

Steven S. Andrews

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EDUCATION

- 2001 Stanford University. PhD in Chemistry and PhD minor in Physics.
• Dissertation: The Measurement and Physics of Vibrational Stark Effects
• Annual Reviews Prize in Physical Chemistry.
- 1991 Dartmouth College. B.A. in Chemistry.
• Thesis: An Integral Equation Treatment of a Compressible Fluid
• Awards: *cum laude* with high honors; Associate member of Sigma Xi;
Haseltine Chemistry-Physics Prize; First place Thayer Math Prize.

RESEARCH EXPERIENCE

- 2020-present University of Washington Department of Bioinformatics (Seattle, WA). Programmer. Mentor: Herbert Sauro. Cell biology modeling.
- 2009-present Fred Hutchinson Cancer Research Center (Seattle, WA). Research Associate 2009-2014, Research Affiliate 2014-present. Mentor: Roger Brent. Cell biology modeling.
- 2016-2016 Isaac Newton Institute for Mathematical Sciences (Cambridge, UK). Invited participant in 6-month program on “Stochastic Dynamical Systems in Biology: Numerical Methods and Applications” organized by R. Erban, D. Holcman, S. Isaacson, and K. Zygalakis. Chemical reaction modeling.
- 2006-2009 Molecular Sciences Institute (Berkeley, CA). Consultant 2006-2007, Research Fellow 2008-2009. Director: Roger Brent. Stochastic simulation method development and cell biology modeling.
- 2007 National Centre for Biological Sciences (Bangalore, India). Visiting scientist. Host: Upinder Bhalla. Simulation method development.
- 2003-2007 Lawrence Berkeley National Laboratory (Berkeley, CA). Research Associate 2003-2007 with Adam Arkin, Post-doc 2005-2006 with Jay Groves and Adam Arkin. Cell biology experiments and modeling.
- 2001-2003 University of Cambridge (Cambridge, UK). Research Associate. Supervisor: Dennis Bray. Stochastic simulation method development and cell biology modeling.
- 1994-2001 Stanford University (Stanford, CA). Graduate student. Advisor: Steven Boxer. Experimental and theoretical chemical physics.
- 1993-1994 Woods Hole Oceanographic Institution (Woods Hole, MA). Research Assistant. Mentor: Oliver Zafiriou. Experimental chemical oceanography.
- 1991-1992 Mount Washington Observatory (Gorham, NH). Intern. Mentors: Kenneth Rancourt, Joel White, and Guy Gosslin. Experimental meteorology and icing research.
- 1991 Dartmouth College. (Hanover, NH). Undergraduate research and Research Assistant. Advisor: Jane Lipson. Polymer physics theory.

TEACHING EXPERIENCE

- 2015-present Seattle University. Adjunct physics professor.
- Designed and taught “The World of Light” (UCOR 1810, lecture and lab), 2015, 2015, 2017, 2018, 2019.
 - Taught “Mechanics” (PHYS 1050, lecture and lab), 2016, 2018, 2019; “Thermodynamics, Optics, and Modern Physics” (PHYS 1070, lecture and lab), 2018, 2019; “Statistical and Thermal Physics” (PHYS 4200, lecture), 2017; Electricity and Magnetism (PHYS 1221, lab), 2018.
 - Advised James Tretton on a mathematics senior synthesis project and Ethan Hunt on a study of macromolecular crowding, 2019.
- 2014-2015 European Molecular Biology Laboratory. Instructor.
- Designed and taught “Stochastic Events” course at 1-week workshops on “Modelling Cellular Processes in Space and Time” (lecture and lab), 2014 and 2015. Organizer: François Nédélec.
- 2009-2016 Tutorials on the Smoldyn software. Instructor for 2-hour to 1-day classes.
- Taught at Cambridge University, Oxford University, University of Kent, and European Molecular Biology Laboratory, 2016.
 - Taught at q-bio conferences, 2012, 2014, 2015, 2016, 2017, 2019.
 - Taught at EU/India Grid II Symposium, 2011.
 - Taught at International Conference on Systems Biology, 2009.
- 2010 Fred Hutchinson Cancer Research Center. Instructor for 7-lecture series.
- Designed and taught “Introduction to biological modeling” (lecture).
- 2008-2009 Molecular Sciences Institute. Research Fellow.
- Mentor for Nathan Addy, scientific programmer.
- 1994-2001 Stanford University. Graduate student.
- Head TA for Advanced freshman chemistry (Chem 32) for J.P. Coleman and R.N. Zare, 1995.
 - TA for: Physical chemistry laboratory (Chem 174) for C.E.D. Chidsey, 1995; Beginning chemistry laboratory (Chem 36) for K.O. Hodgson, 1995; Advanced freshman chemistry (Chem 32) for J.P. Coleman and R.N. Zare, 1994.
 - Volunteer instructor for introductory and advanced wilderness skills (GES 7) for Dennis Bird, 1997-2001.
 - Primary undergraduate advisor for 8 Stanford students, 1995-1997.
- 1992 Barrier Island Environmental Education Center. Instructor.
- Taught coastal ecology classes for children in fourth to eighth grades, 1992. Supervisor: Ken Alfieri.

RESEARCH SUPPORT

- 2003-2005 NSF/PHY Postdoctoral Fellowship in Biological Informatics (PI). Title: Standard Functional Motifs in Biochemical Networks. This funded part of my LBNL post-doc.
- 2016 Simons Fellowship. Awarded for research at the Isaac Newton Institute on stochastic dynamics of biological systems.

BOOK

Andrews, Steven S. *Light and Waves: A Conceptual Exploration of Physics*. Textbook under contract with Springer. 350 pages, 450 figures. Anticipate publishing 2020.

RESEARCH PUBLICATIONS

42 peer-reviewed publications with 2896 total citations and an h-index of 25.

See citation statistics at: <http://scholar.google.com/citations?user=ByNTWvgAAAAJ>

In preparation

Andrews, Steven S. and Roger Brent “Individual yeast cells signal at different levels but each with good precision” *BioRxiv*, 906867, 2020. Anticipate submitting to *Science*.

Andrews, Steven S. and James Tretton “Physical principles of optical activity and circular dichroism” *J. Chem. Ed.*, submitted 2020.

Published

Papers can be downloaded from: <http://www.smoldyn.org/andrews/publications.html>

Andrews, Steven S. “Effects of surfaces and macromolecular crowding on bimolecular reaction rates” *Physical Biology*, 17:045001, 2020.

Stuart T. Johnston, Christopher N. Angstmann, Satya N.V. Arjunan, Casper H.L. Beentjes, Adrien Coulier, Samuel A. Isaacson, Ash A. Khan, Karen Lipkow, **Steven S. Andrews** “Accurate particle-based reaction algorithms for fixed timestep simulators” *2018 MATRIX Annals*, pp. 149-164, 2020.

Andrews, Steven S. “Rule-based modeling using wildcards” *Methods for Molecular Biology, Methods in Molecular Biology*, 1945:179-202, 2019.

Andrews, Steven S., Roger Brent, and Gabor Balazsi, “Transferring information without distortion” *eLife*, 7:e41894, 2018.

Andrews, Steven S. “Particle-based stochastic simulators” *Encyclopedia of Computational Neuroscience*, 2018.

Andrews, Steven S. “Smoldyn: particle-based simulation with rule-based modeling, improved molecular interaction, and a library interface” *Bioinformatics*, 33:710-717, 2017.

Andrews, Steven S., William J. Peria, Richard C. Yu, Alejandro Colman-Lerner, and Roger Brent. “Push-pull and feedback mechanisms can align signaling system outputs with inputs” *Cell Systems*, 3:444-455, 2016.

Emiola, Akintunde, **Steven S. Andrews**, Carolin Heller, and John George “Crosstalk between the lipopolysaccharide and phospholipid pathways during outer membrane biogenesis in *Escherichia coli*” *Proc. Nat. Acad. Sci. USA*, 113:3108-3113, 2016.

Andrews, Steven S. and Suzannah Rutherford. “A method and on-line tool for maximum likelihood calibration of immunoblots and other measurements that are quantified in batches” *PLoS ONE*, 11:e0149575, 2016.

Robinson, Martin, **Steven S. Andrews**, and Radek Erban. “Multiscale reaction-diffusion simulations with Smoldyn” *Bioinformatics*, 31:2406-2408, 2015.

Emiola, Akintunde, John George, and **Steven S. Andrews**. “A complete pathway model for Lipid A biosynthesis in *Escherichia coli*” *PLoS ONE*, 10:e0121216, 2015.

Andrews, Steven S., Satya N. V. Arjunan, Gianfranco Balbo, Arne T. Bittig, Jérôme Feret, Kazunari Kaizu, and Fei Liu. “Simulating macromolecular crowding with particle and lattice-based methods” in David Gilbert, Monika Heiner, Koichi

- Takahashi, and Adelinde M. Uhrmacher, eds. *Dagstuhl Reports: Multiscale Spatial Computational Systems Biology (Dagstuhl Seminar 14481)*, 4:170-187, 2015.
- Schmidt, Hugo G., Sven Sewitz, **Steven S. Andrews**, and Karen Lipkow. "An integrated model of transcription factor diffusion shows the importance of intersegmental transfer and quaternary protein structure for target site finding" *PLoS ONE*, 9:e108575, 2014.
- Andrews, Steven S.** "Physical models and computational methods for modeling cytoskeletal and DNA filaments" *Physical Biology* 11:011001, 2014. **One of 12 Physical Biology highlights of 2014.**
- Claeys Bouuaert, Corentin, Karen Lipkow, **Steven S. Andrews**, Danxu Liu, and Ronald Chalmers, "The autoregulation of a eukaryotic DNA transposon" *eLife*, 2:e00668, 2013.
- Andrews, Steven S.** "Spatial and stochastic cellular modeling with the Smoldyn simulator" in Jacques van Helden et al., eds. *Bacterial Molecular Networks: Methods and Protocols*, Methods in Molecular Biology, 804:519-542, 2012.
- Gladkov, Denis V., Samuel Alberts, Roshan M. D'Souza, and **Steven Andrews**, "Accelerating the Smoldyn Spatial Stochastic Biochemical Reaction Network Simulator Using GPUs" *Proceedings of the 19th High Performance Computing Symposium (HPC 2011)*, April 3-7, 2011, Boston, MA: Association for Computing Machinery / Special Interest Group on Simulation and Modeling, 2011.
- Andrews, Steven S.**, Nathan J. Addy, Roger Brent, and Adam P. Arkin. "Detailed simulations of cell biology with Smoldyn 2.1" *PLoS Comput. Biol.* e1000705, 2010.
- Andrews, Steven S.** and Adam P. Arkin. "Simulated niche partitioning by bacteria" in Ali Minai, Dan Braha, and Yaneer Bar-Yam, eds. *Unifying Themes in Complex Systems volume V, Proc. of the Fifth International Conference on Complex Systems*, pp. 10-22, 2010.
- Andrews, Steven S.** "Accurate particle-based simulation of adsorption, desorption, and partial transmission." *Physical Biology* 6:046015, 2009.
- Andrews, Steven S.**, Tuan Dinh, and Adam P. Arkin. "Stochastic models of biological processes." *Encyclopedia of Complexity and System Science*, 9:8730-8749, 2009.
- Yu, Richard C., Orna Resnekov, Pia Abola, **Steven S. Andrews**, Kirsten R. Benjamin, Jehoshua Bruck, Ian Burbulis, Alejandro Colman-Lerner, Drew Endy, Andrew Gordon, Mark Holl, Larry Lok, Robert Maxwell, Gustavo Pesce, Eduard Serra, Richard D. Smith, Ty Thomson, Annie Tsong, and Roger Brent. "The Alpha project, a model system for systems biology research" *IEEE Sys. Biol.* 2:222-233, 2008.
- Andrews, Steven S.** and Adam P. Arkin. "A mechanical explanation for cytoskeletal rings and helices in bacteria." *Biophys. J.* 93:1872-1884, 2007.
- Andrews, Steven S.** and Adam P. Arkin. "Systems biology: A switch for sex." *Current Biol.* 17:R410, 2007.
- Andrews, Steven S.** "Review of *System Modeling in Cellular Biology: From Concepts to Nuts and Bolts*, edited by Zoltan Szallasi, Jörg Stelling, and Vipul Periwal" *Quart. Rev. Biol.* 82:145, 2007.
- Andrews, Steven S.** and Adam P. Arkin. "Simulating Cell Biology." *Curr. Biol.* 16:R523-R527, 2006.
- Andrews, Steven S.** "Serial rebinding of ligands to clustered receptors as exemplified by bacterial chemotaxis." *Phys. Biol.* 2:111-122, 2005.
- Lipkow, Karen, **Steven S. Andrews**, and Dennis Bray. "Simulated diffusion of phosphorylated CheY through the cytoplasm of *Escherichia coli*." *J. Bact.* 187:45-53, 2005.

- Adelman, Joshua L. and **Steven S. Andrews**. "Intracellular pattern formation: A spatial stochastic model of bacterial division site selection proteins MinCDE." Complex Systems Summer School Final Papers, Santa Fe Institute, Santa Fe, NM, 2004.
- Andrews, Steven S.** and Dennis Bray. "Stochastic simulation of chemical reactions with spatial resolution and single molecule detail." *Phys. Biol.* 1:137-151, 2004. **One of 6 Physical Biology Highlights of 2004-2005. Single most cited Physical Biology paper 2004-2008.**
- Goldman, Jacki, **Steven S. Andrews**, and Dennis Bray. "Size and composition of membrane protein clusters predicted by Monte Carlo analysis." *Eur. Biophys. J.* 33:506-512, 2004.
- Andrews, Steven S.** "Using rotational averaging to calculate the bulk response of isotropic and anisotropic samples from molecular parameters." *J. Chem Ed.* 81:877-885, 2004.
- Treynor, Thomas P., **Steven S. Andrews**, and Steven G. Boxer. "Intervalence band Stark effect of the special pair radical cation in bacterial photosynthetic reaction centers." *J. Phys. Chem. B* 107:11230-11239, 2003.
- Zafiriou, Oliver C., **Steven S. Andrews**, and Wei Wang. "Concordant estimates of oceanic carbon monoxide source and sink processes in the Pacific yield a balanced global 'blue-water' CO budget." *Global Biogeochemical Cycles* 17:1015, 2003.
- Xie, Huixiang, **Steven S. Andrews**, William R. Martin, Jared Miller, Lori Ziolkowski, Craig D. Taylor, and Oliver C. Zafiriou. "Validated methods for sampling and headspace analysis of carbon monoxide in seawater." *Marine Chem.* 77:93-108, 2002.
- Andrews, Steven S.** and Steven G. Boxer. "Vibrational Stark effects of nitriles. II. Physical origins of Stark effects from experiment and perturbation models." *J. Phys. Chem A* 106:469-477, 2002.
- Andrews, Steven S.** and Steven G. Boxer. "Analysis of noise for rapid-scan and step-scan FTIR difference spectroscopy." *Appl. Spectrosc.* 55:1161-1165, 2001.
- Andrews, Steven S.** and Steven G. Boxer. "Vibrational Stark effects of nitriles. I. Methods and experimental results." *J. Phys. Chem. A.* 104:11853-11863, 2000.
- Andrews, Steven S.** and Steven G. Boxer. "A liquid nitrogen immersion cryostat for optical measurements." *Rev. Sci. Inst.* 71:3567-3569, 2000.
- Andrews, Steven S.**, Sigalit Caron, and Oliver C. Zafiriou. "Photochemical oxygen consumption in marine waters: A major sink for colored dissolved organic matter?" *Limnol. Oceanog.* 45:267-277, 2000.
- Park, Eun Sun, **Steven S. Andrews**, Robert B. Hu, and Steven G. Boxer. "Vibrational Stark spectroscopy in proteins: A probe and calibration for electrostatic fields." *J. Phys. Chem. B* 103: 9813-9817, 1999.
- Weiss, Peter S., **Steven S. Andrews**, James E. Johnson, and Oliver C. Zafiriou. "Photoproduction of carbonyl sulfide in South Pacific Ocean waters as a function of irradiation wavelength." *Geophys. Res. Lett.* 22:215-218, 1995.
- Lipson, J.E.G. and **S.S. Andrews**. "A Born-Green-Yvon Integral Equation Treatment of a Compressible Fluid." *J. Chem. Phys.* 96:1426-1434, 1992.

PUBLICLY AVAILABLE SOFTWARE

Software is an important scholarly product of many of my research projects. My Smoldyn software, listed first, has been particularly significant: it has been the most cited particle-based simulator every year since 2011, and over 50 papers have been published that relied on Smoldyn simulations.

- Andrews, Steven S.** Smoldyn - A Brownian dynamics type simulation of reaction-diffusion systems at the Smoluchowski level of approximation. 2003 (latest version 2019). Website: <http://www.smoldyn.org>
- Andrews, Steven S.** HillSim/NodeSolver - A signaling system analyzer and optimizer. 2008 (latest version 2016).
- Andrews, Steven S.** SmolCrowd - A utility for generating random crowded systems in Smoldyn format. 2008 (latest version 2009).
- Andrews, Steven S.** wrl2smol - A utility for converting VRML format data to Smoldyn format. 2007 (latest version 2008).
- Andrews, Steven S.** Helices – A specialized suite of programs for investigating the statistical mechanics of semi-flexible membrane-bound protein polymers. 2007.
- Andrews, Steven S.** Rebinding - A specialized program for investigating the rebinding of a ligand to a cluster of receptors. 2005.
- Andrews, Steven S.** SpectFit - An interactive program for fitting and manipulating data. Macintosh. 1996 (latest version released 2002).

INVITED ORAL PRESENTATIONS

- Andrews, S.S.** “How cells think”, Seattle University, Seattle, WA, 2020 (Host: David Boness).
- Andrews, S.S.** “Improved particle based reaction algorithms”, MATRIX Institute, Creswick, Victoria, Australia, 2018 (Host: Mark Flegg).
- Andrews, S.S.** “How cells signal precisely: insights from spatial and stochastic modeling”, Oregon Health and Science University, Portland OR, 2018 (Host: Dan Zuckerman).
- Andrews, S.S.** “Biology: Order amid chaos”, Seattle University, Seattle WA, 2017 (Host: David Boness).
- Andrews, S.S.** “The laws of physics within biological cells”, Seattle University, Seattle WA, 2016 (Host: David Boness).
- Andrews, S.S.** “Modeling biological signaling with spatial and stochastic detail”, European Molecular Biology Laboratory, Heidelberg, Germany, 2016 (Host: Karin Sasaki).
- Andrews, S.S.** “Computational methods for simulating biological systems with spatial and stochastic detail” University of Kent, UK, 2016 (Host: Dominique Chiu)
- Andrews, S.S.** “Using stochastic modeling to understand high fidelity cell signaling” University of Kent, UK, 2016 (Host: Chieh Hsu)
- Andrews, S.S.** “Spatial/stochastic and non-spatial/non-stochastic models” Workshop on Modeling Cellular Processes in Space and Time, Porquerolles, France, 2015 (Host: François Nédélec).
- Andrews, S.S.** “On-Lattice and off-Lattice Hybrid Simulation Using the Smoldyn Software”, SIAM meeting, Salt Lake City, 2015 (Host: Andreas Hellander).
- Andrews, S.S.** “Mechanisms for high fidelity cell signaling”, AMOLF, Amsterdam, Netherlands, 2014 (Host: Tom Shimizu).
- Andrews, S.S.** “Mechanisms for high fidelity cell signaling”, Delft, Netherlands, 2014 (Host: Thomas Hermans).
- Andrews, S.S.** “The Smoldyn simulator: overview, applications, and hybrid simulation”, Dagstuhl Seminar on Multiscale Spatial Computational Systems Biology, Dagstuhl, Germany, 2014 (Host: Monika Heiner).
- Andrews, S.S.** “The Smoldyn simulator: particle simulation now and filament ambitions”, Royal Society International Scientific Seminar on Chromatin Dynamics: Computational Models and Experimental Data, Cambridge, UK, 2014 (Host: Karen Lipkow).
- Andrews, S.S.** “The Smoldyn simulator: overview, applications, and hybrid simulation” Particle-Based Stochastic Reaction-Diffusion Models in Biology workshop, Banff, AB, Canada, 2014 (Host: Sam Isaacson).

- Andrews, S.S.** “Mechanisms for high fidelity cell signaling” q-bio summer school symposium, Albuquerque, NM, 2014 (Host: Bill Hlavacek).
- Andrews, S.S.** “Smoldyn: spatial cell biology simulation” q-bio conference, Santa Fe, NM, 2014 (Host: Bill Hlavacek).
- Andrews, S.S.** “Challenges and opportunities for particle-based simulation” HPCS-SMP Workshop on Simulation and Modeling in Biology, Berkeley, CA, 2014 (Host: Phil Colella).
- Andrews, S.S.** “The Smoldyn biochemical simulator” Workshop on critical challenges for spatially and temporally realistic cell modeling, Pittsburgh, PA, 2013 (Host: James Faeder).
- Andrews, S.S.** “Modeling cell biology with spatial and stochastic detail” The Fourth International Workshop on Static Analysis and Systems Biology (SASB), Seattle WA, 2013 (Host: Jérôme Feret). **Keynote presentation.**
- Andrews, S.S.** “Using Smoldyn to model cell biology with spatial and stochastic detail” q-bio conference, Santa Fe, NM, 2012 (Host: William Hlavacek).
- Andrews, S.S.** “How yeast convey information accurately” q-bio summer school, Santa Fe NM, 2012 (Host: William Hlavacek).
- Andrews, S.S.** “Beyond particle-based simulation: rule-based and filament modeling” University of Oxford, 2012 (Host: Radek Erban.)
- Andrews, S.S.** “How yeast convey information accurately” University of Connecticut Health Center, 2012 (Host: Leslie Loew).
- Andrews, S.S.** “Biochemical signaling mechanisms that maximize information transmission” University of Washington, 2012 (Host: Paul Wiggins)
- Andrews, S.S.** “Modeling cell biology with spatial and stochastic detail” University of Pittsburgh / Carnegie Mellon University computational biology seminar, 2011 (Host: Jim Faeder.)
- Andrews, S.S.** “Modeling cell biology with spatial and stochastic detail” International Conference on Systems Biology, Mannheim, Germany, 2011 (Host: Ursula Kummer.)
- Andrews, S.S.** “Particle-based cell simulation with Smoldyn” EU/India Grid II Symposium, Cambridge, UK, 2011 (Host: Karen Lipkow.)
- Andrews, S.S.** “Modeling cell biology with spatial and stochastic detail” EU/India Grid II Symposium, Cambridge, UK, 2011 (Host: Karen Lipkow.) **Keynote presentation.**
- Andrews, S.S.** “Simulating cell biology with spatial accuracy and single molecule detail” University of Uppsala, Uppsala, Sweden, 2011 (Host: Johan Elf.)
- Andrews, S.S.** “Mechanics can explain coiled shapes of bacterial cytoskeletal polymers.” Computational biology seminar, FHCR, Seattle, WA, 2009 (Host: Phil Bradley.)
- Andrews, S.S.** “Simulating biology with spatial accuracy and single molecule detail.” University of British Columbia math department seminar, 2009 (Host: Eric Cytrynbaum.)
- Andrews, S.S.** “Mechanics can explain coiled shapes of bacterial cytoskeletal polymers” ICSB/SMB, Vancouver, BC, 2009, (Host: Omer Dushek.)
- Andrews, S.S.** “New particle-based simulation algorithms for molecule-membrane interactions enable a yeast signaling model” Talk at the Int. Conf. on Math. Biol. and Annual Meeting of Society for Math. Biol. (ICSB/SMB). Vancouver, BC, 2009 (Host: Jun Allard.)
- Andrews, S.S.** “Ongoing computational work at the Molecular Sciences Institute and the CQGF supporting quantitative understanding of cell signaling.” Centers of Excellence in Genomic Sciences meeting, Caltech, Pasadena, CA, 2008.
- Andrews, S.S.** “The Smoldyn biochemical simulator: Algorithms and applications.” European Conference on Mathematical and Theoretical Biology, Edinburgh, Scotland, 2008. (Host: Radek Erban.)
- Andrews, S.S.** “Smoldyn: A new tool for simulating cell biology.” EU/India Grid Symposium. Bangalore, India, 2007.
- Andrews, S.S.** “Kinetics of reactions and diffusion inside cells” 2nd Workshop on Mathematical Aspects of Systems Biology. Göteborg, Sweden, 2007.
- Andrews, S.S.** “Mechanics explains the structures of coiled polymers in bacteria” SIAM/SMB Conference on Life Sciences. Raleigh, NC, 2006. (Host: Sam Isaacson.)

- Andrews, S.S.** “Simulating biology with space and stochastics” Molecular Sciences Institute, Berkeley, CA, 2006.
- Andrews, S.S.** “Challenges in network inference” EMBL, Heidelberg workshop on Structure and Dynamics of Biochemical Networks. Heidelberg, Germany, 2006.
- Andrews, S.S.** “Inferring biochemical reaction network structure from experimental data” EMBL, Heidelberg workshop on Structure and Dynamics of Biochemical Networks. Heidelberg, Germany, 2006.
- Andrews, S.S.** “Physical causes of spatial structure in bacteria” University of California at Merced. Merced, CA, 2006.
- Andrews, S.S.** and D. Bray, “Molecular level simulations of biochemical diffusion and reactions.” First International *E. coli* Alliance Conference on Systems Biology of *E. coli*. Tsuruka, Japan, 2003. (Host: Masaru Tomita.)

POSTERS AND OTHER ORAL PRESENTATIONS

- Andrews, S.S.** “Macromolecular crowding effects on diffusion-influenced reaction rates” Poster at q-bio conference, 2019.
- Andrews, S.S.** “Rule-based modeling using wildcards” Poster at q-bio conference, 2017.
- Andrews, S.S.** “Smoldyn Tutorial” Talk at q-bio conference, 2017.
- Andrews, S.S.**, A. Colman-Lerner, and R. Brent, “Mechanisms for high fidelity cell signaling” Poster at Oregon State University Center for Genome Research and Biocomputing Fall Conference, 2016.
- Andrews, S.S.**, A. Colman-Lerner, and R. Brent, “Mechanisms for high fidelity cell signaling” Poster at q-bio conference, 2016.
- Andrews, S.S.** “Smoldyn Tutorial” Talk at q-bio conference, 2016.
- Andrews, S.S.** “Smoldyn: cell biology simulation with spatial detail” Poster at Isaac Newton Institute, 2016.
- Andrews, S.S.** “Smoldyn: Spatial Cell Biology Simulation” Talk at q-bio conference, 2015.
- Andrews, S.S.** “Reverse Engineering Cell Biology” Seattle University, 2015 (Host: David Boness).
- Andrews, S.S.**, R.C. Yu, G. Pesce, and R. Brent “Signaling mechanisms that can yield Dose-Response Alignment.” Poster at FHCRC Basic Sciences Retreat, 2014.
- Andrews, S.S.**, R.C. Yu, G. Pesce, and R. Brent “Signaling mechanisms that can yield Dose-Response Alignment.” Poster at q-bio conference, 2014.
- Andrews, S.S.**, R.C. Yu, G. Pesce, and R. Brent “Signaling mechanisms that can yield Dose-Response Alignment.” Poster at FHCRC Basic Sciences Retreat, 2012.
- Andrews, S.S.** “Chemical reaction rate constants are not constant.” Poster at FHCRC Basic Sciences Retreat, 2011.
- Andrews, S.S.** “Cell biology modeling.” Poster at FHCRC Basic Sciences Retreat, 2010.
- Andrews, S.S.** “Smoldyn: a simulator for cellular systems biology.” Poster at SBML hackathon, 2010.
- Andrews, S.S.** “Simulating biology with high spatial resolution.” Talk at FHCRC Friday seminar series, 2010.
- Andrews, S.S.** and N.J. Addy “Particle-based cellular simulation with Smoldyn” Talk at International Conference on Systems Biology, Stanford, CA 2009.
- Andrews, S.S.** and K. Lipkow, “Smoldyn: a simulator for cellular systems biology” Poster at the International Conference on Systems Biology, Stanford, CA, 2009.
- Andrews, S.S.** and K. Lipkow, “Smoldyn: a simulator for cellular systems biology” Poster at the Institute for Mathematics and its Applications Conference, and at Apple’s Worldwide Developer’s Conference, 2008.
- Andrews, S.S.**, Moghaddam, A., and J.T. Groves, “Quantification of reaction rates in the *E. coli* Min system” Poster at American Chemical Society national meeting, 2006.

- Andrews, S.S.** and A.P. Arkin, "Mechanics explains coiled protein polymers in bacteria" Poster at American Society of Microbiology general meeting, 2006.
- Andrews, S.S.** and A.P. Arkin, "Mechanics explains coiled protein polymers in bacteria" Poster at Keystone Symposium on Systems Biology: Integrating Biology, Technology and Computation, 2006.
- Andrews, S.S.** and A.P. Arkin, "Helices in bacteria: simulations of membrane-bound protein polymers." Poster at the QB3 Symposium on Cell Membrane Systems and Technology, 2005.
- Andrews, S.S.** and A.P. Arkin, "Helices in bacteria: simulations of membrane-bound protein polymers." Poster at the Third International Symposium on Computational Cell Biology, 2005.
- Andrews, S.S.**, J. Adelman, and A.P. Arkin, "Simulated spontaneous oscillation and pattern formation by Min proteins." Poster at the Second International *E. coli* Alliance Conference on Systems Biology, 2004.
- Andrews, S.S.** and A.P. Arkin, "Simulated niche partitioning by bacteria." Talk at the International Conference on Complex Systems, 2004.
- Andrews, S.S.** and Dennis Bray, "Reaction and diffusion simulations at the molecular level." Poster at the Second International Symposium on Computational Cell Biology, 2003.
- Treynor, T.P., **S.S. Andrews**, and S.G. Boxer, "Stark spectroscopic investigation of the electronic properties of the Rb. sphaeroides special pair radical cation at 77 K." Poster by T. Treynor at Biophysical Society meeting, 2002.
- Wang, W., **S.S. Andrews**, and O.C. Zafiriou, "The marine carbon dioxide budget: global blue-water photoproduction of ~40 Tg CO-C/year based on concordant source and sink estimates in the N. and S. Pacific." Poster by W. Wang at American Society for Limnology and Oceanography meeting, 2001.
- Andrews, S.S.** and S.G. Boxer, "Vibrational Stark effects of nitriles." Poster at American Chemical Society meeting, 2000.
- Park, E.S., **S.S. Andrews**, R.B. Hu, and S.G. Boxer, "Vibrational Stark spectroscopy in proteins: a probe and calibration for electrostatic fields." Poster by E. Park at American Chemical Society meeting, 2000.
- Park, E.S., **S.S. Andrews**, R.B. Hu, and S.G. Boxer, "Vibrational Stark spectroscopy in proteins: a probe and calibration for electrostatic fields." Poster by E. Park at Biophysical Society meeting, 2000.
- Zafiriou, O.C. and **S.S. Andrews**, "Photoproduction of CO in N. and S. Pacific surface waters: wavelength dependent quantum yields, potential rates, and the origins of precursor CDOM." Talk by O. Zafiriou at American Society of Limnology and Oceanography meeting, 1997.

REFERENCES

The following list includes supervisors, mentors, and particularly close colleagues. Most have written letters of recommendation for me and I am sure would be happy to recommend me again.

Adam Arkin. Physical Biosciences Division, Lawrence Berkeley National Laboratory, 1 Cyclotron Road, M.S. 955-512L, Berkeley, CA 94720. Phone: 510-495-2116. E-mail: aparkin@lbl.gov.

Upinder Bhalla. National Centre for Biological Sciences, Tata Institute for Fundamental Research, GKVK Bellary Road, Bangalore 560065, India. E-mail: bhalla@ncbs.res.in.

David Boness. Department of Physics, Seattle University, 901 12th Avenue, Seattle WA 98122. Phone: 206-296-5924. E-mail: dboness@seattleu.edu.

Steven Boxer. Department of Chemistry, Stanford University, 380 Roth Way, Keck-325, Stanford, CA 94305. Phone: 650-723-4482. E-mail: sboxer@stanford.edu.

Dennis Bray. Department of Physiology, Development and Neuroscience (emeritus), University of Cambridge, Cambridge CB2 3DY, UK. Phone: +44-1223-333771. E-mail: db10009@cam.ac.uk.

Roger Brent. Division of Basic Sciences, Fred Hutchinson Cancer Research Center, 1100 Fairview Ave N., Seattle, WA 98109. Phone: 206-667-1482. E-mail: rbrent@fhcrc.org.

Alejandro Colman-Lerner. Department of Physiology, Molecular and Cellular Biology, University of Buenos Aires, Buenos Aires, Argentina. Phone: (+54-11) 4576-3368. E-mail: alerner2@gmail.com.

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