

CURRICULUM VITAE

Bernard S. Gerstman

Present Address: Department of Physics
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Education: B.S. with High Honors, 1976; Department of Physics,
Stony Brook University.
Award for Outstanding Physics Undergraduate.
Senior Honors Thesis: "Gamma-Heavy Ion Reaction of ^{16}O on ^{27}Al ".
Research performed at the Stony Brook Tandem Graaff.

ΦBK - 1976

Ph.D., 1981; Department of Physics, Specialty area: Biological Physics
Princeton University.
"Electronic Spin Tunneling in the Binding of CO to Hemoglobin"

Employment: 1998-present Professor of Physics Florida International University
2011-present Chair, Department of Physics
Honors College Faculty Fellow

1990-1998 Associate Professor of Physics
Florida International University

1985-1990 Assistant Professor of Physics
Florida International University

1982-1985 Visiting Assistant Professor of Physics
University of Virginia

1981-1982 Post-Doctoral Research Associate, Physics
University of Virginia

Committee Chairmanships: University Research Council, Florida International University
Human Subject Institutional Review Board, FIU

Professional Society Memberships: The American Physical Society

Editorial Positions: Executive Editor, American Institute of Physics *Advances*

Research Interests: Biophysics, protein folding and aggregation, non-linear dynamics in
biomolecules, laser effects on biological cells and materials.

Publications

(Refereed journals)

M. H. Redi, B. S. Gerstman and J. J. Hopfield,
"Hemoglobin-Carbon Monoxide Binding Rate"
Biophysical Journal, **35**, 471, 1981.

B. S. Gerstman, R. H. Austin, and J. J. Hopfield,
"Investigation of Spin-Tunneling in Carbon Monoxide Recombination with β -Hemoglobin"
Phys. Rev. Lett., **47**, 1636, 1981.

R. H. Austin, A. M. Cheng, B. S. Gerstman, D. Rokhsar,
"Introduction to Tunneling in Biological Systems"
Comments on Molecular and Cellular Biophysics, **2**, 34, 1984.

B. S. Gerstman and A. S. Brill,
"Magnetic Circular Dichroism of Low Symmetry Cupric Sites"
Journal of Chemical Physics, **32**, 1212, 1985.

A. S. Brill and B. S. Gerstman,
"Redox-Insensitive Molecular Force Constants"
Journal of Chemical Physics, **85**, 2227, 1986.

B. S. Gerstman and R. H. Austin,
"Atomic Tunneling in Biological Molecules"
Comments on Molecular and Cellular Biophysics, **4**, 305, 1988.

B. S. Gerstman and A. S. Brill,
"The Linear Electric Field Effect in Low Symmetry Cupric Sites"
Physical Review A, **37**, 2151, 1988.

B. S. Gerstman,
"CO Binding to Hemoglobin: Spin Tunneling Temperature Dependence, Fe Electronic States,
and Electronic Effects on Non-Adiabatic Dynamics"
Journal of Chemical Physics, **88**, 6228, 1988.

B. Gerstman, M. Roberson, and R. Austin,

"Enhancement of Ligand Binding to Myoglobin By Far-Infrared Excitation from a Free Electron Laser"
Journal of the Optical Society of America B, **6**, 1050, 1989.

B. S. Gerstman and A. S. Brill,
"Hyperfine Contributions to the Linear-Electric-Field Effect in Low-Symmetry Cupric Sites"
Physical Review A, **39**, 5903, 1989.

M. K. Hong, E. Shamysunder, R. H. Austin, B. S. Gerstman, and S.S. Chan,
"Time-Resolved Infrared Studies of Molecular Diffusion in Myoglobin"
Physical Review Letters, **66**, 2673, 1991.

A. Aqualino, A. S. Brill, G. F. Bryce, and B. S. Gerstman,
"Correlated Distributions in g and A tensors at a Biologically Active Low-Symmetry Cupric Site"
Physical Review A, **44**, 5257, 1991.

B. S. Gerstman and N. Sungar,
"Non-Adiabatic Electronic Spin Transition in Ligand-Heme Protein Binding Kinetics and the Influence of the Heme Fe Molecular Environment"
Journal of Chemical Physics, **96**, 387, 1992.

N. Sungar and B. S. Gerstman,
"Control of Long Time Dependence of CO Binding to Heme Systems By Inhomogeneous Spread in Electronic Prefactor"
Journal of Chemical Physics, **102**, 1225, 1995.

A. S. Brill, F. G. Fiamingo, and B. S. Gerstman,
"Electronic Paramagnetism in Biomolecular Structure and Function"
American Journal of Physics, **63**(12), 1096-1114, 1995.

B. S. Gerstman, C. R. Thompson, S. L. Jacques, and M. E. Rogers,
"Laser Induced Bubble Formation in the Retina"
Lasers in Surgery and Medicine, **18**(1), 10-21, 1996.

C. R. Thompson, B. S. Gerstman, S. L. Jacques, and M. E. Rogers,
"Melanin Granule Model for Laser Induced Thermal Damage in the Retina",
Journal of Mathematical Biology, **58**(3), 513-553, 1996.

B. Gerstman and Y. Garbourg,
"Structural Information Content and Lyapunov Exponent Calculation in Protein Unfolding",
Journal of Polymer Science B: Polymer Physics, **36**, 2761-2769, 1998.

J. Sun and B. Gerstman,
"Photoacoustic Generation for a Spherical Absorber with Impedance Mismatch with the
Surrounding Media",
Physical Review E, **59**(5), 5772-5789, 1999.

B. S. Gerstman and R. D. Glickman,
"Activated Rate Processes and a Specific Biochemical Mechanism for Explaining Delayed Laser
Induced Thermal Damage to the Retina",
Journal of Biomedical Optics, **4**(3), 345-351, 1999.

J. M. Sun, B. S. Gerstman, and B. Li,
"Bubble Dynamics and Shock Waves Generated by Laser Absorption of a Photoacoustic
Sphere",
Journal of Applied Physics, **88**(5), 2352-2362, 2000.

B.S. Gerstman, "An Effective Short Course on Research Integrity", Proceedings of the First ORI
Research Conference on Research Integrity, Office of Research Integrity, Department of Health
and Human Services, 2001.

B.S. Gerstman, P. Chapagain, L. Lu,
"Polymer Dynamics and Chaos in Protein Folding",
Current Trends in Polymer Science, **7**, 151-155, 2002.

P. P. Chapagain and B. S. Gerstman
"Finite Size Scaling of Structural Transitions in a Simulated Protein with Secondary and Tertiary
Structure"
The Journal of Chemical Physics, **119**(2), 1174-1180, 2003.

P. P. Chapagain and B. S. Gerstman
“Excluded Volume Entropic Effects on Protein Unfolding Times and Intermediary Stability”
The Journal of Chemical Physics, **120**(5), 2475-2481, 2004.

B.S. Gerstman and P. P. Chapagain
“Self-Organization in Protein Folding and the Hydrophobic Interaction”
The Journal of Chemical Physics, **123**, 054901, 1-6, 2005.

E. Faraggi, B.S. Gerstman, and J.M. Sun
“Biophysical Effects of Pulsed Lasers in the Retina and Other Biological Tissues With Strongly Absorbing Particles: Shockwave and Explosive Bubble Generation”
The Journal of Biomedical Optics, **10**(6), 064029, 2005.

P. P. Chapagain and B. S. Gerstman
“Removal of Kinetic Traps and Enhanced Protein Folding by Strategic Substitution of Amino Acids in a Model α -helical Hairpin Peptide”
Biopolymers, **81**(3), 167-178, 2006.

B. S. Gerstman
“Investigating The Nanoparticle Transition From Bulk Behavior to Discrete Atom/Finite Size Behavior Using Laser Induced Pressure Generation”
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E. Faraggi, B. S. Gerstman, and J. Sun
“The Emergence of Chaos in a Laser Irradiated Spherical Absorber”
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P. P. Chapagain, J. L. Parra, B. S. Gerstman and Y. Liu
“Sampling of states for estimating the folding funnel entropy and energy landscape of a model alpha-helical hairpin peptide”
The Journal of Chemical Physics, **127**, 075103, 1-7, 2007.

E. Faraggi and B. S. Gerstman
“Resonant Absorption of Pulsed Laser Radiation by a Spherical Absorber”
Journal of Applied Physics, **102**, 123505, 1-15, 2007

Y. Liu, P. P. Chapagain, J. L. Parra, and B. S. Gerstman
“Lattice model simulation of interchain protein interactions and the folding dynamics and dimerization of the GCN4 leucine zipper”
The Journal of Chemical Physics, **128**, 045106, 1-10, 2008.

P. P. Chapagain, Y. Liu, and B. S. Gerstman
“The trigger sequence in the leucine zipper: α -helical propensity dependence of folding and dimerization”
The Journal of Chemical Physics, **129**, 175103, 1-9, 2008.

B. S. Gerstman and P. P. Chapagain
“Self-organizing Dynamics in Protein Folding”
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Progress in Molecular Biology and Translational Science, 84, 1-37, 2008.

Y. Liu, P. P. Chapagain, and B. S. Gerstman
“Stabilization of native and non-native structures by salt bridges in a lattice model of the GCN4 leucine dimer”
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Publication Date (Web): December 28, 2009
The Journal of Physical Chemistry B, **114** (2), 796–803, 2010.

P. P. Chapagain, B. S. Gerstman, Y. Bhandari, and D. Rimal
“Free energy landscapes and thermodynamic parameters of complex molecules from non-equilibrium simulation trajectories”
Physical Review E, **83**(6), 061905, 2011.

T. Steckmann, Z. Awan, B. S. Gerstman, and P. P. Chapagain,
“Kinetics of Peptide Secondary Structure Conversion During Amyloid β -Protein Fibrillogenesis”
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Chosen as BioModel of the month, October, 2015 by the European Bioinformatics Institute of the European Molecular Biology Laboratory, Cambridge, England.

R. H. Austin and B. S. Gerstman
“Physics of Cancer”
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Y. R. Bhandari, P. P. Chapagain, and B. S. Gerstman
“Lattice model simulations of the effects of the position of a peptide trigger segment on helix

folding and dimerization”
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I. E. Chemmama, A. C. Pelea, Y. R. Bhandari, P. P. Chapagain, and B. S. Gerstman,
“Structural propensities and entropy effects in peptide helix-coil transitions”
Physical Review E, **86**, 031915, 2012.

C. K. Regmi, Y. R. Bhandari, B. S. Gerstman, and P. P. Chapagain
“Exploring the diffusion of molecular oxygen in the red fluorescent protein mCherry using
explicit oxygen molecular dynamics simulations”
The Journal of Physical Chemistry B, **117**(8), 2247-53, 2013.

Bernard S. Gerstman and Prem P. Chapagain
“Computational Investigations of Protein Folding to Engineer Amino Acids to Encourage
Desired Supersecondary Structure Formation”
In: Protein Supersecondary Structures, 191-204, Ed. Alexander E. Kister,
Methods in Molecular Biology 932, ISBN 978-1-62703-064-9, ISSN 1064-3745,
Humana Press 2013, Springer New York.

P. Konold, C. K. Regmi, P. P. Chapagain, B. S. Gerstman, R. Jimenez
“Hydrogen Bond Flexibility Correlates with Stokes Shift in mPlum Variants”,
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J. B. GC, Y. R. Bhandari, B. S. Gerstman, and P. P. Chapagain
“Molecular Dynamics Investigations of the α -Helix to β -barrel Conformational Transformation
in the RfaH Transcription Factor”
The Journal of Physical Chemistry B, **118**(19), 5101-8, 2014.

K. M. Dean, J. L. Lubbeck, L. M. Davis, C. K. Regmi, P. P. Chapagain, B. S. Gerstman, R.
Jimenez, and A. Palmer
“Microfluidics-Based Selection of Red-Fluorescent Proteins with Decreased Rates of
Photobleaching”
Integrative Biology **7**, 263-273, 2015.

K. Pham, G. Dhulipala, W. Gonzalez, B. Gerstman, C. Regmi, P. Chapagain, and J. Miksovská
“Ca²⁺ and Mg²⁺ modulate conformational dynamics and stability of Downstream Regulatory
Element Antagonist Modulator”
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R.B. Pandey, B.L. Farmer, Bernard S. Gerstman
“Self-assembly dynamics for the transition of a globular aggregate to a fibril network of lysozyme proteins via a coarse-grained Monte Carlo simulation”
AIP Advances 5, 092502, 2015; <http://dx.doi.org/10.1063/1.4921074>.

B. S. Gerstman
“Bio-nanoparticles: Determining fundamental physical properties and bio-medical applications through laser induced pressure and cavitation”
Journal of Physical Chemistry & Biophysics 2015, 5:3, 34, doi/10.4172/2161-0398.S1.009.

I. E. Chemmama, P. P. Chapagain, B. S. Gerstman
“Pairwise Amino Acid Secondary Structural Propensities”
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J. B. GC, B. S. Gerstman, and P. P. Chapagain
“The Role of the Interdomain Interactions on RfaH Dynamics and Conformational Transformation”
The Journal of Physical Chemistry B, 2015, 119 (40), pp 12750–12759
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B. S. Gerstman and Y. Miller
“Amyloid Aggregation: Characterization, Function and Molecular Mechanisms”
AIP Advances 5, 092301, 2015; <http://dx.doi.org/10.1063/1.4932621>.

F. Leng, G. Fulcrand, S. Dages, X. Zhi, P. Chapagain, B. S. Gerstman, and D. Dunlap,
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J. B. GC, K. A. Johnson, M. L. Husby, C. T. Frick, B. S. Gerstman, R. V. Stahelin, P. P. Chapagain,
“Interdomain salt-bridges in Ebola virus protein VP40 and their role in domain association and plasma membrane localization”
Protein Science, 2016 Sep; 25(9):1648-58.
doi: 10.1002/pro.2969. Epub 2016 Jul 4.

P. Konold, E. Yoon, J. Lee, S. Allen, P. Chapagain, B. Gerstman, C. Regmi, K. Piatkevich, V. Verkhusha, T. Joo, and R. Jimenez

“Fluorescence from Multiple Chromophore Hydrogen-Bonding States in the Far-Red Protein TagRFP675”

The Journal of Physical Chemistry Letters

Journal of Physical Chemistry Letters, 2016, 7 (15), pp 3046–3051

DOI: 10.1021/acs.jpcllett.6b01172

“The Ebola virus protein VP40 hexamer enhances the clustering of PI(4,5)P₂ lipids in the plasma membrane”

Jeevan B. GC, Bernard S. Gerstman, Robert V. Stahelin, Prem P. Chapagain

Physical Chemistry Chemical Physics, 2016, 18, 28409-28417,

DOI: 10.1039/c6cp03776c

Chosen for Cover Figure.

“Temperature dependent solvation dynamics of the protein-chromophore environment in the far-red fluorescent protein mPlum”

Chola K Regmi, Bernard S Gerstman, Prem Chapagain,

Submitted

Bernard S. Gerstman

Published Conference Proceedings

S. L. Jacques, A. A. Oraevsky, C. R. Thompson, and B. S. Gerstman,
“A Working Theory and Experiments on Photoacoustic disruption of Melanosomes to Explain the Threshold for Minimum Visible Lesions for Sub-ns Laser Pulses”,
SPIE International Symposium on Biomedical Optics, SPIE Proceedings, Vol. **2134**, 54-65, 1994.

B. S. Gerstman, C. R. Thompson, S. L. Jacques and M. E. Rogers,
"Laser-Induced Bubble Formation in the Retina",
SPIE International Symposium on Biomedical Optics, SPIE Proceedings, Vol. **2391**, 60-71, 1995.

C. R. Thompson and B. S. Gerstman,
"Gruneisen Equation of State for Melanosomes Irradiated by Sub-Nanosecond Laser Pulses",
Laser-Tissue Biophysics, SPIE International Symposium on Biomedical Optics, SPIE Proceedings, Vol. **2681**, 449-459, 1996.

B. S. Gerstman
“Nanosecond Laser Pulses: Refined Surgical Treatment of Congenital Nevi and Melanoma”,
Laser-Tissue Biophysics, SPIE International Symposium on Biomedical Optics, SPIE Proceedings, Vol. **2975**, 180-191, 1997.

J. Sun and B. S. Gerstman
“Pressure Generation in Melanosomes by Sub-Nanosecond Laser Pulses”
Laser-Tissue Biophysics, SPIE International Symposium on Biomedical Optics, SPIE Proceedings, Vol. **3254**, 156-167, 1998.

B. S. Gerstman
“Activated Rate Processes and a Specific Biochemical Mechanism for Explaining Laser Induced Thermal Damage to the Retina”,
Experimental Eye Research, Vol. **67**, suppl. 1, July, 1998.

J. Sun and B. S. Gerstman
“Modeling of Pressure Generation by Lasers in Melanosomes: How to Avoid Stress Confinement

and Blow Up a Melanosome”

Laser-Tissue Interaction X, SPIE International Symposium on Biomedical Optics, SPIE Proceedings, Vol. **3601**, 43-54, 1999.

B. S. Gerstman

“Theoretical Modeling of Laser-Induced Explosive Pressure Generation and Vaporization in Pigmented Cells”,

Proceedings of the 31st Annual Boulder Colorado Damage Symposium, Laser-Induced Damage in Optical Materials: 1999; Editors: G. J. Exarhos, A. H. Guenther, M. R. Kozlowski, K. L. Lewis, M. J. Soileau, Proceedings of SPIE Vol. **3902**, 41-53, 2000.

J. Sun, B. S. Gerstman, B. Li

“Shock Wave Generation and Bubble Formation in the Retina By Lasers”,

Proceedings of SPIE, vol. **3914**, June 2000, p.154-165.

B. S. Gerstman and J. Sun

“Laser-Induced Retinal Shock Waves and Bubbles and Their Dependencies on the Thermomechanical Properties of Melanosomes”,

Proceedings of SPIE, vol. **4257**, July 2001, p.149-158.

S.J. Till and B.S. Gerstman

“The Limits of Activated Arrhenius Models for Simulating the Spot-Size Dependence of Thermal Laser-Retinal Damage Thresholds”, Laser Bioeffects Meeting, Val de Grace, DGA, Paris, France, June, 2002.

B.S. Gerstman, S. Wang, and E. Faraggi

“Ab-Initio Calculations for Shock Wave and Bubble Production with Gaussian Temporal Laser Pulses”

Proceedings of SPIE, vol. **5319**, July 2004, p. 217-223.

Eshel Faraggi, Bernard S. Gerstman, and Shijun Wang

“Response to Pulsed Radiation by a Spherical Solid Absorber Immersed in a Transparent Fluid”

Proceedings of SPIE, vol. **5696**, March 2005, p. 101-109.

Eshel Faraggi , Shijun Wang and Bernard Gerstman

“Stress Confinement, Shock Wave Formation and Laser Induced Damage”

Proceedings of SPIE, vol. **5695**, April 2005, p. 209-215.

Bernard S. Gerstman

“Investigating The Nanoparticle Transition From Bulk Behavior to Discrete Atom/Finite Size Behavior Using Laser Induced Pressure Generation”

ChinaNano2005, January, 2006.

Eshel Faraggi, Bernard S. Gerstman

“Resonant absorption in nanometer gold spherical particles”

Proceedings of SPIE, vol. **6084**, March, 2006.

Bernard S. Gerstman, Eshel Faraggi, Jinming Sun

“Chaos in the Pressure Generated by Laser Absorption by Microparticles”

Proceedings of SPIE, vol. **6084**, March, 2006.

Bernard S. Gerstman and Eshel Faraggi,

“Analyzing chaos in the pressure generated by laser absorption by microparticles”

Proceedings of SPIE, vol. **6436**, 643617, February, 2007.

Books

Physics of Cancer

R. H. Austin and B. S. Gerstman
AIP Advances, **2**, 010901, 2012.

Amyloid Aggregation: Characterization, Function and Molecular Mechanisms

Bernard S. Gerstman and Yifat Miller
AIP Advances **5**, 092301, 2015; <http://dx.doi.org/10.1063/1.4932621>

Research on the Physics of Cancer: A Global Perspective

Bernard S. Gerstman
World Scientific Publishing Co.
ISBN: 978-981-4730-25-9 (hardcover), ISBN: 978-981-4730-27-3 (ebook), 2016.

Book Chapters

Melanin Granule Model for Laser-Induced Thermal Damage in the Retina,
Selected Papers on Ultrashort Laser Pulse Bioeffects , p. 407-447,
Editor(s): William P. Roach, Thomas E. Johnson, SPIE Milestone Series MS174, International
Society for Optical Engineering Press, Bellingham , WA, ISBN 0-8194-4747-1, Jan 2003.

Laser Induced Bubble Formation in the Retina,
Selected Papers on Ultrashort Laser Pulse Bioeffects , p. 448-459,
Editor(s): William P. Roach, Thomas E. Johnson, SPIE Milestone Series MS174, International
Society for Optical Engineering Press, Bellingham , WA, ISBN 0-8194-4747-1, Jan 2003.

Activated Rate Processes and a Specific Biochemical Mechanism for Explaining Delayed Laser
Induced Thermal Damage to the Retina,
Selected Papers on Ultrashort Laser Pulse Bioeffects , p. 593-599,
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Society for Optical Engineering Press, Bellingham , WA, ISBN 0-8194-4747-1, Jan 2003.

Bubble Dynamics and Shock Waves Generated by Laser Absorption of a Photoacoustic Sphere,
Selected Papers on Ultrashort Laser Pulse Bioeffects , p. 600-612,
Editor(s): William P. Roach, Thomas E. Johnson, SPIE Milestone Series MS174, International
Society for Optical Engineering Press, Bellingham , WA, ISBN 0-8194-4747-1, Jan 2003.

Using Laser Induced Shock Waves to Investigate Nanoparticle Thermomechanical Properties,
Shock Compression of Condensed Matter – 2007, p. 703-706,
Editor(s): M. Elert, M. D. Furnish, R. Chau, N. Holmes, J. Nguyen,

Proceedings of the 15th APS Topical Conference on Shock Compression of Condensed Matter,
AIP Conference Proceedings 955, Melville, New York, 2007.
ISBN 978-0-7354-0469-4.

Self-Organizing Dynamics in Protein Folding
Molecular Biology of Protein Folding, Part B, Ed.: P. M. Conn
Progress in Molecular Biology and Translational Science, 84, 1-37, 2008.
Elsevier, ISBN 978-0-12-374595-8, ISSN 0079-6603.

Bernard S. Gerstman and Prem P. Chapagain
“Computational Investigations of Protein Folding to Engineer Amino Acids to Encourage
Desired Supersecondary Structure Formation”
In: **Protein Supersecondary Structures**, 191-204, Ed. Alexander E. Kister,
Methods in Molecular Biology 932, ISBN 978-1-62703-064-9, ISSN 1064-3745,
Humana Press 2013, Springer New York.

Bernard S. Gerstman
Preface
Research on the Physics of Cancer: A Global Perspective
Ed. Bernard S. Gerstman
World Scientific Publishing Co.
ISBN: 978-981-4730-25-9 (hardcover), ISBN: 978-981-4730-27-3 (ebook), 2016.

Recent Invited Presentations

“Transformer Proteins: Friends and Foes”, American Chemical Society, Memphis, November, 2015.

“Bio-Nanoparticles: Determining Fundamental Physical Properties and Bio-Medical Applications Through Laser Induced Pressure and Cavitation”, Keynote speaker, Laser-Tech 2015, Orlando, Florida, July, 2015.

“Transformer Proteins: Friends and Foes”, JILA, University of Colorado, November, 2014.

“Protein Folding: Energy, Entropy, and Prion Diseases”, Department of Physics, Kathmandu University, Nepal, June, 2013.

“Protein Folding: Energy, Entropy, and Prion Diseases”, Department of Physics, The University of Southern Mississippi, January, 2013.

“Protein Folding: Energy, Entropy, Non-Linear Dynamics, and Neurological Diseases”, University Of The West Indies, Kingston, Jamaica, October, 2012.

“Laser Effects on the Eye”, Optical Radiation Division, Brooks Air Force Base, San Antonio, Texas, March, 2011.

“Protein Folding: Energy, Entropy, Non-Linear Dynamics, and Neurological Diseases”, University of Miami, 2010.

“Protein Folding: From Non-Linear Dynamics to Neurological Diseases”, University of Central Florida, October, 2009.

“Retinal Damage from Resonant Absorption of Multi-Pulse Laser Trains”, Joint US/UK Laser Bioeffects Meeting, Porton Down, England, August, 2008.

“Protein Folding: Energy, Entropy, and Prion Diseases”, Department of Physics, University of Virginia, January, 2008.

“Molecular and Cellular Biophysics: Energy and Entropy”, Department of Biomedical Engineering, Florida International University, February, 2008.

“Computational Investigations of Protein-Protein Interactions”, Nano-BioForum, Milan, Italy, September, 2007.

“Nanoparticle and Laser Usage for Selective Cell Surgery”, ChinaNANO2007 International Conference on Nanoscience & Technology, Beijing, China, June, 2007.

“Mathematics of distal revascularization-interval ligation (DRIL)”, American Society of Diagnostic and Interventional Nephrology, 3rd Annual Scientific Meeting, San Juan, Puerto Rico, April, 2007.

“The Non-Linear Dynamics of Protein Folding: The Anti-Chaos of Life”, University of Genova, Italy, September, 2006. “Laser Effects on the Retina; Micro and Nanoscale Pressure Generation”, Nano-BioForum, Milan, Italy, September, 2006.

“Bio-Nanoparticles: Discovering Fundamental Truths and Bio-Medical Applications for the Eye Through Laser Induced Pressure and Cavitation”, Cornell University, February, 2006.

“The Non-Linear Dynamics of Protein Folding: The Anti-Chaos of Life”, University of California San Francisco, January, 2006.

“Bio-Nanoparticles: Discovering Fundamental Truths and Bio-Medical Applications for the Eye Through Laser Induced Pressure and Cavitation”, Department of Biomedical Engineering, Columbia University, October, 2005.

“Nanoparticles: Discovering Fundamental Truths and Blowing Them Up With Lasers”, University of Swansea, Wales, February, 2005.

“Laser Effects on the Retina”, International Commission on Non-Ionizing Radiation, Baltimore, September, 2004.

“Cavitation and Shock Waves Generated by Laser Absorption of Nanoparticles”, University of Swansea, Wales, July, 2004.

“Theoretical Modeling of Laser Generated Thermo-Mechanical Effects in Strongly Absorbing Microparticles and Nanoparticles”, Laser Bioeffects Workshop, San Antonio, Texas, March, 2004.

“Laser Damage To The Retina”, Bascom-Palmer Eye Institute, University of Miami Medical School, February, 2004.

“Modeling Laser Generated Shock Damage and Thermo-Mechanical Chaos in Nanoparticles”, Material Research Society Fall Meeting, Boston, December, 2003.

“Chaotic Dynamics of Laser Induced Shock Waves”, Cavendish Laboratory, Department of Physics, Cambridge University, England, July, 2003.

“The Limits of Activated Arrhenius Models for Simulating the Spot-Size Dependence of Thermal Laser-Retinal Damage Thresholds”, Laser Bioeffects Meeting, Val de Grace, Paris, France, June, 2002.

“The Importance of Basic Research for Determining Health and Safety Standards”, United States Food and Drug Administration, Rockville Maryland, May, 2001.

“Theoretical Treatments of Laser Induced Retinal Damage-What’s Next”, VII Workshop on Ultrashort Laser Pulse Effects, San Jose, California, January, 2001.

“Theoretical Modeling of Shock Waves and Vaporization in the Retina Induced by Lasers”, Workshop 2000, Organized by The International Commission on Non-Ionizing Radiation, Baltimore, September, 2000.

“Bubble Formation and Shock Wave Generation in the Retina by Lasers”, The British Defence Research Agency, Malvern, England, August 3, 2000.

“Medical Applications of Nanosecond Laser Pulses on Heavily Pigmented Cells”, The X International Conference on Laser Optics, St. Petersburg, Russia, June 2000.

“Theoretical Modeling of Laser Induced Explosive Pressure Generation and Vaporization in Pigmented Cells”, 31st Annual Symposium on Optical Materials for High Power Lasers, Boulder, Colorado, October 5, 1999.

“Laser Generation of High Pressures in the Eye”, Department of Physics, Tribhuvan University, Kathmandu, Nepal, October 1, 1999.

“Laser Generation of High Pressures in the Eye”, XIII International Biophysics Congress, New Delhi, India, September, 1999.

“Modeling of Pressure Generation by Ultrashort Lasers”, VIth Ultrashort Laser Workshop, San Antonio, Texas, February, 1999.

“The Physics of Life: Protein Folding”, Department of Physics Seminar Series, Princeton University, November, 1997.

Conference Session Chairperson:

Bio-Nanophotonics, Laser-Tech 2015, Orlando, FL, July, 2015.

Physics of Proteins: American Physical Society, Boston, February-March, 2012.

Physics of Proteins: Folding, Structure and Stability, American Physical Society, Dallas, TX, March, 2011.

Nanomaterials for Biomedical Applications, ChinaNANO2007 International Conference on Nanoscience & Technology, Beijing, China, June, 2007.

Localized Dynamical States, American Physical Society, Los Angeles, CA, March, 2005.

Biomolecular Computation, American Physical Society, Montreal, Canada, March, 2004.

Program Committee: Laser-Tissue Biophysics, OE/LASE, Photonics West, SPIE International Symposium, San Jose, CA. January, 2001.

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Melanin Modeling, VIth, Ultrashort Laser Workshop, San Antonio, Texas, February, 1999.

Advances in Biophysics, American Physical Society, Southeast Regional Meeting, Miami, Florida, November, 1998.

Ocular Effects, Laser-Tissue Biophysics, OE/LASE, Photonics West, SPIE International Symposium, San Jose, CA. January, 1998.

Ocular Effects, Laser-Tissue Biophysics, OE/LASE, Photonics West, SPIE International Symposium, San Jose, CA., February, 1997.

Laser Melanosome Interactions, 4th Ultrashort Laser Pulse Workshop, Sponsored by Armstrong Laboratory and Air Force Office of Scientific Research, San Antonio, Texas, March, 1996.

Ocular Effects, Laser-Tissue Biophysics, OE/LASE, Photonics West, SPIE International Symposium, San Jose, CA., January, 1996.

Ocular Laser Effects, Laser-Tissue Biophysics, Photonics West, SPIE International Symposium, San Jose, CA., February, 1995.

Conference Presentations (including invited presentations)

"Crystal Field Effects on the Hb-CO Spin Tunneling Rate",
B. Gerstman, M. Redi, J. Hopfield, American Physical Society,
New York, March, 1980.

"Magnetically Induced Optical Anisotropy Measurements as a Test for Spin-Orbit Tunneling in Low Temperature Hemoglobin-CO Recombination", B. Gerstman, R. Austin, J. Hopfield, R. Aggarwal, M. Redi, American Biophysical Society, New Orleans, June, 1980.

"The Spin-Tunneling Model of Hb-CO Binding", M. Redi, B. Gerstman, J. Hopfield, American Biophysical Society, New Orleans, June, 1980.

"Experimental and Theoretical Investigation of Spin-Tunneling in CO Recombination to Hemoglobin", B. Gerstman, R. Austin, J. Hopfield, VII International Biophysics Congress, Mexico City, August, 1981.

"On the Determination of Zero-Field Splittings from the Temperature Dependence of Magnetic Susceptibility", B. Gerstman and A. Brill, Biophysical Society, Boston, February, 1982.

"Magnetic Circular Dichroism of Cupric-Protein Complexes: Calculations Based Upon Hybrid Atomic Orbital Models", B. Gerstman and A. Brill, American Physical Society, Los Angeles, March, 1983.

"Modeling the Magnetic Circular Dichroism of Low Symmetry Cupric Sites", B. Gerstman and A. Brill, VIII International Biophysics Congress, Bristol, England, July, 1984.

"Electronic Transition in CO-Heme Recombination: Adiabatic vs. Non-Adiabatic and Low Temperature Rates", B. Gerstman, American Physical Society, Las Vegas, March, 1986.

"Modeling the Linear Electric Field Effect of Low Symmetry Cupric Sites", B. Gerstman and A. Brill, American Physical Society, Las Vegas, March, 1986.

"Linear Electric Field Effects of the Hyperfine Interaction in Low Symmetry Cupric Sites", B. Gerstman and A. Brill, American Physical Society, New York, March, 1987.

"CO-Heme Binding: Molecular Structure, Low Temperature Electronic Transitions, and Non-Adiabatic Dynamics", B. Gerstman, 9th International Biophysics Congress, Jerusalem, Israel, August, 1987.

"A Non-Slaved Glass Transition in Heme Protein", J. Yedidia, R. H. Austin, P. A. Mansky, M. W. Roberson and B. S. Gerstman, American Physical Society, New Orleans, March, 1988.

"A New Spectroscopy", Pumping Heme Proteins with Far-Infrared Radiation", R. H. Austin, P.

A. Mansky, M. W. Roberson and B. S. Gerstman, American Physical Society, New Orleans, March, 1988.

"Non-Adiabatic Spin Tunneling in CO-Heme Protein Binding and the Influence of the Heme Fe Molecular Environment", B. S. Gerstman, N. Sungar, American Physical Society, St. Louis, March, 1989.

"Far Infrared Excitation of Myoglobin with a Free Electron Laser: Theory and Experiment", B. S. Gerstman, R. H. Austin, P. Mansky and M. Roberson, American Physical Society, St. Louis, March, 1989.

"Ligand Field Induced Electronic Interference Effects in Heme Protein Binding Kinetics at Room Temperature", B. Gerstman, American Physical Society, Anaheim, CA, March, 1990.

"Protein Function and Structural Dynamics: Binding Rate in Heme Proteins", Department of Biology Colloquium, Florida International University, Miami, Florida, September, 1990. Invited Presentation.

"Time Resolved Infrared Studies of Protein Relaxation", B. Gerstman, M. Hong, E. Shyamsunder, R. Austin, and S. Chan, Biophysical Society, San Francisco, February, 1991.

"The Hybrid Atomic Orbital Model of Low Symmetry Cupric Sites", A. S. Brill and B. S. Gerstman, Fifth International Conference On Bioinorganic Chemistry, University of Oxford, Oxford, England, 1991.

"Non-Slaved Rubber-Glass Transition in a Globular Protein", B. Gerstman, University of California at San Diego, Physics Department Biophysics Seminar Series, August, 1991. Invited Presentation.

"Distribution in the Binding Pre-Exponential Factor Due to Non-Adiabatic Effects", B. Gerstman and N. Sungar, American Physical Society, Indianapolis, March, 1992.

"Modeling the Primary Steps of Photon-Induced Retinal Damage", B. Gerstman, Optical Biophysics Colloquium Series, Armstrong Laboratories, Brooks AFB, Texas, August, 1992. Invited Presentation.

"A New Thermal Model for Laser Retinal Damage", C. R. Thompson, M. E. Rogers, and B. S. Gerstman, American Physical Society, Seattle, March 1993.

"Investigation of Effects of Distribution in the Electronic Coupling on the Pre-Exponential Factor Due to Non-Adiabatic Effects", N. Sungar and B. Gerstman, American Physical Society, Seattle, March 1993.

"Thermodynamics of Molecular Processes in Thermally Induced Laser Damage and Theoretical Implications For Experiments", B. S. Gerstman, 2nd AFOSR Ultrashort Laser Program

Collaborative Workshop, Armstrong Laboratory, Brooks AFB, Texas, July, 1993.
Invited Presentation

"Laser Induced Retinal Damage: Implications of Nanosecond Discrepancy Data for Picosecond Anomaly, and Theoretical Modelling of Damage and Repair Mechanisms", B. S. Gerstman, 11th International Biophysics Congress, Budapest, Hungary, July, 1993.
Invited Presentation

Neuroscience Seminar Program, Miami Children's Hospital, November, 1993.
Invited Presentation

"A Working Theory and Experiments on Photomechanical Disruption of Melanosomes to Explain the Threshold for Minimal Visible Retinal Lesions for Sub-ns Laser Pulses", S. L. Jacques, A. A. Oravesky, R. Thompson, and Bernard S. Gerstman, SPIE OE-LASE, Los Angeles, 1994.

"Control of Long Time Dependence of CO Binding to Heme Systems By Inhomogeneous Spread in Electronic Prefactor", B. S. Gerstman and N. Sungar, American Physical Society, Pittsburgh, March, 1994.

"Laser Induced Bubble Formation in the Retina", B. Gerstman, Optical Biophysics Colloquium Series, Armstrong Laboratories, Brooks AFB, Texas, August, 1994.
Invited Presentation.

"Protein Structural Inhomogeneity and Functional Kinetics: When Electronic Inhomogeneity Can Dominate Enthalpic and Entropic Inhomogeneities", B. S. Gerstman, Southeastern Sectional Meeting of The American Physical Society, Newport News, Virginia, November, 1994.
Invited Presentation.

"Bubble Production in the RPE by Sub-Microsecond Laser Pulses", B. S. Gerstman, C. R. Thompson, and M. E. Rogers, 3rd AFOSR Ultrashort Laser Program Collaborative Workshop, Sponsored by Armstrong Laboratory and AFOSR, San Antonio, Texas, December, 1994.
Invited Presentation.

"Bubble Production in the RPE by Sub-Microsecond Laser Pulses", B. S. Gerstman, C. R. Thompson, and M. E. Rogers, SPIE International Symposium on Biomedical Optics, SPIE Proceedings, Vol. 2391, Photonics West, San Jose, CA., February, 1995.

"Laser Induced Bubble Formation in the Retina and Sub-Microsecond Threshold Damage", Wellman Laboratories, Harvard University, November, 1995.

"Protein Structural Inhomogeneity and Electronic Ramifications on Functional Kinetics", Department of Biophysics, Albert Einstein College of Medicine, November, 1995.

"Gruneisen Equation of State for Melanosomes Irradiated by Sub-Nanosecond Laser Pulses", C.R. Thompson and B. S. Gerstman, Laser-Tissue Biophysics, SPIE International Symposium on

Biomedical Optics, SPIE Proceedings, Vol. 2681, OE/LASE Photonics West, San Jose, CA., February, 1996.

"Thermodynamic Modeling of Laser-Melanin Interaction", 4th Ultrashort Laser Pulse Workshop, Sponsored by Armstrong Laboratory and Air Force Office of Scientific Research, San Antonio, Texas, March, 1996.

Invited Presentation

"Modeling Bubble Formation and Damage in the Retina by Pulsed Lasers", B. Gerstman, XIIth International Biophysics Congress, Amsterdam, Holland, August, 1996.

"The Physics of Life: Protein Folding", Department of Physics Colloquium, University of Virginia, October, 1996.

Invited Presentation

"Laser Induced Damage to the Retina", Biophysics Program, University of Virginia, October, 1996.

Invited Presentation

"Nanosecond Laser Pulses: Refined Surgical Treatment of Congenital Nevi and Melanoma", B. S. Gerstman, Laser-Tissue Biophysics, SPIE International Symposium on Biomedical Optics, SPIE Proceedings, Vol. 2975, OE/LASE Photonics West, San Jose, CA., January, 1997.

Invited Presentation

"The Physics of Life: Protein Folding", Department of Physics Seminar Series, Princeton University, November, 1997.

Invited Presentation

"Pressure Generation in Melanosomes by Sub-Nanosecond Laser Pulses"
Laser-Tissue Biophysics, SPIE International Symposium on Biomedical Optics, SPIE Proceedings, OE/LASE Photonics West, San Jose, CA., January, 1998.

"Activated Rate Processes and a Specific Biochemical Mechanism for Explaining Laser Induced Thermal Damage to the Retina", XIII International Congress of Eye Research, Paris, France, July, 1998.

"Modeling of Pressure Generation by Lasers in Melanosomes; How to Avoid Stress Confinement and Blow Up a Melanosome", Laser-Tissue Biophysics, SPIE International Symposium on Biomedical Optics, SPIE Proceedings, OE/LASE Photonics West, San Jose, California, January, 1999.

"Modeling of Pressure Generation by Ultrashort Lasers", VIth Ultrashort Laser Workshop, San Antonio, Texas, February, 1999.

Invited Presentation

“Laser Generation of High Pressures in the Eye”, XIII International Biophysics Congress, New Delhi, India, September, 1999.

Invited Presentation

“Theoretical Modeling of Laser Induced Explosive Pressure Generation and Vaporization in Pigmented Cells”, 31st Annual Symposium on Optical Materials for High Power Lasers, Boulder, Colorado, October, 1999.

Invited Presentation

“Shock Wave Generation in the Retina by Lasers”, Laser-Tissue Biophysics, SPIE International Symposium on Biomedical Optics, SPIE Proceedings, OE/LASE Photonics West, San Jose, California, January, 2000.

“Medical Applications of Nanosecond Laser Pulses on Heavily Pigmented Cells”, The X International Conference on Laser Optics, St. Petersburg, Russia, June 2000.

Invited Presentation

“Bubble Formation and Shock Wave Generation in the Retina by Lasers”, The British Defence Research Agency, Malvern, England, August 3, 2000.

Invited Presentation

“Self-Consistent Models of Thermally Induced Damage to the Retina”, Workshop 2000, Organized by The International Commission on Non-Ionizing Radiation, Baltimore, September, 2000.

“Theoretical Modeling of Shock Waves and Vaporization in the Retina Induced by Lasers”, Workshop 2000, Organized by The International Commission on Non-Ionizing Radiation, Baltimore, September, 2000.

Invited Presentation

“An Effective Short Course on Research Integrity”, United States Office of Research Integrity@ Conference on Ethics in Research, National Institutes of Health, Bethesda, Maryland, November, 2000.

Invited Presentation

“Laser Induced Retinal Shock Waves and Bubbles and Their Dependencies on the Thermo-Mechanical Properties of Melanosomes”, Laser-Tissue Biophysics, SPIE International Symposium on Biomedical Optics, SPIE Proceedings, OE/LASE Photonics West, San Jose, California, January, 2001.

“Theoretical Treatments of Laser Induced Retinal Damage-What’s Next”, VII Workshop on Ultrashort Laser Pulse Effects, San Jose, California, January, 2001.

Invited Presentation.

“Non-Linear Dynamics of Protein Folding and Lyapunov Exponent Calculation”, 4th International Conference on Biological Physics, Kyoto, Japan, August, 2001.

“Damaging Cellular Membranes with Laser Induced Shock Waves”, 4th International Conference on Biological Physics, Kyoto, Japan, August, 2001.

“The Limits of Activated Arrhenius Models for Simulating the Spot-Size Dependence of Thermal Laser-Retinal Damage Thresholds”, Laser Bioeffects Meeting, Val de Grace, Paris, France, June, 2002.
Invited Presentation

“The Non-Linear Dynamics of Protein Folding: The Anti-Chaos of Life”, Conference on Spatio-Temporal Chaos, The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy, July, 2002.

“Chaotic Dynamics of Laser Induced Shock Waves”, Cavendish Laboratory, Department of Physics, Cambridge University, England, July, 2003.
Invited Presentation

“Magnetic Effects in the Structure and Function of Biomolecules”, International Conference of Magnetism, Rome, Italy, August, 2003.

“Modeling Laser Generated Shock Damage and Thermo-Mechanical Chaos in Nanoparticles”, Material Research Society Fall Meeting, Boston, December, 2003.
Invited Presentation

“Ab-Initio Calculations for Shock Wave and Bubble Production with Gaussian Temporal Laser Pulses”, Symposium on Biomedical Optics, SPIE Proceedings, Photonics West, San Jose, California, January, 2004.

“Theoretical Modeling of Laser Generated Thermo-Mechanical Effects in Strongly Absorbing Microparticles and Nanoparticles”, Laser Bioeffects Workshop, San Antonio, Texas, March, 2004.
Invited Presentation

“Finite size scaling of structural transitions in a simulated protein with secondary and tertiary structure”, American Physical Society, Montreal, Canada, March, 2004.

“The evolution of protein composition determined by the thermodynamics of nucleotide coupling”, American Physical Society, Montreal, Canada, March, 2004.

“Liquid-Vapor Equation of State for Laser Induced Vaporization in the Retina”, 11th International Symposium on Solubility Phenomena, Aveiro, Portugal, July, 2004.

“Laser Effects on the Retina”, International Commission on Non-Ionizing Radiation, Baltimore, September, 2004.

Invited Presentation

“Stress Confinement, Shock Wave Formation and Laser Induced Damage”, Symposium on Biomedical Optics, SPIE Proceedings, Photonics West, San Jose, California, January, 2005.

“Enhanced Shock Wave and Bubble Formation by Resonant Laser Absorption”, Symposium on Biomedical Optics, SPIE Proceedings, Photonics West, San Jose, California, January, 2005.

“Evolution at the Nucleotide Level”, American Physical Society, Los Angeles, March, 2005.

“Folding Kinetics and Thermodynamics of a Model Alpha Helical Hairpin Peptide”, American Physical Society, Los Angeles, March, 2005.

“Investigating The Nanoparticle Transition from Bulk Behavior to Discrete Atom/Finite Size Behavior Using Laser Induced Pressure Generation”, ChinaNANO International Conference on Nanoscience and Technology, Beijing, China, June, 2005.

“Resonant Absorption in Nanometer Gold Spherical Particles”, Symposium on Biomedical Optics, SPIE Proceedings, Photonics West, San Jose, California, January, 2006.

“Chaos in the Pressure Generated by Laser Absorption by Microparticles”, Symposium on Biomedical Optics, SPIE Proceedings, Photonics West, San Jose, California, January, 2006.

“Quantifying Energy, Entropy and Free-Energy in Protein Folding Funnels”, American Physical Society, Baltimore, March, 2006.

“Nucleotide Mutation and Amino Acid Evolution”, American Physical Society, Baltimore, March, 2006.

“Resonant Absorption in Micrometer and Nanometer Absorbing Particles”, American Physical Society, Baltimore, March, 2006.

“Laser-Induced Semiquinone Formation and Damage to the Retina”, Federation of European Biochemical Societies, Istanbul, Turkey, June, 2006.

“Laser Effects on the Retina; Micro and Nanoscale Pressure Generation”, Nano-BioForum, Milan, Italy, September, 2006.

Invited Presentation

“Analyzing chaos in the pressure generated by laser absorption by microparticles”, Symposium on Biomedical Optics, SPIE Proceedings, Photonics West, San Jose, California, January, 2007.

“Lattice Model Investigations of Protein Aggregation”, American Physical Society, Denver, March, 2007.

“Interplay between secondary and tertiary structure formation in a lattice model alpha helical hairpin peptide”, American Physical Society, Denver, March, 2007.

“Mathematics of distal revascularization-interval ligation (DRIL)”, American Society of Diagnostic and Interventional Nephrology, 3rd Annual Scientific Meeting, San Juan, Puerto Rico, April, 2007.

Invited Presentation

“Pressure Generation by Resonant Absorption of Pulsed Laser Radiation by Nanoparticles”, ChinaNANO2007 International Conference on Nanoscience & Technology, Beijing, China, June, 2007.

“Nanoparticle and Laser Usage for Selective Cell Surgery”, ChinaNANO2007 International Conference on Nanoscience & Technology, Beijing, China, June, 2007.

Invited Presentation

“Computational Investigations of Protein-Protein Interactions”, Nano-BioForum, Milan, Italy, September, 2007.

Invited Presentation

“Computer simulations of the folding mechanism of the GCN4 Leucine zipper”, American Physical Society, New Orleans, March, 2008.

“The trigger sequence in the protein folding and dimerization of the Leucine zipper coiled-coil motif”, American Physical Society, New Orleans, March, 2008.

“Retinal Damage from Resonant Absorption of Multi-Pulse Laser Trains”, Joint US/UK Laser Bioeffects Meeting, Porton Down, England, August, 2008.

Invited Presentation

“Stability versus flexibility in the dimerization kinetics and thermodynamics of the GCN4 Leucine zipper”, American Physical Society, Pittsburgh, March, 2009.

“Position dependence of the trigger sequence in the folding and dimerization of a lattice model coiled-coil peptide”, American Physical Society, Portland, March, 2010.

“Can finite size scaling analysis improve protein engineering?”, StatPhys24 (XXIV International Conference on Statistical Physics of the International Union for Pure and Applied Physics (IUPAP)), July 2010, Cairns, Queensland, Australia

“Heterogeneous helical propensity and its effects on dimerization and the stability of a model protein dimer”, American Physical Society, Dallas, March, 2011.

“Protein barrel fluctuations and the barrel permeability: A comparison between Green and Red Fluorescent proteins”, American Physical Society, Dallas, March, 2011.

“Barrel fluctuation and oxygen diffusion pathways in the monomeric fluorescent proteins”, American Physical Society, Boston, February-March, 2012.

“Effects of pressure on the protein barrel and the chromophore interactions in mCherry”, American Physical Society, Boston, February-March, 2012.

“Diffusion of molecular oxygen in the monomeric red fluorescent proteins using Molecular Dynamics simulations”, The Biophysical Society, Philadelphia, February, 2013.

“Structural Transformation and Aggregation of cc-beta Peptides Into Amyloid Proto-Fibrils”, American Physical Society, Baltimore, March, 2013.

“Diffusion of molecular oxygen in the red fluorescent protein mCherry”, American Physical Society, Baltimore, March, 2013.

“Temperature Dependence of the Protein-Chromophore Hydrogen Bond Dynamics in the Far-red Fluorescent Protein mPlum”, The Biophysical Society, February, 2014.

“Structural Transitions and Aggregation in Amyloidogenic Proteins”, American Physical Society, Denver, March, 2014.

“Temperature Dependent Solvation Dynamics of the Chromophore Environment in the Far-Red Fluorescent Protein mPlum”, American Physical Society, Denver, March, 2014.

“Molecular dynamics investigations of protein barrel flexibility and oxygen diffusion pathways in red fluorescent proteins”, International Biophysics Congress, Brisbane, Australia, August, 2014.

“A Switching Hydrogen Bond Explains the Bathochromic Shifts Observed in mPlum”, International Biophysics Congress, Brisbane, Australia, August, 2014.

“Hydrogen bond flexibility and water dynamics in the far red emitting fluorescent protein TagRFP675”, Biophysical Society Meeting, Baltimore, February, 2015.

“Molecular Dynamics Investigations of the alpha-helix to Beta-barrel Conformational Transformation in RfaH-CTD”, American Physical Society, San Antonio, March, 2015.

“Bio-Nanoparticles: Determining Fundamental Physical Properties and Bio-Medical Applications Through Laser Induced Pressure and Cavitation”, Keynote speaker, Laser-Tech 2015, Orlando, Florida, July, 2015.

“Transformer Proteins: Friends and Foes”, American Chemical Society, Memphis, November, 2015.
Invited Presentation.

“Interdomain Interactions and the Mechanism of the Structural Transformation in RfaH”, Biophysical Society, Los Angeles, February, 2016.

“The Molecular Dynamics Study of the Structural Conversions in the Transformer Protein RfaH”, American Physical Society, Baltimore, March, 2016.

“Towards Designing Fluorescent Proteins With Improved Photophysical Properties”, IUPAC, Osaka, Japan, April, 2016.

“Structural Propensities and Entropy Effects in Peptide Helix-Coil Transitions”, StatPhys 26, Lyon, France, July, 2016.

EXTERNAL FUNDING

Current

“Computational Investigations of Monomeric Variants of Red Fluorescent Proteins”

National Institutes of Health

2011-2016

\$428,376

PI: Prem Chapagain

Recent

“Laser Induced Shock Waves and Vaporization in Biological Systems and Material Science”

Air Force Office of Scientific Research

2003-2007

\$458,500.

PI

"Theoretical Modeling of Damage Mechanisms for Ultrashort Laser Pulses in Ocular Media."

Air Force Office of Scientific Research.

1996-2001

\$678,483.

PI

Editorial Positions: Executive Editor, American Institute of Physics *Advances*

Refereeing Activities:

Proposals:

- National Science Foundation
- American Institute of Biological Sciences
- Israel Science Foundation
- Austrian Science Foundation
- National Institutes of Health

Manuscripts:

- Physical Review Letters
- Physical Review
- Journal of Chemical Physics
- The Biophysical Journal
- The Bulletin of Mathematical Biology
- Journal of Physical Chemistry
- Comments on Molecular and Cellular Biophysics
- Journal of Biomedical Optics
- Journal of Laser Application
- PLoS
- AIP Advances

Program Review (Panel Member):

- American Institute of Biological Sciences

Courses Taught

Graduate Statistical Physics

Graduate Electrodynamics

Graduate Condensed Matter Physics

Graduate Molecular Biophysics

Advanced Biophysics

Molecular Biophysics

Physics with/Calculus I (Mechanics)

Physics with/Calculus II (Electricity and Magnetism)

Physics without/Calculus I (Mechanics)

Physics without/Calculus II (Electricity and Magnetism)

University Honors Program (interdisciplinary)

Ethical Behavior in Research