

**SAMUEL P. KOUNAVES**  
Curriculum Vitae

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**EDUCATION**

Post-doctoral Fellow, Harvard University, 1987-88, Advisor: James Young  
Post-doctoral Fellow, SUNY at Buffalo, 1985-86, Advisor: Janet G. Osteryoung  
D.Sc. (Ph.D.), Université de Genève, 1985 (Chemistry) Advisor: Jacques Buffle  
M.S., California State University at San Diego, 1978 (Chemistry) Advisor: Alberto Zirino  
B.S., California State University at San Diego, 1975 (Chemistry)

**PROFESSIONAL APPOINTMENTS**

**Current**

Professor of Chemistry, Tufts University, Department of Chemistry  
Adjunct Professor, Tufts University, Department of Earth & Ocean Sciences  
Visiting Professor, Imperial College London, Department of Earth Science & Engineering, UK  
Scientific Advisor, Centre of Astronomy & Astrophysics, Technical University Berlin, Germany  
Affiliate Scientist, NASA Jet Propulsion Laboratory

**Previous**

Associate Professor, Department of Chemistry (1994-2012); Faculty Researcher, Center for Field Analytical Studies & Technology (1994-2002); Assistant Professor, Department of Chemistry (1988-1994); Lecturer, SUNY at Buffalo, Department of Chemistry (1985-86); Scientific Associate, European Organization for Nuclear Research (1979-81); Research Chemist, U.S. Naval Ocean Systems Center, San Diego (1975-79)

**PROFESSIONAL AFFILIATIONS**

American Chemical Society, 1974-	American Geophysical Union, 1998-
American Association for the Adv. of Science, 1976-	Geochemical Society, 2009-
The Geological Society, 2016-	Royal Society of Chemistry, 2014-
Society for Electroanalytical Chemistry, 1987-	Sigma Xi, 1988-

**HONORS AND AWARDS**

ACS-Kavli Award for Innovations in Chemistry (2019); NASA Exceptional Achievement Award for ELSHA Team (2019); Fellow, The Geological Society (2016); Fellow, Royal Society of Chemistry (2015); Fellow, American Association for the Advancement of Science (2013); NASA Group Achievement Award for Outstanding Performance in the Planning and Execution of the Science for the Phoenix Mars Mission (2009); NASA Group Achievement Award for Development and Operation of the Phoenix Spacecraft Leading to the First Landing in the Martian Arctic (2009); John L. "Jack" Swigert, Jr., Award for Space Exploration as member of the Phoenix Mars Mission Team (2009); Massachusetts Columbus Quincentennial Exploration & Discovery Award for Innovative Achievement (2008); K. D. Wood Colloquium Lecture, Aerospace Sciences, University of Colorado (2006); Arno Heyn Memorial Award, NE Section of the American Chemical Society (2006); Tufts Junior Faculty Fellowship (1990); National Research Council, Research Fellowship (1986)

## **PROFESSIONAL ACTIVITIES, PANELS, & COMMITTEES**

Editorial Board, ScienceOpen, 2013-  
Editorial Advisory Board, The Analytical Scientist, 2012-  
Tufts Institutional Representative, University Space Research Association (USRA), 2006-  
NASA SSW Review Panel Member, 2020  
Organizer, AAAS Planetary Science Symposium, Boston MA, February 14-18, 2013  
Convener, NASA/LPI, The New Martian Chemistry Workshop, Boston MA, July 27-28, 2009  
NASA PIDDP Review Panel Member, 2005-06  
NASA Panel on Capability Roadmaps, National Academies/NRC, 2005-06  
Board of Directors, Society for Electroanalytical Chemistry, 2001-05  
NASA Mars Human Precursor Science Steering Group, 2004-05  
School Board Member, Winchester School District, Elected Member 2003-2008  
ACS - Northeastern Section, Board of Publications, 2002-05  
ACS - Northeastern Section, Web Editor, 2003-2005  
Chair, The Electrochemical Society, NE Section, 2002-03  
Web Editor, SEAC Communications, The Society for Electroanalytical Chemistry, 1998-  
Panel on Impact of Advances in Computing, National Research Council, 1998  
Graduate Program Director, Tufts University, 1996-99  
Consultant, Orion Research Corporation, 1997-2001  
Chair, Advisory Board, Tufts Experimental College, 1991-92  
Advisory Board, Tufts Experimental College, 1989-91  
Consultant, Osram-Sylvania Corporation, 1996-97  
Consultant, Medford Public Schools, City of Medford, MA, 1990  
Consultant, Willkie Farr & Gallagher / American Express Corporation, 1989-90  
U.S. National Committee Representative, 34th IUPAC General Assembly, 1987

## **PUBLICATIONS - PEER REVIEWED**

111. "Degradation of Amino Acids on Mars by UV Irradiation in the Presence of Chloride and Oxychlorine Salts", D. Liu and S. P. Kounaves, *Astrobiology*, **2021**, *21*, 793-801  
doi:10.1089/ast.2020.2328.
110. "The Enceladus Orbilander Mission Concept: Balancing Return and Resources in the Search for Life", S. M. MacKenzie, M. Neveu, A. Davila, J. Lunine, K. Craft, M. Cable, C. Phillips, J. D. Hofgartner, J. L. Eigenbrode, J. H. Waite, C. R. Glein, R. Gold, P. J. Greenauer, K. Kirby, C. Bradburne, S. P. Kounaves, M. J. Malaska, F. Postberg, G. W. Patterson, C. Porco1, J. I. Núñez, C. German, J. A. Huber, C. P. McKay, J-P. de Vera, J. R. Brucato, L. J. Spilker, *Planet. Sci. J.* **2021**, *2*:7, doi:10.3847/PSJ/abe4da
109. "Microbial Hotspots in Lithic Microhabitats Inferred from DNA Fractionation and Metagenomics in the Atacama Desert ", D. Schulze-Makuch, D. Lipus, F. L. Arens, M. Baqué, T. L. V. Bornemann, J.-P. deVere, M. Flury, J. Frösler, J. Heinz, Y. Hwang, S. P. Kounaves, K. Mangelsdorf, R. U. Meckenstock, M. Pannekens, A. J. Probst, J. S. Sáenz, J. Schirmack, M. Schloter, P. Schmitt-Kopplin, B. Schneider, J. Uhl, G. Vestergaard, B. Valenzuela, P. Zamorano, and D. Wagner, *Microorganisms*, **2021**, *9*(5), 1038, doi:10.3390/microorganisms9051038.
108. "Stable Nitrogen and Oxygen Isotope Fractionation During Precipitation of Nitrate Salt from Saturated Solutions", H. Welsh, G-A. Gueorguieva, S.P. Kounaves, and R. Amundson, *Rapid Comm. Mass Spectrom.* **2020**, *34*:e8905, doi:10.1002/rcm.8905.

107. "Methanogenic Archaea Can Produce Methane in Deliquescence-Driven Mars Analog Environments", D. Maus, J. Heinz, J. Schirmack, A. Airo, S.P. Kounaves, D. Wagner, and D. Schulze-Makuch, *Nature Sci. Rep.* **2020**, 10(6), doi:10.1038/s41598-019-56267-4. [**Top 100 Nature Scientific Reports Physics Papers in 2020**]
106. "Solar-System-Wide Significance of Mars Polar Science: White Paper", Smith, I., Calvin, W. M., Smith, D. E., Hansen, C., Diniega, S., McEwen, A., ...Kounaves, S. P., et al., *Bull. Amer. Astro. Soc.*, **53**, **2020**, doi:10.3847/25c2cfcb.4db95c67.
105. "The Role of Titanium Dioxide (TiO<sub>2</sub>) in the Production of Perchlorate (ClO<sub>4</sub><sup>-</sup>) from Chlorite (ClO<sub>2</sub><sup>-</sup>) and Chlorate (ClO<sub>3</sub><sup>-</sup>) on Earth and Mars ", D. Liu and S. P. Kounaves, *ACS Space Earth Chem.* **2019**, 3, 1678-1684, doi:10.1021/acsearthspacechem.9b00134
104. "Indigenous Organic-Oxidized Fluid Interactions in the Tissint Mars Meteorite", E. A. Jaramillo, S. H. Royle, M. W. Claire, S. P. Kounaves, and M. A. Sephton, *Geophys. Res. Lett.* **2019**, *46*, 3090-3098, doi:10.1029/2018GL081335.
103. "Effects of Oxygen-Containing Salts on the Detection of Organic Biomarkers on Mars and in Terrestrial Analogue Soils", W. Montgomery, E. A. Oberlin, S. H. Royle, S. P. Kounaves, D. Schulze-Makuch, M. A. Sephton, *Astrobiology*, **2019**, *19*, 711-721, doi:10.1089/ast.2018.1888.
102. "Survivability of 1-Chloronaphthalene During Simulated Early Diagenesis - Implications for Chlorinated Hydrocarbon Detection on Mars", S. H. Royle, J. Tan, S. P. Kounaves, M. A. Sephton, *J. Geophys. Res.*, **2018**, *123*, 2790-2802, doi:10.1029/2018JE005711.
101. "Perchlorate Driven Combustion of Organic Matter During Py-GC-MS: Implications for Organic Matter Detection on Earth & Mars", S. H. Royle, E. A. Oberlin, J. S. Watson, W. Montgomery, S. P. Kounaves, M.A. Sephton, *J. Geophys. Res.* **2018**, *123*, 1901-1909, doi:10.1029/2018JE005615.
100. "Enhanced Microbial Survivability in Subzero Brines", J Heinz, J. Schirmack, A. Airo, D. Schulze-Makuch, S. P. Kounaves, *Astrobiology*, **2018**, *18*, doi:10.1089/ast.2017.1805.
99. "A Transitory Microbial Habitat in the Hyperarid Atacama Desert, D. Schulze-Makuch, D. Wagner, S. P. Kounaves, K. Mangelsdorf, K. G. Devine, J-P. de Verai, et al., *PNAS*, **2018**, *115*, 2670-2675, doi:10.1073/pnas.1714341115.
98. "Evaluation of the Tindouf Basin Region in Southern Morocco as an Analogue Site for Soil Geochemistry on Noachian Mars", E. A. Oberlin, M. W. Clair, and S. P. Kounaves, *Astrobiology*, **2018**, *18*, 1318-1328, doi:10.1089/ast.2016.1557.
97. "Effect of Hydration State of Martian Perchlorate Salts on their Decomposition Temperatures During Thermal Extraction", S. H. Royle, W. Montgomery, S. P. Kounaves, and M. A. Sephton, *J. Geophys. Res.*, **2017**, *122*, 2793-2802, doi:10.1002/2017JE005381.
96. "Solid Contact Ion Selective Electrodes for In Situ Measurements at High Pressure" A. W. Weber, G. D. O'Neil, S. P. Kounaves, *Anal. Chem.*, **2017**, *89*, 4803-07, doi:10.1021/acs.analchem.7b00366.
95. "Measurements of Oxychlorine species on Mars", B. Sutter, R. C. Quinn, P. D. Archer, D. P. Glavin, T. D. Glotch, S. P. Kounaves, M. M. Osterloo, E. B. Rampe and D. W. Ming, *Int. J. Astrobiol.*, **2017**, *16*, 203-217, doi:10.1017/S1473550416000057.
94. "Deliquescence-Induced Wetting and RSL-like Darkening of a Mars Analogue Soil Containing Various Perchlorate and Chloride Salts", J. Heinz, D. Schulze-Makuch, and S. P. Kounaves, *Geophys. Res. Lett.*, **2016**, *43*, 4880-4884, doi:10.1002/2016GL068919.

93. "Evidence for the Distribution of Perchlorates on Mars", B. C. Clark and S. P. Kounaves, *Int. J. Astrobiol.*, **2016**, *15*, 311-318, doi:10.1017/S1473550415000385
92. "The Origins of Perchlorate in the Martian Soil", B. L. Carrier and S. P. Kounaves, *Geophys. Res. Lett.*, **2015**, *42*, 3739-3745, doi:10.1002/2015GL064290.
91. "The Use of Graphene Oxide as a Fixed Charge Carrier in Ion-Selective Electrodes", G. D. O'Neil, M. Fouskaki, S. P. Kounaves, and N. A. Chaniotakis, *Electrochem. Commun.* **2015** *55*, 51-54, doi: 10.1016/j.elecom.2015.03.014.
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89. "Evidence of martian perchlorate, chlorate, and nitrate in Mars meteorite EETA79001: implications for oxidants and organics", S. P. Kounaves, B. L. Carrier, G. D. O'Neil, S. T. Stroble, M. W. Claire, *Icarus*, **2014**, *229*, 206-213, doi:10.1016/j.icarus.2013.11.012
88. "Electrochemistry of Aqueous Colloidal Graphene Oxide on Pt Electrodes", G. D. O'Neil, A.W. Weber, R. Buiculescu, N. A. Chaniotakis, S. P. Kounaves, *Langmuir*, **2014**, *30*, 9599-9606, doi:10.1021/la502053m
87. "Comparison of the Phoenix Mars Lander WCL Soil Analyses with Antarctic Dry Valley Soils, Mars Meteorite EETA79001 Sawdust, and a Mars Simulant", S. T. Stroble, K. M. McElhoney, and S. P. Kounaves, *Icarus*, **2013**, *225*, 933-939, doi:10.1016/j.icarus.2012.08.040
86. "Stability and Lifetime of Potassium Solid-Contact Ion Selective Electrodes for Continuous and Autonomous Measurements", K. McElhoney, G. D. O'Neil, N. A. Chaniotakis, S. P. Kounaves, *Electroanalysis*, **2012**, *24*, 2071-2078, doi:10.1002/elan.201200264
85. "An Electrochemically-Based Total Organic Carbon Analyzer for Planetary and Terrestrial On-Site Applications", S. T. Stroble and S. P. Kounaves, *Anal. Chem.*, **2012**, *84*, 6271-6276, doi:10.1021/ac301704m
84. "Effects of Extreme Cold and Aridity on Soils and Habitability: McMurdo Dry Valleys as an Analog for the Mars Phoenix Landing Site", L. K. Tamppari, R. M. Anderson, P. D. Archer Jr., S. Douglas, S. P. Kounaves, C. P. McKay, D. W. Ming, Q. Moore, J. E. Quinn, P. H. Smith, S. Stroble, A. P. Zent, *Antarctic Science*, **2012**, *24*, 211-228, doi:10.1017/S0954102011000800
83. "Carbon Nanofiber-Based Nanocomposite Membrane as a Highly Stable Solid-State Junction for Reference Electrodes", G. D. O'Neil, R. Buiculescu, S. P. Kounaves, and N. Chaniotakis *Anal. Chem.*, **2011**, *83*, 5749-5753, doi:10.1021/ac201072u.
82. "The Oxidation-Reduction Potential of Aqueous Soil Solutions at the Mars Phoenix Landing Site", R. C. Quinn, J. D. Chittenden, S. P. Kounaves, M. H. Hecht, *Geophys. Res. Lett.*, **2011**, *38*, L14202, doi:10.1029/2011GL047671.
81. "Soluble Sulfate in the Martian Soil at the Phoenix Landing Site" S. P. Kounaves, M. H. Hecht, J. Kapit, R. C. Quinn, D.C. Catling, B. C. Clark, D. W. Ming, K. Gospodinova, P. Hredzak, K. McElhoney, J. Shusterman, *Geophys. Res. Lett.*, **2010**, *37*, L09201, doi:10.1029/2010GL042613.

80. "Discovery of Natural Perchlorate in the Antarctic Dry Valleys and Its Global Implications ", S. P. Kounaves, S. Stroble, R. M. Anderson, Q. Moore, D. C. Catling, S. Douglas, C. P. McKay, D. Ming, P. H. Smith, L. K. Tamppari, A. Zent, *Environ. Sci. & Tech.*, **2010**, *44*, 2360-2364.
79. "Habitability of the Phoenix Landing Site" C. R. Stoker, A. Zent, D. C. Catling, S. Douglas, J. Marshall, D. Archer, B. C. Clark, S. P. Kounaves, M. Lemmon, R. C. Quinn, N. Renno, P. H. Smith, and S. Young, *J. Geophys. Res.*, **2010**, *115*, E00E20, doi:10.1029/2009JE003421
78. "A Perchlorate Brine Lubricated Deformable Bed Facilitating Flow of the North Polar Cap of Mars: Possible Mechanism for Water Table Recharging" D. Fisher, M. H. Hecht, S. P. Kounaves, and D. C. Catling, *J. Geophys. Res.*, **2010**, *115*, E00E12, doi:10.1029/2009JE003405
77. "Atmospheric Origins of Perchlorate on Mars and in the Atacama" D. C. Catling, M. W. Claire, K. J. Zahnle, R. Quinn, B. C. Clark, M. H. Hecht, and S. P. Kounaves, *J. Geophys. Res.*, **2010**, *115*, E00E11, doi:10.1029/2009JE003425
76. "The Wet Chemistry Experiments on the 2007 Phoenix Mars Scout Lander Mission: Data Analysis and Results", S. P. Kounaves, M. H. Hecht, J. Kapit, K. Gospodinova, L. DeFlores, R. Quinn, W. V. Boynton, B. C. Clark, D. C. Catling, P. Hredzak, D. W. Ming, Q. Moore, J. Shusterman, S. Stroble, S. J. West, and S.M.M. Young, *J. Geophys. Res.*, **2010**, *115*, E00E10, doi:10.1029/2009JE003424
75. "Detection of Perchlorate & the Soluble Chemistry of Martian Soil at the Phoenix Mars Lander Site", M. H. Hecht, S. P. Kounaves, R. Quinn, S. J. West, S.M.M. Young, D. W. Ming, D. C. Catling, B. C. Clark, W. V. Boynton, J. Hoffman, DeFlores, L., Gospodinova, K., Kapit, J., and P.H. Smith, *Science*, **2009**, *325*, 64-67
74. "Evidence for Calcium Carbonate at the Mars Phoenix Landing Site" W. V. Boynton, D. W. Ming, S. P. Kounaves, S. M. Young, R. E. Arvidson, M. H. Hecht, J. Hoffman, D. K. Hamara1, R. C. Quinn, P. Smith, B. Sutter, D. C. Catling, and R. V. Morris, *Science*, **2009**, *325*, 61-64
73. "H<sub>2</sub>O at the Phoenix Landing Site" P.H. Smith, L.K. Tamppari, R.E. Arvidson, D. Bass, D. Blaney, W.V. Boynton, A. Carswell, D.C. Catling, B.C. Clark, T. Duck, E. DeJong, D. Fisher, W. Goetz, H.P. Gunnlaugsson, M.H. Hecht, V. Hipkin, J. Hoffman, S.F. Hviid, H.U. Keller, S. P. Kounaves, C.F. Lange, M. Lemmon, M.B. Madsen, M. Malin, W.J. Markiewicz, J. Marshall, C.P. McKay, M.T. Mellon, D.W. Ming, R.V. Morris, N. Renno, W.T. Pike, U. Staufer, C. Stoker, P. Taylor, J. Whiteway, A.P. Zent, *Science*, **2009**, *325*, 58-61
72. "Possible Physical and Thermodynamical Evidence for Liquid Water at the Phoenix Landing Site ", N.O. Renno, B.J. Bos D. Catling, B.Clark, L. Drube, D.Fisher, W. Goetz, S. Hviid, H. Keller, J.F. Kok, S. P. Kounaves, K. Leer, M. Lemmon, M.B. Madsen, W. Markiewicz, J.Marshall, C. McKay, M. Mehta, M.Smith, M. P. Zorzano, P.H. Smith, C. Stoker, S. Young, *J. Geophys. Res.* **2009**, *114*, E00E03, doi:10.1029/2009JE003362.
71. "The MECA Wet Chemistry Laboratory on the 2007 Phoenix Mars Scout Lander, S. P. Kounaves, M. H. Hecht, S. J. West, J. Morookian, S. Young, R. Quinn, P. Grunthner, X. Wen, M. Weilert, C. A. Cable, A. Fisher, K. Gospodinova, J. Kapit, S. Stroble, P. Hsu, B. C. Clark, D. W. Ming, and P. H. Smith, *J. Geophys. Res.*, **2009**, *114*, E00A19, doi:10.1029/2008JE003084
70. "Introduction to Special Section on the Phoenix Mission: Landing Site Characterization Experiments, Mission Overviews, and Expected Science", Smith, P. H., L. Tamppari, R. E. Arvidson, D. Bass, D. Blaney, W. Boynton, A. Carswell, D. Catling, B. Clark, T. Duck, E. DeJong, D. Fisher, W. Goetz, P. Gunnlaugsson, M. Hecht, V. Hipkin, J. Hoffman, S. Hviid, H. Keller, S. P. Kounaves, C. F. Lange, M. Lemmon, M. Madsen, M. Malin, W. Markiewicz, J. Marshall, C. McKay, M. Mellon, D.

- Michelangeli, D. Ming, R. Morris, N. Renno, W. Pike, U. Staufer, C. Stoker, P. Taylor, J. Whiteway, S. Young, and A. Zent, *J. Geophys. Res.*, **2008** 113, E00A18, doi:10.1029/2008JE003083
69. "Effects of the Phoenix Lander descent thruster plume on the Martian surface", D. H. Plemmons, M. Mehta, B. C. Clark, S. P. Kounaves, L. L. Peach, N. O. Renno, L. Tamppari, and S. M. M. Young, *J. Geophys. Res.*, **2008**, 113, E00A11, doi:10.1029/2007JE003059
  68. "Unambiguous Detection of Microbial Metabolic Activity in Astrobiology Applications", A. Hoehn, K. L. Lynch, J. Clawson, J. B. Freeman, J. Kapit, S. M. M. Young, S. P. Kounaves, and I. I. Brown, *SAE Proceedings, ICES 2007*, International Conference On Environmental Systems, Proceedings, Chicago, IL, USA, **2007**
  67. "Analysis of Simulated Martian Regolith Using an Array of Ion Selective Electrodes", S. R. Lukow and S. P. Kounaves, *Electroanalysis*, **2005**, 17, 1441-49 (Special Issue Invited Paper).
  66. "The MSP'01 MECA Wet Chemistry Lab - A Sensor Array for Chemical Analysis of the Martian Soil", S. P. Kounaves, S. R. Lukow, B. Comeau, M. H. Hecht, S. M. Grannan, K. Manatt, S. J. West, X. Wen, M. Frant, T. Gillette, *J. Geophys. Res.*, **2003**, 108(E7), 5077-89
  65. "Electrochemical Approaches for Chemical and Biological Analysis on Mars" S. P. Kounaves, *ChemPhysChem*, **2003** 4, 162-168 (Special Issue Invited Paper)
  64. "Voltammetric Measurement of Arsenic in Natural Waters", R. Feeney and S. P. Kounaves, *Talanta*, **2002**, 58, 23-31 (Special Issue Invited Paper)
  63. "Rapid On-Site Analysis of Arsenic in Groundwater using a Microfabricated Gold Ultramicroelectrode Array", R. Feeney and S. P. Kounaves, *Anal. Chem.*, **2000**, 72, 2222-28
  62. "Microfabricated Ultramicroelectrode Arrays: Developments, Advances, and Applications in Environmental Analysis", R. Feeney and S. P. Kounaves, *Electroanalysis*, **2000**, 12, 677-84
  61. "The Source of the Anomalous Cathodic Peak During ASV with In Situ Mercury Film Formation in Chloride Solutions", M. A. Nolan and S. P. Kounaves, *Electroanalysis*, **2000**, 12, 96-99.
  60. "Adsorptive Stripping Analysis of Trace Nickel at Iridium-Based Ultramicroelectrode Arrays", J. Wang, J. Wang, W. K. Adeniyi, and S. P. Kounaves, *Electroanalysis*, **2000**, 12, 44-47.
  59. "Determination of Heterogeneous Electron Transfer Rate Constants at Microfabricated Iridium Electrodes", R. Feeney and S. P. Kounaves, *Electrochem. Comm.*, **1999**, 1, 453-458
  58. "Microfabricated Array of Iridium Microdisks as a Substrate for Direct Determination of Cu<sup>2+</sup> or Hg<sup>2+</sup> using Square Wave Anodic Stripping Voltammetry", M. A. Nolan and S. P. Kounaves, *Anal. Chem.*, **1999**, 71, 3567-3573
  57. "Effects of Chloride Ion Concentration on Mercury (I) Chloride Formation During ex Situ and in Situ Mercury Deposition with Selected Electrode Substrates and Electrolytes", M. A. Nolan and S. P. Kounaves, *Anal. Chem.*, **1999**, 71, 1176-82
  56. "Failure Analysis of Microfabricated Ir-Ultramicroelectrodes in Chloride Media", M. A. Nolan and S. P. Kounaves, *Sensors & Actuators B*, **1998**, 50, 117-124
  55. "Effects of Mercury Electrodeposition on the Surface of Microlithographically Fabricated Ir Ultramicroelectrodes", M. A. Nolan and S. P. Kounaves, *J. Electroanal. Chem.* **1998**, 453, 39-48

54. "Determination of Selenium(IV) at a Microfabricated Gold Ultramicroelectrode Array Using SWASV", S. Tan and S. P. Kounaves, *Electroanalysis*, **1998**, *10*, 364-368
53. "Analytical Characterization of Microlithographically Fabricated Ir-Based Ultramicroelectrode Arrays", R. Feeney, J. Herdan, M. Nolan, S. Tan, V. Tarasov, and S. P. Kounaves, *Electroanalysis*, **1998**, *10*, 89-93
52. "Field Evaluation of an Electrochemical Probe for In-Situ Determination of Heavy Metals in Ground Water", J. Herdan, R. Feeney, S. P. Kounaves, A. F. Flannery, C. W. Stormont, G. T. A. Kovacs, and R. B. Darling, *Env. Sci. & Technol.*, **1998**, *32*, 131-136
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49. "Microfabricated Electrochemical Analysis System for Heavy Metal Detection", R. J. Reay, A. F. Flannery, C. W. Stormont, S. P. Kounaves, and G.T. A. Kovacs, *Sensors and Actuators B*, **1996**, *B34*, 450-455
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47. "Determination of Aromatic Nitriles Using Enzyme-Based Selectivity Mechanisms: 2 - A Nitrilase Modified Glassy Carbon Microelectrode Sensor for Benzonitrile ", T. Z. Liu, Y. Wang, S. P. Kounaves and E.J. Brush, *Anal.Chem.*, **1995**, *67*, 1679-1683
46. "Microfabricated Heavy Metal Ion Sensor", G. T. A. Kovacs, C. W. Stormont, and S. P. Kounaves, *Sensors and Actuators B*, **1995**, *B23*, 41-47
45. "An Iridium-Based Ultramicroelectrode Array Fabricated by Microlithography ", S. P. Kounaves, W. Deng, P. R. Hallock, G. T. Kovacs, and C. Stormont, *Anal.Chem.*, **1994**, *66*, 418-423
44. "Determination of Aromatic Nitriles Using Enzyme-Based Selectivity Mechanisms: 1 - An Ammonia GSE Based Sensor for Benzonitrile", Z. Liu, Y. Wang, S. P. Kounaves and E.J. Brush, *Anal.Chem.*, **1993**, *65*, 3134-3136
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42. "Pseudopolarography at the Mercury Hemisphere Ultramicroelectrode: Theory and Experiment", S. P. Kounaves, *Anal.Chem.*, **1992**, *64*, 2998-3003
41. "Acquisition and Presentation of 3D Chromatovoltammographic Data", S. P. Kounaves and D. D Lu, *Computers & Chem.*, **1992**, *16*, 29-33
40. "The Effect of Electrode Surface Morphology on Square Wave Current Response", S. P. Kounaves and W. Deng, *J.Electroanal.Chem.*, **1991**, *306*, 111-124

39. "Fabrication and Characterization of an Iridium Based Mercury Ultramicroelectrode", S. P. Kounaves and W. Deng, *J.Electroanal.Chem.*, **1991**, 301, 77-85
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35. "An Iridium Based Mercury Film Electrode: Part-I Selection of Substrate and Preparation", S. P. Kounaves and J. Buffle, *J.Electroanal.Chem.*, **1987** 216, 53-69
34. "Square Wave Voltammetry at the Mercury Film Electrode: Theoretical Treatment", S. P. Kounaves, J. O'Dea, P. Chandrasekhar and J. Osteryoung, *Anal.Chem.*, **1986**, 58, 3199-3202
33. "Deposition and Stripping Properties of Mercury on Iridium Electrodes", S. P. Kounaves and J. Buffle, *J.Electrochem.Soc.*, **1986**, 133, 2495-2498
32. "The Importance of Concentration Effects at the Electrode Surface in Anodic Stripping Voltammetric Measurements of Metal Ion Complexation at Natural Water Concentrations", A. M. Almeida Mota, J. Buffle, S. P. Kounaves and M. L. Simoes Goncalves, *Anal.Chim.Acta*, **1985**, 172, 13-30
31. "Stripping Polarography and the Reduction of Copper(II) in Sea Water at the HMDE", A. Zirino and S. P. Kounaves, *Anal.Chim.Acta*, **1980**, 113, 79-90
30. "Studies of Cadmium-Ethylenediamine Complex Formation in Sea Water by Computer Assisted Stripping Polarography", S. P. Kounaves and A. Zirino, *Anal.Chim.Acta*, **1979**, 109, 327-339
29. "Rapid Determination of Titration Alkalinity of Sea Water by Equilibration with CO<sub>2</sub>", R. S. Keir, S. P. Kounaves and A. Zirino, *Anal.Chim.Acta*, **1977**, 91, 181-188
28. "Anodic Stripping Peak Currents : Electrolysis Potential Relationships for Reversible Systems", A. Zirino and S. P. Kounaves, *Anal.Chem.*, **1977**, 49, 56-59

#### **PUBLICATIONS - BOOKS/PROCEEDINGS/REVIEWS/LETTERS**

27. "Analyzing Life, the Universe, and Everything: Chemistry Among Stars" S. P. Kounaves, *The Analytical Scientist*, **2019**, 82, 26-29.
26. "Volatiles Measured by the Phoenix Lander at the Northern Plains of Mars", Chapter 9, S. P. Kounaves and E. A. Oberlin, in *Volatiles in the Martian Crust*, J. Filiberto and S. Schwenzer (Eds.), Elsevier, NY, **2019**, pp. 265-283.
25. "Nearly Forty Years after Viking: Are We Ready for a New Life-Detection Mission", D. Schulze-Makuch, J. D. Rummel, S. A. Benner, G. Levin, V. Parro and S. Kounaves, *Astrobiology*, **2015**, 15, 413-419. doi:10.1089/ast.2015.1336










24. "Extraterrestrial Electroanalysis", Chapter 6, K. M. McElhoney, G. D. O'Neil, and S. P. Kounaves, in *Environmental Analysis by Electrochemical Sensors and Biosensors, Volume 1*, L. M. Moretto and K. Kalcher (Eds.) Springer, NY, **2014**, pp. 131-151.
23. "The Epic Saga: Quantitative Analysis and the Essence of Doing Good Science" S. P. Kounaves, *The Analytical Scientist*, **2013**, *1*, 10-11.
22. "Perchlorate Will Accumulate", S. P. Kounaves, *The Environmental Forum*, **2010**, *27*, 41
21. "Life on Mars Hidden Like Earth's Extremophiles", S. P. Kounaves, *Nature*, **2007**, *449*, 281
20. "Detecting Heavy Metals in Solution Using Electronic-Tongue 3 REDOX Water Quality Sensors", Gregory M. Kuhlman, D. Keymeulen, M. G. Buehler, and S. P. Kounaves, *2004 IEEE Aerospace Conference Proceedings*, Vol. 1, **2004**, 363-377
19. "Toward Developing Long-Life Water Quality Sensors for the ISS using Ceramic-Based Planar REDOX and Conductivity Sensors", M. G. Buehler, G. M. Kuhlman, D. Keymeulen, N. Myung, and S. P. Kounaves, *2003 IEEE Aerospace Conference Proceedings*, Vol. 2, **2003**, 535-550
18. "Geochemical Analysis on Mars" S.P. Kounaves & M.H. Hecht, *Geochimica Cosmochimica Acta*, **2002**, *66*, A413
17. "An Advanced Electronic Tongue Concept", M.G. Buehler, G.M.Kuhlman, D.Keymeulen, and S.P.Kounaves, *2002 IEEE Aerospace Conference Proceedings*, Vol.1, **2002**, 407-416
16. "Determination of Geochemistry on Mars using an Array of Electrochemical Sensors", S. P. Kounaves, M. G. Buehler, M.H. Hecht and S. West in *Environmental Electrochemistry: Analysis of Trace Element Biogeochemistry*, T. Rozan & M. Taillefert (Eds), ACS Symposium Series, Vol. 811, **2002**, pp. 306-318 (Peer Reviewed Chapter)
15. "Microbial Life Detection With Minimal Assumptions", S.P. Kounaves, R.A. Noll, M.G. Buehler, M.H. Hecht, K. Lankford and S.J. West, in *Instruments, Methods, & Missions for Astrobiology IV*, P.B. Hoover, G.L. Levin, et al. (Eds), SPIE Proceedings, Vol. 4495, **2002**, pp. 137-144
14. "Ultramicroelectrode Arrays Modified With Ionomer-Entrapped Silica Films as Potential Voltammetric Sensors for Cu, Pb and Se", S. P. Kounaves, O.Y. Nadzhafova, V. Tarasov, and S. H. Tan, *Analytical Sciences (Sup)*, *17*, **2001**, 1031-33
13. "A Water Quality Monitor using an Array of Ion Selective Electrodes", M.G. Buehler, S. P. Kounaves, D.P. Martin, and S. West, *2001 IEEE Aerospace Conference Proceedings*, Vol.1, **2001**, 331-337
12. "Measuring the Chemical Potential of the Martian Regolith to Generate and Sustain Life", S. P. Kounaves, M. G. Buehler, and K. R. Kuhlman, in *Workshop on Mars 2001: Integrated Science in Preparation for Sample Return and Human Exploration* (Eds: J. Marshal, C. Weitz), LPI Contribution 991, Lunar and Planetary Institute, Houston, **1999**, pp 61.
11. "The Mars Environmental Compatibility Assessment (MECA) Wet Chemistry Experiment on the Mars '01 Lander", S. M. Grannan, M. Frant, M. H. Hecht, S.P. Kounaves, K. Manatt, T. P. Meloy, W. T. Pike, W. Schubert, S. West, X. Wen, in *Workshop on Mars 2001: Integrated Science in Preparation for Sample Return and Human Exploration* (Eds: J. Marshal, C. Weitz), LPI Contribution 991, Lunar and Planetary Institute, Houston, **1999**, pp 41-42.
10. "Electrochemistry on Mars", S.J.West, M.S.Frant, X.Wen, R.Geis, J.Herdan, T.Gillet, M.H.Hecht, W.Schubert, S. Grannan, S.P.Kounaves, *American Laboratory*, **1999**, *20*, 48-54,

9. "Microfabricated Arrays of Iridium Ultramicroelectrodes for Direct ASV Determination of Cu(II)", M. A. Nolan and S.P.Kounaves, in *Proceedings of the Symposium on Microstructure & Microfabricated Systems*, The Electrochemical Society, **1998** Vol. 98-14, 148-55
8. "Voltammetric Techniques", Chapter 37, S.P. Kounaves in *Handbook of Instrumental Techniques for Analytical Chemistry*, F.A.Settle (Ed.) Prentice Hall, Upper Saddle River, NJ, **1997**
7. "Microfabricated Electrochemical Analysis System for Heavy Metal Detection", R.J. Reay, C.W.Stormont, A.F.Flannery, S.P. Kounaves, and G.T.A. Kovacs, *Transducers'95-Euroensors IX*, 8th International Conference on Solid-State Sensors & Actuators, Sweden, 2, **1995**, 932-934
6. "An Integrated CMOS Potentiostat for Miniaturized Electroanalytical Instrumentation", R. J. Reay, S. P. Kounaves and G. T. A. Kovacs, *Digest of Technical Papers - IEEE 41st International Solid State Circuits Conference*, **1994**, 37, 162-163
5. "Iridium Based Ultramicroelectrodes: Development and Use in Electrochemical Analysis" S. P. Kounaves, *Platinum Metals Rev.*, **1990**, 34, 131-134

## PATENTS

4. Total Organic Carbon Analyzer (TOC), S. P. Kounaves, US Patent No. 7,632,393 Issued 12/15/09, International Patent WO-03104765 Issued 12/18/2003,
3. Microfabricated Iridium Ultramicroelectrode Array for Determination of Copper(II), S. P. Kounaves and M. A. Nolan, US Patent No. 6,527,930; Issued 3/4/03.
2. Iridium-Based Mercury Microelectrode Array Sensor for Heavy Metals, S. P. Kounaves, G. T. Kovacs, and C.W. Stormont, US Patent No. 5,378,343 Issued 1/3/95
1. Metals, Metal Alloys, and Metal Oxide Formation by Electrodeposition of Polymetallic Complexes, S. P. Kounaves, A. Robbat, and G. Davies, US Patent No. 5,277,789 Issued 1/11/94

## SELECTED MEDIA APPEARANCES & E/PO LINKS

- [ACS Kavli Award Lecture](#)  "The Chemistry of Finding Extraterrestrial Life" April 2019
- [AAAS Annual Meeting News](#)  "Perchlorate on Mars" February 2013
- [NECN TV](#)  "Curiosity Rover Lands on Mars" August 2012
- [NPR Interview](#)  "Scientists Look To Martian Rocks For History Of Life" August 2012
- [WGBH 7 One Guest Interview](#)  May 2009
- [NOVA ScienceNOW](#)  "Phoenix Lander Wet Chemistry with PBS/Tyson" July 2008
- [MSNBC Today Show "Is There Life on Mars" Interview with Ann Curry](#)  June 2008

## PRESENTATIONS & INVITED TALKS

Harvard University, Space & Life Sciences Seminar Series, November 6, 2020, "Determining the Habitability of Mars & Icy Ocean Worlds" (**Invited**)

236th Electrochemical Society Meeting, Atlanta GA, October 13-17, 2019, " Measuring Soluble Properties of Planetary Science Samples: Sensor and System Development Since the Wet Chemistry Laboratory". (with A. Noell et al.)

German Astrobiological Society (DAbG), Vienna Austria, September 27, 2019, "Comparison of sterilization methods on bacteria embedded in a Mars regolith analog" (with J. Schirmack et al.)

European Astrobiology Network Association (EANA-2019), Orléans, France, September 4, 2019, " The Process of Deliquescence Might Allow Methanogenic Archaea to Metabolize on Mars" (with D. Maus et al.)

NASA/ESA Interplanetary Probe Workshop, IPPW-2019, Oxford University, Oxford UK, July 8, 2019, "Assessing the Habitability of Icy Ocean Worlds" (**Invited**)

AbSciCon 2019 Astrobiology Conference, Seattle, WA, June 24, 2019, "Assessing Habitability of Ocean Worlds Using the Microfluidic Wet Chemistry Laboratory (mWCL): Preliminary Results With Simulated Enceladus Brine" Abstract 406-5. (with N. Naz et al.)

AbSciCon 2019 Astrobiology Conference, Seattle, WA, June 26, 2019, "Protective Role of Martian Analogue Minerals for Bio-Organic Molecules Against the Effects of Galactic Cosmic Radiation" Abstract 318-208. (with G. Ertem et al.)

AbSciCon 2019 Astrobiology Conference, Seattle, WA, June 27, 2019, "MICA: Microfluidic Icy-World Chemistry Analyzer" Abstract 408-7. (with A. Noell et al.)

AbSciCon 2019 Astrobiology Conference, Seattle, WA, June 27, 2019, "Organic Records of life on Mars: An Experiment-Based Kinetic Modelling Approach" Abstract 406-5. (with J. Tan et al.)

American Chemical Society National Meeting 2019, Orlando Fl, April 1, 2019, Kavli Foundation Lecture, The Chemistry of Finding Extraterrestrial Life, (**Invited**)

American Geophysical Union Meeting 2018, Washington D.C., December 12, 2018, "Increasing our understanding of perchlorate salts during thermal decomposition and their implications for life detection on Mars" (with S. Royle et al.)

American Geophysical Union Meeting 2018, Washington D.C., December 13, 2018, "Effect of UV Radiation and Shock Pressures on the Fate of Bio-organic Molecules in the Presence and Absence of Martian Analogue Minerals" (with G. Ertem et al.)

American Geophysical Union Meeting 2018, Washington D.C., December 13, 2018, "Protective Role of Martian Analogue Minerals for Organic Molecules Against the Effects of Gamma Radiation" (with G. Ertem et al.)

LACE - 24th Latin-American Symposium on Applications of Capillary Electrophoresis and Microchip Technology, Mendoza, Argentina, December 4, 2018, "Soluble inorganic ion measurements for planetary science missions" (with A. Noell et al.)

European Astrobiology Network Association (EANA-2018), Berlin, Germany, September 25, 2018, "Protection of organic compounds from gamma radiation by Mars analogue minerals"

COSPAR Scientific Assembly 2018, Pasadena CA, July 19, 2018, "Increasing our understanding of perchlorate salts during thermal decomposition and their implications for life detection on Mars" (with S Royle et al.)

NASA Exploration Science Forum, Moffett Field, CA, June 24, 2018, " Qualification of Phoenix Heritage Ion-Selective Electrodes for Long-Duration Space Exploration" (with A. Noell et al.)

15th International Planetary Probe Workshop, Boulder, Colorado, June 12, 2018, "Ion selective electrodes for soluble salt measurements on icy worlds" (with A. Noell et al.)

Technical University of Berlin: Habitability of Martian Environments (HOME), Berlin, Germany, February 15, 2018, "Atacama and Simulation Studies for Differentiating Atmospheric and Surface Production of  $\text{ClO}_4$  &  $\text{NO}_3$  on Mars and Earth" (**Invited**)

COSPAR Scientific Assembly 2018, Pasadena CA, July 19, 2018, "Increasing our understanding of perchlorate salts during thermal decomposition and their implications for life detection on Mars" (with S Royle et al.)

American Geophysical Union Meeting 2017, New Orleans LA, December 14, 2017, " Effect of hydration state of Martian perchlorate salts on their decomposition temperatures during thermal extraction" (with S. Royle et al.)

British Planetary Science Congress 2017, Glasgow UK, December 3, 2017, "Effects of oxygen-containing salts on the detection of organic biomarkers" (with S. Royle et al.)

German Astrobiological Society Meeting 2017, Potsdam Germany, November 8, 2017, "Supercritical  $\text{CO}_2$  used for Sterilization of a Mars Regolith Analog Soil" (with J. Schirmack et al.)

Sensing in Water Conference 2017, Nottingham, UK, September 27, 2017, "The Phoenix Mars Lander Array: Sensing in Water From Earth to Mars to Enceladus" (Invited Keynote Speaker)

Seventh International Conference on Polar & Alpine Microbiology (PAM2017), Nuuk, Greenland, September 11, 2017, "New terrestrial Mars analog habitat sites in the Permafrost of Continental Antarctica" (with J-P de Vera et al.)

European Astrobiology Network Association (EANA-2017), Aarhus, Denmark, August 15, 2017, " Brines formed by Deliquescence as a Habitat for Methanogenic Archaea" (with D. Maus et al.)

Goldschmidt Conference, Paris, France, August 15, 2017, "Real-time in-situ chemical analysis of an anoxic coastal pond" (with J. Dabrowski)

XXIIth SCAR Biology Symposium, Leuven, Belgium, July 12, 2017, "New terrestrial analog sites in continental Antarctica for investigating potential habitats on Mars" (with J.-P. de Vera et al.)

AbSciCon 2017 Astrobiology Conference, Mesa, AZ, April 27, 2017, "Determining Habitability of Icy World Oceans via Analysis of Plume Particles" Abstract 3251. (with E. Oberlin et al.)

AbSciCon 2017 Astrobiology Conference, Mesa, AZ, April 27, 2017, "Unambiguous In-Stu Life Detection Using a Microbial Growth Sensing Array" Abstract 3248. (with M. Clark et al.)

AbSciCon 2017 Astrobiology Conference, Mesa, AZ, April 26, 2017, "Investigation of the Formation and Habitability of Recurring Slope Lineae (RSL) like Environments" Abstract 3111. (with J. Heinz et al.)

Harvard University, Center for Astrophysics, November 2, 2016, "Sampling Enceladus' Interior Ocean from Orbit" (Invited)

German Astrobiological Society, Berlin-Adlershof, Germany, September 1, 2016, "The Core Region of the Atacama Desert as an Analog for Life on Mars" (with D. Schulze-Makuch et al.)

6th International Conference on Mars Polar Science & Exploration, Reykjavik, Iceland, September 6, 2016, "Formation of Recurrent Slope Lineae on Mars by Rewetting of Salt Deposits Formed in an Earlier Wetter Climate", Abstract 6015. (with J. Heinz & D. D. Schulze-Makuch)

27th British Organic Geochemical Society (BOGS) Conference, London, UK, July 12, 2016, "The Discovery of Perchlorate on Mars" (Plenary)

Martian Gullies and their Earth Analogues Conference, The Geological Society, London UK, June 20, 2016, "Implications of a Non-Salt-Recharge RSL Mechanism for Martian Gullies as Remnants of an Earlier Wetter Period" (Invited)

Technical University of Berlin: Habitability of Martian Environments (HOME), Berlin, Germany, April 6, 2016, "Pyrolysis-GC-MS Analysis of Atacama Soil Samples" (Invited)

15th European Astrobiology Conference EANA15, Noordwijk, Netherlands, October 8, 2015, "The Biological Oxidant and Life Detection (BOLD) Mission: A Proposal for a Low-Cost In-Situ Mission to Mars" (with D. Schulze-Makuch et al.)

European Geophysical Union, General Assembly, Vienna, Austria, April 15, 2015, "Origin of the soluble species in the Tissint Mars meteorite", (with E. Oberlin et al.)

46th Lunar & Planetary Science Conference, Houston, TX, March 18, 2015, "Computational Reanalysis of the Phoenix Lander Wet Chemistry Lab Data" Abstract 1594. (with E. Oberlin et al.)

46th Lunar & Planetary Science Conference, Houston, TX, March 20, 2014, "Martian Perchlorate Chemistry: Perchlorate formation and effects on organics" Abstract 2997. (with B. Carrier & E. Oberlin)

American Geophysical Union, San Francisco, CA, December 17, 2014, "Effects of Perchlorate on Organic Molecules under Simulated Mars Conditions" (with B. Carrier)

NASA Ames Research Center, Moffett Field, CA, December 13, 2014, "Martian Perchlorate Chemistry: Recent Findings & Implications" (Invited)

University of Warwick, Coventry, UK, November 24, 2014, "The New Surface Chemistry of Mars: Implications for Habitability & Organics" (Invited)

14th European Astrobiology Conference EANA-2014, Edinburgh, UK, October 13, 2014, "Unambiguous Detection of Microbial Growth on Mars with Minimal Assumptions" (Invited)

Imperial College London, UK, October 8, 2014, "Discovery of Perchlorate on Mars by Phoenix & Confirmation by Curiosity: Recent Results and Implications for Habitability and Organics" (Invited)

Eighth International Conference on Mars, Pasadena, CA, July 14-18, 2014, "Formation of Perchlorate from Chlorine Species under Simulated Mars Conditions" (with B. Carrier)

International Conference on Electrochemical Sensors - Mátrafüred Series, Budapest, June 15-20 2014, "Electrochemical Analysis on the Surface of Mars: Results & Future Directions" (Invited)

45th Lunar & Planetary Science Conference, Houston, TX, March 20, 2014, "Oxidation of Chloride to Perchlorate Under Mars Ambient Conditions" Abstract 2570. (with B. Carrier)

45th Lunar & Planetary Science Conference, Houston, TX, March 20, 2014, "Gaussian Noise Removal for Wet Chemistry Data from the Phoenix Mission" Abstract 1142. (with Y. Mu\*, W. Ding, X. Ren, and E. Oberlin)

Pittsburgh Conference on Analytical Chemistry & Applied Spectroscopy, Chicago IL, March 3, 2014, "In-Situ Electrochemical Analysis of Martian Soil: Implications for Mars and Earth" (Invited)

American Geophysical Union, San Francisco, CA, December 10, 2013, "Perchlorate Formation on Mineral Surfaces Under Mars Ambient Conditions" (with B. L. Carrier)

European Planetary Science Congress EPSC2013, London, UK, September 10, 2013, "Destruction of Organics on Mars by Oxychlorines"(Invited)

European Planetary Science Congress EPSC2013, London, UK, September 10, 2013, "The Mars Chemical Analysis Laboratory (MCAL) for In Situ Analysis of Martian Aqueous Geochemistry"

Concepts and Approaches for Mars Exploration, Houston, TX, June 12, 2013, "MECA Microscopy, the Next Generation" LPI Contribution No. 1679, id.4335 (with M. H. Hecht et al)

UK Astrobiology Conference, Edinburgh, UK, April 18, 2013, Results & Implications of Perchlorate at the Phoenix Landing Site, ADV, and in Martian meteorite EETA79001" (Invited)

Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Philadelphia PA, March 20, 2013, "Carbon Nanomaterial-Based Electrochemical Sensors in Microfluidic Total Analysis Systems for Extraterrestrial Analysis" (with G. O'Neil et al.)

American Association for the Advancement of Science, Boston, MA, February 15, 2013, "Surface Missions: From Viking to the Latest Phoenix Results" (Symposium Organizer and Speaker)

UCLA, Institute for Planets & Exoplanets, Los Angeles, CA, February 4, 2013, " The Phoenix Mars Lander Wet Chemistry Laboratory: New Results for Perchlorate and its Implications for Water, Organics, and Life" (Invited)

American Geophysical Union, San Francisco, CA, December 3, 2012, "Identity of the Perchlorate Parent Salts at the Phoenix Mars Landing Site" (Invited)

NASA International Workshop on Planetary Missions, Greenbelt, MD, October 11, 2012, "The Phoenix WCL: Understanding the Aqueous Geochemistry of the Martian Soil" (Invited)

Tufts University, Department of Mechanical Engineering, September 13, 2012, "Curiosity on Mars The Amazing Synergy of Science, Technology, and Engineering" (Invited)

Fermi National Accelerator Laboratory, Batavia, IL, June 26, 2012, "Comparison of Extreme Environments on Mars and Earth" (Invited Colloquium Speaker)

IMAPS Symposium and Exhibition, Boxborough, MA, May 8, 2012, "Making Scientific Measurements in Extreme Environments" (Invited Keynote Speaker)

AbSciCon 2012 Astrobiology Conference, Atlanta, GA, April 16-20, 2012, "Microfluidic Sensing Technologies for Planetary Science"

43rd Lunar & Planetary Science Conference, Houston, TX, March 19-23, 2012, "In-Situ Wet Chemical Analysis Lab & Sensor Array: The Next Generation Mars Soil Analyzer" (with K. McElhoney, et al.)

Association of Engineering Geologists, November 17, 2011, Woburn MA, "Results of the Phoenix Mars Lander: Implications for Global Oxidizing Geochemistry on Mars, Earth, and Venus" (Invited)

Massachusetts Institute of Technology, Science Museum, "What are we Really Searching for on Mars, and What we Might Conceivably Find", (Invited Panelist/Presenter)

University of Massachusetts at Amherst, Department of Microbiology, November 3, 2011, "Evidence for Possible Past or Present Microbial Life on Mars and Its Detection" (Invited)

Fifth Mars Polar Conference, Fairbanks AK, September 15, 2011, Comparison of the WCL Soil Analyses on the Phoenix Mars Lander with Antarctic Dry Valley Soils, Mars Meteorite Sawdust, and a Mars Simulant. (Invited)

Massachusetts Institute of Technology, Department of Earth, Atmospheric and Planetary Sciences, October 25, 2011, "Global Oxidizing Chemistry on Mars, Earth and Venus" (Invited)

American Chemical Society, 242nd National Meeting, Denver, August 31, 2011, "In-situ planetary chemical analysis of aqueous geochemistry: Results of the Phoenix Mars Lander Wet Chem Lab and the global implications for both Mars and Earth" (Invited)

American Chemical Society, 242nd National Meeting, Denver, August 28, 2011, "Effects of  $\text{ClO}_4^-$  and UV radiation on organic molecules under ambient martian conditions" (with B. Carrier)

American Chemical Society, 242nd National Meeting, Denver, August 28, 2011, "NERNST: An electrofluidic platform for planetary surface analysis" (with G. O'Neil et al.)

Nanotech Conference, Boston, June 16, 2011, "Using Nanomaterials as Novel Solid State Junctions for Reference Electrodes" (with G. O'Neil & N. Chaniotakis)

European Geophysical Union, General Assembly, Vienna, Austria, April 6, 2011, "Determination of the Parent Salt for the Perchlorate Ion Measured at the Phoenix Landing Site" (Invited)

European Geophysical Union, General Assembly, Vienna, Austria, April 6, 2011, "The Expected Dominance of Biotic and Abiotic L-Chirality on Mars and in the Solar System" (Invited)

American Chemical Society, 242nd National Meeting, Denver, August 28, 2011, " Novel electroanalytical instrument for soil samples: CHEMSENS " (with K. McElhoney et al.)

Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Atlanta, GA, March 15, 2011, "An Electrochemically-based Total Organic Carbon (TOC) Analyzer for Earth and Planetary Science Applications" (with S. Stroble)

Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Atlanta, GA, March 14, 2011, " Solid State Reference Electrode Based on a Nanocomposite Polymer for Electrochemical Analysis of Extraterrestrial and Extreme Environments" (with G. O'Neil & N. Chaniotakis)

42nd Lunar & Planetary Science Conference, Houston, TX, March 8-10, 2011, "The Production of L-Dominant Biotic and Abiotic Chirality on Mars"

42nd Lunar & Planetary Science Conference, Houston, TX, March 8-10, 2011, "Chemistry & Mineralogy of Antarctica Dry Valley Soils: Implications for Mars" (with J. Quinn et al.)

American Geophysical Union Meeting, San Francisco, CA, December 13, 2010, "Yungay Atacama, Chile, and University Valley, Antarctica, as Mars Analogs: Use of Isotopic Ratios and Ionic Profiles as Proxies for Aridity and Biology"

ECOST/B-USOC/ESA Carbon in the Solar System Workshop, Brussels, December 6, 2010, "In-situ Confirmation of Calcium and Magnesium Carbonates by the 2007 Phoenix Mars Lander" (Invited)

American Chemical Society, 240th National Meeting, Boston, August 24, 2010, "Novel Detection Method for Total Organic Carbon Analysis for Planetary Science Applications" (with S. Stroble)

American Chemical Society, 240th National Meeting, Boston, August 24, 2010, "MiDA -An Incontrovertible Electroanalytical Method to Detect Extraterrestrial Microbial Life" (with J. Wage)

Goldschmidt 2010, Knoxville, TN, June 15, 2010, "Aqueous Chemistry on Mars" (with M. Hecht)

Oslo Science Conference - IPY, Oslo, Norway, June 9, 2010, "The Discovery of Perchlorate in Antarctica and its Polar and Global Implications" (Invited)

41st Lunar & Planetary Science Conference, Houston, TX, March 1, 2010, "Confirmation of Soluble Sulfate at the Phoenix Landing Site" (Invited)

41st Lunar & Planetary Science Conference, Houston, TX, March 3, 2010, "Mineralogy of Antarctica Dry Valley Soils" (with J. Quinn et al.)

41st Lunar & Planetary Science Conference, Houston, TX, March 3, 2010, "McMurdo Dry Valleys, Antarctica - A Mars Phoenix Mission Analog" (with L. Tamppari et al.)

Eastern Analytical Symposium, Somerset, NJ, November 19, 2009, "Electroanalysis on Mars: Going Where No Electrode Has Gone Before" (Keynote Speaker)

American Chemical Society, 238th National Meeting, Washington D.C., August 15-17, 2009, "Mars' New Aqueous Geochemistry" (Keynote Speaker)

American Chemical Society, 238th National Meeting, Washington D.C., August 15-17, 2009, "Physical and Thermodynamic Evidence for Liquid Water on Mars"

The New Mars Chemistry Workshop, Medford MA, July 27-28, 2009, "Aqueous Chemistry of the Martian Soil: Results from the Phoenix Mars Lander" (Convened, Chaired Workshop and Presented)

40th Lunar & Planetary Science Conference, Houston, TX, March 25, 2009, "Aqueous Carbonate Chemistry of the Martian Soil at the Phoenix Landing Site" (Invited)

40th Lunar & Planetary Science Conference, Houston, TX, March 25, 2009, "Possible Atmospheric Origins of Perchlorate on Mars" (with D Catling et al.)

Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Chicago, IL, March 9, 2009, "Analysis of the Martian Soil Using an Array of Ion Selective Electrodes"

Boston Museum of Science/WBUR, Boston, MA, January 12, 2009, "Implications of the Latest Mars Results" (Keynote Speaker)

Association for Science Teacher Education, Faculty Institute for NASA Earth and Space Science Education, Hartford, CT, January 6, 2009, "Exploring Mars" (Keynote Speaker)



Northeastern University, Boston, MA, January 15, 2009, "The Phoenix Mars Mission In-Situ Chemical Analysis of Martian Soil" (Invited)

American Geophysical Union Meeting, San Francisco, CA, December 15, 2008, " The Aqueous Chemistry of the Soils at the Phoenix Landing Site" (Invited)

American Geophysical Union Meeting, San Francisco, CA, December 15, 2008, " Wet Chemical Analysis of Antarctica Dry Valley Soils" (Stroble, Kounaves, et al.)

American Geophysical Union Meeting, San Francisco, CA, December 15, 2008, " Discovery of Perchlorate at the Phoenix Landing Site " (with M. Hecht et al.)

American Geophysical Union Meeting, San Francisco, CA, December 15, 2008, " Voltammetric and Chronopotentiometric Soil Analysis at the Phoenix Landing Site " (Quinn, Kounaves, et al.)

American Geophysical Union Meeting, San Francisco, CA, December 15, 2008, " Physical and Thermodynamical Evidence of Liquid Water on Mars " (Renno, Kounaves, et al.)

American Geophysical Union Meeting, San Francisco, CA, December 15, 2008, "Segregated Ice at the Phoenix Landing Site: Was Liquid Water Involved?" (Stoker, Kounaves, et al.)

American Geophysical Union Meeting, San Francisco, CA, December 15, 2008, "Effects of deliquescent salts in soils of polar Mars on the flow of the N. Ice Cap" (Fisher, Kounaves, et al.)

American Geophysical Union Meeting, San Francisco, CA, December 15, 2008, " Preliminary identification of minerals at the Mars Phoenix Landing Site " (Ming, Kounaves, et al.)

Georgetown University, Washington, DC, October 27, 2008, "In-Situ WetChemical Analysis on the Surface of Mars" (Invited)

Delaware Valley College, Doylstown, PA, November 2, 2008, "The Phoenix Mars Mission: Preliminary Results" (Invited)

Dartmouth College, Hanover, NH, April 25, 2008, "Phoenix Mars Mission: Investigating the Chemistry of the Martian Polar Soil and Ice"

Rhode Island College, Providence, RI, February 15, 2008, "Chemical Analysis of the Martian Surface Material"

Brown University, Providence, RI, November 19, 2007, "The Wet Chemistry Experiments on the 2007 Mars Phoenix Lander"

Bridgewater State College, Bridgewater, MA, November 15, 2007, "Robotic Chemical Analysis of the Martian surface"

Association of Environmental Geologists, Woburn, MA, September 20, 2007, "Exploring the Chemistry & Geology of the Martian Arctic"

Astronomical Society of New England, Kennebunk, ME, September 15, 2007, "Exploring Mars – The Phoenix Mission"

Seventh Mars Conference, Pasadena, CA, July 13, 2007, "Detection of Microbial Life in soil Based on Minimal Assumptions"

Second International Mars & Earth Analogs Conference, Trento, Italy, June 19, 2007, "Geochemical Considerations for Selecting the Phoenix Landing Site"

Harvard University, Earth & Planetary Sciences, Cambridge, MA, May 9, 2007, “The Phoenix Investigations – Understanding the history of Mars”

Conference on Martian Sulfates as Recorders of Atmospheric-Fluid-Rock-Interactions, Houston, TX, October 23, 2006, “Dissolved Sulfate Analysis on the 2007 Phoenix Mars Scout Mission”

University of Geneva, Geneva, Switzerland, October 10, 2006, “The 2007 Phoenix Mars Mission - In Situ Chemical Analysis on Mars”

Fourth International Conference on Mars Polar Science & Exploration, Davos, Switzerland, October 5, 2006, “The Phoenix Chemistry and Mineralogy Experiments”

American Chemical Society, 232th National Meeting, San Francisco, CA, September 10, 2006, “Novel Wet Chemistry Analyses of a Martian Meteorite in Preparation for the NASA Phoenix Mars Lander Mission”, (with C. Cable and S. Young)

University of Colorado, Boulder CO, April 21, 2006, K.D.Wood Speaker “Phoenix: The 2007 Mars Scout Mission”

Oklahoma State University, Stillwater OK, April 17, 2006, “Exploring Mars - What We Know and a Preview of the 2007 Phoenix Mission”

AbSciCon 2006 Astrobiology Conference, Washington, D.C., March 26-30, 2006, “Microbial Growth Detection Array”

AbSciCon 2006 Astrobiology Conference, Washington, D.C., March 26-30, 2006, “Wet Chemistry Experiment at Mars”

37th Lunar & Planetary Science Conference, Houston, TX, March 13-17, 2006, “The RCAL Wet Chemistry Experiment at Mars”

37th Lunar & Planetary Science Conference, Houston, TX, March 13-17, 2006, “Measurement of Total Organic Carbon on Mars”

European Geophysical Union General Assembly, Vienna, Austria, April 25, 2005, “WetChem Experiment at Mars”, (with, L. Beegle, I. Kanik, M. Hecht, & R. Cooks)

Alliance for Coastal Technologies, MLML/MBARI, Seaside CA, April 12, 2005, Plenary Speaker, “Sensors, Past & Present from Earth to Mars”

Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Orlando, FL, March 3, 2005, Symposium Speaker, “The Mars 2007 Phoenix Mission; In-situ Chemical Analysis”

Colgate University, Hamilton, NY, October 19, 2004, “Understanding the Geochemistry and Biological Potential of Mars”

Carnegie Institution of Washington, D.C., Mars Astrobiology Conference, September 8-10, 2004, “The 2007 Phoenix Mars Scout MECA Wet Chemistry Laboratory”

Aldrich Astronomical Society, Anna Maria College, Paxton, MA, April 24, 2004, “The Phoenix Martian Lander”

Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Chicago, IL, March 7-12, 2004, “Martian Soil Analysis with Ion Selective Electrodes” (with S. Lukow)

Lowell Lecture, Boston Museum of Science, Boston, MA, April 21, 2004, "Mars Exploration: An Odyssey of Discovery"

Astrobiology Science & Technology for Exploring Planets, University of Colorado, Boulder, CO, January 20-21, 2004, "Chemistry & Imaging for Martian Soils" (with J. Nadeau)

American Geophysical Union, San Francisco, CA, December 8-12, 2003, "The MECA Payload on the 2007 Phoenix Mars Scout Mission", (with M. Hecht, J. Marshall, U. Staufer, & P. Smith)

Harvard-Smithsonian Center for Astrophysics, Harvard University, Cambridge, MA, August 26, 2003, "Mars: Now & Then"

Biological & Chemical Sensors in the Ocean Conference, Woods Hole Oceanographic Institute, Woods Hole, MA, July 13-16, 2003, Symposium Speaker, "Chemical & Biological Analysis on Mars & Europa"

34th Lunar & Planetary Science Conference, Houston, TX, March 17-21, 2003, "MECA Science and the Phoenix 2007 Mars Lander Mission"

Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Orlando, FL, March 9-14, 2003, "Fabrication & Evaluation of an ISE Array for Water Quality Monitoring on the International Space Station", (with B. Comeau, M. Buehler, & S. Lukow)

Bioastronautics Conference 2003, Galveston TX, January 13-15, 2003, "Monitoring Water Quality on Spacecraft and Planetary Habitats" (with B. Comeau)

Forth Annual Mars Conference @ MIT, Cambridge, MA, October 4-6, 2002, "In-Situ Chemical & Biological Analysis on the Surface of Mars"

Goldschmidt 2002 Conference, Davos, CH., August 18-23, 2002, "Geochemical Analysis on Mars"

International Meeting on Chemical Sensors, Boston, MA, July 7-10, 2002, "Evaluation of ISE Sensor Array for Martian Soil Analysis" (with S. Lukow, et al.)

Ninth International Meeting on Chemical Sensors, Boston, MA, July 7-10, 2002, "An ISE sensor Array for Water Quality Monitoring" (with B. Comeau, et al.)

NASA-JPL In-Situ Instruments Conference, Pasadena, CA, June 11-13, 2002, "Unambiguous In-Situ Detection of Extraterrestrial Microorganisms"

NASA-JPL In-Situ Instruments Conference, Pasadena, CA, June 11-13, 2002, "E-Tongue 2 Redox Responses to Heavy Metals" (with M. Buehler & G. Kuhlman)

Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, New Orleans, LA, March 17-22, 2002, "Multisensor Array for Water Quality on the International Space Station", (with B. Comeau & S. Lukow)

University of Connecticut, Storrs, Ct, March 13, 2002, "In-Situ Electrochemical Sensors for Planetary Chemistry & Life Detection"

Gordon Research Conference, Ventura, CA, January 20-25, 2002, "Electroanalysis at the Frontiers of Planetary Science"

FACCS 2001, Detroit MI, October 8, 2001, "Electroanalysis in Extraterrestrial Environments"

International Congress on Analytical Sciences 2001 (ICAS), Tokyo, Japan, August 7, 2001, "Ultramicroelectrode Arrays Modified With Ionomer-Entrapped Silica Films as Potential Voltammetric for Cu, Pb and Se", (with O. Nadzhafova, V. Tarasov & S. Tan)

SPIE 46th Annual Meeting – Instruments & Methods for AstrobiologyIV, San Diego, CA, July 29, 2001, "Microbial Life Detection With Minimal Assumptions"

NASA Mars Scout Concept Workshop, Pasadena, CA, May 22-25, 2001, "MarsLab-An Integrated In Situ Chemical & Microbial Analysis Mission"

The Electrochemical Society, New England Local Section, Bedford, MA, March 13, 2001, "Electroanalysis in Extraterrestrial Environments"

IEEE Aerospace Conference, Big Sky, MT, March 13, 2001, "Designing a Water Quality Monitor with ISEs for Use in Space Habitats" (with M. Buehler, D. Martin, & S. West)

Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, New Orleans, LA, March 5-8, 2001, "Evaluation of the Mars Environmental Compatibility Assessment Wet Laboratory Sensors", (with S. Lukow)

Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, New Orleans, LA, March 5-8, 2001, "Multisensor Array for Monitoring Water Quality on Spacecraft and Planetary Habitats", (with B. Comeau)

American Chemical Society, 220th National Meeting, Washington DC, August 20 2000, "Electrochemical Sensor Array for Determination of Trace Metal Geochemistry on Mars"

NASA Advanced Environmental Monitoring & Control, Arcadia, CA, April 24-26, 2000, "An Electronic Tongue for Monitoring Water Quality on Spacecraft and Planetary Habitats"

American Chemical Society, 219th National Meeting, San Francisco, CA, March 28, 2000, "On-Site Analysis of As in Groundwater Using a Microfabricated Au UMEA ", (with R. Feeney)

Gordon Research Conference, Ventura, California, January 23-28, 2000, "The Mars Environmental Compatibility Assessment: In-Situ Electroanalysis of the Soil on Mars"

Lunar & Planetary Institute Workshop on Mars 2001, Houston, TX, October 3, 1999, "Measuring the Chemical Potential of the Martian Regolith to Generate and Sustain Life"

Fifth International Conference on Mars, Pasadena, CA, July 20, 1999, "The Mars Environmental Compatibility Assessment Wet Chemistry Experiments on the Mars Surveyor 2001 Lander", (with S. Grannan, et al.)

American Geophysical Union Meeting, Boston, MA, June 4, 1999, "The Mars Environmental Compatibility Assessment Wet Chemistry Experiments on the Mars Surveyor 2001 Lander", (with S. Grannan, et al)

The Electrochemical Society, 195th Meeting, Seattle, WA, May 3, 1999, "Electrochemistry of Homo and Heterotetranuclear Cu(II) Complexes ", (with J. Birtles)

The Northeast Student Research Conference, MIT, Cambridge, MA, April 24, 1999, "In Situ Electrochemical Atomic Force Microscopy Study of Glassy Carbon" (with M. Nolan)

The Northeast Student Research Conference, MIT, Cambridge, MA, April 24, 1999, "Investigation of Kinetics and Determination of As(III) at Microfabricated Arrays" (with R. Feeney)

Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Orlando, FL, March 10 1999, "Field Portable Electrochemical Analysis System for Heavy Metals", Paper 1368, (with J.Herdan, et al.)

NASA Jet Propulsion Laboratory, Pasadena, CA December 2, 1998, "In Situ Electroanalysis of Martian Soil for the Mars 2001 Lander Mission"

Merrimack College, North Andover, MA, November 11, 1998, "Microfabricated Sensors for Heavy Metals Determination in Terrestrial & Extraterrestrial Environments"

The Electrochemical Society, 194th Meeting, Boston, MA, November 1-6, 1998, "Use of Iridium Ultramicroelectrode Arrays for the Determination of Copper" (with M. Nolan)

The Electrochemical Society, 194th Meeting, Boston, MA, November 1-6, 1998, "Electrodeposition of Heterotetranuclear Cu(II) Complexes", (with J. Birtles)

The Electrochemical Society, 194th Meeting, Boston, MA, November 1-6, 1998, "The Use of Voltammetry & Microscopy for Analytical Evaluation of Sensors for Multi-metal Analysis" (with M. Nolan & R. Feeney)

American Chemical Society, 216th National Meeting, Boston, MA, August 23-27, 1998, "Evaluation of an Electrochemical Sensor for Arsenic", (with R. Feeney)

American Chemical Society, 216th National Meeting, Boston, MA, August 23-27, 1998, "Evaluation of Mercury Film Formation on Various Electrode Substrates", (with M. Nolan)

American Chemical Society, 216th National Meeting, Boston, MA, August 23-27, 1998, "Selenium(IV) Detection at Mercury-Coated Iridium Ultramicroelectrodes Using Square Wave Cathodic Stripping Voltammetry", (with S. Tan )

American Chemical Society, 216th National Meeting, Boston, MA, August 23-27, 1998, "Fabrication and Characterization of a Novel Integrated Sensor for Determination of Heavy Metals", (with J. Herdan, X. Wen, & S. West)

Gordon Research Conference, Colby-Sawyer College, New London, NH, August 9-14, 1998, "Electrodeposition of Copper and Nickel ( $\mu_4$ -O) Tetranuclear Complexes", (with J. Birtles)

Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, New Orleans, LA, March 2, 1998, "Sensor for Electrochemical Determinations of Arsenic (III)", Paper 1757, (with R.Feeney)

Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, New Orleans, LA, March 3, 1998, " Characterization of Thin Films Produced by the Electroreduction of Tetranuclear Copper(II) Complexes", Paper 507, (with J. Birtles)

Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, New Orleans, LA, March 3, 1998, " Evaluation of a Microlithographically Fabricated Electrochemical Sensor", Paper 511, (with M. Nolan)

Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, New Orleans, LA, March 3, 1998, "Selenium (IV) Detection at Mercury Coated Iridium Microelectrodes", Paper 556, (with S. Tan)

PITTCON-1998, New Orleans, LA, March 4, 1998, "Self-Assembled Monolayers on Au(Ir) Microelectrode Arrays", Paper 1070, (with V. Tarasov)

International NanoScope Users Conference, UCSB, Santa Barbara, CA, August 24-27, 1997, "AFM Study of the Degradation of Iridium Ultramicroelectrode Arrays", (with M. Nolan)

American Chemical Society, 27th NERM Meeting, Saratoga Springs, NY, June 22-25, 1997, "In-Situ Determination of Heavy Metal Ions"

University of Massachusetts at Boston, Boston, MA, February 18, 1997, "Polymer Modified Electrochemical Sensors"

Fifth International Symposium - Field Analytical Methods, (EPA/AWMA), Las Vegas, NV, January 29-31, 1997, "Micromachined Electrochemical Sensor for In-Situ Determination of Metal Ions"

North Carolina State University Chemistry Symposium, NCSU, Raleigh, NC, January 23-25, 1997, "In-Situ Voltammetric Analysis of Metal Ions"

Gordon Research Conference, Invited Speaker, Colby-Sawyer College, New London, NH, August 11-16, 1996, "Stoichiometric Electrodeposition of Alloys Using a Single Precursor Complex"

Centre Chimie Analytique et Biophysicochimie de l'Environnement (CABE), University of Geneva, Switzerland, July 12, 1996, "Recent Advances in Microlithographically Fabricated Microsensors for In-Situ Measurement of Metal Ions in Natural Waters"

Naval Ocean Systems & Control Center (NOSC/NRaD), San Diego, CA, March 21, 1996, "Polymer Modified Ultramicroelectrode Array Sensors for Heavy Metal Analysis"

Dionex Corporation, Sunnyvale, CA, November 3, 1995, "Electrochemical Microsensor Array for On-line Detection of Heavy Metal Ions"

Lawrence Berkeley Laboratory, Berkeley, CA, November 1, 1995, "On-Site Environmental Field Assessment Technologies"

Rhode Island College, Providence, RI, December 2, 1994, "Analysis of Toxic Metals in Natural Water Systems"

University of Massachusetts at Lowell, Lowell, MA, September 26, 1994, "In-Situ Electrochemical Analysis of Heavy Metals"

American Chemical Society, National Meeting, Washington D. C., August 21-26, 1994, "An Integrated Microelectrode Array and Potentiostat for Electroanalysis"

American Chemical Society, National Meeting, Washington D. C., August 21-26, 1994, "Characterization of Copper-Nickel Alloy Films Made by Unimolecular Electrodeposition"

The Electrochemical Society, 185th Annual Meeting, San Francisco CA, May 26, 1994, "Stoichiometric Electrodeposition of Single-Phase Alloy Films from Heteropolymetallic Complexes - EDX, XRD and ESCA Studies", Symposium Co-Chair

IEEE International Solid State Circuits Conference, San Francisco, CA, February 17, 1994, "An Integrated CMOS Potentiostat for Miniaturized Electroanalytical Instrumentation"

St. Anselm College, Manchester, NH, November 19, 1993, "In-Situ Analysis of Heavy Metals in Natural Waters"

The Electrochemical Society, 184th Annual Meeting, New Orleans LA, October 13, 1993, "Single Phase Alloys Obtained from Electrodeposition" (with B. Workie, A. Robbat, and G. Davies)

Raytheon Corporation, Lexington, MA, October 6, 1993, "Microelectrodes for On-Site Environmental Analysis"

Université de Genève, Switzerland, June 30, 1993, "Applications of UME Array Sensors to Determination of Heavy Metals in Natural Water Samples"

Northeastern University, Barnett Symposium, Boston, MA, April 21, 1993, "Electrodeposition of Metal Alloys Using Heteropolymetallic Complexes" (with B. Workie, A. Robbat, and G. Davies)

American Association for the Advancement of Science, Annual Meeting, Boston, MA, February 13, 1993, "Electrodeposition of Metal Alloys Using Heteropolymetallic Complexes" (with B. Workie, A. Robbat, and G. Davies)

Colby College, Waterville, ME, November 10, 1992, "Ultramicroelectrode Array Sensors for In-Situ Monitoring"

American Chemical Society, National Meeting, Washington D. C., August 23-28, 1992, "Theory of SWV at the Hemispherical Mercury Electrode" (with Z. Liu)

American Chemical Society, National Meeting, Washington D. C., August 23-28, 1992, "Application of Ir-Based Mercury Ultramicroelectrode Array" (with W. Deng)

Gordon Research Conference, New Hampton School, New Hampshire, August 3-7, 1992, "Ultramicroelectrode Array for Measurement of Heavy Metals in Ground Water"

Institute for Applied Physical Chemistry, KFA, Jülich, Germany, August 23, 1991, "The Analytical Utility of Mercury Ultramicroelectrodes"

International Society of Electrochemistry, 42nd Annual Meeting, Montreux, Switzerland, August 29, 1991, "An Electrochemical Sensor for Measurement of Trace Metals"

Northeast Hazardous Substance Research Center, Science Advisory Committee Meeting, NJIT, Newark, NJ, April 1991, "Measurement of Trace Metals in Groundwater"

University of Massachusetts, Amherst, MA, March 1991, "Iridium-based Ultramicroelectrode for Trace Metal Analysis"

Federation of Analytical Chemistry and Spectroscopy Societies, XVII Meeting, Cleveland, Ohio, October 1990, "Trace Metal Analysis Using Mercury Ultramicroelectrodes" (with W. Deng)

The Electrochemical Society, 177th Annual Meeting, Montreal, Canada, May 1990, "An Iridium Based Micro Mercury Hemisphere Electrode"

California State at San Diego, California, April 1988, "A Chemically Modified Electrode for Detection of Neurotransmitters"

American Association for the Advancement of Science, 154th Meeting, Boston, MA, Feb. 1988, "3-D Chromatovoltammetry of Catecholamines Using SWV and HPLC", (with J. Young)

Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Atlantic City, NJ, March 1987, "Square Wave Voltammetry of Mercury Soluble Metals", Paper 179

McGill University, Montreal, Canada, September 1986, "Development and Applications of an Ir-based Microelectrode"

Salem State College, Salem, MA, April 1986, "Electroanalysis using Ir-based Hg-film Electrodes"

IAEAC International Conference on Toxic Substances, Geneva, Switzerland, October 1984,  
"Electroanalysis of Heavy Metals in the Environment" (with P. Valenta and H.W.Nürnberg)

8th Annual Symposium on the Analytical Chemistry of Pollutants, Geneva, Switzerland, April 1978,  
"Computer-assisted Stripping Polarography for Determination of Trace Metals in Seawater" (with  
A. Zirino)