Jared D. Harris, Ph.D.

Colorado College
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Education

Dartmouth College Hanover, NH
Postdoctoral Fellow, Dartmouth College Society of Fellows (2017-2019).

University of Massachusetts – Amherst Amherst, MA
Ph.D. & M.S., Polymer Science & Engineering. Dissertation: "Synthesis and Characterization of Imidazole-Containing Conjugated Polymers" (2012-2017).

Appalachian State University Boone, NC
B.S. Chemistry with Departmental and University Honors, Mathematics Minor. *Summa Cum Laude* (2008-2012).

Teaching

Colorado College Colorado Springs, CO
Laboratory Lecturer – Organic Chemistry I & II (2019-present)
Laboratory Lecturer – General Chemistry I & II (2019-present)

Dartmouth College Hanover, NH
Lecturer – Organic Chemistry II Lab (2018)
Guest Lecturer – Organic Chemistry II (2018)
Guest Lecturer – Polymer Chemistry (2018)

University of Massachusetts – Amherst Amherst, MA
Teaching Assistant – Introduction to Polymer Science & Engineering (2017)
Teaching Assistant – Introduction to Polymer Synthesis Laboratory Instructor (2014, 2015)
Teaching Assistant – Polymer Characterization Laboratory NMR Instructor (2015, 2016)

Research

Dartmouth College Hanover, NH
Advisor: Ivan Aprahamian.
Investigated the synthesis of polymerizable hydrazone-based molecular switches and their incorporation into various polymeric network systems. Investigated hydrazone photoisomerization as handle to manipulate bulk polymer properties (i.e. glass transition temperature, modulus, viscoelasticity, etc.) through the synthesis and characterization of hydrazone-pendant polymers.

University of Massachusetts – Amherst Amherst, MA
Advisor: Kenneth R. Carter.
Focused on the synthesis and inclusion of imidazole moieties into semiconducting conjugated polymers. Over a dozen novel materials were synthesized and characterized through fundamental and applied studies. Additional studies addressed the reproducibility and homogeneity of polymer chain-end microstructures synthesized via commonly employed Stille cross-couplings.

University of Akron Akron, OH
Advisor: Ali Dhinojwala.
REU research quantitatively characterized the adhesion energy of pyriform attachment discs used by cob- and web-weaving spiders. These two spider types utilize very different prey capture strategies which are reflected in their web architectures and the manner in which their webs are anchored to substrates.

Appalachian State University Boone, NC
Advisor: Libby Puckett.
Undergraduate research developed a fusion protein intended to decontaminate and detect organophosphate nerve agents and pesticides. Work focused on recombinant DNA technology that enabled *E. coli* to synthesize a fusion protein containing a hydrolytic enzyme (organophosphate hydrolase) capable of decontaminating the analyte and a signaling fluorophore (enhanced green fluorescent protein).

Professional Development and Service

Participant – Learning Community for Future Faculty at Dartmouth College (2017-2019)
Student – Dartmouth Center for the Advancement of Learning Future Faculty Teaching Series (2018)
Student – Center for the Integration of Research, Teaching and Learning 'The College Classroom' (2016)
Chair – Gordon Research Seminar – Polymers (2017)
Discussion Leader – Gordon Research Seminar – Polymers (2015)
Member – American Chemical Society (2010-present)

Honors

Junior Fellow, Dartmouth College Society of Fellows (2017-2020)
NSF Graduate Research Fellow, University of Massachusetts - Amherst (2014-2017)
Most Outstanding Chemistry Senior, Appalachian State University (2012)
REU Scholar in the University of Akron's Department of Polymer Science (Summer 2011)
North Carolina Space Grant Recipient, Appalachian State University (2010-2011)
Chancellor's Academic Honors List, Appalachian State University (2008-2012)
Member of Honors College, Appalachian State University (2008-2012)

Technical Skills

Extensive experience in: organic monomer and polymer synthesis, characterization (e.g. NMR, GPC, GC-MS, MALDI-ToF, FTIR, UV-vis, photoluminescence, DSC, TGA), and solution processing (e.g. spin coating, drop casting, surface treatments).

Publications

7. Harris, J.D.; Stihl, M.; Schmidt, H.-W.; Carter, K.R. "Dithienobenzimidaole-Containing Conjugated Donor-Acceptor Polymers: Synthesis and Characterization" *Journal of Polymer Science, Part A: Polymer Chemistry* **2019** *57*, 60-69, DOI: 10.1002/pola.29284.

6. Harris, J.D.[†]; Moran, M.J.[†]; and Aprahamian, I. "New Molecular Switch Architectures" *Proceedings of the National Academy of Sciences of the USA* **2018** *115*, 9414-9422, DOI: 10.1073/pnas.1714499115.

5. Harris, J.D. and Carter, K.R. "A one-pot strategy to improve end-capping efficacy in Stille poly-condensations" *Polymer Chemistry* **2018** *9*, 1132-1138, DOI: 10.1039/C7PY01761H.

4. Homyak, P.D.; Liu, Y.; Harris, J.D.; Liu, F.; Carter, K.R.; Russell, T.P.; Coughlin, E.B. "Systematic Fluorination of P3HT: Synthesis of P(3HT-co-3H4FT)s by Direct Arylation Polymerization, Characterization, and Device Performance in OPVs" *Macromolecules* **2016**, *49*, 3028-3037, DOI: 10.1021/acs.macromol.6b00386.

3. Harris, J.D.; Liu, J.; Carter, K.R. "Synthesis of π-Bridged Dually-Dopable Conjugated Polymers from Benzimidazole and Fluorene: Separating Sterics from Electronics" *Macromolecules* **2015**, *48*, 6970-6977, DOI: 10.1021/acs.macromol.5b01174.

2. Harris, J.D.; Mallet, C.; Mueller, C.; Fischer, C.; Carter, K.R. "Synthesis and Characterization of Poly(2-alkylbenzimidazole-alt-9,9-dihexylfluorene)s: A Dually Dopable Polymer System" *Macromolecules* **2014**, *47*, 2915-2920, DOI: 10.1021/ma500231n.

1. Sahni, V.; Harris, J.; Blackledge, T.A.; Dhinojwala, A. "Cobweb-weaving spiders produce different attachment discs for locomotion and prey capture" *Nature Communications* **2012**, *3*, DOI: 10.1038/ncomms2099.

† denotes equal contribution

Presentations

Harris, J.D.; Carter, K.R. (June 2017) "A One-Pot Strategy to Improve End-Capping Efficacy in Stille Polycondensations." Poster at Gordon Research Seminar & Conference – Polymers, South Hadley, MA.

Harris, J.D.; Carter, K.R. (October 2016) "Synthesis of Conjugated Polymeric Materials: Chain-End Functionalization in Stille Polycondensations." Presentation and Poster at UMass – Amherst Fall Polymer Meeting, Amherst, MA.

Harris, J.D.; Carter, K.R. (June 2016) "Semiconducting Polyionomers: Design and Synthesis of Tunable Materials." Presentation at UMass-Amherst/University of Bayreuth Joint Workshop, Bayreuth, Germany.

Harris, J.D.; Carter, K.R. (June 2015) "Incorporation and use of imidazoles as a dually dopable moiety in conjugated polymers." Poster at Gordon Research Seminar & Conference – Polymers, South Hadley, MA.

Harris, J.D.; Carter, K.R. (March 2015) "Incorporation and use of imidazoles as a dually dopable moiety in conjugated polymers." Presentation at 249th National Meeting of the American Chemical Society, Denver, CO.

Harris, J.D.; Sahni, V. Blackledge, T.A.; Dhinojwala, A. (July 2011) "The Adhesive Properties of Spider Web Attachment Discs". Presentation and Poster at Northeast Ohio NSF-REU Symposium, Cleveland, OH.

Harris, J.D.; Conway, M.; Adams, C.M. Hounshell, B.; Puckett, L.G. (August 2010) "Development of a protein-based system for the detection of organophosphates using the pH-dependence of enhanced fluorescent protein." 240th National Meeting of the American Chemical Society, Boston, MA.

Activities

Member, American Chemical Society (2010-present). Member, Vermont Mountain Biking Association. Member (2017-2019), Appalachian State University Cross Country and Track Team (2008-2009). Interests include reading, woodworking, mountain biking, camping, and cooking.