

**Michael H. Bartl**

Research Professor of Chemistry  
 Deputy Director  
 MUSE Energy Frontier Research Center  
 University of Utah  
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Executive Director  
 Berkeley Emerging Technology Research Center  
 University of California, Berkeley  
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**University Education**

Dr. rer. nat.  
(Ph.D.)      Chemistry, September 2002, Karl-Franzens-University of Graz, Austria  
 Thesis: "Synthesis and Investigation of Ordered Mesoporous Silica and  
 Titania Composites for Novel Optical Applications"  
 Advisors: Prof. Alois Popitsch and Prof. Galen Stucky

Diploma  
(M.Sc.)      Physical Chemistry, May 2000, Graz University of Technology, Austria  
 Thesis: "Spectroscopy and Theoretical Crystal Field Investigation of Kramers  
 and non-Kramers Rare Earth Ions in Single Crystals - Two Case Studies"  
 Advisors: Prof. Karl Gatterer and Prof. Harald Fritzer

**Professional Appointments**

2020–Present	<b>Research Professor</b> , Materials/Physical Chemistry, University of Utah
2019–Present	<b>Executive Director</b> , Berkeley Emerging Technologies Research (BETR) Center, University of California, Berkeley
2018–Present	<b>Deputy Director</b> , MUSE Energy Frontier Research Center, University of Utah
2015–2022	<b>Executive Director</b> , Center for Energy Efficient Electronics Science (E3S), University of California, Berkeley
2015–2020	<b>Research Associate Professor</b> , Physical Chemistry, University of Utah
2014–2021	<b>Deputy Editor</b> , Scripta Materialia; Acta Materialia, Inc.
2013–2014	<b>Visiting Professor</b> , Technical University of Munich (TUM), Germany
2012–2015	<b>Associate Professor</b> ( <i>tenured</i> ), Materials/Physical Chemistry, University of Utah
2012–2015	<b>Adjunct Associate Professor</b> , Physics & Astronomy, University of Utah
2012	<b>Scientific co-Founder</b> , Navillum Nanotechnologies, LLC
2012	<b>Research Staff Physicist</b> , Architected Materials, Sensors and Materials Laboratory, HRL Laboratories, LLC, Malibu
2005–2012	<b>Assistant Professor</b> , Department of Chemistry, University of Utah
2004–2005	<b>Postdoctoral Fellow</b> with Prof. Evelyn Hu and Prof. David Awschalom, California NanoSystems Institute, UCSB
2002–2004	<b>Max-Kade Postdoctoral Fellow</b> with Prof. Galen Stucky, Department of Chemistry, University of California, Santa Barbara

**Research Background/Interests**

- Chemical Synthesis of Nanostructured Materials
- Supramolecular Self-Assembly
- Functional Materials for Energy Applications
- Mesoporous Thin Films and Smart Interfaces
- Bioinspired Photonic Materials

## **Professional Service**

### ***Organization of Scientific Conferences***

- DisoMat 2019 Conference, September 2019, Berlin, Germany
- STC Annual Directors Conference, August 2018, Berkeley, California
- Berkeley Symposium on Energy Efficient Electronics, October 2017, Berkeley, California

### ***Organization of Symposia at International Scientific Conferences***

- EMRS Spring Meeting, May 2015, Lille, Bioinspired and Biointegrated Materials
- MRS Spring Meeting, April 2015, San Francisco, Tailored Disorder
- MS&T'14 Conference, October 2014, Pittsburgh; Bioinspired Materials Engineering
- MS&T'13 Conference, October 2013, Montreal; Bioinspired Materials Engineering
- MS&T'12 Conference, October 2012, Pittsburgh; Bioinspired Materials Technology

***International Academic Review Service:*** External advisor, panelist and reviewer for the German Research Foundation ("Tailored Disorder Priority Programme" in Biomaterials); external faculty appointment evaluator for the Technical University of Munich, Germany.

***Grant Review Service:*** National Science Foundation, Department of Energy, Hungarian Research Foundation, Army Research Office, European Research Foundation, DARPA, ARPA-E

***Scientific Review Service (selection):*** Science, Nature, Nature Materials, Nature Photonics, PNAS, JACS, Physical Review Letters, Physical Review B and E, Nano Letters, ACS Nano, Chemical Communications, Journal of Physical Chemistry, Chemistry of Materials, Advanced Materials, Advanced Functional Materials, Journal of Materials Chemistry

***Public Outreach Activities:*** Lectures and workshops in collaboration with the NSF NISE Network, the Utah Museum of Natural History, The Leonardo (Science Museum Salt Lake City), the Lawrence Berkeley National Lab, and the California Community College System

***Membership in Professional Societies:*** American Chemical Society, Materials Research Society, American Association for Advancement of Science

## **University Service** (University of Utah, *selection*)

Faculty Search Committee, MRSEC, Chair  
 College of Science Academic Appeals and Misconduct Committee, Chair  
 Seed Funding Committee, MRSEC, Chair  
*ad hoc* Inquiry Committee, Chair (appointed by AVP of Research Integrity)  
 University Conflict of Interest Committee, Member  
 Task Force on Women and Minorities in the College of Science, Member

## **Departmental Service** (Department of Chemistry, University of Utah, *selection*)

Graduate Admission Committee, Chair  
 Faculty Search Committee, Chair  
 Graduate Recruiting Committee, Chair  
 Physical Chemistry Division, Chair  
 Department Advisory Committee, Member  
 Optical and X-ray Facility Lead

**Courses Taught** (University of Utah and Technical University of Munich)

CHEM 1210, "General Chemistry"  
CHEM 3060, "Quantum Chemistry and Spectroscopy"  
CHEM 5720, "Advanced Physical Chemistry Laboratory"  
CHEM 7020, "Introduction to Spectroscopy"  
CHEM 7050, "Classical Thermodynamics"  
TU Munich: "Grundlagen der Physik" (Introduction to Physics)

**Honors and Awards**

- Deputy Editor, Scripta Materialia (2014–2021)
- Visiting Professor, Technical University of Munich (TUM), Germany (2013/2014)
- Scialog Fellow, Research Corporation for Science Advancement, RCSA (2013)
- Guest Editor, Scripta Materialia (2013)
- JFK 50 Years, Legacy Gallery (2011)
- Brilliant 10 ("America's Young Science Geniuses") by *Popular Science Magazine* (2010)
- Emerging Investigator (Materials Chemistry), Royal Society of Chemistry (2010)
- DuPont Young Professor (2007–2011)
- Max-Kade Postdoctoral Research Fellowship (2003–2004)
- Outstanding Scientific Achievement Award of the Karl-Franzens-University Graz (2002)
- Scholarship of the Austrian Government for Scientific Stays at Foreign Universities (1999)
- ERASMUS Scholarship from the European Union (1995)

**Research Funding**

MUSE: Energy Frontier Research Center, Department of Energy, August 1, 2018 – July 31, 2024, \$12,700,000 (co-PI and deputy director); incl. 2-year \$1M extension  
MRSEC: Next Generation Materials for Plasmonics and Organic Spintronics, National Science Foundation, Sept 15, 2011 – Sept 14, 2017, \$12,000,000 (co-PI and IRG director)  
Enhanced Solar-Matched Photocatalysis of H<sub>2</sub>O using GaN Surface States, Research Corporation for Science Advancement (RCSA), July 1, 2013 – June 30, 2016, \$250,000  
Spectrum Splitting for Low-Cost Hybrid PV/Solar Thermal Generation, Research Corporation for Science Advancement (RCSA), January 1, 2014 – December 31, 2015, \$100,000  
Nanocrystal Quantum Dot Materials, Center of Excellence Grant (State of Utah), May 1, 2011 – April 30, 2016, \$40,000  
Nanocrystal Manufacturing, Technology Commercialization and Innovation Program (State of Utah), February 1, 2012 – January 31, 2017, \$40,000  
Quantum Dot Tracers for Use in Engineered Geothermal Systems, Department of Energy, February 1, 2010 – May 31, 2013, \$1,116,499 (co-PI)  
Bioinspired Fabrication of Periodically Organized Structures, National Science Foundation, August 1, 2010 – July 31, 2014, \$338,366  
Large-Scale Semiconductor Nanocrystal Fabrication, Utah USTAR Technology Commercialization Grant, October 1, 2010 – September 30, 2011, \$40,000  
Low-Temperature Large-Scale Synthesis of Size and Shape-Controlled Nanocrystal Materials, University of Utah Research Foundation, June 1, 2009 – December 31, 2010, \$35,000

## Research Funding *continued*

- Biological Photonic Crystals for Nonlinear Optics and Optoelectronics, University of Utah SYNERGY Program, September 15, 2007 – September 14, 2008, \$100,000
- New Strategies for Optically Amplified Solar Energy Conversion and Photocatalysis, DuPont Young Professor Grant Program, September 1, 2007 – August 31, 2011, \$75,000
- Utilizing Photonic Band Structure Engineering for Advanced Photon Management in Solar Energy Conversion, ACS-PRF, June 1, 2007 – May 31, 2009, \$40,000
- Development and Investigation of Magneto-Optically Active 3-Dimensional Photonic Band Structure Crystals, Utah Research Foundation, June 1, 2006 – May 31, 2007, \$27,000
- Design and Study of Non-Classical Optical Phenomena in Self-Assembled Nanophotonics, National Science Foundation, June 1, 2006 – May 31, 2008, \$99,503

## Granted Patents

7. M.H. Bartl, J.T. Siy, "Modification of Colloidal Nanocrystals", *U.S. Patent US 10,290,387* (2019).
6. P.E. Rose, M.H. Bartl, "Colloidal-Crystal Quantum Dots as Tracers in Underground Formations", *U.S. Patent US 10,125,601* (2018).
5. A.P. Novak, A.F. Gross, M.H. Bartl, "Structural Coatings with Dewetting and Anti-Icing Properties, and Coating Precursors for Fabricating Same", *U.S. Patent US 9,546,280* (2017).
4. M.H. Bartl, M. Barhoum, D. Riassetto, "Sol-Gel Method for Fabricating High-Quality, Single and Multi-Layer Dielectric Materials on Planar and Curved Substrates", *U.S. Patent US 9,403,186 B2* (2016).
3. M.H. Bartl, J.T. Siy, "Low-Temperature Synthesis of Colloidal Nanocrystals", *U.S. Patent US 9,273,410 B2* (2016).
2. J.M. Lupton, M.H. Bartl, D. Chaudhuri, J. Galusha, N. Borys, M.J. Walter, "Subdiffraction Wide-Field White Light Transmission Microscopy of Near-Opaque Media", *U.S. Patent US 7,929,132* (2011).
1. J. Cha, T.J. Deming, G.D. Stucky, M. Wong, H. Birkedal, M.H. Bartl, J.L. Sumerel, "Nanoparticle Assembled Hollow Spheres", *U.S. Patent US 7,563,457* (2009).

## Published Book Chapters

4. A. Risbud and M.H. Bartl, "Solution-Based Techniques for Biomimetics and Bioreplication" in "Engineered Biomimicry" (edited by A. Lakhtakia and R. Martin-Palma), Elsevier: Waltham (2013), pp. 359-382.
3. A. Risbud, A. Lakhtakia, M.H. Bartl, "Towards Bioreplicated Texturing of Solar-Cell Surfaces" in "Encyclopedia of Nanotechnology" (edited by B. Bhushan), Springer: Dordrecht, Heidelberg, New York (2012), pp. 2755-2762.
2. M.H. Bartl, J.W. Galusha, M.R. Jorgensen, "Oxide-Based Photonic Crystals from Biological Templates" in "Functional Metal-Oxide Nanostructures" (edited by J. Wu, W. Han, H. Kim, A. Janotti, and J. Cao), Springer: New York (2012), pp. 175-207.
1. G.D. Stucky and M.H. Bartl, "Mesosstructured Thin Film Oxides" in "Thin Film Metal-Oxides: Fundamentals and Applications in Electronics and Energy" (edited by S. Ramanathan), Springer: New York (2010), pp. 255-279.

## Peer-Reviewed Publications

63. S. Sen, S.H. Risbud, M.H. Bartl, "Thermodynamic and Kinetic Transitions of Liquids in Nanoconfinement", *Acc. Chem. Res.* **2020**, 53, 2869.
62. H. Asgar, S. Seifert, I. Kuzmenko, M.H. Bartl, G. Gadikota, "Mechanistic Insights into the Colloidal Assembly of Mesoporous Silica Using *in-operando* Cross-Scale X-ray Scattering and Spectroscopic Measurements", *Materialia* **2020**, 12, 100764.
61. Y. Xia, H. Cho, S.H. Risbud, M.H. Bartl, S. Sen, "Coexistence of Structural and Dynamical Heterogeneity in Liquids Under Nanoconfinement", *Front. Phys.* **2020**, 8, 130.
60. Y. Xia, H. Cho, M. Deo, S.H. Risbud, M.H. Bartl, S. Sen, "Layer-by-Layer Freezing of Nanoconfined Water", *Sci. Rep.* **2020**, 10, 5327.
59. D. van Opdenbosch, G. Hukic-Markosian, S. Ott, C. Abert, M.H. Bartl, "An Experiment-Based Numerical Treatment of Spin Wave Modes in Periodically Porous Materials", *Phys. Status Solidi B* **2020**, 257, 1900296.
58. R.K. Nagi, D.E. Montanari, M.H. Bartl, "Photonic crystal micro-pixelation and additive color mixing in weevil scales", *Bioinspir. Biomim.* **2018**, 13, 035003.
57. H. Cho, D. Caputo, M.H. Bartl, M. Deo, "Measurements of Hydrocarbon Bubble Points in Synthesized Mesoporous Siliceous Monoliths", *Chem. Eng. Sci.* **2018**, 177, 481-490.
56. H. Cho, M.H. Bartl, M. Deo, "Bubble Point Measurements of Hydrocarbon Mixtures in Mesoporous Media", *Energy Fuels* **2017**, 31, 3427-3435.
55. E.M. Brauser, T.D. Hull, J. McLennan, J.T. Siy, M.H. Bartl, "Experimental Evaluation of Kinetic and Thermodynamic Reaction Parameters of Colloidal Nanocrystals", *Chem. Mater.* **2016**, 28, 3831-3838.
54. W.J. Nimens, L. Whittaker-Brooks, M.H. Bartl, "Enhanced Sensing in Mixed Porous–Solid Photonic Stacks", *J. Mater. Chem. C* **2016**, 4, 668-672.
53. H. Maheshwari, J.D. Roehling, B.A. Turner, J. Abdinor, T.B. Tran-Roehling, M.D. Deo, M.H. Bartl, S.H. Risbud, K. van Benthem, "Robust Mesoporous Silica Compacts: Multi-scale Characterization of Microstructural Changes Related to Physical–Mechanical Properties", *J. Mater. Sci.* **2016**, 51, 4470-4480.
52. E. Brauser, P. Rose, J. McLennan, M.H. Bartl, "Optical Detection of Tracer Species in Strongly Scattering Media", *Appl. Spectrosc.* **2015**, 69, 363-369.
51. M.H. Bartl, A. Lakhtakia, "The Artificial Beetle: A Brief Manifesto for Engineered Biomimicry", *Proc. SPIE* **2015**, 9429, 94290B-1.
50. M.H. Bartl, "Butterfly-Inspired Photonics Reverse Diffraction Color Sequence", *Proc. Nat. Acad. Sci.* **2014**, 111, 15602-15603. (invited commentary)
49. G. Hukic-Markosian, Y. Zhai, D.E. Montanari, S. Ott, A. Braun, D. Sun, Z.V. Vardeny, M.H. Bartl, "Magnetic Properties of Periodically Organized Cobalt Frameworks", *J. Appl. Phys.* **2014**, 116, 013906.
48. H.-L. Vo, J.L. Arthur, M. Capdevila-Cortada, S.H. Lapidus, P.W. Stephens, J.J. Novoa\*, A.M. Arif, R.K. Nagi, M.H. Bartl, J.S. Miller, "Structure and Properties of Nitrogen-Rich 1,4-Dicyanotetrazine, C<sub>4</sub>N<sub>6</sub>. A Comparative Study with Related Tetracyano Electron Acceptors", *J. Org. Chem.* **2014**, 79, 8189-8201.
47. M.R. Dahlby, M. Barhoum, M.H. Bartl, "Sol-Gel Derived Thin-Film Stacks with High Radiation Stability", *Thin Solid Films* **2014**, 562, 435-439.
46. F.P. Barrows, M.H. Bartl, "Photonic Structures in Biology: A Possible Blueprint for Nanotechnology", *Nanomater. Nanotechnol.* **2014**, 4, 1-12.
45. J.T. Siy, E.H. Brauser, T.K. Thompson, M.H. Bartl, "Synthesis of Bright CdSe Nanocrystals by Optimization of Low-Temperature Reaction Parameters", *J. Mater. Chem. C* **2014**, 2, 675-682.
44. M.H. Bartl, "Nanostructure-Driven Functionalities in Thin Films and Coatings", *Scripta Mater.* **2014**, 74, 1.

**Peer-Reviewed Journal Publications** *continued*

43. M.R. Jorgensen, E.S. Butler, M.H. Bartl, "Controlling Spontaneous Emission in Bioreplica Photonic Crystals", *Proc. SPIE* **2012**, 8339, 83390Z-1.
42. M.H. Bartl, M.R. Dahlby, F.P. Barrows, Z.J. Richens, T. Terooatea, M.R. Jorgensen, "Natural Photonic Crystals: Formation, Structure, Function", *Proc. SPIE* **2012**, 8279, 827907.
41. M. Barhoum, J. Morrill, D. Riassetto, M.H. Bartl, "Rapid Sol-Gel Fabrication of High-Quality Thin-Film Stacks on Planar and Curved Substrates", *Chem. Mater.* **2011**, 23, 5177-5184.
40. M.R. Jorgensen, B. Yonkee, M.H. Bartl, "Solid and Hollow Inorganic Replicas of Biological Photonic Crystals", *Scripta Mater.* **2011**, 65, 954-957.
39. M.R. Jorgensen, J.W. Galusha, M.H. Bartl, "Strongly Modified Spontaneous Emission Rates in Diamond-Structured Photonic Crystals", *Phys. Rev. Lett.* **2011**, 107, 143902.
38. D. Riassetto, N. Ma, J. Amador, B. Benson, A. Briggs, M. Mella, P. Rose, M.H. Bartl, "Biphasic Route to Silica-Encapsulation of Quantum Dots", *Nanosci. Nanotechnol. Lett.* **2011**, 3, 655-658.
37. M.R. Jorgensen, B. Yonkee, M.H. Bartl, "Strong Modification of Density of Optical States in Biotemplated Photonic Crystals", *Proc. SPIE* **2011**, 8071, 807109.
36. M.R. Jorgensen, M.H. Bartl, "Biotemplating Routes to Three-Dimensional Photonic Crystals", *J. Mater. Chem.* **2011**, 21, 10583-10591.
35. J.T. Siy, E.M. Brauser, M.H. Bartl, "Low-Temperature Synthesis of Colloidal CdSe Nanocrystal Quantum Dots", *Chem. Commun.* **2011**, 47, 364-366.
34. J.T. Siy, M.H. Bartl, "Insights into Reversible Dissolution Study of Colloidal CdSe Nanocrystal Quantum Dots", *Chem. Mater.* **2010**, 22, 5973-5982.
33. J.W. Galusha, M.R. Jorgensen, M.H. Bartl, "Diamond-Structured Titania Photonic Band Gap Crystals from Biological Templates", *Adv. Mater.* **2010**, 22, 107-110. (cover article)
32. J.W. Galusha, L.R. Richey, M.R. Jorgensen, J.S. Gardner, M.H. Bartl, "Study of Natural Photonic Crystals in Beetle Scales and Their Conversion into Inorganic Structures via a Sol-Gel Bio-Templating Route", *J. Mater. Chem.* **2010**, 20, 1277-1284.
31. J.W. Galusha, M.R. Jorgensen, L.R. Richey, J.S. Gardner, M.H. Bartl, "Oxide-Based Photonic Crystals from Biological Templates", *Proc. SPIE* **2009**, 7401, 74010G-1.
30. D. Chaudhuri, J.W. Galusha, M.J. Walter, N.J. Borys, M.H. Bartl, J.M. Lupton, "Towards Sub-Diffraction Transmission Microscopy of Diffuse Materials by Using Silver Nanoparticle White-Light Beacons", *Nano Lett.* **2009**, 9, 952-956.
29. J.W. Galusha, L.R. Richey, J.S. Gardner, J.N. Cha, M.H. Bartl, "Discovery of a Diamond-Based Photonic Crystal Structure in Beetle Scales", *Phys. Rev. E* **2008**, 77, 050904. (featured in *ScienceDirect*, *MIT Technology Review*, *Laser Focus World*, *Materials Today*)
28. J.W. Galusha, C.-K. Tsung, G.D. Stucky, M.H. Bartl, "Planar Open-Surface Titania Inverse Opals Fabricated by a Novel Sol-Gel Infiltration Method", *Chem. Mater.* **2008**, 20, 4925-4930.
27. J.W. Galusha, L.R. Richey, M.H. Bartl, "High Resolution Three-Dimensional Reconstruction of Photonic Crystal Structure Found in Beetle Scales", *Proc. IEEE LEOS, Adv. Biophotonics*, **2008**, 83.
26. J.T. Siy, L. Leone, M.H. Bartl, "Effect of Ligand Exchange on the Stability and Optical Properties of Colloidal CdSe Nanocrystal Quantum Dots", *Mater. Res. Soc. Symp. Proc.* **2007**, 1056-HH07-03.
25. J.W. Galusha, K. Carter, M.H. Bartl, "3-D Photonic Band Structure Engineering in Self-Assembled Photonic Crystals", *Mater. Res. Soc. Symp. Proc.* **2006**, 0988-QQ05-08.
24. L.E. Euliss, M.H. Bartl, G.D. Stucky, "Control of Calcium Carbonate Crystallization Utilizing Amphiphilic Block Copolypeptides", *J. Crystal Growth* **2006**, 286, 424-430.

**Peer-Reviewed Journal Publications** *continued*

23. N.P. Stern, M. Poggio, M.H. Bartl, E.L. Hu, G.D. Stucky, D.D. Awschalom, "Spin Dynamics in Electrochemically Charged CdSe Quantum Dots", *Phys. Rev. B* **2005**, 72, 161303.
22. D.R. Rink, M.H. Bartl, L. Zhang, G.D. Stucky, E.L. Hu, "External Coupling of Molecular Dye Emission to High-Q Microdisk Resonators", *CLEO, OSA Technical Digest (online)*, **2005**, CMEE4, 550-552.
21. M.H. Bartl, S.W. Boettcher, K.L. Frindell, G.D. Stucky, "Molecular Assembly of Function in Titania-Based Composite Material Systems", *Acc. Chem. Res.* **2005**, 38, 236-271.
20. S.W. Boettcher, M.H. Bartl, J.G. Hu, G.D. Stucky, "Structural Analysis of Hybrid Titania-Based Mesoporous Composites", *J. Am. Chem. Soc.* **2005**, 127, 9721-9730.
19. M.H. Bartl, S.W. Boettcher, E.L. Hu\*, G.D. Stucky, "Dye-Activated Hybrid Organic/Inorganic Mesoporous Titania Waveguides", *J. Am. Chem. Soc.* **2004**, 126, 10826-10827.
18. B.J. McKenna, H. Birkedal, M.H. Bartl, T.J. Deming, G.D. Stucky, "Micrometer-Sized Spherical Assemblies of Polypeptides and Small Molecules by Acid-Base Chemistry", *Angew. Chem. Int. Ed.* **2004**, 43, 5652-5655.
17. M.H. Bartl, S.P. Puls, J. Tang, H.C. Lichtenegger, G.D. Stucky, "Cubic Mesoporous Frameworks with a Mixed Semiconductor Nanocrystalline Wall Structure and Enhanced Sensitivity to Visible Light", *Angew. Chem. Int. Ed.* **2004**, 43, 3037-3040.
16. M.H. Bartl, B.J. Scott, G. Wirnsberger, A. Popitsch, G.D. Stucky, "Single-Photon Hot Band Absorption Induced anti-Stokes Luminescence of Rhodamine 101 in Mesoporous Thin Films", *ChemPhysChem* **2003**, 4, 392-395.
15. J.N. Cha, H. Birkedal, L.E. Euliss, M.H. Bartl, M.S. Wong, T.J. Deming, G.D. Stucky, "Spontaneous Formation of Nanoparticle Vesicles from Homopolymer Polyelectrolytes", *J. Am. Chem. Soc.* **2003**, 125, 8285-8289.
14. J.N. Cha, M.H. Bartl, M.S. Wong, A. Popitsch, T.J. Deming, G.D. Stucky, "Microcavity Lasing from Block Peptide Hierarchically Assembled Quantum Dot Spherical Resonators", *Nano Lett.* **2003**, 3, 907-911.
13. K.L. Frindell, M.H. Bartl, M.R. Robinson, G.C. Bazan, A. Popitsch, G.D. Stucky, "Visible and Near IR Luminescence via Energy Transfer in Rare Earth Doped Mesoporous Titania Thin Films with Nanocrystalline Walls", *J. Solid State Chem.* **2003**, 172, 81-88.
12. B.J. Scott, M.H. Bartl, G. Wirnsberger, G.D. Stucky, "Energy Transfer in Dye Doped Mesoporous Composites", *J. Phys. Chem. A* **2003**, 107, 5499-5502.
11. M.H. Bartl, B.J. Scott, H.C. Huang, G. Wirnsberger, A. Popitsch, B.F. Chmelka, G.D. Stucky, "Synthesis and Luminescence Properties of Mesoporous Thin Films Activated by in-situ Formed Trivalent Rare Earth Ion Complexes", *Chem. Commun.* **2002**, 2474-2475.
10. H.C. Lichtenegger, Th. Schöberl, M.H. Bartl, H. Waite, G.D. Stucky, "High Abrasion Resistance with Sparse Mineralization: Copper Biomineral in Worm Jaws", *Science* **2002**, 298, 389-392.
9. V.I. Srdanov, M.R. Robinson, M.H. Bartl, X. Bu, G.C. Bazan, "Polarization Effects of a Europium Complex in Stretched Polyethylene", *Appl. Phys. Lett.* **2002**, 80, 3042-3044.
8. M.H. Bartl, E.C. Fuchs, K. Gatterer, H.P. Fritzer, M. Bettinelli, A. Speghini, "Spectroscopic and Crystal Field Investigation of Kramers Ions: Nd<sup>3+</sup>:YAB – a Case Study of the Crystal Field Structure of the <sup>4</sup>I<sub>9/2</sub> Ground State", *J. Solid State Chem.* **2002**, 167, 386-392.
7. M. Niederberger, M.H. Bartl, G.D. Stucky, "Benzyl Alcohol and Titanium Tetrachloride – A Versatile Reaction System for Non-Aqueous and Low-Temperature Preparation of Crystalline and Luminescent Titania Nanoparticles", *Chem. Mater.* **2002**, 14, 4364-4370.
6. M. Niederberger, M.H. Bartl, G.D. Stucky, "Benzyl Alcohol and Transition Metal Chlorides as a Versatile Reaction System for the Non-Aqueous and Low-Temperature Synthesis of Nano-Objects with Controlled Dimensionality", *J. Am. Chem. Soc.* **2002**, 124, 13642-13643.

### Peer-Reviewed Journal Publications *continued*

5. K.L. Frindell, M.H. Bartl, A. Popitsch, G.D. Stucky, "Sensitized Luminescence of Trivalent Europium by Three-Dimensionally Arranged Anatase Nanocrystals in Mesostructured Titania Thin Films", *Angew. Chem. Int. Ed.* **2002**, *41*, 959-962.
4. M.H. Bartl, K. Gatterer, E. Cavalli, A. Speghini, M. Bettinelli, "Growth, Optical Spectroscopy and Crystal Field Investigation of  $\text{YAl}_3(\text{BO}_3)_4$  Single Crystals Doped with Tripositive Praseodymium", *Spectrochim. Acta A* **2001**, *57*, 1981-1990.
3. M.H. Bartl, K. Gatterer, H.P. Fritzer, S. Arafa, "Investigation of Phase Separation in  $\text{Nd}^{3+}$  Doped Ternary Sodium Borosilicate Glasses by Optical Spectroscopy", *Spectrochim. Acta A* **2001**, *57*, 1991-1999.
2. G. Wirnsberger, M.H. Bartl, B.J. Scott, G.D. Stucky, "Mesostructured Optical Devices by Room Temperature Self-Assembly", *Aust. J. Chem.* **2001**, *54*, 225-227.
1. G. Concas, F. Congiu, G. Spano, A. Speghini, K. Gatterer, M.H. Bartl, "Hyperfine Interactions at Lanthanide Sites in Europium Doped Oxide Glasses", *Z. Naturforschung* **2000**, *55a*, 499-506.

### Invited Seminars and Presentations

73. "Nanotechnology – A Different View"  
Transfer-to-Excellence Seminar Series, UC Berkeley; July 7, 2022
72. "A Global Perspective on Energy and Sustainability"  
Materials Science and Engineering Department, UC Davis; May 21, 2020
71. "Research Opportunities in Science and Engineering"  
Northern California Forum for Diversity in Graduate Education; Apr 6, 2019
70. "Energy Efficient Electronics"  
Ohlone College, Fremont; Nov 30, 2018
69. "Brilliant Coloration from Tailored Photonic Disorder in Weevil Scales"  
Materials Research Society Fall Meeting, Boston; Nov 25-30, 2018
68. "Functional Materials by Structural Design"  
Materials Science and Engineering Department, UC Davis, Oct 23, 2018
67. "STC for Energy Efficient Electronics Science"  
ASML-Berkeley Symposium, Berkeley; May 23, 2018
66. "Energy Efficient Electronics"  
Ohlone College, Fremont; Nov 2, 2017
65. "Functional Materials by Structural Design"  
IBM Almaden Research Center, San Jose; July 24, 2015
64. "The Artificial Beetle: A Brief Manifesto for Engineered Biomimicry"  
SPIE Smart Structures Conference, San Diego; March 9, 2015
63. "Functional Energy Materials by Structural Design"  
nanoUtah Conference, Salt Lake City, Utah, October 13, 2014
62. "Materials Chemistry: How Structure Creates Function"  
Department of Chemistry, Southern Oregon University, May 9, 2014
61. "Structure, Form and Function in Nanoscale Materials"  
Science Colloquium, Utah Valley University, Orem; March 19, 2014
60. "Micro-pixelation and color mixing in biological photonic structures"  
SPIE Smart Structures Conference, San Diego; March 12, 2014
59. "Bioinspiration in Photonic Materials Research"  
Technical University Munich, Straubing, Germany; December 17, 2013
58. "Solar-Matched Photocatalytic Water-Splitting using GaN Surface States"; RCSA Scialog Conference, Tucson; October 16, 2013



**Invited Seminars and Presentations** *continued*

57. "Bioinspired Nanophotonics: Design, Structure, Function"  
European Materials Research Society Meeting, Warsaw, Poland; Sept 18, 2013
56. "Big Buzz About Tiny Things"  
NanoDays 2013, The Leonardo, Salt Lake City; April 6, 2013
55. "Solution-Based Techniques for Biomimicry"  
SPIE Smart Structures Conference, San Diego; March 12, 2013
54. "Materials Chemistry: How Structure Creates Function"  
Department of Chemistry, Texas Lutheran University, Seguin; November 9, 2012
53. "Bioinspired Photonic Crystals: Design, Structure, Function"  
MS&T'12 International Conference, Pittsburg; October 8, 2012
52. "Bioinspired Photonic Crystals: Design, Structure, Function"  
Oregon Materials Science Institute Fall Conference, Eugene, September 13, 2012
51. "Formation and Properties of Biopolymeric Photonic Crystals"  
SPIE Photonics West Meeting, San Francisco; January 22, 2012
50. "Sol-Gel Chemistry Routes for Nanostructuring Oxides"  
Lawrence Berkeley National Lab User Meeting, Berkeley; October 6, 2011
49. "Bioinspired Photonic Crystals: Design, Structure and Function"  
Conference of the National Societies of Black and Hispanic Physicists, Austin; Sep 23, 2011
48. "Bioinspiration in Photonic Materials Design"  
HRL Laboratories, Malibu, Los Angeles; July 21, 2011
47. "Functional Porous Materials by Sol-Gel-Based Processing"  
IBM Almaden Research Center, San Jose; April 22, 2011
46. "Bioinspired Design of 3D Photonic Crystals"  
DFG-NSF Biomaterials Research Conference 2011, New York; March 25, 2011
45. "Bioinspired Photonic Crystals: Design, Structure and Function"  
Department of Physics and Astronomy, University of Utah; February 17, 2011
44. "Architectural Colors"  
NISE Meeting, San Francisco; October 26, 2010
43. "Controlling Light in Bioinspired Photonic Crystals"  
DuPont Experimental Station, Wilmington, DE; October 22, 2010
42. "Bioinspired Three-Dimensional Photonic Band Gap Crystals"  
Department of Physics and Astronomy, Brigham Young University; September 29, 2010
41. "Bioinspired Photonic Crystals at Visible Frequencies"  
Department of Chemistry, Wayne State University, Detroit; September 16, 2010
40. "Materials Chemistry: How Structure Creates Function"  
Department of Chemistry, Fort Lewis College, Durango, CO, September 24, 2010
39. "Bioinspired Materials Chemistry"  
Dept of Chemistry & Biochemistry, CA State University, Chico, CA, September 3, 2010
38. "Bio-Templating of High-Dielectric Photonic Crystals"  
Gordon Research Conference, Colby Sawyer College, NH; August 4, 2010
37. "Bioinspired Photonic Band Gap Crystals at Visible Frequencies"  
The Molecular Foundry, Lawrence Berkeley National Lab, Berkeley; July 27, 2010
36. "Biological and Bio-Templated Photonic Crystals"  
College of Engineering, Pennsylvania State University, State College; March 23, 2010
35. "Photonic Band Gap Crystals from Biological Structures"  
Department of Chemical Engineering, University of Florida, Gainesville; March 22, 2010
34. "Bioinspired Photonic Band Gap Crystals at Visible Frequencies"  
Department of Chemistry, University of California, Riverside; February 3, 2010

**Invited Seminars and Presentations** *continued*

33. "Bioinspired Photonic Band Gap Crystals"  
Department of Chemistry, Brigham Young University, Provo; January 7, 2010
32. "Photonic Band Gap Crystals from Biological Structures"  
Department of Chemistry, Oregon State University, Corvallis; November 23, 2009
31. "Three-Dimensional Photonic Band Gap Crystals from Biological Structures"  
Department of Chemistry, Ohio State University, Columbus; November 13, 2009
30. "Bioinspired Photonic Band Gap Crystals at Visible Frequencies"  
Department of Chemistry, University of South Carolina, Columbia; November 4, 2009
29. "Three-Dimensional Photonic Band Gap Crystals from Biological Systems"  
Materials Department, University of Pennsylvania, Philadelphia; October 29, 2009
28. "Bioinspired Photonic Band Gap Crystals at Visible Frequencies"  
Department of Mathematics, University of Utah, Salt Lake City; October 19, 2009
27. "Three-Dimensional Photonic Band Gap Crystals from Biological Structures"  
Department of Chemistry, University of Illinois, Urbana Champaign; October 1, 2009
26. "High-Dielectric Photonic Band Gap Structures from Biological Templates"  
SPIE Nanoscience and Engineering Conference, San Diego; August 3, 2009
25. "Bio-Templated Photonic Band Gap Crystals at Visible Wavelengths"  
European Materials Research Society Meeting, Strasbourg, France; June 10, 2009
24. "Photonic Band Gap Crystals from Biological Structures"  
Austrian Chemical Society (GOECH), Graz University of Technology, Austria; June 3, 2009
23. "Three-Dimensional Photonic Band Gap Crystals from Biological Systems"  
Institute for Collaborative Biotechnologies, UCSB, Santa Barbara, CA; May 14, 2009
22. "Nanophotonics: From Biology to Technology"  
Dept of Chemistry & Biochemistry, CA State University, Long Beach, CA, April 22, 2009
21. "Sol-Gel Bio-Templating of Titanium Dioxide Photonic Band Gap Structures"  
Materials Research Society Spring Meeting, San Francisco; April 14, 2009
20. "Nanophotonics: From Biology to Technology"  
American Chemical Society National Meeting, Salt Lake City; March 23, 2009
19. "Nanophotonics: From Biology to Technology"  
Department of Chemistry, California State University, Sacramento, CA, March 13, 2009
18. "Photonic Band Gap Crystals from Biological Structures"  
Department of Chemistry, Purdue University, West Lafayette, IN; February 10, 2009
17. "Photonic Band Gap Crystals from Biological Templates"  
DuPont Experimental Station, Wilmington, DE; November 21, 2008
16. "Biological Photonic Crystals: High-Resolution 3-D Structure Analysis and Characterization"  
Lawrence Berkeley National Lab User Meeting, Berkeley; November 10, 2008
15. "A Cue from Nature: The Photonic Beetle"  
Science Night Live, University of Utah, Salt Lake City; October 28, 2008
14. "Diamond-Based Photonic Crystal Lattices in Iridescent Beetle Scales"  
American Chemical Society Regional Meeting, Park City, UT; June 17, 2008
13. "Designing Novel Optical Phenomena in Nanostructured Materials"  
Materials Department, University of Utah, Salt Lake City; January 9, 2008
12. "Nanophotonics: From Biology to Technology"  
Technology in Math, Science, and Engineering, USU-Ephraim, UT; April 18, 2008
11. "Towards Band Structure Engineering in Self-Assembled 3-D Photonic Crystals"  
American Chemical Society National Meeting, Boston; August 21, 2007
10. "Architectural Colors: Manipulating Light in Photonic Crystals"  
Chemistry Department, Seattle University, WA, May 10, 2007

**Invited Seminars and Presentations** *continued*

9. "Architectural Colors: Manipulating Light in Self-Assembled Nanophotonics"  
Dept of Chemistry & Geochemistry, Colorado School of Mines, Golden, CO; April 13, 2007
8. "Band Structure Engineering in 3D Photonic Crystals"  
IBM Almaden Research Center, San Jose; March 23, 2007
7. "Architectural Colors: Manipulating Light in Self-Assembled Nanophotonics"  
Physics Department, University of Utah, Salt Lake City; November 21, 2006
6. "Manipulating Light in Self-Assembled Nanophotonics"  
Department of Chemistry, Boise State University, ID; September 29, 2006
5. "Architectural Colors: Manipulating Light in Self-Assembled Nanophotonics"  
Department of Chemistry, Santa Clara University, CA; May 5, 2006
4. "Life After the B.S. Degree – Careers in Chemistry/Nano-Sciences"  
Department of Chemistry and Biochemistry, University of Denver, CO; February 15, 2006
3. "Manipulating Light in Self-Assembled Photonic Crystals"  
Chemistry and Biochemistry Department, Eastern Oregon University, OR; February 3, 2006
2. "Architectural Colors: Manipulating Light in Self-Assembled Nanophotonics"  
Department of Chemistry, Southern Oregon University, OR; January 25, 2006
1. "Self-Assembled 3-Dimensional Photonic Air-Sphere Crystals in Titania"  
JCIS – Photonics, Networking and Computing, Salt Lake City; July 21, 2005

**Bartl Research Group*****Postdoctoral Researchers***

2009—2011	Dr. David Riassetto
2010—2012	Dr. Jacqueline Siy
2012—2015	Dr. Golda Hukic-Markosian
2014—2015	Dr. Daniel van Opdenbosch
2018—2020	Dr. Hyeyoung Cho

***Graduate Students***

2005—2009	Jeremy Galusha (Ph.D. degree)
2005—2010	Jacqueline Siy (Ph.D. degree)
2006—2011	Moussa Barhoum (Ph.D. degree)
2007—2008	Kaycee Carter (M.S. degree)
2007—2011	Matthew Jorgensen (Ph.D. degree)
2010—2012	Nhi Ma (M.S. degree)
2010—2015	Michael Dahlby (Ph.D. degree)
2010—2016	Eric Brauser (Ph.D. degree)
2012—2014	Ramneet Nagi (M.S. degree)
2012—2015	Bryce Turner (M.S. degree)
2012—2017	Danielle Montanari (M.S. degree)
2013—2015	Peter Schulze (M.S. degree)
2013—2015	Carlos Burga (M.S. degree)
2013—2018	Wendy Consoer (Ph.D. degree)
2015—2017	Dominic Caputo (M.S. degree)
2020—Present	Ahmed El Nashar (Ph.D. track)

**Visiting Graduate Students**

2007	Dennis Chercka (Braunschweig exchange student)
2010	Simon Prescher (Braunschweig exchange student)
2012—2013	Cedric Porsiel (Braunschweig exchange student)

**Undergraduate Students**

2005—2008	Jessica Pauley
2005—2008	Joe Marchese
2007	Lindsay Leone (NSF REU student)
2007—2011	Lauren Richey (BYU)
2008—2009	Stewart Barlow
2008—2011	Jacob Morrill
2009	Eric Brauser (NSF REU student)
2009—2011	Benjamin Yonkee
2010—2011	Royce Davidson
2010—2011	Jennifer Amador
2010—2011	Adam Briggs
2010—2011	Elizabeth Ward (ACCESS student)
2011—2013	Zack Richens
2012—2013	Carlos Burga
2012—2014	Trevor Hull
2013	Adrianne Braun (MRSEC REU student)
2013—2015	Steven Ott
2014	Karina Smolyar (MRSEC REU student)
2014—2015	Dominic Caputo
2014—2015	Yusef Farah

**High-school Students (Summer Research Experience)**

2009, 2011	Todd Anderson
2010	Rachel Nakagawa
2013	Jackson Herron
2014	Anjali Nahata

**Collaborators**

- Prof. Darryl Butt, School of Mines, University of Utah
- Prof. Milind Deo, Department of Chemical Engineering Science, University of Utah
- Dr. Seth Fortuna, Sandia National Laboratories
- Prof. Greeshma Gadikota, Civil and Environmental Engineering, Cornell University
- Prof. John McLennan, Department of Chemical Engineering Science, University of Utah
- Prof. Joel Miller, Department of Chemistry, University of Utah, Salt Lake City
- Prof. Subhash Risbud, Materials Department, University of California at Davis
- Prof. Peter Rose, Energy and Geoscience Institute, University of Utah, Salt Lake City
- Prof. Jim Schuck, Mechanical Engineering, Columbia University (previously, LBL)
- Prof. Sabyasachi Sen, Materials Department, University of California at Davis
- Dr. Jacqueline Siy, Navillum Nanotechnologies, LLC, Salt Lake City, Utah
- Dr. Daniel van Opdenbosch, Biogenic Materials, Technical University of Munich, Germany
- Prof. Valy Vardeny, Physics Department, University of Utah, Salt Lake City
- Prof. Ming Wu, Electrical Engineering and Computer Science, UC Berkeley
- Prof. Cordt Zollfrank, Biogenic Materials, Technical University of Munich, Germany