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Education:

University of California, Berkeley: Ph.D. in Physical Chemistry, 2004.
Thesis title: New materials for nanocrystal solar cells
Advisor: A. Paul Alivisatos
Princeton University: A.B., *summa cum laude*, in Chemistry, Certificate in Materials Science and Engineering, 1999.
Thesis title: Charge injection and chemistry at the indium tin oxide-organic interface
Advisors: Jeffrey Schwartz, Antoine Kahn

Positions Held:

2014 – : Fellow of the Henry Beckman Professorship, University of Texas at Austin
2013 – : Associate Professor, Department of Chemical Engineering, University of Texas at Austin
2008 – 2014: Staff Scientist, Materials Sciences Division, LBNL, Berkeley, California
2005 – 2008: Research Staff Member, IBM Almaden Research Center, San Jose, California
2004 – 2005: Postdoctoral Researcher, IBM Watson Research Center, Yorktown Heights, New York

Administrative Appointments:

2012 – 2013: Deputy Director, Molecular Foundry, LBNL
2008 – 2012: Director, Inorganic Nanostructures Facility, Molecular Foundry, LBNL

Publications:

*Contact author(s) are marked with *.*

- J Kim, GK Ong, Y Wang, G LeBlanc, TE Williams, TM Mattox, BA Helms, DJ Milliron*, "Nanocomposite Architecture for Rapid, Spectrally-Selective Electrochromic Modulation of Solar Transmittance," *Nano Lett.* (2015), doi: 10.1021/acs.nanolett.5b02197.
- CJ Dahlman, Y Tan, MA Marcus, DJ Milliron*, "Spectroelectrochemical Signatures of Capacitive Charging and Ion Insertion in Doped Anatase Titania Nanocrystals," *J. Am. Chem. Soc.* (2015), doi: 10.1021/jacs.5b04933.
- HM Jeong, KM Choi, T Cheng, DK Lee, R Zhou, IW Ock, DJ Milliron, WA Goddard, JK Kang*, "Rescaling of Metal Oxide Nanocrystals for Energy Storage Having High Capacitance and Energy Density with Robust Cycle Life," *PNAS* (2015), doi:10.1073/pnas.1503546112. http://www.pnas.org/cgi/doi/10.1073/pnas.1503546112
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- RJ Mendelsberg, PM McBride, JT Duong, MJ Bailey, A Llordes, DJ Milliron*, BA Helms*, "Dispersible Plasmonic Doped Metal Oxide Nanocrystal Sensors that Optically Track Redox Reactions in Aqueous Media with Single-Electron Sensitivity," *Adv. Opt. Mater.* (2015), doi: 10.1002/adom.201500208. http://onlinelibrary.wiley.com/doi/10.1002/adom.201500208/abstract
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"United States Energy and CO_2 Savings Potential from Deployment of Near-Infrared Electrochromic Window Glazings," *Build. Environ.* **89** (2015), 107-117. http://www.sciencedirect.com/science/article/pii/S0360132315000785

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- A Singh, C Coughlan, DJ Milliron, KR Ryan*, "Solution Synthesis and Assembly of Wurtzite derived Cu-In-Zn-S Nanorods with Tunable Composition and Band Gap," *Chem. Mater.* **27** (2015), 1517-1523. http://pubs.acs.org/doi/abs/10.1021/cm5035613
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- IE Rauda, R Buonsanti, LC Saldarriaga-Lopez, K Benjauthrit, LT Schelhas, M Stefik, V Augustyn, J Ko, B Dunn, U Wiesner, DJ Milliron, SH Tolbert*, "General method for the synthesis of hierarchical nanocrystal-based mesoporous materials," *ACS Nano* **6** (2012), 6386. http://pubs.acs.org/doi/pdf/10.1021/nn302789r
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- A Llordes, AT Hammack, R Buonsanti, R Tangirala, S Aloni, BA Helms, DJ Milliron*, "Polyoxometalates and colloidal nanocrystals as building blocks for metal oxide nanocomposite films," *J. Mater. Chem.* **21** (2011), 11631. *Invited*
- RY Wang, MA Caldwell, RGD Jeyasingh, S Aloni, RM Shelby, HSP Wong, and DJ Milliron*, "Electronic and Optical Switching of Solution-Phase Deposited $SnSe_2$ Phase Change Memory Material," *J. Appl. Phys.* **109** (2011), 113506.
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- MJ Polking, JJ Urban, DJ Milliron, H Zheng, E Chan, MA Caldwell, S Raoux, CF Kisielowski, JW Ager, R Ramesh*, and AP Alivisatos*, "Size-Dependent Polar Ordering in Colloidal GeTe Nanocrystals," *Nano Lett.* **11** (2011), 1147.
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- MA Caldwell, B Haynor, S Aloni, DF Ogletree, HSP Wong, JJ Urban*, DJ Milliron*, "Spectroscopic Evidence for Exceptional Thermal Contribution to Electron-Beam Induced Fragmentation," *J. Phys. Chem. C* **114** (2010), 22064.
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- EM Chan, C Xu, AW Mao, G Han, JS Owen, BE Cohen, DJ Milliron*, “Reproducible, high-throughput synthesis of colloidal nanocrystals for optimization in multidimensional parameter space,” *Nano Lett.* **10** (2010), 1874. http://pubs.acs.org/doi/abs/10.1021/nl100669s *Highlighted by* Materials Today *and* Nanotechnology Alert.
- R Tangirala, JL Baker, AP Alivisatos, DJ Milliron*, “Modular inorganic nanocomposites by conversion of nanocrystal superlattices,” *Angew. Chem. Int. Ed.* **49** (2010), 2878. *Highlighted by* Chem. Eng. Prog. http://onlinelibrary.wiley.com/doi/10.1002/anie.200906642/pdf
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and Solution-Processable Precursor to Bismuth Chalcogenide Thermoelectrics," *Chem. Mater.* **22** (2010), 1943.

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- HR Moon, JJ Urban, DJ Milliron*, "Size-controlled synthesis and optical properties of monodisperse colloidal magnesium oxide nanocrystals," *Angew. Chem. Int. Ed.* **48** (2009), 6278. *Selected by the editor as a "hot paper;" highlighted by* Photonics Spectra.
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- WU Huynh, JJ Dittmer, N Teclemariam, DJ Milliron, AP Alivisatos*, KWJ Barnham, "Charge transport in hybrid nanorod-polymer composite photovoltaic cells," *Phys. Rev. B* **67** (2003), 115316.
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Editorial & Commentary:

- BA Helms*, TE Williams, R Buonsanti, DJ Milliron, “Colloidal Nanocrystal Frameworks,” *Adv. Mater.* (2015), http://dx.doi.org/10.1002/adma.201500127
- DJ Milliron, “Quantum dot solar cells: The surface plays a core role,” *Nat. Mater.* **13** (2014), 772. http://www.nature.com/nmat/journal/v13/n8/full/nmat4032.html
- B Dubertret, J Hollingsworth, H Liu, D Milliron, J Owen, E Weiss, WE Buhro, F Caruso, SM Kauzlarich, M Ward, “Preface to the *Chemistry of Materials* Special Issue: Synthetic and Mechanistic Advances in Nanocrystal Growth,” *Chem. Mater.* **25** (2013), 1153-1154.

Book Chapters:

- JJ Urban, DJ Milliron, “Heterojunction solar cells based on colloidal quantum dots,” in *Colloidal Quantum Dot Optoelectronics and Photovoltaics*, G Konstantatos and EH Sargent, Eds. Cambridge Univ. Press, 2013.
- DJ Milliron, Q Huang, Y Zhu, “Novel Deposition Methods,” in *Phase Change Materials: Science and Applications*, S Raoux and M Wuttig, Eds. Springer, 2009.

Issued Patents:

- DJ Milliron, R Buonsanti, "Colloidal infrared reflective and transparent conductive aluminum-doped zinc oxide nanocrystals," US8961828, 2015.
- AP Alivisatos, JJ Dittmer, WU Huynh, D Milliron, “Semiconductor-nanocrystal/conjugated polymer thin films,” US8753916, 2014.
- AP Alivisatos, I Gur, D Milliron, “Nanocrystal solar cells processed from solution,” US8440906, 2013.
- I Gur, D Milliron, AP Alivisatos, H Liu, “Methods of making functionalized nanorods,” US8093494, 2012.
- J Hedrick, DJ Milliron, A Nelson, R Pratt, “Method for forming and aligning chemically mediated dispersion of magnetic nanoparticles in a polymer,” US7854878, 2010.
- AP Alivisatos, JJ Dittmer, WU Huynh, DJ Milliron, "Semiconductor-nanocrystal/conjugated polymer thin films," US7777303, 2010.
- MA Caldwell, DJ Milliron, “Inorganic metal chalcogen cluster precursors and methods for forming colloidal metal chalcogenide nanoparticles using the same,” US7670584, 2010.
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- AP Alivisatos, D Milliron, L Manna, SM Hughes, “Nanocrystals with linear and branched topology,” US7303628, 2007.

Pending Patent Applications:

- DJ Milliron, A Llordes, Y Wang, G LeBlanc, “Method for Producing Electrochromic Films by Low Temperature Chemical Condensation of Polyoxometalates,” 2014.
- DJ Milliron, B Koo, G Garcia, CJ Dahlman, TM Mattox, L De Trizio, “Conductive Transition Metal Oxide Nanostructured Electrochromatic Material and Optical Switching Devices Constructed Thereof,” 2014.
- BE Cohen, PJ Schuck, D Gargas, EM Chan, A Ostrowski, JJ Urban, DJ Milliron, “Engineering Bright Sub-10-nm Upconverting Nanocrystals for Single-Molecule Imaging,” 2014.
- BA Helms, DJ Milliron, EL Rosen, R Buonsanti, A Llordes, “Surface chemical modification of nanocrystals,” 2013.

- DJ Milliron, E Runnerstrom, “Nanocrystal polymer composite electrochromic device,” 2012.
- DJ Milliron, G Garcia, A Llordes, R Tangirala, R Buonsanti, "Nanostructured transparent conducting oxide electrochromic device," 2011.
- DJ Milliron, A Llordes, R Buonsanti, G Garcia, “Electrochromic nanocomposite films,” 2011, 2014.
- DJ Milliron, R Tangirala, A Llordes, “Nanocomposite and method of making thereof,” 2010, 2014.
- DJ Milliron, DB Mitzi, S Raoux, R Ruiz, A Schrott, “Method for filling holes with metal chalcogenide material,” 2008.

Honors and Awards:

- Defense Science Study Group member (2016-2017)
- Caltech Resnick Institute Resonate Award (2015)
- DOE Early Career Research Program Awardee (2010-2015)
- R&D 100 Award for Universal Smart Windows (2013)
- BASF/VW Science Award in Electrochemistry (finalist, 2012, 2013)
- Saint-Gobain NOVA External Venturing Innovation Competition (w/ Heliotrope, 1st place, 2012)
- NREL Innovation Growth Forum (w/ Heliotrope, finalist, 2012)
- Berkeley Lab Spot Award (2011)
- MDV (Mohr Davidow Ventures) Innovators Award (2010)
- LBNL Outstanding Performance Award (2010)
- DOE Outstanding Mentor Award (2010)
- Berkeley Lab Spot Award (2010)
- R&D 100 Award for Nanocrystal Solar Cells (2009)
- E\PCOS Conference, Best Presentation Award (2009)
- MRS Spring Meeting, Best Poster Award (2007)
- Tech Transfer Award, LBNL (2004)
- National Defense Science and Engineering Graduate Fellowship (1999-2002)
- Barry M. Goldwater Scholarship (1997-1999)
- Robert C. Byrd Scholarship (1995-1999)
- National Science Scholars’ Program award recipient (1995)
- Calvin Dodd MacCracken Senior Thesis Award (1999) – one of two awarded from 300 eligible
- Robert Thornton McCay Prize in Physical Chemistry (1999) – one of three (class of 40)
- Outstanding Achievement in Materials Science (1999) – only award in Materials Science
- William Foster Memorial Prize in Chemistry (1998) – only award (class of 40)

Synergistic Activities:

- Gordon Research Conference on Colloidal Semiconductor Nanocrystals (founding vice chair, 2014; chair, 2016)
- Founder, Chief Scientific Officer, and Board Member Heliotrope Technologies (2012 -)
- Scientific Advisory Board, PLANT PV (2011 -)
- Technical Advisory Board, Pacific Light Tech (2011 -)
- Technical Advisory Board, Spectrawatt (2010-2011)
- Scientific Advisory Board, Nanosys (2009-2010)
- MRS/APS committee on Energy Critical Elements (2009-2011)

Teaching Experience:

Chemical Engineering Materials	UT-Austin CHE 350 (2014-2015)
General Chemistry	Graduate Student Instructor, UCB Chemistry
Statistical Mechanics and Thermodynamics	Graduate Student Instructor, UCB Chemistry (2 terms)
Introduction to Nanotechnology	Annual (4 times to date) guest lecture at Haas School of Business, UCB
Introduction to Nano-Science and Engineering	Guest lecture in graduate class, UCB MSE Department
Preparative Strategies in Solid State and Materials Chemistry	Guest lectures in ICMR summer school, UCSB

Materials Chemistry	Guest lectures, UCB Chem and MSE Depts
Introduction to Nanotechnology	Guest lecture, Stanford EE Dept

Graduate and Postdoctoral Advisors and Advisees:

First name	Last name	Relationship	Co-advisor	Current Affiliation
Ankit	Agrawal	student		UT-Austin
Amy	Bergerud	student		UC Berkeley
Clayton	Dahlman	student		UT-Austin
Sung Yeon	Heo	student		UT-Austin
Rob	Johns	student		UC Berkeley
Gary	Ong	student		UC Berkeley
Evan	Runnerstrom	student		UC Berkeley
Camila	Saez	student		UT-Austin
Corey	Staller	student		UT-Austin
Byung Hyo	Kim	postdoc		UT-Austin
Jongwook	Kim	postdoc		UT-Austin
Gabriel	LeBlanc	postdoc		UT-Austin
Beth	Lindquist	postdoc	TM Truskett, UT-Austin	UT-Austin
Ajay	Singh	postdoc		UT-Austin
Amita	Singh	postdoc		UT-Austin
Yang	Wang	postdoc		UT-Austin
Marissa	Caldwell	student	H-SP Wong, Stanford	Wildcat Technologies
Guillermo	Garcia	student		Heliotrope Technologies
Sebastien	Lounis	student		LBNL
Raffaella	Buonsanti	postdoc		LBNL
Emory	Chan	postdoc		LBNL
Gang	Han	postdoc	BE Cohen, LBNL	Univ. of Massachusetts
Natacha	Krins	postdoc	TJ Richardson, J Cabana, LBNL	Univ. Pierre et Marie Curie
Anna	Llordes	postdoc		Nanogune, Spain
Rueben	Mendelsberg	postdoc	A Anders, LBNL	First Solar
Oun Ho	Park	postdoc		Applied Materials
Jessy	Rivest	postdoc		Palo Alto Research Center
Evelyn	Rosen	postdoc	BA Helms, LBNL	Heliotrope Technologies
April	Sawvel	postdoc	BA Helms, LBNL	
Richa	Sharma	postdoc		Schlumberger Research
Yizheng	Tan	postdoc		
Ravisubhash	Tangirala	postdoc		Invisage, Inc.
Robert	Wang	postdoc		Arizona State Univ.
Renjia	Zhou	postdoc		Linear Technologies
A. Paul	Alivisatos	PhD advisor		UC Berkeley/LBNL
David	Mitzi	PD advisor		Duke Univ.

Professional Memberships:

- American Chemical Society
- Materials Research Society
- American Physical Society
- American Institute of Chemical Engineers
- Sigma Xi

- Phi Beta Kappa

Research Proposal Review Activities:

- NSF Division of Materials Research
- DOE Basic Energy Sciences
- Proposal Study Panels for Center for Functional Nanomaterials, Brookhaven National Laboratory and Center for Integrated Nanotechnologies, Los Alamos and Sandia National Labortories

Journal Review and Editorial Activities:

- Chemistry of Materials, Editorial Advisory Board (2015 -)
- ACS Combinatorial Science, Editorial Advisory Board (2011 -)
- Scientific Reports, Editorial Board (2013 - 2015)
- Science
- Nature
- Nature Materials
- Nature Nanotechnology
- Angewandte Chemie
- Nano Letters
- ACS Nano
- Advanced Materials
- Advanced Functional Materials
- Chemistry of Materials
- Journal of Materials Chemistry
- Langmuir
- Crystal Growth and Design
- Journal of the American Chemical Society
- Journal of Physical Chemistry
- Solar Energy Materials and Solar Cells
- Chemical Society Reviews

Invited Presentations and Seminars:

07.2015	Aspen Ideas Festival, Aspen
05.2015	Electrochemical Society National Meeting, Chicago
05.2015	Washington University, St. Louis, Institute for Materials Science & Engineering
04.2015	Washington University, St. Louis, Department of Chemistry
03.2015	American Chemical Society National Meeting, Denver, Colorado (2 presentations)
03.2015	BASF 150th Anniversary Science Symposium, Ludwigshafen, Germany
03.2015	American Physical Society National Meeting, San Antonio
02.2015	Gordon Research Conference, Nanomaterials for Energy Technologies, Ventura
02.2015	CORE-CM seminar, Michigan State University
02.2015	Center for Nano- and Molecular Science, University of Texas at Austin
01.2015	Materials Science & Engineering Department, North Carolina State University
10.2014	KAUST, Applied Functional Materials Workshop, Saudi Arabia
10.2014	Wayne State University, Nano@Wayne seminar, Detroit, Michigan
09.2014	Center for NanoScience, Workshop: Walk and Talk at the Nanoscale, Venice, Italy
08.2014	American Chemical Society National Meeting, San Francisco, California
07.2014	Gordon Research Conference, Nanostructure Fabrication, University of New England
07.2014	Gordon Research Conference, Plasmonics, Sunday River Resort
06.2014	The Molecular Foundry, Lawrence Berkeley National Lab, Berkeley
05.2014	European Materials Research Society Spring Meeting, Lille, France (2 presentations)
05.2014	Nanoscience with Nanocrystals (NaNaX), Bad Hofgastein, Austria
04.2014	Materials Research Society National Meeting, San Francisco, California
03.2014	American Chemical Society National Meeting, Dallas, Texas

02.2014	ARPA-E Energy Innovation Summit, Washington, DC
02.2014	Studio One: The Nature of Programming Matter, University of California, Berkeley (plenary)
01.2014	Middle Eastern Technical University, Ankara, Turkey
10.2013	Norwegian University of Science and Technology, Trondheim, Norway
09.2013	Department of Chemistry, Texas A&M University, College Station, Texas
09.2013	American Chemical Society National Meeting, Indianapolis
08.2013	Transatlantic Frontiers of Chemistry, Seeon, Germany
07.2013	ICMAT, Singapore
05.2013	BASF, Ludwigshafen, Germany
04.2013	Ludwig Maximillian University, Department of Chemistry, Munich, Germany
04.2013	Max Planck Institute for Chemical Energy Conversion, Muelheim, Germany
04.2013	Max Planck Institute for Solid State Research, Stuttgart, Germany
04.2013	Massachusetts Institute of Technology, Materials Science and Engineering Department
04.2013	University of Texas at Austin, Chemical Engineering Department
04.2013	Materials Research Society Spring Meeting, San Francisco
03.2013	University of California, Berkeley, Nanoscale Science and Engineering seminar
02.2013	University of California, Berkeley, Chemical Engineering Department
02.2013	Cornell University, Materials Science and Engineering Department, Ithica
02.2013	University of Washington, Materials Science and Engineering Department, Seattle
11.2012	ALS/CXRO Seminar Series, Berkeley
11.2012	Seoul National University, Department of Chemical and Biological Engineering, Seoul
11.2012	KAIST, EEWS Department, Daejeon
11.2012	Yonsei University, Department of Chemistry, Seoul
11.2012	Stanford University, Optics and Electronics seminar, Palo Alto, California
10.2012	Advanced Light Source Workshop on mesoscale science beamline, Berkeley
10.2012	Molecular Foundry Workshop on Nanoscale Battery Materials, Berkeley
10.2012	Bay Area Photovoltaics Consortium Annual Meeting, Berkeley (plenary)
09.2012	University of California, Berkeley, Department of Chemistry
08.2012	Dow Chemical, Midland, MI
08.2012	Tenth International Meeting on Electrochromism, Holland, MI (plenary)
06.2012	Gordon Research Conference, Inorganic Chemistry, University of New England
06.2012	Istituto Italiano di Tecnologia, Genoa, Italy
06.2012	CIMTEC, Montecatini Terme, Italy
04.2012	Princeton University, Department of Chemistry
04.2012	University of California, Los Angeles, CNSI
02.2012	University of California, Santa Barbara, Materials Department
01.2012	SPIE Photonics West, BiOS, San Francisco, California
11.2011	Marin Science Seminar, San Rafael, California
10.2011	ARPA-E, US Department of Energy, Washington, DC
09.2011	European Materials Research Society Meeting, Warsaw
08.2011	American Chemical Society National Meeting, Denver
07.2011	Gordon Research Conference, Clusters, Nanocrystals, & Nanostructures, Mount Holyoke
07.2011	Argonne National Laboratory, Center for Nanoscale Materials
05.2011	LBNL Carbon Cycle 2.0 Seminar, Berkeley
05.2011	University of California, San Diego, Nanoengineering Department
04.2011	University of California, Berkeley, EECS Solid State Seminar
04.2011	California Institute of Technology, Forum on Nanotechnology for Sustainability
02.2011	University of California, Santa Barbara, MROP
09.2010	Istituto Italiano di Tecnologia, Genoa, Italy
08.2010	LBNL Summer Lecture Series, Berkeley
06.2010	Crystal Growth West, South Lake Tahoe, California
05.2010	DNV Materials Forum, Columbus, Ohio

01.2010	University of California, Santa Barbara, Materials Department
09.2009	European Phase Change and Ovonic Science conference, Aachen, Germany, Selected as “Best Presentation.”
06.2009	NSRC contractors meeting, Annapolis, Maryland
04.2009	MRS Spring Meeting, San Francisco
01.2009	Oregon State University, Eugene
10.2008	University of California, Berkeley, Nanoscience seminar series
09.2008	LBNL, The Molecular Foundry
09.2008	European Phase Change and Ovonic Science Conference, Prague
04.2008	SUNY, Stonybrook, Department of Physics and Astronomy
04.2008	MRS Spring Meeting, San Francisco
10.2007	CCNY, New York, Department of Chemistry
11.2006	Palo Alto Research Center (PARC)
03.2003	International Symposium on Compound Semiconductors (ISCS), San Diego
03.2003	Nanoscale Science Research Centers Workshop, Washington, DC