» CURRICULUM VITAE «

Benjamin R. Luginbuhl

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Education

Doctor of Philosophy*
Materials Chemistry
Summer 2020 (expected)

UNIVERSITY OF CALIFORNIA, SANTA BARBARA
Advisors: Prof. Thuc-Quyen Nguyen; Prof. Mattanjah de Vries

Bachelor of Science
Biochemistry (ACS)
May 2015

NORTHERN ARIZONA UNIVERSITY
Minors: Biology, Mathematics, Physics
GPA: 3.89/4.0 *Summa Cum Laude*

Research & Teaching Experience

Software Engineering Intern
Jun 2019 - Current

INVOCA, INC.
Supervisor: Caitlin Davis

- Work with a team of developers on software for call tracking and analytics
- Continuous Integration/Development of Ruby-on-Rails and React apps
- Work closely with product and customer success teams to deliver valuable software updates that are immediately used by the company and customers

Graduate Teaching Assistant
Sept 2015 – Current

UNIVERSITY OF CALIFORNIA, SANTA BARBARA
Supervisors: Dr. Petra van Koppen; Dr. Dmitriy Uchenik

- Taught 8 sections of General Chemistry Lab (24 students/section)
- Write, proctor, and grade quizzes; grade lab reports and exams
- Safety and sample analysis for Mass Spectrometry facility

Graduate Research Assistant
July 2015 – Oct 2019

UNIVERSITY OF CALIFORNIA, SANTA BARBARA
Nguyen Research Group (Prof. Thuc-Quyen Nguyen)

- Research focuses on the fabrication and characterization of organic semiconductor devices, including photovoltaic cells, photodiodes, and light-emitting diodes
- Investigation of the effects of electronic traps on the recombination dynamics of charge carriers within organic solar cells
- Device physics of semi-transparent organic solar cells with non-fullerene acceptors

Undergraduate Researcher
July 2013 – May 2015

NORTHERN ARIZONA UNIVERSITY
Browder Research Group (Prof. Cindy Browder)

- Performed original research on the fabrication and implementation of sustainable high surface area materials (carbon aerogels) in multifunctional electrochemical capacitors
- Research presented at multiple symposia (see Publications & Presentations)
- Project received funding from the NASA Space Grant program and the Hooper Undergraduate Research Program

Teaching Assistant | NORTHERN ARIZONA UNIVERSITY
Sept 2014 – May 2015 | Supervisors: Prof. Edgar Civitello, Jr; Prof. Cynthia Hartzell

- Graded exams for sophomore-level organic chemistry course
- Graded homework for senior-level (co-convened with graduate-level) quantum and statistical mechanics course

After School Instructor | MONTESSORI SCHOOLS OF FLAGSTAFF
Aug 2009 – May 2011 | Supervisor: Marina Smith

- Instructed afterschool program for grades 1 through 6 at a Flagstaff, AZ charter school

Laboratory Technician | SENESTECH, INC.
Feb 2008 – Aug 2008 | Supervisors: Dr. Robert Audet; Dr. Jinhee Yi

- Worked closely with research scientists at a startup company to formulate a chemical sterilant for Indonesian rice rats (*Rattus argentiventer*)
- Learned basic laboratory techniques, including micro gel encapsulation
- Communicated technical results and data to supervisors in weekly meetings

Academic Awards, Scholarships, & Fellowships

NSF-GRFP – Honorable Mention (2016)

Junia E. McAlister Senior Award

Earle B. Hoyt Jr. Chemistry Scholarship

ACS Inorganic Chemistry Award

Summer Research Fellowship - UCSB

NAU/NASA Space Grant

Goldwater Scholarship – Nominee (2014)

Hooper Undergraduate Research Award

Publications & Presentations

Brus, V V; Lee, J; **Luginbuhl, B R**; Ko, S-J; Bazan, G C; Nguyen, T-Q. Solution-processed semitransparent organic photovoltaics: from molecular design to device performance. *Adv. Mater.* **2019**, 1900904.

Rosenthal, K D; Hughes, M P; **Luginbuhl, B R**; Ran, N A; Karki, A; Ko, S-J; Hu, H; Wang, M; Ade, H; Nguyen, T-Q. Quantifying and understanding voltage losses due to nonradiative recombination in bulk heterojunction organic solar cells with low energetic offsets. *Adv. Energy Mater.* **2019**, *9*, 1901077.

Hughes, M P; Rosenthal, K D; Dasari, R R; **Luginbuhl, B R**; Yurash, B; Marder, S R; Nguyen, T-Q. Charge recombination dynamics in organic photovoltaic systems with enhanced dielectric constant. *Adv. Funct. Mater.* **2019**, *29*, 1901269.

Luginbuhl, B R; Ko, S-J; Lee, J; Wang, H; Nakayama, N; Bazan, G C; Nguyen, T-Q. Visible and near-infrared organic photodetectors using non-fullerene acceptors. *In preparation.*

Ko, S-J; Ran, N A; **Luginbuhl, B R**; Karki, A; Seifrid, M; Okubo, T; Wang, M; Bazan, G C; Nguyen, T-Q. High potential organic solar cells light the way for semitransparent photovoltaics with high efficiency. *Adv. Energy Mater.* Submitted for publication.

Lee, J; Ko, S-J; Seifrid, M; Lee, H; **Luginbuhl, B R**; Karki, A; Ford, M; Rosenthal, K; Cho, K; Nguyen, T-Q; Bazan, G C. Bandgap narrowing in non-fullerene acceptors: single atom substitution leads to high optoelectronic response beyond 1000 nm. *Adv. Energy Mater.* **2018**, *8*, 1801212.

Lee, J; Ko, S-J; Seifrid, M; Lee, H; McDowell, C; **Luginbuhl, B R**; Karki, A; Cho, K; Nguyen, T-Q; Bazan, G C. Design of nonfullerene acceptors with near-infrared light absorption capabilities. *Adv. Energy Mater.* **2018**, *8*, 1801209.

Heiber, M C; Okubo, T; Ko, S-J; **Luginbuhl, B R**; Ran, N A; Wang, M; Wang, H; Uddin, M A; Woo, H Y; Bazan, G C; Nguyen, T-Q. Measuring the competition between bimolecular charge recombination and charge transport in organic solar cells under operating conditions. *Energy Environ. Sci.* **2018**.

B. R. Luginbuhl. *Mitsubishi Chemical Center for Advanced Materials*. University of California, Santa Barbara. April 16, 2018. [Presentation]

B. R. Luginbuhl. Progress towards near-infrared organic photodetectors. *Center for Polymers & Organic Solids Symposium*. University of California, Santa Barbara. September 04, 2018. [Presentation]

B. R. Luginbuhl; A. Karki, N. A. Ran; S. D. Collins; T.-Q. Nguyen. Investigating energetic disorder in organic solar cells. *Center for Advanced Organic Photovoltaics – Annual Meeting.* Atlanta, GA. February 16, 2017. [Poster]

B. R. Luginbuhl. Organic photodiodes for narrowband near-infrared detection. *Center for Polymers & Organic Solids Symposium.* University of California, Santa Barbara. November 21, 2017. [Presentation]

B. R. Luginbuhl. Charge transfer state properties of organic solar cells. *Center for Polymers & Organic Solids Symposium*. University of California, Santa Barbara. January 10, 2017. [Presentation]

B. R. Luginbuhl. Agar-derived carbon aerogels for use in structural electric double-layer capacitors. *Arizona Space Grant Consortium*. Tempe, AZ. April 18, 2015. [Presentation]

B. R. Luginbuhl; B. D. Cutler; C. C. Browder. Sustainable carbon aerogels as surface area enhancements for multifunctional electric double layer capacitors. *National Conference on Undergraduate Research,* Spokane, WA. April 16-18, 2015. [Poster]

B. R. Luginbuhl; B. D. Cutler; A Jauregui, C. C. Browder. Electrical optimization of agar-derived carbon aerogels for use in structural electric double-layer capacitors. *249th National Meeting of the American Chemical Society*, Denver, CO. March 20-26, 2015. [Poster]

B. R. Luginbuhl; A. Jauregui. Synthesis of plant-derived carbon aerogels for electrode surface area enhancement in electrochemical double-layer capacitors. *Northern Arizona University Undergraduate Research Symposium*, Flagstaff, AZ. April 12, 2015. [Poster]

Outreach & Volunteerism

SB CTF

Volunteer

UCSB GSDS

Sept 2015 - Current

Marketing Director; Advertising Chair

website: http://gsds.mrl.ucsb.edu/

UCSB ChemPD

Jan 2019 - Current

Co-President

website: http://www.chem.ucsb.edu/graduate/resources/chem-pd

CSEP FUSE

Nov 2016 - Current

Volunteer

website: https://csep.cnsi.ucsb.edu/programs/fuse
contact: Wendy Ibsen, ibsen@cnsi.ucsb.edu

UCSB SciTrek

Sept 2015 – Current

Graduate Student Collaborator

website: http://www.chem.ucsb.edu/scitrek/
contact: Paige Roberts, scitrekcoord@chem.ucsb.edu

NanoDays (CNSI)

Apr 2016

Volunteer

website: http://www.nisenet.org/nanodays
contact: Wendy Ibsen, ibsen@cnsi.ucsb.edu

Flagstaff Festival of Science | *Volunteer*

Sept 2013, 2014 | *website:* http://www.scifest.org/

Flagstaff Star Party | *Volunteer*

Sept 2014 | *website:* http://www.flagstaffstarparty.org/

Relevant Skills & Training

Chemistry: spectroscopy (UV-vis-IR, fluorescence, 1-D & 2-D NMR); GC/MS; HPLC; solid-phase peptide synthesis; basic organic synthesis

Materials/Devices: electron microscopy (SEM, TEM, STEM, EDS/WDS); semiconductor device characterization; impedance spectroscopy; cyclic voltammetry, spin-coating, thermal vapor deposition, glove-box processing

Analysis/Software: programming (Python, SQL, Mathematica, LabView); molecular dynamics (Amber/lammps); IgorPro; OriginPro; MS Office Suite; Gaussian; Windows and Linux operating systems; 3D modeling (blender, SolidWorks, AutoCAD)

Programming/Development: web-design (Django, Ruby-on-Rails, React, HTML/CSS), testing (Rspec, minitest, jest, etc.), git, bash, VisualBasic.

Professional Affiliations

Selected References

Mattanjah de Vries, PhD
Professor
Dept. of Chemistry & Biochemistry
Univ. of California, Santa Barbara
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Cindy Browder, PhD
Associate Professor
Dept. of Chemistry & Biochemistry
Northern Arizona University
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Thuc-Quyen Nguyen, PhD
Professor
Dept. of Chemistry & Biochemistry
Univ. of California, Santa Barbara
quyen@ucsb.edu

Michael C. Heiber, PhD
Scientific Software Developer
Enthought
Austin, TX
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Alexander Mikhailovsky, PhD
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Optical Characterization Facility
Univ. of California, Santa Barbara
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Caitlin Davis
Director of Software Engineering
Invoca, Inc.
Santa Barbara, CA
cdavis@invoca.com

more references available upon request

Websites

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