Saturday June 19

- 7:00 AM – Registration (Lobby)
- 8:00 AM – Workshop: Methods for Investigating Microbial-Mineral Interactions (Meet bus at front of hotel for ride to EMSL Auditorium) – 4:30 PM
- 5:30 PM – Workshop Reception (Benton-Franklin)
- 7:00 PM – Executive Committee (Ice Harbor/ McNary) – 10:00 PM

Sunday June 20

- 7:00 AM – Registration (Lobby)
- 8:00 AM – Clay Council (Ice Harbor/ McNary)
- 8:00 AM – Field Trip #1 Missoula Floods (Meet bus at front of hotel)
- 5:00 PM – Registration (Lobby)
- 7:00 PM – Opening Reception (Columbia Room) – 10:00 PM

Monday June 21

- 7:00 AM – Registration (Lobby)
- 8:00 AM – Plenary Session (Columbia/Benton-Franklin Room)
  - 8:10 AM – Welcome from City of Richland (Carol Moser, Mayor Pro Tem)
  - 8:20 AM – Welcome from PNNL (Dr. Len K. Peters, Director)
- 8:30 AM – Presidential Address Dr. Kathryn L. Nagy
- 8:50 AM – The Marilyn and Sturgis W. Bailey Distinguished Member Award Lecture Dr. Benny K. G. Theng "Of Clays, Colloids, and Composites"
- 9:40 AM
- 10:00 AM
  - Computational Clay Chemistry I (Richland/ Kennewick/Pasco)
  - Environmental and Soil Chemistry of Clays (Columbia)
  - Industrial Applications of Clays (Benton-Franklin)
- 12:00 PM – Sustaining Member's Lunch (Invitation only)
- 1:20 PM
  - Computational Clay Chemistry II
  - Microbial Impacts on Clay Transformation and Reactivity I (Columbia)
  - Illite Diagenesis a Quarter Century After Hower et al. I (Benton-Franklin)
- 2:00 PM
  - Adsorbates at Mineral Surfaces I (Richland/ Kennewick/Pasco)
- 3:00 PM
- 3:20 PM
  - Adsorbates at Mineral Surfaces II
  - Microbial Impacts on Clay Transformation and Reactivity II
  - Illite Diagenesis a Quarter Century After Hower et al. II
- 5:00 PM
  - Posters and Reception I (downstairs, Vernita Room)
  - Student Reception (Invitation Only)
- 7:00 PM – Editor's Dinner (Invitation only) – 9:00 PM

Tuesday June 22

- 7:00 AM – Registration (Lobby)
- 8:00 AM – Plenary Session (Columbia/Benton-Franklin Room)
- 8:10 AM – The Marion L. and Chrystie M. Jackson Mid-Career Clay Scientist Award Lecture Dr. Fred G. Longstaffe "Basal Reflections of a Stable Isotopist: Revealing the Secrets of Fluid, Climate, and Crystal Chemistry from the Clay Archive"
- 9:00 AM – Business Meeting (Dr. Kathyrn L. Nagy, presiding)
- 10:00 AM
  - Field Trip #2 Hanford Geology (Meet bus at front of hotel)
- 10:30 AM – EMSL Tour #1 (Meet bus at front of hotel) – 11:50 AM
- 1:30 PM – EMSL Tour #2 (Meet bus at front of Hotel) – 2:50 PM
- 5:00 PM – Posters and Reception II (downstairs, Vernita Room)
- 7:00 PM – Banquet (Columbia/Benton-Franklin)

  Featured Speaker: Dr. James C. Chatters
  Author of *Ancient Encounters: Kennewick Man and the First Americans*
- 9:00 PM
  - Piano Music Steven Beus
  - Dancing The Howlers Blues Band (Lounge/Patio) – 10:00 PM

Wednesday June 23

- 7:00 AM – Registration (Lobby)
- 8:00 AM – Plenary Session (Columbia/Benton-Franklin Room)
- 8:10 AM – The Pioneer in Clay Science Lecture Dr. Hideomi Kodama "Clay-Organic Matter Interactions in the Soil Environment - 30 Years of Personal Contributions and Perspectives for Future Research"
- 9:00 AM
  - Magnetic Resonance Spectroscopy of Clays I (Richland/ Kennewick/Pasco)
  - Zeolites and Feldspathoids I (Columbia)
  - Oxide Nanomaterials: Synthesis, Properties, and Applications I (Benton-Franklin)
- 10:00 AM
- 10:20 AM
  - Magnetic Resonance Spectroscopy of Clays II
  - Zeolites and Feldspathoids II
  - Oxide Nanomaterials: Synthesis, Properties, and Applications II
- 12:00 PM
  - EMSL Tour #3 (Meet bus at front of hotel)
  - Former President's Lunch (Invitation only)
- 1:20 PM
  - Advanced Analytical Techniques for Clay Characterization I (Richland/ Kennewick/Pasco)
  - Microbial Impacts on Clay Transformation and Reactivity III (Columbia)
  - Oxide Nanomaterials: Synthesis, Properties, and Applications III (Benton-Franklin)
- 3:00 PM
- 3:20 PM
  - Advanced Analytical Techniques for Clay Characterization II
  - Microbial Impacts on Clay Transformation and Reactivity IV
  - Oxide Nanomaterials: Synthesis, Properties, and Applications IV
- 4:20 PM – Volcanically Derived Clays – 5:00 PM
- 5:30 PM – Outdoor Barbeque (Patio)

  Music by "Okay 2 Botay" Steel Drum Band – 8:00 PM

Thursday June 24

- 7:00 AM
- 7:30 AM
- 8:00 AM – Field Trip #3 Missoula Floods (Meet bus at front of hotel) – 4:30 PM

Monday June 21

7:00 AM	**Registration (Lobby)**	**Registration (Lobby)**				7:00 AM
8:00 AM	**Plenary Session (Columbia/Benton-Franklin Room)**	**Welcome and Opening Remarks (Jim Amonette and Paul Gassman, co-organizers)**				8:00 AM
8:10 AM		**Welcome from the City of Richland (Carol Moser, Mayor pro tem)**				8:10 AM
8:20 AM		**Welcome from the Pacific Northwest National Laboratory (Dr. Len K. Peters, Director)**				8:20 AM
8:30 AM		**Presidential Address** **Dr. Kathryn L. Nagy**				8:30 AM
8:50 AM		**The Marilyn and Sturgis W. Bailey Distinguished Member Award Lecture** **Dr. Benny K. G. Theng:** Of Clays, Colloids, and Composites				8:50 AM
9:40 AM						9:40 AM
10:00 AM	**Computational Clay Chemistry I** →	**Sainz-Diaz**: Theoretical approach on vibrational and crystallographic properties of dioctahedral 2:1 phyllosilicates	**Environmental and Soil Chemistry of Clays** →	**Kaplan:** Plutonium transport for 11 years through a vadose zone sediment: influence of oxidation state	**Industrial Applications of Clays** →	**Kottegoda:** Synthesis and characterisation of layered double hydroxide (LDH)/polymer nanocomposites 10:00 AM
10:20 AM				**Cooper:** Uranium and tritium transport in vadose zone sediments		**Wongkerd:** Phase change of catalysts derived from deoxycholate pillared-hydrotalcite-type clay and impacts on NOx reduction from 10:20 AM
10:40 AM		**Müller:** Interlayer cation arrangement and hydration shells in sodium and calcium montmorillonite obtained by Monte Carlo simulations		**Mello:** Arsenic mobilization and mineralogy of anomalous soils from Brazil		**Kim, Ungsoo:** The effects of alkali metal cations on kaolin suspension rheology 10:40 AM
11:00 AM		**Tambach:** Molecular simulations of hysteresis in clay swelling		**Chappell:** Interactions with the nonionic surfactant Brij 35 influence sorption of atrazine on K- and Ca-smectites		**Kasbohm:** Short term experiments with different bentonites in saline solutions 11:00 AM
11:20 AM		**Rosso:** Charge transport in micas: an ab initio model of Fe(II)/Fe(III) electron hopping and the effects of substitutional defects		**Pils:** Sorption of tetracycline and chlorotetracycline on K- and Ca-saturated soil clays and humic substances		**Post:** A comparison of fibrous clays and fibrous amphiboles as industrial minerals 11:20 AM
11:40 AM		**Bylaska:** Self-consistent self-interaction corrected DFT studies of annite		**Fisher:** Tectonic implications of soil clay mineralogy and geochemistry in a tropical terrace sequence, Costa Rica		11:40 AM
12:00 PM	Sustaining Member's Lunch (Invitation only)					12:00 PM
1:20 PM	**Computational Clay Chemistry II** →	**Tambach:** Understanding layer charge determination by the alkylammonium method using molecular simulations	**Microbial Impacts on Clay Transformation and Reactivity I** →	**Geesey:** Behavior of iron-reducing bacteria at Fe(III)-oxide surfaces	**Illite Diagenesis a Quarter Century After Hower et al. I** →	**Srodon:** John Hower was right: illite-smectite as a paleogeothermometer 1:20 PM
1:40 PM		**Gibbs:** A comparison of theoretical and experimental properties of the electron density distributions for earth minerals				1:40 PM
2:00 PM	**Adsorbates at Mineral Surfaces I** →	**Cervini-Silva:** Effect of interlayer cation on dehydrochlorination of polychlorinated ethanes by redox-manipulated smectite clay minerals		**Khare:** Interaction of mitochondrial cytochrome c with hematite (001) surfaces		**Bauer:** The fate of smectite before becoming illite in bentonite experiments 2:00 PM
2:20 PM		**Peak:** Probing oxyanion adsorption mechanisms at the mineral water interface with molecular-scale techniques		**Jaisi:** Control of Fe(III) site occupancies on microbial reduction in the nontronite structure		**Solum:** The role of illite and I-S neomineralization in fault zones 2:20 PM
2:40 PM		**Strawn:** Molecular-level investigation of metal interactions with clay minerals		**Lee:** Effects of bacterial reduction of structural iron on the infrared spectra of iron-bearing smectites		**Collins:** An interpretation of octahedral ordering and site occupancies of Fe^{2+} in muscovite and illite 2:40 PM
3:00 PM						3:00 PM
3:20 PM	**Adsorbates at Mineral Surfaces II** →	**Roto:** Mass and charge transport in layered double hydroxide modified electrodes	**Microbial Impacts on Clay Transformation and Reactivity II** →	**DiChristina:** New insights into the molecular mechanisms of bacterial metal respiration	**Illite Diagenesis a Quarter Century After Hower et al. II** →	**Eberl:** Illitization as a crystal growth process 3:20 PM
4:00 PM		**Fujita:** Stereoselective photo-oxidation of sulfide by use of clay-chiral metal complex adducts as a photosensitive adsorbent		**Ribeiro:** Degradation of oxamyl by redox-modified smectites: dissimilarities between chemical and bacterial reduction		**Grathoff:** Illite polytypes and diagenesis since Hower et al. 1976 4:00 PM
4:20 PM		**Quintana:** Synthesis and characterization of clays and organoclays for the selective adsorption of N-nitrosoamines		**Lee:** Effects of in-situ microbial stimulation on Fe phases in a sub-surface saprolitic soil: a variable-temperature Mossbauer spectroscopy study		**Williams:** Stable isotope evidence for metastable illite growth in a matrix of non-equilibrium smectite 4:20 PM
4:40 PM		**Mustafa:** Factors affecting the desorption of cadmium from goethite		**Kukkadapu:** Bioreduction of Fe in shale-limestone saprolite containing Fe(III) oxides and Fe(II)/Fe(III) phyllosilicates		**Bruvoll:** Smectite illitization in organic rich shale offshore Mid-Norway 4:40 PM
5:00 PM	**Posters and Reception (Vernita Room, Downstairs)**	**Kulshrestha:** Investigating the molecular interactions of oxytetracycline in clay and organic matter: insights on factors affecting its mobility in soils	**Posters and Reception (Vernita Room, Downstairs)**	**Melendez-Pizarro:** Simple approach to remove lead from water with clay	Student Reception (invitation only)	5:00 PM
		Komatsu: QCM studies on adsorption by an ion exchange adduct		**Moon:** Evaluation of the potential for bioremediation of deeply weathered soil/saprolite in Area 2, NABIR FRC Site, Tennessee		
		Allen: Sequence stratigraphy of the Eocene Huber-Dry Branch interval in the Georgia coastal plain		**Nguyen:** Mineralogical-geochemical characterization of sediments below mangrove forests at the Red River mouth (an example from Nam Dinh province, Vietnam)		
		Dixon: Fifty years of clay mineralogy development: review and outlook		**Reynolds:** The ionic-covalent parameter in ion-exchange equilibrium	**Posters and Reception (Vernita Room, downstairs)**	**Hoang:** UV-protection creams: first results for substitution of non-natural additives by clay minerals
		Saglam: An investigation of the iron oxides and clay minerals of the Ankara clay		**Rytwo:** A worksheet model for adsorption/desorption of ions on clay surfaces		**Kyle:** Sinter mineralogy of terrestrial hot spring vent, Uzon caldera, Kamchatka, Russia
		Sato: First-principle study on polytype structures of 1:1 dioctahedral phyllosilicates		**Zhang, Gengxin:** Bioavailability of organic matter intercalated into nontronite clay		**Müller, Barbara:** Interaction between vermiculite and the bacterium *Pseudomonas fluorescens* strain CHA0 and its genetic derivatives
7:00 PM	Editors' Dinner (Invitation only)					7:00 PM
9:00 PM						9:00 PM

Tuesday June 22

7:00 AM	**Registration (Lobby)**	**Registration (Lobby)**		
8:00 AM	**Plenary Session (Columbia/Benton-Franklin Room)**	**Opening Remarks and Announcements (Jim Amonette and Paul Gassman)**		
8:10 AM		**The Marion L. and Chrystie M. Jackson Mid-Career Clay Scientist Award Lecture** **Dr. Fred J. Longstaffe:** Basal Reflections of a Stable Isotopist: Revealing the Secrets of Fluids, Climate & Crystal Chemistry from the Clay Archive		
9:00 AM		**Business Meeting (Dr. Kathryn L. Nagy, presiding)**		
10:00 AM				**Field Trip #2** **Hanford Geology** **(meet bus in front of hotel)**
10:30 AM		**EMSL Tour #1 (meet bus in front of hotel)**		
11:50 AM				
1:30 PM		**EMSL Tour #2 (meet bus in front of hotel)**		
2:50 PM				
5:00 PM	**Posters and Reception (Vernita Room, downstairs)**	**Kogure:** Polytype and morphology analyses of kaolin minerals by electron back-scattering diffraction (EBSD)	**Hollingsworth:** Clay mineralogy of core samples from the Uzon caldera, Kamchatka, far east Russia	**Chen:** Prograde changes of phyllosilicate microstructures in low-grade pelitic rocks as characterized by X-ray peak profile analysis and texture goniometry
		Plötze: In-situ XRD measurements of interlayer swelling of clays	**Moore:** A review of the frictional strength of montmorillonite	**Jiang:** Interplay of processes of mineral transformation, strain recovery, and recrystallization in low-grade pelitic rocks
		Yoon: Soft X-ray spectromicroscopy and ATR-FTIR study of clay mineral-natural organic matter suspensions	**Toprak:** High-resolution chemistratigraphic correlation of the lower Silurian (Llandovery) Osmundberg K-bentonite in Baltoscancia and northern Europe	**Zhang, Yan:** Preliminary studies on the separation of diagenetic illite from detrital minerals in sedimentary rocks for Ar isotope dating
6:30 PM		**Schleicher:** Mesozoic hydrothermal illites in the altered Soultz-Sous-Forets granite, France	**Deng:** Cancrinite and sodalite formation in the presence of Cs+, K+, Mg2+, Ca2+, or Sr2+ in Hanford tank waste simulants	**Banquet Reception (Columbia/Benton-Franklin Room)**
		Ohnuki: Interactions of uranium with mixtures of microorganisms and kaolinite clay	**Deng:** Stability of incorporated Cs in feldspathoids, zeolites and allophane formed in Hanford tank waste simulants	
7:00 PM	**Annual Banquet (Columbia/Benton-Franklin Room)**	**Featured Speaker: Dr. James C. Chatters, author of *Ancient Encounters: Kennewick Man and the First Americans***		
9:00 PM		**Piano Music** **Steven Beus** **(Columbia/Benton-Franklin Room)**		**Dancing** **The Howlers Blues Band** **(Lounge/Patio)**
10:00 PM				
10:30 PM				

Wednesday June 23

7:00 AM	**Registration (Lobby)**	**Registration (Lobby)**					7:00 AM
8:00 AM	**Plenary Session (Columbia/Benton-Franklin Room)**	**Opening Remarks and Announcements (Jim Amonette and Paul Gassman)**					8:00 AM
8:10 AM		**The Pioneer in Clay Science Lecture** **Dr. Hideomi Kodama:** Clay-Organic Matter Interactions in the Soil Environment - 30 Years of Personal Contributions and Perspectives for Future Research					8:10 AM
9:00 AM	**Magnetic Resonance Spectroscopy of Clays I** →	**Weil:** Some applications of EPR spectroscopy to minerals for the non-expert	**Zeolites and Feldspathoids I** →	**Navrotsky:** Conventional and unconventional zeolites: thermodynamics of formation, hydration, and ion exchange	**Oxide Nanomaterials: Synthesis, Properties, and Applications I** →	**Fryxell:** Environmental applications of synthetic nanoporous ceramic oxides	9:00 AM
9:20 AM						**Williford:** The origins of pore shapes in mesoporous silica thin films	9:20 AM
9:40 AM		**Plötze:** EPR studies of copper exchanged smectite and the behaviour upon heating		**Choi:** Molecular characterization of strontium uptake and transformation with kaolinite reacted at high pH		**Addleman:** Mesoporous materials for analytical sensing and separation of environmental contaminants	9:40 AM
10:00 AM							10:00 AM
10:20 AM	**Magnetic Resonance Spectroscopy of Clays II** →	**Grandjean:** NMR characterization of the structure and dynamics in modified clays and polymer/clay nanocomposites	**Zeolites and Feldspathoids II** →	**Weller:** Optical, magnetic, and electronic properties of natural and synthetic feldspathoids	**Oxide Nanomaterials: Synthesis, Properties, and Applications II** →	**Lei:** Immobilized enzymes in nanoporous materials exhibit enhanced stability and activity	10:20 AM
10:40 AM						**Kim, Jungbae:** Single-enzyme nanoparticles	10:40 AM
11:00 AM		**Mueller:** Solid-state NMR studies of the transformation of clay minerals in the environment		**Thompson:** VOC sorption by hydrophobic zeolites, and the effects of confined water		**Bruckner-Lea:** Applications of microbeads and nanoparticles for bioseparations and biosensing	11:00 AM
11:20 AM						**Ampian:** Characterizing particles for toxicological studies	11:20 AM
11:40 AM		**Kuang:** Nanostructuration of pyridine guest molecules entrapped in the tunnels of sepiolite				**Zhang, Miqin:** Iron-oxide superparamagnetic nanoparticles for tumor diagnosis and therapeutics	11:40 AM
12:00 PM	**EMSL Tour #3 (Meet bus in front of hotel)**				Former President's Lunch (Invitation only)		12:00 PM
1:20 PM	**Advanced Analytical Techniques for Clay Characterization I** →	**Kogure:** Direct determination of defect structures in kaolin minerals by high-resolution transmission electron microscopy (HRTEM)	**Microbial Impacts on Clay Transformation and Reactivity III** →	**Gorby:** Controlled cultivation: approaches for debugging biogeochemical research	**Oxide Nanomaterials: Synthesis, Properties, and Applications III** →	**Zhang, Wei-xian:** Iron nanoparticles for site remediation: synthesis and characterization	1:20 PM
1:40 PM		**Gaillot:** Crystal structure of birnessite: from well-crystallized to highly defective structures					1:40 PM
2:00 PM		**Warr:** In-situ monitoring of solution-clay reactions by wet-cell X-ray diffraction (WC-XRD) techniques		**Kim, Jinwook:** Role of microbes in promoting the smectite to illite reaction		**Qiang:** Synthesis and applications of oxide nanoclusters and nanocluster-assembled materials	2:00 PM
2:20 PM		**Ufer:** Quantitative Rietveld phase analysis of smectites using a single-layer approach		**O'Reilly:** Dissolution of microbial reduced nontronite in a flow-through system		**Linehan:** Synthesis routes to nanometer-sized iron oxides	2:20 PM
2:40 PM		**Kleeberg:** Outcomes of the second Reynolds Cup in quantitive mineral analysis of clay-bearing samples		**Seabaugh:** Reduction of structural Fe(III) in nontronite by a thermophilic bacterium		**Anschutz:** Reactivity of iron oxyhydroxide nanoparticles	2:40 PM
3:00 PM							3:00 PM
3:20 PM	**Advanced Analytical Techniques for Clay Characterization II**	**Logsdon:** Electrical conductivity spectra of smectites as influenced by saturating cation and humidity	**Microbial Impacts on Clay Transformation and Reactivity IV** →	**Ferris:** Nanoparticulate silica colloid size distributions associated with bacterial cells	**Oxide Nanomaterials: Synthesis, Properties, and Applications IV** →	**Henderson:** Water on metal oxides: an experimental perspective	3:20 PM
3:40 PM		**Wolters:** Smectites for tailored applications					3:40 PM
4:00 PM		**Ribeiro:** Iron-bearing compounds formed during aging of residues from industrial kaolin leaching: a variable-temperature Mossbauer study		**Benzerara:** Microbial weathering of orthopyroxene and clay formation in an arid environment: a STXM and HRTEM study		**Dohnalek:** Chemical activity of nanoporous MgO	4:00 PM
4:20 PM	**Volcanically Derived Clays** →	**Schroeder:** Sulfur isotope and potassium-argon analysis of minerals from the Turplu halloysite mine, Balisiker region, northwest Turkey		**Cervini-Silva:** Biogenic dissolution of soil phosphate minerals		**Gamelin:** Synthesis and spectroscopy of doped oxide semiconductor nanocrystals	4:20 PM
4:40 PM		**Huff:** Biotite as a discriminator in the Late Ordovician Deicke, Millbrig, and Kinnekulle K-bentonite		**Hepinstall:** Effects of siderophores on Pb and Cd adsorption to kaolinite		**Norberg:** Synthesis of colloidal Mn^{2+}:ZnO quantum dots and high-T_c ferromagnetic nanocrystalline thin films	4:40 PM
5:00 PM							5:00 PM
5:30 PM	**Outdoor Barbeque (Patio)**	**Music by "Okay 2 Botay" Steel Drum Band**					5:30 PM
8:00 PM							8:00 PM