

Michael H. Bartl, Ph.D.

Executive Director
 Center for Energy Efficient Electronics Science
 University of California, Berkeley
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Deputy Director
 MUSE Energy Frontier Research Center
 University of Utah
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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 Mesostructured 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

2019–Present **Executive Director**, Berkeley Emerging Technologies Research Center
 University of California, Berkeley

2018–Present **Deputy Director**, MUSE Energy Frontier Research Center
 University of Utah

2015–Present **Executive Director**, Center for Energy Efficient Electronics Science
 University of California, Berkeley

2015–Present **Research Associate Professor**, Department of Chemistry
 University of Utah

2014–Present **Deputy Editor**, Scripta Materialia; Acta Materialia, Inc.

2012–2015 **Associate Professor (tenured)**, Department of Chemistry
 University of Utah

2012–2015 **Adjunct Associate Professor**, Department of Physics and Astronomy
 University of Utah

2013–2014 **Visiting Professor**, Technical University of Munich (TUM), Germany

2012 **Research Staff Physicist**, Architected Materials, Sensors and
 Materials Laboratory, HRL Laboratories, LLC, Malibu

2005–2012 **Assistant Professor**, Department of Chemistry
 University of Utah

2004–2005 **Postdoctoral Fellow** with Prof. Evelyn Hu and Prof. David Awschalom
 California NanoSystems Institute, UCSB

2002–2004 **Max-Kade Postdoctoral Fellow** with Prof. Galen Stucky
 University of California, Santa Barbara

Research Projects/Interests

- Nanostructured Materials
- Functional Materials for Energy Applications
- Nanostructured Thin Films and Smart Interfaces
- Energy-Efficient Electronics and Photonics
- Bioinspired Materials

Honors and Awards

- Deputy Editor, *Scripta Materialia* (2014–)
- 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)

Professional Service

MRSEC, IRG Director, Plasmonic Metamaterials (2014–2015)

NSF funded Materials Research Science and Engineering Center: Next Generation Materials for Plasmonics and Organic Spintronics (\$12M + \$6M State of Utah)

Technology Commercialization: Scientific Co-Founder, Advisor and Consultant of Navillum Nanotechnologies, LLC

International Scientific Conference Organizer

Berkeley Symposium on Energy Efficient Electronics, October 2017, Berkeley

Symposium Organizer 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, Pittsburg; Bioinspired Materials Engineering

MS&T’13 Conference, October 2013, Montreal; Bioinspired Materials Engineering

MS&T’12 Conference, October 2012, Pittsburg; Bioinspired Materials Technology

Research Grant Making: External advisor, panelist and reviewer for the German Research Foundation (“Tailored Disorder Priority Programme” in Biomaterials)

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

Scientific Review Service: *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*, *Scripta Materialia*, *Thin Solid Films*, *Crystals*, *Langmuir*, *Interface*

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, American Physical Society, Materials Research Society, American Ceramic Society, American Association for Advancement of Science, SPIE

University Service (University of Utah, *selection*)

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

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

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

Courses Taught (Department of Chemistry, University of Utah)

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)

Research Funding

MUSE: Energy Frontier Research Center, Department of Energy, August 1, 2018 – July 31, 2017, \$11,700,000 (co-PI and deputy director)
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 H₂O 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
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

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, “Mesostructured 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

(* indicates corresponding author)

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.

Peer-Reviewed Journal Publications *continued*

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* and 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, C₄N₆. A Comparative Study with Related Tetracyano Electron Acceptors", *J. Org. Chem.* **2014**, *79*, 8189-8201.
47. M.R. Dahlby, M. Barhoum, M.H. Bartl*, "Effect of Annealing on Sol-Gel-Derived Multilayer Thin-Film Stacks", *Thin Solid Films* **2014**, *562*, 435-439.
46. F.P. Barrows, M.H. Bartl*, "Photonic Structures in Biology: A Possible Blueprint for Nanotechnology", *Nanomater. Nanotechn.* **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.
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.M. 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. (featured as "PRL Editors' Suggestion")
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.

Peer-Reviewed Journal Publications *continued*

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**) (*among five most read articles in Advanced Materials in January 2010*)
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. (*featured in ScienceDirect*)
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.
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 Mesostructured 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 Mesostructured Titania Waveguides", *J. Am. Chem. Soc.* **2004**, 126, 10826-10827.

Peer-Reviewed Journal Publications *continued*

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 Mesostructured 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 Mesostructured 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 Mesostructured 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: Nd³⁺:YAB – a Case Study of the Crystal Field Structure of the ⁴I_{9/2} 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.
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 YAl₃(BO₃)₄ Single Crystals Doped with Tripositive Praseodymium", *Spectrochim. Acta A* **2001**, *57*, 1981-1990.

Peer-Reviewed Journal Publications *continued*

3. M.H. Bartl, K. Gatterer*, H.P. Fritzer, S. Arafa, "Investigation of Phase Separation in Nd³⁺ 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*, "Mesostuctured 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.

Invention Disclosures and Patents

Patents Pending

8. M. Deo, H. Cho, D. Caputo, M.H. Bartl, "A Novel Method to Synthesize Silica Monoliths", *Invention Disclosure submitted* (2018).
7. M.H. Bartl, E. Brauser, P. Rose, J. McLennan, "Optical Detection of Tracer Species in Strongly Scattering Media", *Invention Disclosure submitted* (2015).
6. M.H. Bartl, J.T. Siy, "Method for the Post-Synthesis Shape Modification of Colloidal Nanocrystals in Solution", Pat. Pend. **US 13/142,191** (2009); **WO2010083431** (2009).

Patents Granted

5. P.E. Rose, M.H. Bartl, "Colloidal-Crystal Quantum Dots as Tracers in Underground Formations", *U.S. Patent US 10,125,601* (2018).
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).

Invited Seminars and Presentations

69. "Brilliant Coloration from Tailored Photonic Disorder in Weevil Scales"
Materials Research Society Fall Meeting, San Francisco; 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, CA; May 23, 2018
66. "Opportunities in Energy Efficient Electronics"
Ohlone College, Fremont, CA; Nov 2, 2017
65. "Functional Materials by Structural Design"
IBM Almaden Research Center, San Jose; July 24, 2015

Invited Seminars and Presentations *continued*

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
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

Invited Seminars and Presentations *continued*

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
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

Invited Seminars and Presentations *continued*

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
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

Invited Seminars and Presentations *continued*

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

Contributed Seminars and Presentations

26. "Equilibrium-Based Dissolution Studies of Colloidal Nanocrystals"
nanoUtah Conference, Salt Lake City, UT; October 12, 2012
25. "Controlling Spontaneous Emission in Bioreplica Photonic Crystals"; Jorgensen *et al.*
SPIE Smart Structures and Materials Conference 2012, San Diego, CA; March 13, 2012
24. "Strong Modification of Density of Optical States in Biotemplated Photonic Crystals"
Jorgensen *et al.*
SPIE Optics and Optoelectronics Meeting 2011, Prague, Czech Republic; April 19, 2011
23. "Water Solubilization of Highly Luminescent Quantum Dots With Tunable Size, Optical and Chemical Properties"; Riassetto *et al.*
American Chemical Society National Meeting, Anaheim; March 30, 2011
22. "Photonic Crystals With Diamond-Based Lattices from Bio-Templates"; Jorgensen *et al.*
American Chemical Society National Meeting, Anaheim; March 31, 2011
21. "Equilibrium-Based Dissolution Studies of Colloidal Nanocrystals"
Materials Research Society Fall Meeting, Boston, MA; December 3, 2010
20. "Sol-Gel Bio-Templated Photonic Band Gap Crystals"
Gordon Research Conference on Soft Condensed Matter Physics, Colby-Sawyer College, New London, NH; August 9-14, 2009
19. "Equilibrium-based Post-Synthesis Size Tailoring of CdSe Nanocrystals"; Siy *et al.*
American Chemical Society National Meeting, Salt Lake City; March 25, 2009
18. "Colloidal Nanocrystals: Post-Synthesis Size Tuning and Optical Studies"
nanoUtah Conference, Salt Lake City, UT; October 17, 2008
17. "Effect of Ligand Exchange on the Stability of CdSe Nanocrystal Quantum Dots"; Siy *et al.*
Materials Research Society Fall Meeting, Boston, MA; November 29, 2007
16. "3D Band Structure Engineering in Self-Assembled Photonic Crystals"; Galusha *et al.*
Materials Research Society Fall Meeting, Boston, MA; November 28, 2007
15. "About Photons and Electrons in the Nanoworld"
Science Day at the University of Utah, Salt Lake City, UT; November 10, 2007
14. "Architectural Colors: Manipulating Light in Nanophotonics"
Recent Advances in Nanoscale Materials Research, Santa Barbara, CA; December 8, 2006
13. "3D Photonic Band Structure Engineering in Self-Assembled Macroporous Photonic Crystals" Materials Research Society Fall Meeting, Boston, MA; November 29, 2006
12. "About Photons and Electrons in the Nanoworld"
Science Day at the University of Utah, Salt Lake City, UT; November 11, 2006

Contributed Seminars and Presentations *continued*

11. "Post-Synthesis Size Engineering of CdSe Nanocrystal Quantum Dots"; Siy *et al.* American Chemical Society Regional Meeting, Tucson, AZ; October 16, 2006
10. "3-D Band Gap Engineering of Self-Assembled Photonic Crystals"; Galusha *et al.* American Chemical Society Regional Meeting, Tucson, AZ; October 16, 2006
9. "Spectroscopic Studies of Rare Earth Ions in Sol-Gel Derived Titania Thin Films and Multi-Layer Matrices"; Pauley *et al.* American Chemical Society Regional Meeting, Tucson, AZ; October 16, 2006
8. "Molecular Assembly of Function in 3-D Ordered Composite Material Systems" American Chemical Society National Meeting, San Diego, CA; March 16, 2005
7. "Self-Assembled Sol-Gel Derived 3-Dimensional Photonic Crystals" CeNS-CNSI Symposium, Santa Barbara, CA; March 15, 2004
6. "Optically Activated Mesostructured Titania Composites with Controlled Morphologies" Materials Research Society Fall Meeting, Boston, MA; December 3, 2003
5. "Synthesis and Spectroscopic Properties of Optically Activated Planar Open-Surface Titania Inverted Opals" Materials Research Society Fall Meeting, Boston, MA; December 4, 2003
4. "3D Organized Nanocrystalline Frameworks for Electro-Optical Applications" American Chemical Society Regional Meeting, Long Beach, CA; October 17, 2003
3. "Simultaneous Synthesis and Self-Assembly of Mixed Semiconductor Nanocrystallites in a Cubic Mesoporous Titania Matrix" Materials Research Society Spring Meeting, San Francisco, CA; April 23, 2003
2. "Whispering Gallery Mode Emission and Lasing from Hierarchically Assembled Quantum Dot Spherical Microcavities" Materials Research Society Spring Meeting, San Francisco, CA; April 4, 2002
1. "Spectroscopy and Crystal Field Investigation of $\text{YAl}_3(\text{BO}_3)_4:\text{Pr}^{3+}$ Single Crystals" Spectroscopy and Theory in Science and Technology, Graz, Austria; September 13, 2000

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

Graduate Students

2005—2009	Jeremy Galusha (Ph.D. degree)
2005—2010	Jacqueline Siy (Ph.D. degree)
2006—2011	Moussa Barhoum (Ph.D. degree)
2007	Dennis Chercka (Braunschweig exchange student)
2007—2008	Kaycee Carter (M.S. degree)
2007—2011	Matthew Jorgensen (Ph.D. degree)
2010	Simon Prescher (Braunschweig exchange student)
2010—2012	Nhi Ma (M.S. degree, pending)

Graduate Students continued

2010—2015	Michael Dahlby (Ph.D. degree)
2010—2016	Eric Brauser (Ph.D. degree)
2012—2013	Cedric Porsiel (Braunschweig exchange student)
2012—2014	Ramneet Nagi (M.S. degree)
2012—2015	Bryce Turner (M.S. degree)
2012—2017	Danielle Montanari (M.S. degree pending)
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)

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	Adrienne 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	Todd Anderson
2010	Rachel Nakagawa
2011	Todd Anderson
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
- Prof. Jordan Gerton, Physics Department, University of Utah, Salt Lake City
- Prof. Ben Lear, Department of Chemistry, Penn State 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. Ajay Nahata, Electrical and Computer Engineering, 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
- Dr. Jim Schuck, Molecular Foundry, Lawrence Berkeley National Lab, Berkeley
- Dr. Jacqueline Siy, Navillum Nanotechnologies, LLC, Salt Lake City, Utah
- Dr. Adele Taboli, National Renewable Energy Laboratory, Golden, Colorado
- Prof. Eric Toberer, Department of Physics, Colorado School of Mines, Golden, Colorado
- Dr. Daniel van Opdenbosch, Biogenic Materials, Technical University of Munich, Germany
- Prof. Valy Vardeny, Physics Department, University of Utah, Salt Lake City
- Prof. Eli Yablonovitch, Electrical Engineering, University of California, Berkeley
- Prof. Cordt Zollfrank, Biogenic Materials, Technical University of Munich, Germany