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
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
Adjunct Professor, Tufts University, Department of Earth & Ocean Sciences (2008-2021)
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 Association for the Adv. of Science, 1976-
The Geological Society, 2016-
Society for Electroanalytical Chemistry, 1987-
American Geophysical Union, 1998-
Geochemical Society, 2009-
Royal Society of Chemistry, 2014-
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:10.3847/25c2cfeb.4db95c67.

105. "The Role of Titanium Dioxide (TiO_2) in the Production of Perchlorate (ClO_4^-) from Chlorite (ClO_2^-) and Chlorate (ClO_3^-) 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-Chloronapthalene 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. Mangelsdorfg, 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

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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. Let.*, **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. Let.*, **2010**, 37, L09201, doi:101029/2010GL042613.

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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_2O 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. Grunthaner, 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

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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^{2+} or Hg^{2+} 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. Storment, 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. Storment, S. P. Kounaves, and G.T. A. Kovacs, *Sensors and Actuators B*, **1996**, *B34*, 450-455

48. "Electrodeposition of Metal Alloy and Mixed Metal Oxide Films Using a Single-Precursor Tetranuclear Copper-Nickel Complex", C. E. Dubé, B. Workie, S.P.Kounaves, A. Robbat, M. L. Aksu, and G. Davies, *J.Electrochem.Soc.*, **1995**, *142*, 3357-3365

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46. "Microfabricated Heavy Metal Ion Sensor", G. T. A. Kovacs, C. W. Storment, and S. P. Kounaves, *Sensors and Actuators B*, **1995**, *B23*, 41-47

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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

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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.Storment, A.F.Flannery, S.P. Kounaves, and G.T.A. Kovacs, *Transducers'95-Eurosensors IX*, 8th International Conference on Solid-State Sensors & Actuators, Sweden, *2*, **1995**, 932-934

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5. "Iridium Based Ultramicroelectrodes: Development and Use in Electrochemical Analysis" S. P. Kounaves, *Platinum Metals Rev.*, **1990**, *34*, 131-134

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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. Storment, 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 (Past Five Years)

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 ClO_4 & 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 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.

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