

# William P. Bricker, Ph.D.

Assistant Professor

Department of Chemical and Biological Engineering

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## EDUCATION

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**Ph.D. in Energy, Environmental & Chemical Engineering** **2014**  
Washington University in St. Louis, St. Louis, MO

**B.S. in Chemical Engineering** **2007**  
Bucknell University, Lewisburg, PA

## PROFESSIONAL APPOINTMENTS

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**Assistant Professor** **2019–Present**  
Department of Chemical and Biological Engineering, University of New Mexico, Albuquerque, NM

**Postdoctoral Associate** **2015–2019**  
Department of Biological Engineering, Massachusetts Institute of Technology, Cambridge, MA

## PUBLICATIONS

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- [15] Jun, H.; Wang, X.; **Bricker, W. P.**; Bathe, M. Automated sequence design of 2D wireframe DNA origami with honeycomb edges. *Nature Communications* **10**, 5419 (2019). [ [Link](#) ]
- [14] Wamhoff, E.-C.; Banal, J. L.; **Bricker, W. P.**; Shepherd, T. R.; Parsons, M. F.; Veneziano, R.; Stone, M. B.; Jun, H.; Wang, X. & Bathe, M. Programming structured DNA assemblies to probe biophysical processes. *Annual Review of Biophysics* **48**, 395–219 (2019). [ [Link](#) ]
- [13] Jun, H.\*; Shepherd, T. R.\*; Zhang, K.\*; **Bricker, W. P.**; Li, S.; Chiu, W. & Bathe, M. Automated sequence design of 3D polyhedral wireframe DNA origami with honeycomb edges. *ACS Nano* **13**, 2083–2093 (2019). [ [Link](#) ]
- [12] **Bricker, W. P.**<sup>†</sup>; Banal, J. L.; Stone, M. B. & Bathe, M.<sup>†</sup> Molecular model of J-aggregated pseudoisocyanine fibers. *Journal of Chemical Physics* **149**, 024905 (2018). [ [Link](#) ]
- [11] Balevičius Jr., V.; Fox, K. F.; **Bricker, W. P.**; Jurinovich, S.; Prandi, I. G.; Mennucci, B. & Duffy, C. D. P. Fine control of chlorophyll-carotenoid interactions defines the functionality of light-harvesting proteins in plants. *Scientific Reports* **7**, 13956 (2017). [ [Link](#) ] [ [Top 100 in Chemistry](#) for 2017 ]
- [10] Cunningham, P. D.; **Bricker, W. P.**; Díaz, S. A.; Medintz, I. L.; Bathe, M. & Melinger, J.

- S. Optical determination of the electronic coupling and intercalation geometry of Thiazole Orange homodimer in DNA. *Journal of Chemical Physics* **147**, 055101 (2017). [ [Link](#) ]
- [9] Pan, K.\*; **Bricker, W. P.\***; Ratanalert, S. & Bathe, M. Structure and conformational dynamics of scaffolded DNA origami nanoparticles. *Nucleic Acids Research* **45**, 6284–6298 (2017). [ [Link](#) ]
- [8] Nguyen, A. Y.; **Bricker, W. P.**; Zhang, H.; Weisz, D.; Gross, M. & Pakrasi, H. B. The proteolysis adaptor, NblA, binds to the N-terminus of  $\beta$ -phycocyanin: Implications for the mechanism of phycobilisome degradation. *Photosynthesis Research* **132**, 95–106 (2017). [ [Link](#) ]
- [7] Shenai, P. M.; Fernandez-Alberti, S.; **Bricker, W. P.**; Tretiak, S. & Zhao, Y. Internal conversion and vibrational energy redistribution in chlorophyll a. *Journal of Physical Chemistry B* **120**, 49–58 (2016). [ [Link](#) ]
- [6] Fox, K. F.; **Bricker, W. P.**; Lo, C. S. & Duffy, C. D. P. Distortions of the xanthophylls caused by interactions with neighbouring pigments and the LHCII protein are crucial for studying energy transfer pathways within the complex. *Journal of Physical Chemistry B* **119**, 15550–15560 (2015). [ [Link](#) ]
- [5] **Bricker, W. P.\***; Shenai, P. M.\*; Ghosh, A.; Liu, Z.; Enrriquez, M. G. M.; Lambrev, P. H.; Tan, H.-S.; Lo, C. S.; Tretiak, S.; Fernandez-Alberti, S. & Zhao, Y. Non-radiative relaxation of photoexcited chlorophylls: Theoretical and experimental study. *Scientific Reports* **5**, 13625 (2015). [ [Link](#) ]
- [4] Chmeliov, J.; **Bricker, W. P.**; Lo, C.; Jouin, E.; Valkunas, L.; Ruban, A. V. & Duffy, C. D. P. An ‘all pigment’ model of excitation quenching in LHCII. *Physical Chemistry Chemical Physics* **17**, 15857–15867 (2015). [ [Link](#) ]
- [3] **Bricker, W. P.** & Lo, C. S. Efficient pathways of excitation energy transfer from delocalized  $S_2$  excitons in the peridinin-chlorophyll *a*-protein complex. *Journal of Physical Chemistry B* **119**, 5755–5764 (2015). [ [Link](#) ]
- [2] **Bricker, W. P.** & Lo, C. S. Excitation energy transfer in the peridinin-chlorophyll *a*-protein complex modeled using configuration interaction. *Journal of Physical Chemistry B* **118**, 9141–9154 (2014). [ [Link](#) ]
- [1] Kovács, S. A.; **Bricker, W. P.**; Niedzwiedzki, D. M.; Colleti, P. F. & Lo, C. S. Computational determination of the pigment binding motif in the chlorosome protein A of green sulfur bacteria. *Photosynthesis Research* **118**, 231–247 (2013). [ [Link](#) ]

\*Co-first author | †Co-corresponding author | See [Google Scholar](#) page for more information.

## CONTRIBUTED PRESENTATIONS

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- **AICHE Annual Meeting (2018)**, Pittsburgh, PA. *Modeling the Aggregation Behavior of Cyanine Dyes for Efficient Energy Transport*.
- **Center for Excitonics (CFE) All Hands Meeting (2018)**, Boston, MA. *Exciton Dynamics in Self-Aggregated Cyanine Fibers*.

- **Center for Excitonics (CFE) All Hands Meeting (2016)**, Boston, MA. *Mimicking Optical Properties of Natural Light Harvesting Complexes using DNA-based Designer Excitonic Circuits.*
- **Photosynthetic Antenna Research Center (PARC) All Hands Meeting (2014)**, St. Louis, MO. *Excitation Energy Transfer in Peridinin-Chlorophyll *a*-Protein Complex Modeled using Configuration Interaction.*
- **APS Annual Meeting (2014)**, Denver, CO. *Excitation Energy Transfer in Peridinin-Chlorophyll *a*-Protein Complex using Förster Resonance Energy Transfer.*
- **AIChE Annual Meeting (2012)**, Pittsburgh, PA. *Modeling Biomolecular Structure and Excitation Energy Transfer in Photosynthetic Pigment-Protein Complexes.*
- **AIChE Annual Meeting (2011)**, Minneapolis, MN. *Modeling Excitation Energy Transfer in Photosynthetic Systems: Application to Peridinin-Chlorophyll-Protein Complex in Dinoflagellates.*

## TEACHING EXPERIENCE

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### Methods of Analysis in Chemical and Nuclear Engineering (CBE/NE 525) Fall 2019

University of New Mexico, Albuquerque, NM

- Required graduate course detailing methods of applied mathematics to science and engineering problems. Co-listed as BME 558 in the Biomedical Engineering program.

### Kaufman Teaching Certificate Program

Spring 2017

Massachusetts Institute of Technology, Cambridge, MA

- Semester-long certificate program detailing how to incorporate active learning techniques as well as other methods of effective teaching into a lecture-based course.

### Modeling and Computing in Chemical Engineering (Lecturer)

Spring 2015

Washington University in St. Louis, St. Louis, MO

- Instructor of record for the sophomore-level undergraduate course *Modeling and Computing in Chemical Engineering*, in the Energy, Environmental & Chemical Engineering (EECE) program.

### Chemical Engineering Laboratory (Teaching Associate)

Fall 2014

Washington University in St. Louis, St. Louis, MO

- Managed the *Chemical Engineering Laboratory* course and six teaching assistants, and developed course materials.

## HONORS AND AWARDS

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- **Kaufman Teaching Certificate**, Massachusetts Institute of Technology, 2017. *Certificate program for incorporation of active learning techniques into lectures.*
- **Doctoral Student Research Award**, Energy, Environmental & Chemical Engineering Department, Washington University in St. Louis, 2015. *Annual award for the highest impact publication within a scientific cluster.*

- **Scientific Exchange Program Award**, Photosynthetic Antenna Research Center, Washington University in St. Louis. *Hosted by Dr. Sergei Tretiak at Los Alamos National Laboratory in May 2013.*

## SERVICE AND LEADERSHIP

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- Member of the American Institute of Chemical Engineering (AIChE), the American Chemical Society (ACS), and the American Association for the Advancement of Science (AAAS).
- Co-reviewer for *Nano Letters*, *ACS Nano*, *Nucleic Acids Research*, and *Journal of Chemical Theory and Computation*.
- Photosynthetic Antenna Research Center (PARC) outreach at Maplewood Richmond Heights Middle School in St. Louis, MO (Feb. 2011). *Taught students about renewable energy with hands-on experiments.*