

# Clayton Dahlman

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## education.

### University of Texas at Austin

Doctor of Philosophy, Chemical Engineering, Aug. 2017 (expected) Austin TX, U.S.A.  
Advisor: Delia J. Milliron 2014 - present  
Dissertation: Electrochromism in plasmonic metal oxide nanocrystals  
via structural and electronic phase transformations

### University of California, Berkeley

Master of Science\*, Chemical Engineering, May 2014 Berkeley CA, U.S.A.  
Advisors: Delia J. Milliron, Jeffrey A. Reimer 2012 - 2014  
Graduate Student User at Lawrence Berkeley Lab, Molecular Foundry  
*\* Transferred to University of Texas, Austin with advisor Prof. Delia J. Milliron to complete Ph.D.*

### Columbia University

Bachelor of Science, Chemical Engineering, May 2011 New York NY, U.S.A.  
Minor in Materials Science 2007 - 2011  
*Magna Cum Laude*  
Advisor: Irving P. Herman 2007-2012  
Research: Controlled self-assembly of colloidal metal oxide  
nanocrystals into 3D binary superlattices  
Advisors: Scott Banta, Adam West, Michael Hill 2011  
Research: Isobutanol production in a regenerative bio-fuel cell  
from electricity and CO<sub>2</sub> with nitrogen-fixing bacteria

## honors.

- National Science Foundation Graduate Research Fellow 2012-2015
- Cockrell School of Engineering Fellow, U.T. Austin 2014-2017
- Graduate Dean's Prestigious Fellowship Supplement, U.T. Austin 2014-2015
- ARPA-E Energy Innovation Summit Student Program Fellow, U.S. Department of Energy 2016
- C.P. Davis Engineering Scholar, Columbia University 2007-2011
- Columbia University Scholars Summer Enhancement Fellow 2010

# publications.

**C. J. Dahlman**, G. LeBlanc, A. Bergerud, C. Staller, J. Adair, D. J. Milliron. "Electrochemically Induced Transformations of Vanadium Dioxide Nanocrystals", *Nano Lett.*, **2016**, 16 (10), 6021-6027

E. L. Runnerstrom, A. Bergerud, A. Agrawal, R. W. Johns, **C. J. Dahlman**, A. Singh, S. M. Selbach, D. J. Milliron. "Defect Engineering in Plasmonic Metal Oxide Nanocrystals", *Nano Lett.*, **2016**, 16 (5), 3390-3398

**C. J. Dahlman**, Y. Tan, M. A. Marcus, D. J. Milliron. "Spectroelectrochemical Signatures of Capacitive Charging and Ion Insertion in Doped Anatase Titania Nanocrystals", *J. Am. Chem. Soc.*, **2015**, 137 (28), 9160-9166.

C. Lu, A. J. Akey, **C. J. Dahlman**, D. Zhang, and I. P. Herman. "Resolving the Growth of 3D Colloidal Nanoparticle Superlattices by Real-Time Small-Angle X-ray Scattering", *J. Am. Chem. Soc.*, **2012**, 134 (45), 18732-18738.

## In progress:

**C. J. Dahlman**, J. Adair, O. Zandi, A. Agrawal, R. W. Johns, D. J. Milliron. "Electrochemical Modulation of Mid-IR Localized Surface Plasmon Resonance in Substitutionally Doped TiO<sub>2</sub> Nanocrystals". In preparation.

**C. J. Dahlman**, D. C. He, M. Tang, D. J. Milliron. "Size and Shape Dependent Lithium Intercalation Dynamics in Titanium Dioxide Nanocrystals". In preparation.

**C. J. Dahlman**, L. C. Gilbert, G. Henkelman, D. J. Milliron. "Lattice Expansion and Oxygen Defect Behavior During Sequential Insulator-Metal-Insulator Transition in Reduced VO<sub>2</sub> Nanocrystals". In preparation.

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# patents.

D. J. Milliron, B. Koo, G. Garcia, **C. J. Dahlman**, T. M. Mattox, L. De Trizio, "Conductive Transition Metal Oxide Nanostructured Electrochromatic Material and Optical Switching Devices Constructed Thereof," U.S. Patent Application No. 14/671,061. **2014**

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# presentations.

**C. J. Dahlman**, A. J. Bergerud, G. Leblanc, C. Staller, J. Adair, D. J. Milliron. "Metal-Insulator Transitions in VO<sub>2</sub> Nanocrystals by Electrochemical Charging", Gordon Research Conference (GRC): Colloidal Semiconductor Nanocrystals, 30 July – 5 August 2016, Poster.


**C. J. Dahlman**, Y. Tan and D. J. Milliron. "Dual-Mode Electrochromism in Doped Anatase TiO<sub>2</sub> Nanocrystals", Gordon Research Conference (GRC): Materials for Applications in Energy Technology, 21-27 February 2015, Poster.

**C. J. Dahlman** and D. J. Milliron. "Tunable Dual Mode Electrochromic Switching in Doped TiO<sub>2</sub> Nanocrystals", MRS Spring Meeting, Session F10.12, 25 April 2014, Presentation.

S. S. Cheema, **C. J. Dahlman**, L. Jiang, L. C. Stowe, C. B. Wang, M. M. Patel, A. K. Bains, C. C. Liu. "Source-Separating Latrines: Implementing Sustainable Energy, Waste Management and Agricultural Solutions in Developing Communities" EPA P3 National Sustainable Design Expo, 16-17 April 2011, Poster.

**C. J. Dahlman** and C. W. Roebuck. "Education for System and Idea Transfer" Engineers Without Borders Northeast Regional Workshop. Columbia University, 19 November 2011, Presentation.

# teaching.

- Teaching Assistant, CHE350: Chemical Engineering Materials, U.T. Austin  
Prof. Delia Milliron  
Upper-level undergraduate materials science survey course  
Austin TX, U.S.A.  
2014 - present
- Roles:
- Assisted with curriculum development
  - Prepared exam and homework problems
  - Delivered discussion sections and multiple class lectures
- Teaching Assistant, CHE384T: Materials Physics, U.T. Austin  
Prof. Delia Milliron  
Graduate level materials chemistry and solid-state physics course  
Austin TX, U.S.A.  
2014 - present
- Roles:
- Assisted with curriculum development
  - Selected reading and reference materials
  - Prepared exam and homework problems
  - Delivered discussion sections
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# service and activities.

- Emerging Leaders in Technology and Engineering, Inc.  
Co-founder and Executive Vice-President  
New York NY, U.S.A.  
2009 - present
- 501(c)3 non-profit that delivers project-oriented educational STEM engagement activities to over four hundred middle and high school students per year in New York, and about fifty West African students per year during summer camps in Ghana.
- Roles:
- Fundraising, grant-writing and strategic development
  - Teaching and curriculum/activity development
  - Hiring and personnel management
  - Accounting and financial management
  - Marketing and public relationship building
- Volunteer, Girl Day at U.T. Austin  
Austin TX, U.S.A.  
2015-2017
- Volunteer, Explore U.T.  
Austin TX, U.S.A.  
2015-2017
- Student Project Mentor, Students for Environmental Energy Development (SEED)  
Berkeley High School  
Berkeley CA, U.S.A.  
2013
- Engineers Without Borders, Columbia University chapter  
Program Manager, Ghana Program  
New York NY, U.S.A.  
2007-2011
- Managed a team of engineering students that helped design and construct composting latrines and water sanitation infrastructure in Obodan, a rural town of about 1000 residents in Ghana, West Africa
- Columbia University Varsity Squash Team  
Team Captain  
New York NY, U.S.A.  
2007-2011
- Selected as an Academic All-Ivy Athlete (2011)