Arthur La Porta

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EDUCATION

Ph.D. in physics, University of California, San Diego (1996).
Thesis title : Pattern Dynamics and Spatiotemporal Disorder in Traveling-wave Convection
Thesis advisor: Clifford M. Surko
B.A. in physics, Columbia College, Columbia University, (1984).

PROFESSIONAL

Assistant Professor, September 2006, Department of Physics and Institute of Physical Science and Technology, University of Maryland, College Park.

Research Associate, January 2005–present, Department of Biological Sciences, Stanford University. Steven M. Block, advisor.

Research Associate, 2001–2004, Laboratory of Atomic and Solid State Physics Cornell University. Michelle D. Wang, advisor.

Post-Doctoral Researcher, 1997–2001, Laboratory of Atomic and Solid State Physics Cornell University. Eberhard Bodenschatz, advisor.

Doctoral Candidate, 1992–1996, Post-Doctoral Researcher, 1996–1997, Department of Physics, University of California, San Diego. Thesis research in experimental physics. Clifford M. Surko, advisor.

Teaching Assistant, 1991–1992, Department of Physics, University of California, San Diego. Coordinator of introductory physics lecture course.

Member Technical Staff, 1986–1991, Department of Optical Physics, AT&T Bell Laboratories. Research and technical support in nonlinear optics, photonics and biophysics.

PUBLICATIONS

Kristina Herbert, Arthur La Porta, Becky J. Wong, Rachel A. Mooney, Keir C. Neuman, Robert Landick, Steven M. Block, *Sequence-resolved Detection of Pausing by Single RNA Polymerase Molecules on Periodic Templates Reveals an Elemental Pause State*, Cell 125, p. 1083 (2006).

Arthur La Porta and Michelle D. Wang, *Optical Torque Wrench: Angular Trapping, Rotation and Torque Detection of Quartz Microparticles*, Physical Review Letters **92**, 190801 (2004).

Arthur La Porta and David Kleinfeld, *Interferometric detection of action potentials in vitro*, in Imaging in Neuroscience and Development: A Laboratory Manual (R. Yuste and A. Konnerth, editors), 2003, Cold Spring Harbor Laboratory Press, NY, in press.

Karen Adelman, Julia Yuzenkova, Arthur La Porta, Nikolay Zenkin, Jookyung Lee, John T. Lis, Sergei Borukhov, Michelle D. Wang and Konstantin Severinov, *Molecular Mechanism of Transcription Inhibition by Peptide Antibiotic Microcin J25*, Molecular Cell, **14** p. 753 (2004).

David Kleinfeld and Arthur La Porta, *Detection of Action Potentials in Vitro by Changes in Refractive Index.*, In Light Scattering Imaging of Neural Tissue Function (D. M. Rector and J. S. George, editors), 2003, Humana Press, in press.

Karen Adelman, Arthur La Porta, Thomas J. Santangelo, John T. Lis, Jeffery W. Roberts and Michelle D. Wang, *Single Molecule Analysis of RNA Polymerase Elongation Reveals Uniform Kinetic Behavior*, PNAS **99** p. 13538-13543 (October 15, 2002).

Arthur La Porta, Greg A. Voth, Alice M. Crawford, Jim Alexander and Eberhard Bodenschatz, *Fluid Particle Accelerations in Fully Developed Turbulence*, Nature **409** p. 1017–1019 (February 22, 2001).

Greg A. Voth, Arthur La Porta, Alice M. Crawford, Jim Alexander and Eberhard Bodenschatz, *Measurement of Fluid Particle Accelerations in Fully Developed Turbulence*, Journal of Fluid Mechanics **469** p. 121–160 (2002).

Arthur La Porta, Greg A. Voth, F. Moisy and Eberhard Bodenschatz, *Using Cavitation to Measure Statistics of Low-Pressure Events in Large-Reynolds-Number Turbulence*, Physics of Fluids **12** p. 1485–1496 (2000).

Arthur La Porta and C. M. Surko, *Predicting the Motion of Phase Defects in a Traveling-Wave Convection Pattern*, Physica D, **139** p. 177–185 (2000).

Arthur La Porta and C. M. Surko, *Quantitative Characterization of 2D Traveling-Wave Patterns*, Physica D, **123** p. 21 (1998).

Arthur La Porta and C. M. Surko, *Convective Instability in a Fluid Mixture Heated from Above*, Physical Review Letters **80** p. 3759 (1998).

Arthur La Porta and C. M. Surko, *Phase Defects and Spatiotemporal Disorder in Travelingwave Convection Patterns*, Physical Review E **56** p. 5351 (1997).

Arthur La Porta and C. M. Surko, *Reflection of Nonlinear Waves from a Domain Boundary*, Physical Review E Rapid Communications, **55** p. R6327 (1997).

Arthur La Porta and C. M. Surko, *Phase Defects as a Measure of Disorder in Traveling-Wave Convection*, Physical Review Letters **77** p. 2678 (1996).

Arthur La Porta, K. D. Eaton and C. M. Surko, *Transition from Curved to Angular Texture in Binary Fluid Convection*, Physical Review **E53**, p. 570 (1996).

Arthur La Porta and C. M. Surko, *Dynamics of 2D Traveling-wave Convection Patterns*, Physical Review **E53**, p. 5916 (1996).

R. P. Barber, L. M. Merchant, A. La Porta, R. C. Dynes, *Tunneling into Granular Pb Films in the Superconducting and Insulating Regimes*, Physical Review **B49**, p. 3409 (1994).

Arthur La Porta and R. E. Slusher, *Squeezing Limits at High Parametric Gain*, Physical Review **A44**, p. 2013 (1991).

R. A. Stepnoski, Arthur La Porta, F. Raccuia-Behling, G. E. Blonder, R. E. Slusher and D. Kleinfeld, *Noninvasive Detection of Changes in Membrane Potential in Cultured Neurons by Light Scattering.* Proceedings of the National Academy of Science **88**, p. 9382 (1991).

Arthur La Porta, R. E. Slusher and B. Yurke, *Back-Action Evading Measurements of an Optical Field Using Parametric Down Conversion*, Physical Review Letters, **62**, p. 28 (1989).

R. E. Slusher, P. Grangier, A. La Porta, B. Yurke and M. J. Potasek, *Pulsed Squeezed Light*, Physical Review Letters, **59**, p. 2566 (1987).

P. Grangier, R. E. Slusher, R. E., B. Yurke and A. La Porta, *Squeezed Light Enhanced Polarization Interferometer,* Physical Review Letters, **59**, p. 2153 (1987).

R. E. Slusher, B. Yurke, P. Grangier, A. La Porta, D. F. Walls and M. Reid, *Squeezed-Light Generation by Four-Wave Mixing Near An Atomic Resonance,* Journal of the Optical Society of America B, **4** p. 1454 (1987).

INVITED PRESENTATIONS

Observing the Sequence Specific Kinetics of RNA Polymerase Using Optical Tweezers, University of New Mexico, Physics Colloquium, October 27, 2006.

Watching RNA Polymerase Transcribe of Not Transcribe a Gene using Optical Tweezers, Physics Colloquium, Georgetown University, September 26, 2006.

Sequence Resolved, Single Molecule Measurements of Transcriptional Elongation, Nucleic Acids Enzyme FASEB Meeting, Saxton's River, Vermont, June 14, 2006.

Using force and torque based optical trap assays to probe the role of pausing in transcriptional regulation. Structural Biology/Biophysics Seminar, Pittsburgh University, November 3, 2005.

Angular Trapping of Nano-Particles: Rotating and Applying Torque to Biological Molecules with Optical Tweezers, Physics Colloquium, Georgia Tech, March 8, 2005

Angular Trapping of Nano-Particles: Rotating and Applying Torque to Biological Molecules with Optical Tweezers, Physics Colloquium, University of Maryland, College Park, March 1, 2005

Angular Trapping of Nano-Particles: Rotating and Applying Torque to Biological Molecules with Optical Tweezers, Physics Colloquium, Emory University, Physics Colloquium, February 24, 2005.

Angular Trapping of Nano-Particles: Rotating and Applying Torque to Biological Molecules with Optical Tweezers, Physics Colloquium, University of Texas, Austin, February 21, 2005

Angular Trapping of Nano-Particles: Rotating and Applying Torque to Biological Molecules with Optical Tweezers, Physis Colloquium, Brandeis University, February 1, 2005

Angular Trapping of Nano-Particles: Rotating and Applying Torque to Biological Molecules with Optical Tweezers, Aspen Center for Physics, Single Molecule Biophysics Conference January 7, 2005

Angular Trapping of Nano-Particles: Rotating and Applying Torque to Biological Molecules with Optical Tweezers, Biophysics Colloquium, Ecole Normale Sup´erieure, Paris, October 29, 2004

Angular Trapping of Nano-Particles: Rotating and Applying Torque to Biological Molecules with Optical Tweezers, Seminar, Institut f¨ur Physikalische Chemie, Universit¨at Heidelberg, October 25, 2004

Angular Trapping of Nano-Particles: Rotating and Applying Torque to Biological Molecules with Optical Tweezers, Sonderseminar, Max Planck Institut f¨ur Str¨omungforschung, G¨ottingen, October 22, 2004

Angular Trapping of Nano-Particles: Rotating and Applying Torque to Biological Molecules with Optical Tweezers, Physics and Chemistry Colloquium, Sandia National Laboratories, July 21, 2004

Angular Trapping of Nanoparticles: Rotating and Applying Torque to Biological Molecules with Optical Tweezers, Platform Seminar, NBTC, Cornell University, April 8, 2003

Lagrangian Measurements in Turbulent Flow, Institute for Theoretical Physics, UCSB, Program on Physics of Hydrodynamic Turbulence, June 15, 2000

Using a Detector Developed for Particle Physics to Probe Intermittency in Turbulence, Special Physics Seminar, Department of Physics, University of Toronto, April 6, 2000

Using a Detector Developed for Particle Physics to Probe Intermittency in Turbulence, Complex Systems Seminar, Department of Physics, University of California, San Diego March 30, 2000

Pressure Statistics and Cavitation in Large-Reynolds-Number Turbulence, Complex Systems Seminar, Department of Physics, University of California, San Diego November 2, 1998

Predicting the Motion of Defects in a Traveling-Wave Pattern, Complex Systems Seminar, Department of Physics, University of California, San Diego October 20, 1997

Phase Defects as a Measure of Disorder in a Traveling-Wave Pattern, Nonlinear Dynamics Seminar, University of Texas at Austin, September 8, 1997

Phase Defects as a Measure of Disorder in Traveling-Wave Convection, invited talk, 1997 March Meeting of the American Physical Society.

Phase Defects and Spatiotemporal Disorder in Traveling-wave Convection, Special Physics Seminar, University of Maryland at College Park, January 27, 1997.

CONTRIBUTED PRESENTATIONS

Arthur La Porta, Kristina M. Herbert, Becky J. Wong, Rachel Mooney, Keir C. Neuman, Robert Landick, Jeff Gelles, Steven M. Block, *Technique for Aligning Single-molecule Transcription Records with the Underlying DNA Sequence*, poster, 2006 Meeting of the Biophysical Society.

Arthur La Porta and Michelle D. Wang, *Angular Trapping of Micro-Particles: Rotating and Applying Torque to Biological Molecules with Optical Tweezers* , poster, 2004 Meeting of the Biophysical Society.

Arthur La Porta Karen Adelman, Thomas J. Santangelo, Jeffery W. Roberts and Michelle D. Wang, *Kinetic analysis of transcription of a DNA template by individual RNA polymerase molecules*, poster, 2003 Meeting of the Biophysical Society.

Arthur La Porta Alice M. Crawford, Greg A. Voth, Eberhard Bodenschatz, Jim Alexander, *Acceleration-Velocity Correlations for Particle Trajectories in Turbulence*, contributed talk, 2000 Meeting of the Division of Fluid Dynamics of the American Physical Society.

A. La Porta Greg A. Voth, Alice M. Crawford, Eberhard Bodenschatz, Jim Alexander, *Statistics of Lagrangian Variables in High Reynolds Number Turbulence*, contributed talk, 2000 March Meeting of the Americal Physical Society.

A. La Porta Greg A. Voth, Alice M. Crawford, Eberhard Bodenschatz, Jim Alexander, *Accelerations of Finite Size Particles in Turbulence*, contributed talk, 1999 Meeting of the Division of Fluid Dynamics of the Americal Physical Society.

A. La Porta, Greg A. Voth, Eberhard Bodenschatz, Pablo Hopman and Jim Alexander, *Measuring the Statistics of Lagrangian Variables in Large Reynolds Number Turbulence*, contributed talk, 1999 Centenial Meeting of the Americal Physical Society.

C. M. Surko and A. La Porta, *Predicting the Motion of Defects in a Traveling-Wave Convection Pattern*, contributed talk, 1999 Centennial Meeting of the Americal Physical Society.

A. La Porta Greg A. Voth, Eberhard Bodenschatz and Frederic Moisy, *Using Cavitation to Probe Pressure Fluctuations in a Turbulent Flow*, contributed talk, 1998 Meeting of the Division of Fluid Dynamics of the Americal Physical Society.

A. La Porta and C. M. Surko, *Fingering Patterns in Soret Convection at Negative Rayleigh Number*, contributed talk, 1997 March Meeting of the Americal Physical Society.

A. La Porta and C. M. Surko, *Phase Defects as a Measure of Disorder in Traveling-Wave Convection*, contributed talk, 1996 Meeting of the Division of Fluid Dynamics of the Americal Physical Society.

C. M. Surko and A. La Porta *Fingering Instability in Soret Convection with Negative Separation Ratio*, contributed talk, 1996 Meeting of the Division of Fluid Dynamics of the Americal Physical Society.

A. La Porta and C. M. Surko, *Domain Boundaries in Traveling-Wave Convection Patterns*, contributed talk, 1996 March Meeting of the Americal Physical Society.

A. La Porta and C. M. Surko, *Dynamics of 2-D Traveling-wave Convection Patterns*, contributed talk, 1995 Meeting of the Division of Fluid Dynamics of the Americal Physical Society.

A. La Porta, K. D. Eaton and C. M. Surko, *Transition from Curved to Angular Texture in Binary Fluid Convection*, contributed talk, 1995 Meeting of the Division of Fluid Dynamics of the Americal Physical Society.

A. La Porta and C. M. Surko, *2-D Traveling-Wave Phenomena in Binary Fluid Convection*, contributed talk, 1995 March Meeting of the Americal Physical Society.

A. La Porta, R. Stepnoski, F. Raccuia-Behling, R. E. Slusher, G. E. Blonder. and D. Kleinfeld, *Recording Action Potentials in Cultured Neurons via Intrinsic Optical Signals.*, contributed talk, 1990 Meeting of the Optical Society of America.

A. La Porta, R. E. Slusher, *Squeezing Limits at High Parametric Gain*, contributed talk, 1990 Meeting of the Optical Society of America.

PROFESSIONAL ASSOCIATIONS

Member, Biophysical Society, America Physical Society.
Referee, Nature, Physical Review Letters, Physical Review E, Experiments in Fluids.

HONORS

UCSD Department of Physics Regents Fellowship (1991-1992)
AT&T Individual Performance Award (1991)
Elected Phi Beta Kappa, Columbia College (1984)
Magna cum Laude, Columbia College (1984)