CURRICULUM VITAE

PATRICK C. STOLLER

PRESENT POSITION

Postdoctoral fellow
Biomedical Photonics Division
Institute of Applied Physics
University of Bern

CONTACT INFORMATION

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EDUCATION

July 1998 – December 2002	Ph.D. in Engineering-Applied Science, University of California, Davis and Lawrence Livermore National Laboratory. Dissertation title: "Polarization-modulated second harmonic generation microscopy in collagen." Thesis advisers: Prof. Dennis Matthews, Dr. Peter Celliers, and Dr. Karen Reiser
July 1997 – May 1998	Massachusetts Institute of Technology, Department of Earth, Atmospheric and Planetary Sciences. Supervisor: Prof. Reginald Newell
August 1994 – May 1997	B.S. in Physics, with highest honors, University of Texas at Austin

EXPERIENCE

September 2005 –	Postdoctoral fellow, Biomedical Photonics Division, Institute of Applied Physics, University of Bern (Switzerland). Responsibilities: Develop new ultra-short pulse laser applications for biology, medicine and geology. Lead laser laboratory team. Plan and carry out research, supervise graduate students, write research proposals, publish in the scientific literature, present work at international conferences.
April 2003 – July 2005	Postdoctoral fellow, Nano-Optics Group, ETH Zurich (Switzerland). Responsibilities: Work in a team to design and implement novel methods for detection and spectroscopy of nanoparticles and investigate their biological applications. Teach laboratory classes and lead discussion sections in physical chemistry. Design, carry out, publish, and present scientific research in the field of nanotechnology.
July 1999 – February 2003	Student Employee Graduate Research Fellow, Medical Technology Program (now M Division), Lawrence Livermore National Laboratory (Livermore, CA). Collaboration with University of California Davis Medical Center (Sacramento, CA). Responsibilities: Design and build new microscope to study collagen using nonlinear optics and investigate medical applications. Develop data acquisition software using Labview and data analysis and modeling programs using Matlab and Mathematica.
July 1997 – May 1998	Research Assistant, Program in Atmospheres, Oceans, and Climate, Massachusetts Institute of Technology (Cambridge, MA). Responsibilities: Analyze concentration of airborne pollutants in an aircraft-based study of the atmosphere over the Pacific Ocean. Develop data analysis and modeling software using Matlab and C on Unix computers. Publish results in scientific journals.
June 1996 – August 1996	Research Experiences for Undergraduates Student Researcher, Langmuir Laboratory for Atmospheric Research, New Mexico Tech (Socorro, NM). Supervisors: Dr. Monte Bateman and Dr. David Rust. Constructed balloon-based raindrop-charge sensor and participated in thunderstorm research. Data analysis using Matlab.

SOFTWARE AND TECHNICAL EXPERTISE

Programming, data analysis, and numerical modeling with Labview, Matlab, Mathematica, C, Maple, Origin, SigmaPlot, Microsoft Excel, and Adobe Photoshop in Windows, Macintosh, and Unix environments.

Expertise in ultra-short pulse lasers, laser-scanning microscopy, optical spectroscopy, nanoparticles, and nonlinear optics, as well as in the design, construction, and alignment of complex optical experiments.

Experience working with biological samples from excised human tissues to cell cultures

TEACHING EXPERIENCE

March 2005 – July 2005	Led discussion section in physical chemistry for 4th semester undergraduates
October 2004 – February 2005	Supervised 5th semester undergraduates in UV-Visible spectroscopy laboratory
October 2003 – February 2004	Supervised 5th semester undergraduates in UV-Visible spectroscopy laboratory
April 2003 – July 2003	Supervised 4th semester undergraduates in Physical chemistry laboratory

HONORS AND MEMBERSHIPS

September 12, 2007	GMP Laser/Photonics Prize for work on "Femtosecond lasers in fluid inclusions"
2005 –	Biomedical Photonics Network of the Swiss Society for Optics and Microscopy
2003 –	Swiss Physical Society and American Physical Society
2000 –	SPIE, the International Society for Optical Engineering Optical Society of America
1996	Sigma Pi Sigma Physics Honors Society, Golden Key National Honor Society, and Phi Beta Kappa
1995 – 1998	Society of Physics Students
1994 – 1997	Dean's List of the University of Texas at Austin

PRESENTATIONS

"Measurement of the second order non-linear susceptibility of collagen using polarization modulation and phase-sensitive detection." Oral presentation and conference paper; Photonics West, January 2001, San Jose, California.

"Second harmonic generation microscopy in collagen.", Poster; Biomedical Engineering Society Conference, October 2001, Raleigh-Durham, North Carolina.

"Polarization-modulated second harmonic generation: A new approach to understanding fibrillar organization of collagen." Oral presentation and conference paper; Photonics West, January 2002, San Jose, California.

"Quantitative second harmonic generation microscopy in collagen." Poster; Gordon Research Conference on Lasers in Medicine and Biology, July 2002, Meriden, New Hampshire.

"Second harmonic generation microscopy in collagen." Oral presentation; UC Davis Cancer Center Symposium, September 2002, Sacramento, California.

"Detection and spectroscopy of gold nanoparticles using white-light confocal microscopy." Poster; Best Poster Award. Conference on elucidating biomolecular networks by single molecule technologies, October 2003, Ascona, Switzerland.

"The Colorful World of Metal Nanoparticles." Oral presentation; Laboratory for Physical Chemistry Colloquium, February 2004, Zurich, Switzerland.

"Detection and spectroscopy of gold nanoparticles using white-light confocal microscopy." Oral presentation; Annual Meeting of the German Physical Society, March 2004, Regensburg, Germany.

"Detection and spectroscopy of gold nanoparticles using confocal microscopy." Oral presentation; Photonics West, January 2005, San Jose, California.

"Interferometric detection and spectroscopy of metal nanoparticles." Oral presentation; Applied Physics Seminar, University of Bern, March 2005, Bern, Switzerland.

"Measurement of the two-photon absorption cross-section of fluorescent dyes." Oral presentation; Biomedical Photonics Network Symposium, October 2005, Bern, Switzerland.

"Second harmonic generation interference microscopy in collagen." Oral presentation; Laser and Biomedical Photonics Seminar (Institute of Applied Physics), June 2006, Bern, Switzerland

"Ultra-short pulse lasers in geological fluid inclusion analysis." Oral presentation; Conference on Lasers and Electro-Optics, Munich, June 2007, Bern, Switzerland.

"Volumetric imaging of fluid inclusions in quartz using second harmonic generation microscopy." Oral presentation; European Current Research on Fluid Inclusions (ECROFI-XIX), June 2007, Bern, Switzerland.

PUBLICATIONS

Stoller P, Cho JYN, Newell RE, Thouret V, Zhu Y, Carroll MA, Albercook GM, Anderson BE, Barrick JDW, Browell EV, Gregory GL, Sachse GW, Vay S, Bradshaw JD, Sandholm S. "Measurements of atmospheric layers from the NASA DC-8 and P-3B aircraft during PEM-Tropics A." *Journal of Geophysical Research* 1999; 104:5745-5764.

Newell RE, Thouret V, Cho JYN, Stoller P, Marenco A, Smit HG. "Ubiquity of quasi-horizontal layers in the troposphere." *Nature* 1999; 398:316-319.

Kim B-M, Feit MD, Rubenchik AM, Joslin EJ, Eichler J, Stoller PC, Da Silva LB. "Effects of high repetition rate and beam size on hard tissue damage due to subpicosecond laser pulses." *Applied Physics Letters* 2000; 76:4001-4003.

Stoller P, Kim B-M, Reiser KM, Rubenchik AM, Da Silva LB. “Polarization dependent optical second harmonic imaging of rat-tail tendon.” *Journal of Biomedical Optics* 2002; 7:205-214.

Stoller P, Reiser KM, Celliers PM, Rubenchik AM. “Polarization-modulated second harmonic generation in collagen.” *Biophysical Journal* 2002; 82:3330-3342.

Stoller P, Reiser KM, Celliers PM, Rubenchik AM. “Effect of structural modification on second harmonic generation in collagen.” *Proceedings of the SPIE* 2003; 4963:41-51.

Stoller P, Celliers PM, Reiser KM, Rubenchik AM. “Quantitative second harmonic generation microscopy in collagen.” *Applied Optics* 2003; 42:5209-5219.

Lindfors K, Kalkbrenner T, Stoller P, Sandoghdar V. “Detection and spectroscopy of gold nanoparticles using supercontinuum white light confocal microscopy.” *Physical Review Letters* 2004; 93:037401-1.

Jacobsen V, Stoller P, Brunner C, Vogel V, and Sandoghdar V. "Interferometric optical detection and tracking of very small gold nanoparticles at a water-glass interface." *Optics Express* 2006; 14:405-414.

Stoller P, Jacobsen V, and Sandoghdar V. “Measurement of the complex dielectric constant of a single gold nanoparticle.” *Optics Letters* 2006. 31:2474-2476.

Kauert M, Stoller P, Rička J, Frenz M. “Absolute measurement of molecular two-photon absorption cross-sections using a fluorescence saturation technique.” *Optics Express* 2006; 14:8434-8447.

Stoller P, Krüger Y, Rička J, Frenz M. “Femtosecond lasers in fluid inclusion analysis: Three-dimensional imaging and determination of inclusion volume in quartz using second harmonic generation microscopy, *Earth and Planetary Science Letters*, **253** (2007) 359-368.

Krüger Y, Stoller P, Rička J, Frenz M. “Femtosecond lasers in fluid inclusion analysis: Overcoming metastable phase states”, *European Journal of Mineralogy*. In press.

Stoller P, Marti D, Schmuckli J, Dobbelaere D, Rička J, Frenz M. “Multiphoton imaging of ultra-short pulse laser ablation in the intracellular parasite *Theileria*”, Submitted.