

# Douglas M. Scott

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## EDUCATION

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**Doctor of Philosophy in Chemical Engineering, Graduate Student (ongoing)** September 2016 – Present  
Princeton University Department of Chemical and Biological Engineering, Princeton, NJ  
Research Advisors: Dr. Robert K. Prud'homme & Dr. Rodney D. Priestley  
Thesis Topic: Scalable Production of Functional and Structured Polymeric Colloids for Novel Encapsulation and Self-Assembled Systems

**Honors Bachelor of Chemical Engineering with Distinction** August 2012 – May 2016  
University of Delaware Department of Chemical and Biomolecular Engineering, Newark, DE  
Minors in Economics and Material Science  
Research Advisor: Dr. Thomas H. Epps III  
Senior Thesis: Simple RSVA-SS Process for Directing Self-Assembled Nanostructures in Block Polymer Thin Films

## PROFESSIONAL EXPERIENCE

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**Graduate Researcher, Prud'homme & Priestley Research Groups, Princeton, NJ** January 2017 – Present

- Investigating the use of scalable processes including confined impingement jet mixing and spinning disk atomization to produce complex nano- and micro-colloids
- Researching the efficacy of natural polyelectrolyte complexation for the encapsulation of sensitive active ingredients (in collaboration with industry)
- Studying the effect of hydrophobic ionomers on flash nanoprecipitation for the formation of amphiphilic particles and encapsulation of charged actives in non-standard media.

**Summer Undergraduate Research Fellow, NIST, Gaithersburg, MD** June 2016 – August 2016

- Collaborated with researchers at the NIST Center for Neutron Research (NCNR)
- Investigated the industrially relevant interaction between surfactants and natural polymers via rheology and small angle neutron scattering (SANS)

**Engineering Intern, W. L. Gore & Associates, Elkton, MD** June 2015 – August 2015

- Collaborated with subject area experts to research composite adhesion to commercial substrates
  - Prototyped laminates for testing
  - Correlated substrate properties to laminate peel strength
- Presented findings to technologists and engineers to discuss results and received feedback

**Research Assistant, Epps Research Group, Newark, DE** January 2014 – May 2016

- Researched block polymer thin films using gradient thickness fabrication methods to investigate substrate and commensurability effects on nanoscale self-assembled morphologies
- Determined effects of tapered molecular architectures on morphological transitions in block polymer thin films during selective solvent vapor annealing
- Developed technique of raster solvent vapor annealing with soft shear (RSVA-SS) to promote long range order in nanoscale block polymer morphologies with micron resolution for directed self-assembly applications

**Tutor, UD Office of Academic Enrichment, Newark, DE**

Sept. 2014 – May 2016

- Schedule and tutor students in course subjects (chemistry, math, economics)

**PUBLICATIONS**

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- Luo, M.; **Scott, D. M.**; Epps, T. H., III. *Macro Letters* **2015**, *4*, 516-520. “Writing highly ordered macroscopic patterns in cylindrical block polymer thin films via raster solvent vapor annealing and soft shear.”
- Luo, M.; Brown, J. R.; Remy, R. A.; **Scott, D. M.**; Mackay, M. E.; Hall, L. M.; Epps, T. H., III. *Macromolecules* **2016**, *49* (14), 5213-5222. “Determination of interfacial mixing in tapered block polymer thin films: experimental and theoretical investigations.”

**PRESENTATIONS**

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- American Institute of Chemical Engineers (AIChE) Annual Meeting, November 2018, Pittsburgh, PA  
**Invited Poster Presenter** “Confined Impingement Jet Mixing of Charged Polymers for Functional Structured Colloids and Encapsulation”

**AWARDS AND ACHIEVEMENTS**

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- Cummins Merit Fellowship September 2016 – May 2017
- Summa Cum Laude Degree Distinction May 2016
- 1<sup>st</sup> Place Overall, AIChE MESD Undergraduate Poster Competition (Salt Lake City, UT) November 2015
- UD College of Engineering Dean’s List Fall 2012 – Spring 2016
- Tau Beta Pi Engineering Honors Society member December 2014 – Present
- UD Summer Scholar; Northeastern Chemical Association (NECA) Scholar Summer 2014

**INVOLVEMENT AND LEADERSHIP**

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**Princeton CBE Department Website Committee**

March 2018 – January 2019

- Served as the graduate student representative
- Reviewed portions of the former website relevant to prospective graduate student recruiting and current graduate student resources from which I provided comments, revisions, and new content
- Attend meetings with faculty and staff to provide comments on overall website design and message.

**Engineers Without Borders UD Student Chapter**

September 2012 – May 2016

- Treasurer (Spring 2014 - May 2016): Coordinated with UD College of Engineering to manage funds for assessment trips and events; networked with university donors; served on executive board
- Researched potential projects in developing countries and contributed to logistical report writing
- Collaborated with fellow members to apply for a water project in Malawi and planned two assessments trips