

Maxim I. Boyanov

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WORK EXPERIENCE

Assistant Professor: Condensed Matter Physics, Department of Physics, University of Sofia, Bulgaria 2007-current

Funded Projects: "Optical and fluorescence microscopy studies of solid phase deposition dynamics in drying suspension drops", Research grant from the University of Sofia, 2008-2009

"Coupled Microbial, Geochemical, and Mineralogical Controls on Biogenic Fe Speciation and Reactivity", Argonne National Laboratory subcontract to the University of Sofia, 2007-2010

Classes: Electricity and Magnetism, Information theory and applications, Experimental methods in Physics (optical microscopy), Scanning electron microscopy for non-physicists, Surface phenomena in dispersed systems, Numerical methods, Radiochemistry

Postdoctoral: X-ray Physical-Chemistry, Environmental Research Division, Argonne National Laboratory, IL, U.S.A. 2003-2006

Projects: "Aqueous adsorption and reduction of U(VI) by Fe(II) at carboxyl surfaces", "Reduction of U(VI) by green rust phases", and "X-ray elemental analysis of single bacterial cells"

Supervisor: Dr. Kenneth Kemner

DEGREES

Ph.D.: **Physics**, University of Notre Dame, IN, U.S.A. 1996-2003

Dissertation: "XAFS spectroscopy studies of metal-ligand interactions at organic surfaces and in solution"

Advisor: Prof. Bruce Bunker

B.Sc., M.Sc.: **Physics**, University of Sofia, Bulgaria. 1991-1995

Illinois Institute of Technology, Chicago, IL, U.S.A. 1990-1991

M.Sc. Thesis: "Two new analytical solutions to the inverse ellipsometric problem"

Advisor: Dr. Stoyan Russev

Graduated: Magna Cum Laude

High School: National English Language School, Sofia, Bulgaria. 1986-1990

RESEARCH INTERESTS

Synchrotron spectroscopy studies of aqueous ion speciation near charged interfaces and in solution, in relation to environmental mineral and bacterial systems. Metal and radionuclide transformations related to bacterial activity. Synchrotron x-ray fluorescence and tomography imaging.

RESEARCH EXPERIENCE

- Complete operation of a synchrotron beamline (MRCAT at the Advanced Photon Source)
- Combined acid-base titration, metal adsorption, and XAFS experiments
 - H^+ , Fe^{2+} , and UO_2^{2+} sorption to colloidal systems: bacteria, minerals, latex spheres
 - Analysis using chemical equilibrium models, including electrostatics
 - UO_2^{2+} - Fe^{2+} redox transformations

- Working with anoxic and radiological samples, Fe^{2+} and UO_2^{2+}
- XAFS data analysis and software development
- Synchrotron X-ray Fluorescence (micro)analysis
 - Elemental content maps of single bacterial cells with 0.15 micron resolution
 - Metal transformations inside and near bacterial surfaces and relation to metabolic processes
 - Elemental content of petrified wood
- Synchrotron X-ray Tomography analysis
 - 3D porosity analysis of soil samples grown under different conditions, at micron resolution
- XAFS of uranium reduction by biotically and abiotically produced green rust phases
 - Determination of uranium valence state and retention mechanisms in mixed-valence iron oxides-hydroxides, known as “green rusts”
- GI-XAFS of aqueous Pb adsorbed underneath a Langmuir monolayer
 - Grazing incidence Pb-L_{III} XAFS measurements on a solution surface. Provided the structure of the adsorbed complex and a model explaining the peculiar effect of Pb on monolayer bulk properties.
- EXAFS applied to metal adsorption onto cell wall biomass
 - Studied Cd ions bound to *B. subtilis* cell-wall biomass as a function of pH. Provided metal binding site speciation and geometry in the 3.4-7.8 pH range.
- XAFS and X-ray Reflectivity on III-V semiconductors and II-VI superlattices
 - Reflectivity and Reflection-mode XAFS on wet-thermally oxidized AlGaAs to characterize the interfacial region structure. Polarization dependent XAFS of II-VI superlattices.
- Ellipsometry applied to protein layers; new analytical solutions to the ellipsometric equation
 - Kinetics and extent of protein adsorption at the air/water interface studied by ellipsometry. Two analytical inversions of the non-linear minimization problem.

REVIEWER for

Environmental Science and Technology, Applied Geochemistry,
Chemical Geology, Journal of Physical Chemistry

AWARDS

Bayer Predoctoral Fellowship in Environmental Science	2001-2002
Bayer Summer Fellowship	2001
Presidential Fellowship, University of Notre Dame, IN	1996-2000
Annual Academic Excellence Stipend, University of Sofia, Bulgaria	1992-1995
Dean's List, Illinois Institute of Technology, Chicago, IL	1991

SPECIAL TRAINING

Research: National School on Neutron and X-ray Scattering, Argonne National Laboratory,
Aug 16-27, 1999

Language: English (fluent), Russian (fluent), Bulgarian (fluent), German (basic)

PROGRAMMING, OPERATING SYSTEMS, AND SOFTWARE

Programming: FORTRAN, PASCAL, DELPHI (developed GUI analysis software for XAFS)

OS: Windows 2000, XP; UNIX; Linux; (administrator skills in all)

Software: MS Office, MS Visual Studio, Origin, EndNote, Labview, Gnuplot, VNC

XAFS software: winIDP, the UW suite (advanced skills in all).

Chemical equilibrium: FITEQL, ECOSAT

Microscopy and tomography analysis: ImageJ, 3DMA-Rock

PUBLICATIONS, peer reviewed journals. (Total number of citations as of 8/2008: 202)

“Integrating Bulk Adsorption Isotherm and EXAFS Measurements to Constrain the Binding Mechanisms of Cd to the Cell Walls of *Bacillus subtilis* and *Shewanella oneidensis*”,
B.Mishra, M.Boyanov, B.Bunker, S.Kelly, K.Kemner, J.Fein, *in review*, *Geochim. et Cosmochim. Acta* (6/2008)

- “X-ray Absorption Spectroscopy Study of Cd Adsorption Onto Bacterial Consortia”, B.Mishra, J.Fein, M.Boyanov, S.Kelly, K.Kemner, B.Bunker, *in review*, Geochim. et Cosmochim. Acta (6/2008)
- “A pH-Dependent X-Ray Absorption Spectroscopy Study of U Adsorption to Bacterial Cell Walls”, B. Ravel, S. Kelly, D.Gorman-Lewis, M. Boyanov, J.Fein, K. Kemner, AIP CP 882, 202-204 (2007) (*cited: 0*)
- “XAFS and X-Ray and Electron Microscopy Investigations of Radionuclide Transformations at the Mineral-Microbe Interface”, K.Kemner, E.O'Loughlin, S.Kelly, B.Ravel, M.Boyanov, D.Sholto-Douglas, B.Lai, R.Cook, E.Carpenter, V.Harris, K.Nealson, AIP CP 882, 250-252 (2007) (*cited: 0*)
- “Comparison of Cd Binding Mechanisms by Gram-Positive, Gram-Negative and Consortia of Bacteria Using XAFS”, B.Mishra, J.Fein, M.Boyanov, S.Kelly, K.Kemner, B.Bunker, AIP CP 882, 343-345 (2007) (*cited: 0*)
- “Adsorption of iron(II) and uranium(VI) to carboxyl-functionalized microspheres: the influence of speciation on uranyl reduction studied by titration and XAFS”, M.Boyanov, E.J.O'Loughlin, E.Roden, J.Fein, K.Kemner, Geochim.Cosmochim.Acta 1898-1912 (2007) (*cited: 6*)
- “Mixed valence cytoplasmic iron granules are linked to anaerobic respiration,” S. Glasauer, S. Langley, M. Boyanov, B. Lai, K. M. Kemner, T. J. Beveridge, Appl. Environ. Microb. 73(3), 993-996 (2007) (*cited: 5*)
- “c-Type Cytochrome-Dependent Formation of U(IV) Nanoparticles by *Shewanella oneidensis*”, M. Marshall et al., PLoS Biology 4(8), 1324-1333 (2006) (*cited: 18*)
- “Synchrotron X-ray Investigations of Mineral–Microbe–Metal Interactions”, K.Kemner, E.O'Loughlin, S.Kelly, M.Boyanov, Elements 1(4), 217-221 (2005) (*cited: 5*)
- “Local structure around Cr³⁺ ions in dilute acetate and perchlorate aqueous solutions”, M.I.Boyanov, K.M.Kemner, T. Shibata, B.A.Bunker, J. Phys. Chem. A 108, 5131-5138 (2004) (*cited: 0*)
- “Adsorption of cadmium to *B.subtilis* bacterial cell walls — a pH-dependent XAFS spectroscopy study”, M.I.Boyanov, S.D.Kelly, K.M.Kemner, B.A.Bunker, J.B.Fein, D.A.Fowle. Geochim. et Cosmochim. Acta 67(18), 3299-3311 (2003) (*cited: 49*)
- “Mechanism of aqueous Pb adsorption to fatty acid Langmuir monolayers studied by XAFS spectroscopy”, M.I.Boyanov, J.Kmetko, T.Shibata, A.Datta, P.Dutta, B.A.Bunker. J. Phys. Chem. B 107, 9780-9788 (2003) (*cited: 7*)
- “X-ray-absorption fine-structure determination of pH-dependent cell wall interactions”, S.Kelly, K.Kemner, J.Fein, D.Fowle, M.Boyanov, B.Bunker, N.Yee. Geochim. et Cosmochim. Acta, 66(22), 3855-3871 (2002) (*cited: 50*)
- “Non-metabolic reduction of Cr(VI) by bacterial surfaces under nutrient-absent conditions”, J.Fein, K.Kemner, D.Fowle, J.Cahill, M.Boyanov, B.Bunker. Geomicrobiology Journal 19(3), 369-382 (2002) (*cited: 16*)
- “XAFS determination of the bacterial cell wall functional groups responsible for complexation of Cd and U as a function of pH”, S.D.Kelly, M.I.Boyanov, B.A.Bunker, J.B.Fein, D.A.Fowle, N.Yee, and K.M.Kemner. J. Synchrot. Radiat. 8, 946-948 (2001) (*cited: 21*)
- “XAFS studies of gold and silver-gold nanoparticles in aqueous solutions”, T. Shibata, H.Tostmann, B.Bunker, A.Henglein, D.Meisel, S.Cheong, and M.Boyanov. J. Synchrot. Radiat. 8, 545-547 (2001) (*cited: 9*)
- “Analytical determination of the optical constants of a substrate in the presence of a covering layer by use of ellipsometric data”, S.C.Russev, M.I.Boyanov, J.P.Drolet, R.M.Lebanc. J. Opt. Soc. Am. A-Opt. Image Sci. Vis. 16(6), 1496-1500 (1999) (*cited: 3*)
- “Polynomial Inversion of the Single Transparent Layer Problem in Ellipsometry”, J.P.Drolet, S.C.Russev, M.I.Boyanov, R.M.Lebanc. J. Opt. Soc. Am. A-Opt. Image Sci. Vis. 1112, 3284-3291 (1994) (*cited: 13*)

CONTRIBUTED PAPERS

- “XAFS investigations of interactions of U(VI) with *Bacillus subtilis*, green rust, and bio-oxidizing *Dechlorosoma suillum*”, S.D.Kelly, K.M.Kemner, E.J.O'Loughlin, J.B.Fein, D.A.Fowle,

- M.I.Boyanov, B.A.Bunker, N.Yee, J. D.Coates. *Preprints of Extended Abstracts*, American Chemical Society, Washington, D.C., 41(2):254-258 (2001).
- "Elemental Analysis and Fe K-edge XAFS of Petrified Wood", M. Boyanov, R. Dayvault, K. Kemner; Chapter included in a book on petrified wood by R. Dayvault.
- "XAFS determination of U-bacterial cell wall interaction at low pH", S.D.Kelly, K.M.Kemner, J.B.Fein, D.A.Fowle, M.I.Boyanov, B.A.Bunker, N.Yee. Abstr. *Preprints of Extended Abstracts*, American Chemical Society, Washington, D.C., 41(1):541-546 (2001)
- "Reduction of trace elements by mixed Fe(II)/Fe(III) hydroxide (green rust)", E.J.O'Loughlin, S.D.Kelly, K.M.Kemner, M.I.Boyanov. *Preprints of Extended Abstracts*, American Chemical Society, Washington, D.C., 41(1):573-577 (2001).
- "XAFS Study of U Sorption to Bacterial Cell Wall," S.D.Kelly, K.M.Kemner, J.B.Fein, D.A.Fowle, M.I.Boyanov, B.A.Bunker, N.Yee. p. 19 in *Proceedings of the Sixth International Conference on Biogeochemistry of Trace Elements*; Guelph '01 (2001).
- "Reduction of Cu(II) and U(VI) by Mixed Fe(II)/Fe(III) Hydroxide (Green Rust)," E. O'Loughlin, S.D.Kelly, K.M.Kemner, M.I.Boyanov. p. 49 in *Proceedings of the Sixth International Conference on Biogeochemistry of Trace Elements*; Guelph '01 (2001).
- "Reflectivity and Reflection-mode XAFS study of III-V compound native oxide/GaAs Interface", B.A.Bunker, S.-K.Cheong, T.Shibata, M.Boyanov, D.Lahiri, D.C.Hall, G.L.Snider, P.J.Barrios. paper B6-04 in *11th International Conference on X-ray Absorption Fine Structure (XAFS XI)*. Aka, Japan, July 27-31 (2000)
- "Reflectivity and Reflection-mode XAFS study of the wet-thermal native oxide/GaAs interface," S-K.Cheong, T.Shibata, M.Boyanov, D.Lahiri, B.A.Bunker, D.C.Hall, G.L.Snider, P.J.Barrios, paper J11.010, in the *Bulletin of the American Physical Society*, vol. 46, no. 1 (2001).
- "X-ray reflectivity and reflection-mode XAFS study of III-V compound native oxide/GaAs interfaces", S.-K.Cheong, T.Shibata, M.Boyanov, D.Lahiri, B.A. Bunker, D.C. Hall, G.L.Snider. paper I19.02, 2000 March Meeting of American Physical Society, Minneapolis, Minnesota, March 20-24, (2000)
- "Reflection Mode XAFS studies of III-V compound native oxide/GaAs Interfaces," S.-K.Cheong, T.Shibata, M.Boyanov, D.Lahiri, B.A.Bunker, D.C.Hall, G.L.Snider, C.B. DeMelo. paper XC23.09, American Physical Society 1999 Centennial Meeting (Atlanta, Georgia, March 20-26, 1999).

PRESENTATIONS

- (*invited talk*, K. Kemner) "Geomicrobiology investigations using x-ray and electron microprobes", K.Kemner, M.Boyanov, et al., workshop on Biological Applications of X-Ray Microprobes, Northwestern Hospital, Chicago, Illinois, November 15 and 16, 2007.
- (*invited talk*, K. Kemner) "Investigation of mineral-metal-microbe interactions with hard x-rays", K.Kemner, M.Boyanov, et al., Pennsylvania State University Environmental Engineering Department Colloquium, State College, Pennsylvania, November 2, 2007.
- (*invited talk*, M. Scherer) "Contaminant Interactions with Green Rusts: Abiotic and Biotic Pathways", M. Scherer, M. Boyanov, J. Coates, C. Gorski, K. Kemner, P. Larese-Casanova, D. Latta, E. O'Loughlin, S. Smith, M. St. Clair, K. Weber, 233rd American Chemical Society (ACS) Meeting, Chicago, March 25-29, 2007
- (*talk*, M. Boyanov) "X-ray microscopy of uranium precipitates near single bacterial cells", M.I. Boyanov, B. Lai, M.J. Marshall, A.C. Dohnalkova, J.K. Fredrickson, K.M. Kemner; Actinide XAS 2006 Conference, Karlsruhe, Germany; September 18-20, 2006.
- (*poster*) "The effect of Fe(II)-Fe(II) coordination on the reduction of U(VI) at a carboxyl surface determined by titration and XAFS", M.I. Boyanov, E.J. O'Loughlin, E.E. Roden, J.B. Fein, K.M. Kemner; Actinide XAS 2006 Conference, Karlsruhe, Germany; September 18-20, 2006.
- (*talk*, B. Ravel), "A pH-dependent X-ray Absorption Spectroscopy study of U adsorption to bacterial cell walls", B. Ravel, S. D. Kelly, D. Gorman-Lewis, M. I. Boyanov, J. B. Fein and K. M.

- Kemner; 13th International XAFS Conference, Stanford University, Palo Alto, CA, July 9-14, 2006.
- (*talk*, D. W. Kennedy) "The Role of *Shewanella oneidensis* MR-1 Outer Membrane c-Type Cytochromes in Extracellular U(IV)O₂ Nanoparticle Formation," D. W. Kennedy, M. J. Marshall, A. S. Beliaev, A. C. Dohnalkova, L. Shi, Z. Wang, M. I. Boyanov, B. Lai, K. M. Kemner, J. S. McLean, S. B. Reed, V. L. Bailey, D. A. Saffarini, M. F. Romine, J. M. Zachara, and J. K. Fredrickson; American Society of Microbiology Meeting, May 21-25, 2006, Orlando.
- (*invited talk*, M. Boyanov) "Formation of Minerals Inside and Near Single Bacterial Cells: Elemental Content and Valence State at the Sub-Micron Scale", M. Boyanov, B. Lai, S. Glasauer, M. Marshall, S. Langley, A. Dohnalkova, J. Fredrickson, T. Beveridge, K. Kemner; X-ray Spectromicroscopy: a Tool for Environmental Science? Workshop, 2006 Users Meeting, Argonne National Laboratory, Argonne, IL; May 1-5, 2006.
- (*talk*, M. J. Marshall) "Biomolecular Mechanisms of U(IV)O₂ and Tc(IV)O₂ Nanoparticle Formation by *Shewanella oneidensis* MR-1," M. J. Marshall, A. S. Beliaev, D. W. Kennedy, A. E. Plymale, A. C. Dohnalkova, L. Shi, Z. Wang, M. I. Boyanov, B. Lai, K. M. Kemner, J. S. McLean, S. B. Reed, D. E. Culley, B. L. Bailey, C. J. Simonson, D. A. Saffarini, M. F. Romine, Y. A. Gorby, J. M. Zachara, and J. K. Fredrickson; Environmental Remediation Science Program PI Meeting, Arlie, VA, April 3-5, 2006.
- (*poster*) Investigation of the Transformation of Uranium under Iron-Reducing Conditions: Reduction of UVI by Biogenic FeII/FeIII Hydroxide (Green Rust), E. O'Loughlin, K. Kemner, S. Kelly, M. Boyanov, B. Ravel, R. Cook; ERSP PI Meeting, Warrenton, VA, April 3-5, 2006
- (*poster*) "U(VI) reaction with green rusts: Influence of anions" St. Clair, M., S. L. Smith, J. O. Harrison, E. J. O'Loughlin, K. M. Kemner, M. I. Boyanov, M. M. Scherer; 231st American Chemical Society National Meeting, Atlanta, GA, March 26-30, 2006.
- (*talk*, M. Boyanov) "Reduction of U(VI) by Fe(II) at a model cell surface: reactive species, products, and insight obtained by EXAFS", M. I. Boyanov, E. J. O'Loughlin, S. K. Kelly, J. B. Fein, E. E. Roden, K. M. Kemner; Synchrotron Environmental Science III, Brookhaven National Laboratory, Upton, NY; September 19-21, 2005.
- (*invited talk*, K. Kemner) "The use of synchrotron-based techniques for biogeoscience research," K. M. Kemner, M. Boyanov, E. J. O'Loughlin, S. D. Kelly, B. Ravel; Synchrotron Environmental Science-III Conference, Brookhaven National Laboratory, Upton, NY, September 19-21, 2005.
- (*poster*) "Investigation of the transformations of Uranium under Fe reducing conditions: Reduction of U(VI) by biogenic Fe(II) in Green Rust", E. J. O'Loughlin, M. Scherer, K. M. Kemner, J. Harrison, M. I. Boyanov, S. K. Kelly; NABIR PI Meeting, Warrenton, VA; April 18-20, 2005.
- (*poster*) "Using XAFS to study U(VI) reduction by Fe(II) at a model bacterial surface", M. I. Boyanov, E. J. O'Loughlin, S. K. Kelly, J. B. Fein, E. E. Roden, K. M. Kemner; Workshop on In-Situ Characterization of Surface and Interface Structures and Processes, Argonne, IL; September 8-9, 2005.
- (*poster*) "Characterization of the c-type Cytochromes and the Type II Secretion System of *Shewanella oneidensis* MR-1 in Radionuclide Reduction and Localization", M. J. Marshall, D. W. Kennedy, A. C. Dohnalkova, A. E. Plymale, D. A. Saffarini, M. I. Boyanov, K. M. Kemner, B. Lai, S. B. Reed, D. E. Culley, M. F. Romine, A. S. Beliaev, J. M. Zachara, J. K. Fredrickson; The Joint International Symposia for Subsurface Microbiology (ISSM 2005) and Environmental Biogeochemistry (ISEB XVII), Jackson Hole, Wyoming - August 14-19, 2005.
- (*invited talk*, K. Kemner) "X-ray microprobe investigations of mineral-metal-microbe interfaces", K. M. Kemner, S. K. Kelly, M. I. Boyanov, B. Lai, S. Glasauer, S. Langley, C. Kulpa, T. Beveridge, K. Neilson; 15th Annual Goldschmidt Conference, Moscow, ID; May 20-25, 2005.
- (*poster*) "Reduction of U(VI) by adsorbed vs. surface-precipitated Fe(II) at model cell surfaces", M. I. Boyanov, E. J. O'Loughlin, S. K. Kelly, J. B. Fein, E. E. Roden, K. M. Kemner; 15th Annual Goldschmidt Conference, Moscow, ID; May 20-25, 2005.

- (poster) "Cd adsorption onto *Bacillus subtilis* bacterial cell walls: integrating isotherm and EXAFS studies", Mishra, B.; Kelly, S. D.; Fein, J. B.; Boyanov, M.; Kemner, K. M.; Bunker, B. A. 15th Annual Goldschmidt Conference, Moscow, ID; May 20-25, 2005.
- (colloquium, S.Kelly) "Biogeochemical processes affecting uranium in calcium carbonate systems – Atomic-scale interactions related to macroscopic properties" S.D. Kelly, K.K. Kemner, S.C. Brooks, J. Fredrickson, T. Rasbury, C. Spotl, N. Sturchio, P. Fenter, S. Chattopadhyay, M. Boyanov, E. O'Loughlin, J. Kropf, Geological Sciences Colloquium, Indiana University, Bloomington, IN, April 25, 2005.
- (invited talk, K. Kemner) "Effect of microbial exopolymers on the spatial distributions and transformations of Cr and U at the bacteria-geosurface interface", Kemner, K.; Kelly, S.; O'Loughlin, E.; Boyanov, M.; Neilson, K.; Glasauer, S.; Beveridge, T.; Lai, B.; Maser, J.; Cai, Z. DOE-NABIR PI Meeting; Warrenton, VA; Apr 18-20, 2005
- (poster) "The Role of *Shewanella oneidensis* MR-1 c-type Cytochromes and Type II Secretion System in Uranium Reduction and Localization of UO₂ Nanoparticles", J.K. Fredrickson, J.M. Zachara, A.S. Beliaev, M.J. Marshall, D.W. Kennedy, A. Dohnalkova, M.I. Boyanov, K. Kemner, B. Lai, S.B. Reed, M.F. Romine, D.A. Saffarini, Annual NABIR PI meeting, Warrenton, VA; April 18-20, 2005.
- (invited talk, S. Glasauer) "Metal sorption and the bacterial membrane : implications for biomineralization and fossilization", S. M. Glasauer, C. Cousins; S. Langley, T. Beveridge, M. Boyanov, B. Lai, K. Kemner, European Geoscience Union General Assembly 2005; Vienna, Austria; Apr 24-29, 2005
- (contributed talk, M. Boyanov) "XAFS of Cd and U sorption to bacterial surfaces—bridging between macroscopic measurements and molecular binding mechanism", M. Boyanov, S. Kelly, K. Kemner, B. Bunker, J. Fein, D. Fowle, N. Yee; Third International Conference on Interfaces Against Pollution, Aachen, Germany, May 24-27, 2005.
- (poster) "Contaminant metal (Cd and Pb) speciation in the presence of biological and mineral surfaces", B. Mishra, M. Boyanov, S. Kelly, K. Kemner, P. Maurice, J. Fein, B. Bunker. APS Users Meeting, May 3, 2004.
- (invited talk, K. Kemner) K. M. Kemner, M. Boyanov "EMSI Collaborative Studies with the ER Division at ANL," EMSI Review, University of Notre Dame, Notre Dame, Indiana, September 24, 2003.
- (invited talk, K. Kemner) "X-ray and electron micro(spectro)scopy investigations of internal biomineralization products produced by dissimilatory metal reducing bacteria (DMRB)", M. Boyanov, S. Glasauer, B. Lai, K. Kemner, T. Beveridge. EMSI Review Meeting, University of Notre Dame, Sept 2003
- (poster) "Spectral features in the XAFS of aqueous metal-acetate complexes", M. Boyanov, T. Shibata, S. Kelly, K. Kemner, B. Bunker. XAFS XII conference in Malmo, Sweden, June 2003
- (invited talk, M. Boyanov) "Mechanism of lead adsorption to fatty acid Langmuir monolayers by XAFS spectroscopy", M. Boyanov, T. Shibata, J. Kmetko, A. Datta, P. Dutta, B. Bunker. APS Users' Meeting, Argonne, March 2003
- (invited talk, J. Fein) "Metal Adsorption onto Bacterial Surfaces: The Use of X-ray Absorption Fine Structure Measurements to Determine Metal Binding Mechanisms", J. Fein, P. Wightman, D. Fowle, N. Yee, K. Kemner, S. Kelly, M. Boyanov, B. Bunker. SES-II Conference, Argonne, May 2002
- (poster) "XAFS of Aqueous Pb Adsorbed Underneath Fatty Acid Langmuir Monolayers", M. Boyanov, J. Kmetko, T. Shibata, A. Datta, B. Bunker, P. Dutta. X-02 Conference, Rome, Italy, June 2002
- (poster) "Adsorption of Cadmium to *B. subtilis* Bacterial Cell Walls — a pH-Dependent XAFS Spectroscopy Study", M. Boyanov, S. Kelly, K. Kemner, B. Bunker, J. Fein, D. Fowle. X-02 Conference, Rome, June 2002
- (contributed talk, D. Lahiri) "Oxidation state and coordination of gold deposited on titania nanoparticles", D. Lahiri, V. Subramanian, T. Shibata, M. Boyanov, A. Stuckey, B. Mishra, P. Kamat, B. Bunker. APS March Meeting, Indianapolis, 2002

- (*contributed talk*, A.Stuckey) "XAFS of Ga(1-x)Mn(x)As alloys", A.Stuckey, M.Boyanov, T.Shibata, T.Wojtowicz, Y.Sasaki, X.Liu, J.Furdyna, B.Bunker. APS March Meeting, Indianapolis, 2002
- (*contributed talk*, S.D.Kelly) "XAFS Study of U Sorption to Bacterial Cell Wall," S.D.Kelly, K.M.Kemner, J.Fein, D.Fowle, M.Boyanov, B.Bunker, N.Yee, Sixth International Conference on the Biogeochemistry of Trace Elements, Guelph, Ontario, August 2001
- (*contributed talk*, O'Loughlin) "Reduction of Cu(II) and U(VI) by mixed Fe(II)/Fe(III) hydroxide (Green rust)," O'Loughlin, E.J., S.D. Kelly, M. Boyanov, and K.M. Kemner. 6th International Conference on the Biogeochemistry of Trace Elements, Guelph, Ontario, August 2001
- (*contributed talk*, S. D.Kelly) "XAFS investigations of interactions of U(VI) with *Bacillus subtilis*, green rust, and bio-oxidizing *Dechlorosoma suillum*", S.D.Kelly , K.M.Kemner , E.J.O'Loughlin , J.B.Fein , D.A.Fowle , M.I.Boyanov , B. A. Bunker , N. Yee , J. D. Coates. 222nd ACS National Meeting, Chicago, August 2001
- (*contributed talk*, S.-K.Cheong) "Reflectivity and Reflection-mode XAFS study of the wet-thermal native oxide/GaAs Interface", S.-K.Cheong, T.Shibata, M.Boyanov, D.Lahiri, B.Bunker, D.Hall, G.Snider, P.Barrios. APS March Meeting, Seattle, 2001
- (*contributed talk*, E.J. O'Loughlin) "Reduction of trace elements by mixed Fe(II)/Fe(III) hydroxide (green rust)", E.J.O'Loughlin, S.D.Kelly, K.M.Kemner, M.Boyanov. 221st ACS National Meeting, San Diego, April 2001
- (*contributed talk*, S.D.Kelly) "XAFS determination of U-bacterial cell wall interaction at low pH", S.D.Kelly, K.M.Kemner, J.B.Fein, D.A.Fowle, M.I.Boyanov, B.A.Bunker, N.Yee. 221st ACS National Meeting, San Diego, April 2001
- (*poster*) "EXAFS of Aqueous Cadmium Complexes: the Role of Hydrogen and Multiple Scattering Paths", M.Boyanov, S.Kelly, B.Bunker, K.Kemner, T.Shibata, S.-K.Cheong, D.Lahiri, J.Fein. The 11th Annual APS Users' Meeting, Argonne, IL, October 2001
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