Abdilla, A., Dolinski, N. D., de Roos, P., Ren, J. M., van der Woude, E., Seo, S. E., Zayas, M. S., Lawrence, J., Read de Alaniz, J., Hawker, C. J. Polymer Stereocomplexation as a Platform for Scalable Nanoparticle Assembly, *J. Am. Chem. Soc.* **2020,** *142,* 1667-1672 [[doi: 10.1021/jacs.9b10156](https://pubs.acs.org/doi/10.1021/jacs.9b10156)].
6. Seo, S. E., Discekici, E. H., Zhang, Y., Bates, C. M., Hawker, C. J. Surface-Initiated PET-RAFT Polymerization under Metal-Free and Ambient Conditions using Enzyme Degassing, *J. Polym. Sci.* **2020,** *58,* 70-76 [[[doi](https://onlinelibrary.wiley.com/doi/full/10.1002/pola.29438): 10.1002/pola.29438](https://onlinelibrary.wiley.com/doi/full/10.1002/pola.29438)].
7. Jung, K., Corrigan, N., Ciftci, M., Xu, J., Seo, S. E., Hawker, C. J., Boyer, C. Designing with Light: Advanced 2D, 3D, and 4D Materials, *Adv. Mater.* **2020,** *32,* 1903850 [[doi: 10.1002/adma.201903850](https://onlinelibrary.wiley.com/doi/10.1002/adma.201903850)].
8. Seo, S. E., Girard, M., de la Cruz, M. O., Mirkin, C. A. The Importance of Salt-Enhanced Electrostatic Repulsion in Colloidal Crystal Engineering with DNA, *ACS Cent. Sci.* **2019,** *5,* 186-191 [[[doi](https://pubs.acs.org/doi/abs/10.1021/acscentsci.8b00826): 10.1021/acscentsci.8b00826](https://pubs.acs.org/doi/abs/10.1021/acscentsci.8b00826)].
9. Seo, S. E., Girard, M., de la Cruz, M. O., Mirkin, C. A. Non-Equilibrium Anisotropic Colloidal Single Crystal Growth with DNA, *Nat. Commun.* **2018,** *9,* 4558 [[[doi](https://www.nature.com/articles/s41467-018-06982-9): s41467-018-06982-9](https://www.nature.com/articles/s41467-018-06982-9)]*.*
10. Gabrys, P. A.,\* Seo, S. E.,\* Wang, M. X.,\* Oh, E., Macfarlane, R. J., Mirkin, C. A. Lattice Mismatch in Crystalline Nanoparticle Thin Films, *Nano Lett.* **2018,** *18,* 579-585 [[[doi](https://pubs.acs.org/doi/abs/10.1021/acs.nanolett.7b04737): 10.1021/acs.nanolett.7b04737](https://pubs.acs.org/doi/abs/10.1021/acs.nanolett.7b04737)].
11. Wang, M. X.,\* Brodin, J. D.,\* Millan, J. A., Seo, S. E., Girard, M., de la Cruz, M. O., Lee, B., Mirkin, C. A. Altering DNA-Programmable Colloidal Crystallization Paths by Modulating Particle Repulsion, *Nano Lett.* **2017,** *17,* 5126-5132 [[[doi](https://pubs.acs.org/doi/abs/10.1021/acs.nanolett.7b02502): 10.1021/acs.nanolett.7b02502](https://pubs.acs.org/doi/abs/10.1021/acs.nanolett.7b02502)].
12. Seo, S. E.,\* Li, T.,\* Senesi, A. J., Mirkin, C. A., Lee, B. The Role of Repulsion in Colloidal Crystal Engineering with DNA, *J. Am. Chem. Soc*. **2017,** *139,* 16528-16535 [[[doi](https://pubs.acs.org/doi/abs/10.1021/jacs.7b06734): 10.1021/jacs.7b06734](https://pubs.acs.org/doi/abs/10.1021/jacs.7b06734)]*.*
13. Wang, M. X.,\* Seo, S. E.,\* Gabrys, P. A., Fleischman, D., Lee, B., Kim, Y., Atwater, H. A., Macfarlane, R. J., Mirkin, C. A. Epitaxy: Programmable Atom Equivalents *versus* Atoms, *ACS Nano* **2017,** *11,* 180-185 [[[doi](https://pubs.acs.org/doi/abs/10.1021/acsnano.6b06584): 10.1021/acsnano.6b06584](https://pubs.acs.org/doi/abs/10.1021/acsnano.6b06584)].
14. Seo, S. E.,\* Wang, M. X.,\* Shade, C. M., Rouge, J. L., Brown, K. A., Mirkin, C. A. Modulating the Bond Strength of DNA-Nanoparticle Superlattices, *ACS Nano* **2016,** ***10,* 1771-1779 [**[[doi](https://pubs.acs.org/doi/abs/10.1021/acsnano.5b07103): 10.1021/acsnano.5b07103](https://pubs.acs.org/doi/abs/10.1021/acsnano.5b07103)**].**
15. Shade, C. M., Kennedy, R. D., Rouge, J. L., Rosen, M. S., Wang, M. X., Seo, S. E., Clingerman, D. J., Mirkin, C. A. Duplex Selective Ruthenium-Based DNA Intercalators, *Chemistry* **2015,** *21,* 10983-10987 [[[doi](https://onlinelibrary.wiley.com/doi/full/10.1002/chem.201502095): 10.1002/chem.201502095](https://onlinelibrary.wiley.com/doi/full/10.1002/chem.201502095)].

**Patents**

1. Mirkin, C. A., Shade, C. M., Rouge, J. L., Seo, S. E., Wang, M. X. “DNA Intercalators with Duplex-Selective Luminescence Enhancement and Their Use as Nanoparticle-Conjugate Sensing Agents.” Patent 9969759, Issued May **2018**.
2. Seo, S. E., Yu, J. -C. “Dynamic Supramolecular Bonds in Self-Healing Polymer Nanocomposites.” U.S. Patent 2952332-000021, Filed April **2023**. Provisional patent.

**Presentations**

22. *AIChE Annual Meeting, 2023 KIChE-US Chapter Emerging Junior Investigator Forum* (*Invited*) — Orlando, FL, November **2023**.

21. *2023 International Symposium on Stimuli-Responsive Materials* (*Invited*) — Sonoma, CA, October **2023**.

20. *ASU Spring 2023 Biological Design Seminar Series* (*Invited*) — Tempe, AZ, September **2023**.

19. *Korea University Chemical Engineering Spring 2023 Seminar* (*Invited*) — Seoul, South Korea, May **2023**.

18. *Mines Chemical and Biological Engineering Spring 2023 Seminar* (*Invited*) — Golden, CO, September

**2023**.

17. *AIChE Annual Meeting, 3D Printing of Composites* — Phoenix, AZ, November **2022**.

16. *ACS Fall Meeting* — Chicago, IL, August **2022**.

15. *Additive Manufacturing of Soft Materials Gordon Research Conference* — Ventura, CA, August **2022**.

14. *ACS Spring Meeting* — San Diego, CA, March **2022**.

1. *ASU Technical Advisory Board Meeting* — Tempe, AZ, February **2022**.
2. *Biodesign Center for Sustainable Macromolecular Materials and Manufacturing Seminar Series* (*Invited*) — Tempe, AZ, October **2021**.
3. *Arizona State University* — Tempe, AZ, February **2021**.
4. *University of California, Berkeley* — Berkeley, CA, February **2021**.
5. *ACS Fall Meeting* — Virtual Meeting, August **2020**.
6. *Cornell University* — Ithaca, NY, February **2020**.
7. *Polymers for Advanced Technologies Conference* — College Station, TX, August **2019**.
8. *Materials Research Outreach Program* — Santa Barbara, CA, January **2019**.
9. *SPIE-MRSEC Student Seminar Series at Northwestern University* — Evanston, IL, March **2018**.
10. *University of California, Santa Barbara* — Santa Barbara, CA, November **2017**.
11. *Gordon Research Conference on Noble Metal Nanoparticles* — South Hadley, MA, June **2016**.
12. *Korean American Scientists and Engineers Association Seminar Series at Northwestern University* — Evanston, IL, March **2016**.
13. *Materials Research Society National Meeting* — San Francisco, CA, April **2015**.

**Teaching**

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| --- | --- | --- |
| Circular Plastics Laboratory, CHE/CHM 598 | Spring **2024** | |
| Soft Matter Morphology, CHE/CHM 494/598 | | Spring **2023** |
| Thermodynamics of Chemical Systems, CHE543 | | Fall **2021 –** **2023** |

**University Service/Activity**

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| *Faculty Mentor* for AIChE ASU Student Chapter | **2023 – present** |
| *External Engagement Leader* for Biodesign Center for SM3 | **2021 – present** |
| *Mentor* for Swing 4 SWE (The Society of Women Engineers) | **2023** |
| Biodesign FUSION 2023 Retreat *Poster Judge* | **2023** |
| *Scientist* for Meet the Scientist Working in Sustainability Day – Grades KG-2 | **2022** |
| School of Molecular Sciences/Center for SM3, *Faculty Hiring Committee* | **2021 – 2023** |
| *Faculty Judge* for Biomaterials Day Conference | **2021** |
| Fulton Undergraduate Research Initiative *Review Committee* | **2021** |
|  |  |
| Prior to ASU |  |
| Future Leaders in Advanced Materials, UCSB, Mentor | **2019** |
| Careers Conference, University of Chicago, Teaching Volunteer | **2016** |
| STEM and Sports Day, Northwestern University, Course Designer | **2015** |
| Science In The Classroom, Northwestern University, Teaching Volunteer | **2014 – 2016** |

**External Service/Activity**

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| *Discussion Leader* for Tosoh Polymer Conference | **2024** |
| *NSF BioPACIFIC MIP Proposal Reviewer (UCSB/UCLA)* | **2023** |
| *Track Chair* for The Society for Laboratory Automation and Screening Meeting  *Micro-and Nanotechnology* | **2023** **–** **2024** |
| *Session Chair* for The Society for Laboratory Automation and Screening Meeting  *Next Generation 3D Printing in Medicine* | **2024** |
| *Session Chair* for The American Institute of Chemical Engineers, MES Division  *Polymer Synthesis and Reaction Engineering* | **2023** |
| *Symposium Organizer* for the 2023 MRS Fall Meeting, Boston MA  *Crystallization and Assembly at Interfaces* | **2023** |
| *Session Chair* for The Society for Laboratory Automation and Screening Meeting  *Nanomedicine* | **2023** |
| *Associate Track Chair* for The Society for Laboratory Automation and Screening Meeting  *Micro-and Nanotechnology* | **2022** **–** **2023** |
| *Session Chair* for The American Institute of Chemical Engineers, MES Division  *Polymer Synthesis and Reaction Engineering*  *Polymer Thermodynamics and Self-Assembly* | **2022** |
| *NSF DMR Workshop: Materials Laboratories of the Future* | **2022** |
| *Mentor* for NSF EFRI REM Program | **2022** |
| *Mentor* for The Chemistry Women Mentorship Network | **2022** |
| *Reviewer* for ACS Nano | **2023** |
| *Reviewer* for Giant | **2023** |
| *Reviewer* for ACS Applied Polymer Materials | **2022 – present** |
| *Reviewer* for Journal of American Chemical Society | **2021 – present** |
| *Reviewer* for Journal of Polymer Science | **2018 – present** |
| *Review Panelist* for NSF SBIR/STTR and CBET Programs |  |

**Professional Organizations and Boards**

American Chemical Society (ACS), ACS POLY Division, ACS PMSE Division, Biodesign Center for Sustainable Macromolecular Materials and Manufacturing, The Society for Laboratory Automation and Screening Program Committee, American Institute of Chemical Engineers.

**Grant Proposals**

1. NSF EFRI E3P GOALI: Waste Management and Circularity of Crosslinked Polyurethane Foams -REM Supplement (co-PI with T. Long, K. Song, K. Biegasiewicz, M. Green, K. Jin), 6/1/22-5/31/23.
2. NIST Training for Improving Plastics Circularity Grant Program – Exciting Students for Sustainability with Curriculum, Open-Access Resources and Training (ESSCORT) (co-PI with T. Long, K. Jin, R. Xie, J. Oswald, C. Muhich, M. Green, K. Dooley), 9/1/22-8/31/24.
3. ASU Lightworks Sustainable Fuels and Products (SF&P) Seed Funding (co-PI with M. Lind, M. Green, F. Perreault), 1/1/23-6/30/23.
4. NSF EFRI E3P GOALI: Waste Management and Circularity of Crosslinked Polyurethane Foams -REM Supplement (co-PI with T. Long, K. Song, K. Biegasiewicz, M. Green, K. Jin, R. Xie), 6/1/23-5/31/24.
5. ORAU Ralph E. Powe Junior Faculty Enhancement Award, 6/1/23-5/31/24.
6. DOE: Sandia National Laboratories (SNL): Sustainable Engineering Polymers Designed for On-Demand Depolymerization (co-PI with T. Long (PD)), 4/17/23-9/30/23 (PO 2480798).
7. Arizona New Economy Initiative (NEI) Performance Engineering and Research for Optimizing Response Mechanisms (PERFORM) Science and Technology Center (STC) Funding with ALTR FLTR: Improving Health and Wellbeing by Reducing Alcohol Consumption Through New Processes to Produce Alcohol-free Beverages (co-PI with M. Lind, M. Green), 9/1/23-8/31/24.