

Assistant Professor

Mechanical Engineering, University of California, Merced

M.S., Ph.D. 2006 (**Mechanical Engineering and Scientific Computing**, University of Michigan, Ann Arbor)

B.Tech. 1997 (**Mechanical Engineering**, Institute of Technology, Banaras Hindu University, India)

Research Expertise and Interests

Core Expertise:

Continuum Mechanics, Dynamics and Controls

Cross-disciplinary Expertise:

Single-Molecule Experiments, Theoretical Biophysics, Biochemistry, Molecular Biology and System Identification.

Awards and Honors

- Excellence-in-Research Fellowship, which accompanies a monthly honorarium over and above the regular salary at Indian Institute of Technology.
- Ivor K. McIvor Award for outstanding research and scholarship in Applied Mechanics, College of Engineering, University of Michigan.
- Rackham Pre-doctoral Fellowship, University of Michigan, the most prestigious graduate student fellowship.
- Fellowship award to attend the 4th Q-Bio conference, Santa Fe, NM, 2010 from its sponsors, Los Alamos National Lab and Center for Nonlinear Studies
- Best Presentation award in Graduate Student Symposium, Bioengineering, Mechanical Engineering, University of Michigan.
- Graduate Fellowship by Mechanical Engineering Department, University of Michigan.
- 1st Rank in a Junior Year semester of B.Tech., ITBHU, India.
- B.D. Bangur trust fellowship for study abroad.

Professional Societies and Technical Committee Memberships

- Publication and Information Subcommittee, MSNDC, American Society of Mechanical Engineers (ASME), Member
- Member, Conference Coordination Committee of the 9th International Conference on Multibody Systems, Nonlinear Dynamics, and Control (MSNDC), which will be held in conjunction with the 2013 ASME International Design Engineering Technical Conference and Computers and Information in Engineering Conference (IDETC/CIE2013)
- American Society of Mechanical Engineers (ASME), Member
- IEEE, Member
- Biophysical Society, Member
- Society of Industrial and Applied Mathematics (SIAM), Member

Symposia and Workshops Organized

- Co-organizer, 9th International Conference on Multibody Systems, Nonlinear Dynamics, and Control (MSNDC) in 2013 ASME IDETC.
- Symposium on "[Molecular Modeling Methods and Applications](#)" in 2009 ASME IDETC.
- 3-day workshop on "Applied Computational Dynamics" for industrial practitioners in Altair Eng. Inc., Bangalore, India in Jan 2009.

Workshops Attended

- Workshop on Mathematical Foundations of Mechanical Biology, Banff, Alberta, Canada, Sept 2010. (**By invitation**)
- Summer School in the Center for the Physics of Living Cells (CPLC), Urbana-Champaign, July 2010.
- NSF, AFOSR, ARO, ONR, NIH, USDA Workshop on New Frontiers in Dynamic Systems, Mar 2007. (**By invitation**)
- ICAM workshop on Physics of cellular objects, Cargèse, France, Aug 2006.

STEM (Science, Technology, Engineering and Mathematics) Outreach in American Education

- Developed discovery-based learning modules with physical toy models of DNA for K-12 students as a part of NSF funded outreach program of Cornell Center of Materials Research (CCMR).
- Conducted several educational programs for Cornell consumer science club, Nottingham high school, Bronx Science high school, etc.
- Offered teachers' training workshop on "Mechanics of DNA" in Center for Nanoscale Systems Institute for Physics Teachers (CIPT).

Other Professional Activities

- Invited talks at several places including University of California at Berkeley, University of Maryland, Rensselaer Polytechnic Institute, Syracuse University, Tufts University, Tulane University, Bronx Science High School, Indo-Australia Symposium on Multifunctional Nanomaterials, Nanostructures and Applications (MNNA 2007), etc.
- Reviewer for ASME Journal of Applied Mechanics, Journal of Computational and Nonlinear Dynamics, Journal of Vibrations and Acoustics, International Journal of Nonlinear Mechanics, International Journal of Structural Stability and Dynamics, Journal of the Mechanics and Physics of Solids, Journal of Physics A: Mathematical and Theoretical, Mathematics and Computers in Simulation, Journal of Statistical Mechanics, Biophysical Journal, Nucleic Acids Research, Automatica, IEEE-CDC, etc.
- Editorial board member of World J. Mechanics, and Int. J. Engineering and Industries.
- Technical adviser to [Timetooth Technologies Pvt. Ltd.](http://www.timetoothtechnologies.com), a start-up that specializes in CAE-based research and development services.
- Invited to submit a book chapter, "*Mechanics of Biofilaments: From Atomistic Simulations to Continuum Modeling*", to "Molecular Dynamics / Book 2", ISBN 979-953-307-865-5.
- Media coverage: <http://esciencecommons.blogspot.com/2011/01/undersea-cables-add-twist-to-dna-study.html>

Education

University of Michigan

MS + PhD, Mechanical Engineering and Scientific Computing (dual degree) (GPA: 8.2/9.0) (8.0=A)

Ann Arbor, MI

May 2006

Dissertation Title: "A Dynamic Rod Model to Simulate Mechanics of Underwater Cables and DNA." [\[PDF\]](#)

Dissertation Committee:

Noel Perkins (Chair), Professor, Mechanical Engineering

Edgar Meyhofer (Co-chair), Professor, Mechanical Engineering and Biomedical Engineering

Krishna Garikipati, Associate Professor, Mechanical Engineering and Theoretical Physics

Jens-Christian Meiners, Associate Professor, Physics and Experimental Biophysics

Ioan Andricioaei, Associate Professor, Chemistry

Relevant Graduate Coursework: Boundary Value Problems, Numerical Methods, Finite Element Method, Computational Inelasticity, Mechanical Vibrations, Analytical and Computational Dynamics, Vehicle Dynamics and Control, Linear Feedback Control, Nonlinear Systems and Control, Multi-Physical Phenomenon at Micro-scale, Biophysics of DNA and Proteins.

Banaras Hindu University

B.Tech, Mechanical Engineering (GPA: 8.4/10.0)

Varanasi, UP, India

May 1997

Undergrad Project: "Conceptual Design of Ordinary Disc Cam Mechanism for Indexing Motion." (thesis + demonstration with a working prototype)

Professional Experience

University of California

Assistant Professor

Merced, CA

July 2012 - present

- Regular tenure-track faculty in the field of Computational Mechanics.

Indian Institute of Technology (IIT)*Assistant Professor*Gandhinagar, India
Dec 2011 – Apr 2012

- Employed by invitation with my commitment for one semester.
- Undergraduate teaching: Simulation-Driven Engineering, Numerical Methods.
- Advising and mentoring students on research projects and B.Tech projects.
- Administrative activities for building the new institute – faculty, scholars and student recruitments, campus planning, strategic planning, curriculum planning, proposal for design innovation center (DIC), multiversity initiatives in Gujarat state, etc.

Emory University*Post-doctoral Fellow*Atlanta, GA
Jan 2010 – Dec 2011

- Performed magnetic-tweezers experiments to analyze non-specific interactions of CI proteins with DNA.
- Established collaboration for Fluorescence Correlation Spectroscopy (FCS) experiments on CI-DNA interactions with the Indian Institute of Chemical Biology.
- Applied Mechanics perspective on the theoretical and experimental Biophysics of DNA deformation.
- Mentored several undergraduate and graduate students.

Cornell University*Visiting Assistant Professor*Ithaca, NY
Aug 2007 – Dec 2009

- Undergraduate teaching: Mechanics of Solids, Calculus for Engineers, Differential Equations for Engineers, Linear Systems
- Graduate Teaching: Intermediate Dynamics, Applied Computational Dynamics.
- Advising and Mentoring: M.Eng. projects and co-advising Ph.D. students. Projects mentored:
 - Development of an interactive JAVA-based Multibody Dynamic Simulator.
 - Modeling the role of micro-fibril buckling in the gecko-inspired adhesion mechanics.
 - Kinematics and compliance (K&C) analysis and design optimization of a BMW car suspension.
 - Multi-body simulation of a spring-mass pattern constituting a beam structure in long-length scale.
- STEM Outreach activities: Bronx Science High School, other upstate NY schools, NSF funded Cornell Outreach.
- Served on interview panels for Ph.D. qualifying exams.

Woods Hole Oceanographic Institution*Post-doctoral Scholar*Woods Hole, MA
Oct 2006 – July 2007

- Extended research on applications to computational rod model to DNA and underwater cables.
- Taught underwater sonar detection techniques to summer students on educational cruises.

University of Michigan*Research Fellow (post-doc)*Ann Arbor, MI
June 2006 – Sept 2006*Research Assistant*

Sept 2001 – April 2006

- Developed a dynamic rod model to simulate nonlinear structural mechanics of underwater cables and DNA (Deoxy-ribo nucleic acid).
- Employed the model to conduct specific studies ranging from underwater cable applications to DNA-Protein interactions.
- Provided insights for future experiments on DNA from model simulations.
- Mobilized an interdisciplinary effort from research teams in Biophysics, Biochemistry and Mechanical Engineering departments within the University of Michigan.

Teaching Assistant

Jan 2005 – April 2005

- Taught Graduate level course on Vehicle Dynamics (Tire Mechanics, Ride and Handling).
- Delivered video-recorded classroom sessions for off-campus students (employees of automotive industry).
- Guest lecture for a sophomore level course on Solid Mechanics (*Fall 2005*).

Independent Research (3 credits)

Jan 2001-April 2001

- Improved the method of “Component Mode Synthesis” to simulate mid-frequency range vibrations of welded structural assemblies (funded by automotive research center).

Larsen & Toubro Limited*Executive Engineer (Turnkey Projects)*Powai Works, Mumbai, India
July 1997 – July 2000

[Turnkey Projects](#) Division of [Larsen & Toubro Limited](#) develops infrastructure in four industrial sectors: - Oil and Gas, Power Plants, Cement Plants and Chemical Plants. In the first two years, I underwent a versatile training through job rotation in all four sectors with different functional roles: Marketing, Engineering, Execution, and Erection & Commissioning. After two years, I opted to work in Oil and Gas Projects. I played a leadership role from Marketing to Detailed Engineering in

“**Pipelines & Platform Modifications Project**” (Site: Bombay High & Neelam offshore oil-fields, Client: [Oil & Natural Gas Corporation Limited](#), Engineering Consultant: [Engineers India Limited](#)).

- Coordinated Engineering and Procurement activities with consortium partners/consultants.
- Developed Vendors and Followed-up Procurement.
- Optimized Fabrication and Procurement logistics.
- Managed Site Construction, Fabrication and Commissioning.
- Planned and Negotiated with clients the Milestones-based Project Billing Schedules.
- Performed Proposal Engineering and Contract Negotiation at the tendering stage.
- Developed Project Plans using PERT and Monitored their Execution/ Progress.
- Organized project specific taskforces and Planned their work interface.
- Implemented ERP (Enterprise Resource Planning) in Engineering and Procurement and Provided the End-User Training.

Escorts Yamaha Motors Limited

Intern

NOIDA, India
May – June 1996

- Studied and Improved Process Plan and Design of Shock Absorber Assembly Layout.

Bharat Heavy Electricals Limited

Intern

Haridwar, India
May – June 1995

- Studied Fabrication & Assembly of 150MW Gas Turbine and its Trial Runs in Balancing Tunnel.
- Learnt and Supervised Non-Destructive Testing of Welded Structures.

Publications

Journal Articles:

1. Hinkle, A. R., **S. Goyal** and H. J. Palanhandalam-Madapusi, 2012, “*Constitutive-law Modeling of Microfilaments from their Discrete-Structure Simulations - A Method based on an Inverse Approach Applied to a Static Rod Model*”, **ASME Journal of Applied Mechanics**, vol. 79 (5), pp. 51005.
2. Haeusler, A., K. Goodson, T. Lillian, **S. Goyal**, N. C. Perkins and J. D. Kahn, 2012, “*FRET Studies of a Landscape of Lac Repressor Mediated DNA Loops*”, **Nucleic Acids Research**, vol. 40 (10), pp. 4432-4445.
3. **Goyal, S.**, C. Fountain, D. Dunlap, F. Family and L. Finzi, 2012, “*Stretching DNA to quantify non-specific protein binding*”, **Physical Review E**, vol. 86 (1), 011905.
4. Shao, Q., **S. Goyal**, D. Dunlap and L. Finzi, 2012, “*Physiological Levels of Salt and Polyamines Favor Writhe and Limit Twist in DNA*”, **Macromolecules**, vol. 45 (7), pp 3188–3196.
5. Palanhandalam-Madapusi, H. J. and **S. Goyal**, 2011, “*Is Parkinsonian Tremor a Limit Cycle?*”, **Journal of Mechanics in Medicine and Biology**, vol. 11 (5), pp. 1017–1023.
6. Palanhandalam-Madapusi, H. J. and **S. Goyal**, 2011, “*Robust estimation of nonlinear constitutive law from static equilibrium data for modeling the mechanics of DNA*”, **Automatica**, vol. 47 (6), pp. 1175-1182.
7. Naderman, N., A. Kumar, **S. Goyal** and C. Hui, 2010, “*Buckling of sheared rods and friction of microfibril arrays*”, **Journal of the Royal Society Interface**, vol. 7 (52), pp. 1581-1589.
8. Liebesny, P., **S. Goyal**, D. Dunlap, F. Family and L. Finzi, 2010, “*Determination of the number of proteins bound non-specifically to DNA*”, **Journal of Physics: Condensed Matter**, Special Issue: From DNA inspired physics to physics inspired biology, vol. 22(41), 414104.

9. Lillian, T., **S. Goyal**, J. D. Kahn, E. Meyhöfer and N. C. Perkins, 2008, “*Computational Looping Analysis of a Large Family of Highly Bent DNA by LacI*”, **Biophysical Journal**, vol. 95, pp. 5832-5842.
10. **Goyal, S.**, and N.C. Perkins, 2008, “*Looping mechanics of rods and DNA with non-homogeneous and discontinuous stiffness*”, **International Journal of Nonlinear Mechanics**, vol. 43(10), pp. 1121-1129.
11. **Goyal, S.**, N.C. Perkins and C.L. Lee, 2008, “*Non-linear dynamic intertwining of rods with self-contact*”, **International Journal of Nonlinear Mechanics**, vol. 43(1), pp. 65-73. [e.g. [simulation video](#)] **[Over 15 citations in google scholar]**.
12. **Goyal, S.**, N.C. Perkins and J.C. Meiners, 2008, “*Resolving the Sequence-Dependent Stiffness of DNA using Cyclization Experiments and a Computational Rod Model*”, **ASME Journal of Computational and Nonlinear Dynamics**, vol. 3(1), 01103.
13. **Goyal, S.**, T. Lillian, S. Blumberg, J. C. Meiners, E. Meyhöfer and N. C. Perkins, 2007, “*Intrinsic Curvature of DNA Influences Lac-R Mediated Looping*”, **Biophysical Journal**, vol. 93, pp. 4342-4359. **[Over 20 citations in google scholar]**.
14. **Goyal, S.**, N.C. Perkins and C.L. Lee, 2005, “*Nonlinear Dynamics and Loop Formation in Kirchhoff Rods with Implications to the Mechanics of DNA and Cables*”, **Journal of Computational Physics**, vol. 209, pp. 371-389. **[Over 60 citations in google scholar]**.

Peer-reviewed Conference Articles:

15. Palanthandalam-Madapusi, H. J. and **S. Goyal**, 2010, “*Modeling Structural Deformations of DNA Molecules Using Identification Techniques*”, Proceedings of the 49th **IEEE Conference on Decision and Control**, Atlanta, USA, December, pp. 3385 - 3390. **(Invited Session on “System Identification in Biology and Medicine”)**
16. Ruimi, A., **S. Goyal** and Nour, B. M., 2009, “*An Interactive Web-based Simulation Tool for Surgical Threads*”, Proceedings of the **International Conference on Biological and Biomedical Engineering**, Amsterdam, the Netherlands, Sept. 23-25, 2009.
17. Hinkle, A. R., **S. Goyal** and Palanthandalam-Madapusi, H. J., 2009, “*An Estimation Method of a Constitutive-Law for the Rod Model of DNA using Discrete Structure Simulations*”, Proceedings of **ASME International Design Engineering Technical Conferences: 7th International Conference on Multibody Systems, Nonlinear Dynamics, and Control**, San Diego, CA.
18. Palanthandalam-Madapusi, H. J. and **S. Goyal**, 2008, “*Estimation of Nonlinear Sequence-dependent Constitutive Law for DNA Molecules*”, Proceedings of the 47th **IEEE Conference on Decision and Control**, Cancun, Mexico, December, pp. 2674-2679.
19. Wilson, D., T. Lillian, **S. Goyal**, A. Tkachenko, N. C. Perkins and J. C. Meiners, 2007, “*Understanding the Role of Thermal Fluctuations in DNA Looping*”, **Proceedings of SPIE**, Vol. 6602, 660208, Florence, Italy.
20. Lillian, T., N.C. Perkins and **S. Goyal**, 2007, “*Computational Elastic Rod Model Applied to DNA Looping*”, CD-ROM Proceedings of **ASME Design Engineering Technical Conference: 6th International Conference on Multibody Systems, Nonlinear Dynamics, and Control**, Las Vegas, NV.

21. **Goyal, S.** and N.C. Perkins, 2005, “*A Hybrid Rod-Catenary Model to Simulate Nonlinear Dynamics of Cables with Low and High Tension Zones*”, Proceedings of **ASME Design Engineering Technical Conference: 5th International Conference on Multibody Systems, Nonlinear Dynamics, and Control**, vol. 6 C, pp. 1691-1698.
22. **Goyal, S.**, T. Lillian, N.C. Perkins and E. Meyhöfer, 2005, “*Cable dynamics applied to long-length scale mechanics of DNA*”, CD-ROM Proceedings of Sixth International Symposium on Cable Dynamics, Charleston, SC. **(Keynote Speech)** [\[PDF\]](#)
23. **Goyal, S.** and N.C. Perkins, 2005, “*Modeling of Cables with High and Low Tension Zones using a Hybrid Rod-Catenary Formulation*”, CD-ROM Proceedings of Sixth International Symposium on Cable Dynamics, Charleston, SC. [\[PDF\]](#)
24. **Goyal, S.**, N.C. Perkins and C.L. Lee, 2003, “*Torsional buckling and writhing dynamics of elastic cables and DNA*”, Proceedings of **ASME Design Engineering Technical Conference: 19th Biennial Conference on Mechanical Vibration and Noise, 2003**, vol. 5 A, pp. 183-191.
25. **Goyal, S.**, N.C. Perkins and C.L. Lee, 2003, “*Writhing Dynamics of Cables with Self-contact*”, Proceedings of Fifth International Symposium on Cable Dynamics, Santa Margherita Ligure, Italy, pp. 27-36.

Conference Abstracts:

Verma, S and **S. Goyal**, “*Simulation-Based Study of Structural Properties of Microtubules*”, Dec 5 – Dec 12, 2012, New Delhi, India, 3rd Asian Conference on Mechanics of Functional Materials and Structures (ACMFMS).

NitishRatan, A. and **S. Goyal**, “*Modeling Thermal Fluctuations of Bio-Filaments with Kirchhoff Rods*”, Dec 5 – Dec 12, 2012, New Delhi, India, 3rd Asian Conference on Mechanics of Functional Materials and Structures (ACMFMS).

Kumar, S., C. Zurla, **S. Goyal**, L. Finzi and D. Dunlap, “*Effects of Viscosity on Tethered Particle Motion (TPM) Experiments*”, Feb 25 – Feb 29, 2012, San Diego, CA, Biophysical Society. **(Poster)**

Shao, Q., **S. Goyal**, C. Fountain, D. Dunlap, F. Family and L. Finzi, “*Probing DNA Stiffness with Magnetic Tweezers*”, Mar 5-Mar 9, 2011, Baltimore, MD, Biophysical Society. **(Poster)**

Goyal, S., C. Fountain, D. Dunlap, F. Family and L. Finzi, “*Stretching DNA to Quantify Non-specific Binding by the Lambda Repressor (CI)*”, Mar 5-Mar 9, 2011, Baltimore, MD, Biophysical Society. **(Poster)**

Shao, Q., **S. Goyal**, C. Fountain, D. Dunlap, F. Family and L. Finzi, “*Probing DNA Stiffness with Magnetic Tweezers*”, Jan 9 – Jan 15, 2011, Aspen, CO, Single Molecule Biophysics.

Goyal, S. and Palantheadalam-Madapusi, H. J., “*From Atomistic Simulations to Continuum Modeling of Bio-filaments*”, Sept 27-Oct 1, 2010, BIRS, Banff, AB, Canada, Mathematical Foundations of Mechanical Biology. **(Presented by Goyal)**

Goyal, S. and Palantheadalam-Madapusi, H. J., “*Continuum Modeling of DNA*”, Aug 11-Aug 14, 2010, Santa Fe, NM, USA, Fourth Annual q-bio Conference. **(Spotlight + Poster)**

Liebesny, P., **S. Goyal**, Dunlap, D., Family, F. and Finzi, L., “*Determination of the number of proteins bound non-specifically to DNA*”, Aug 11-Aug 14, 2010, Santa Fe, NM, USA, Fourth Annual q-bio Conference. **(Spotlight + Poster)**

Liebesny, P., **S. Goyal**, Dunlap, D., Family, F. and Finzi, L., “*Determination of the number of proteins bound non-specifically to DNA*”, Feb 20-Feb 24, 2010, San Francisco, CA, Biophysical Society. **(Poster)**

Bishop, T. C., A. Gramada and **S. Goyal**, “*A Course Grain Model of Histones and DNA in the Nucleosome*”, Feb 28-Mar 4, 2009, Boston, MA, Biophysical Society. **(Poster)**

Goyal, S., T. Lillian, N. C. Perkins, and E. Meyhofer, “*Mechanics of DNA looping by the Lac repressor protein: How stress-free shape influences loop energetics and topology*”, Jun 18-21, 2008, Woods Hole, MA, International Union of Theoretical and Applied Mechanics (IUTAM), Symposium on Cellular, Molecular and Tissue Mechanics. **(Presented by Goyal)**

Goyal, S., T. Lillian, N. C. Perkins, and E. Meyhofer, “*A Computational Rod Model to Simulate the Mechanics of DNA Looping*”, May 11-14, 2008, Philadelphia, PA, SIAM Conference on Mathematical Aspects of Materials Science (MS08). **(Presented by Goyal)**

Smith, M. L., T. J. Healey and **S. Goyal**, “*Modeling the Effects of Chirality on DNA Supercoiling*”, Feb 2-6, 2008, Long Beach, CA, Biophysical Society. **(Poster)**

Lillian T., **S. Goyal**, E. Meyhofer, J. D. Kahn and N. C. Perkins, “*Computational Elastic Rod Theory Captures DNA and Protein Flexibility in the Lac-repressor Complex*”, Feb 2-6, 2008, Long Beach, CA, Biophysical Journal. **(Poster)**

Lillian, T., **S. Goyal**, E. Meyhofer, and N. C. Perkins. 2008. Elastic rod model for protein mediated DNA looping. North American Congress on Biomechanics, Ann Arbor, Michigan. **(Poster)**

Goyal, S., A. Gramada and T. C. Bishop, “*Development of a Coarse-Grain Model of the Nucleosome*”, Jun 19-23, 2007, Albany Conversation 15. **(Poster)**

Goyal, S., T. Lillian, D. Wilson, E. Meyhofer, J. C. Meiners and N. C. Perkins, “*Sensitivity of DNA Looping to Sequence-dependent Stiffness*”, Mar 3-7, 2007, Baltimore, MD, Biophysical Society. **(Poster)**

Lillian, T., **S. Goyal**, N. C. Perkins, J. C. Meiners and J. D. Kahn, “*Computational rod theory predicts experimental characteristics of DNA looping by the Lac repressor*”, Mar 3-7, 2007, Baltimore, MD, Biophysical Society. **(Poster)**

Wilson, D., T. Lillian, **S. Goyal**, N. C. Perkins, A. Tkachenko and J. C. Meiners, “*Modeling Entropic Cost of DNA Looping*”, Mar 3-7, 2007, Baltimore, MD, Biophysical Society. **(Platform)**

Goyal, S., T. Lillian, E. Meyhofer, J. C. Meiners and N. C. Perkins, “*A Computational Rod Model to Simulate the Structural Mechanics of DNA*”, ICAM workshop on Physics of cellular objects, Aug 14-26, 2006, Cargèse, France. **(Poster)**

Goyal, S. and N. C. Perkins, “*Structural Modeling of DNA Loops in Lactose-Repressor*”, Nonlinear Vibrations, Aug 13-17, 2006, Blacksburg, VA. **(Presented by Goyal, S.)** [\[PDF\]](#)

Goyal, S., T. Lillian, E. Meyhofer, J. C. Meiners and N. C. Perkins, “*A Computational Rod Model to Simulate the Structural Mechanics of DNA*”, Single Molecule Symposium, May 18-20, 2006, Ann Arbor, MI. **(Poster)**

Lillian, T., **S. Goyal**, E. Meyhofer, J. C. Meiners and N. C. Perkins, “*Inter-operator Phasing Affects DNA Looping: Computational Study*”, Single Molecule Symposium, May 18-20, 2006, Ann Arbor, MI. **(Poster)**

Wilson, D., T. Lillian, **S. Goyal**, N. C. Perkins, A. Tkachenko and J. C. Meiners, “*Modeling Entropic Cost of DNA Looping*”, Single Molecule Symposium, May 18-20, 2006, Ann Arbor, MI. **(Poster)**

Lillian, T., **S. Goyal**, S. Blumberg, N. C. Perkins and J. C. Meiners, “*Computational Predictions of Optimal Inter-Operator A-Tract Phasing for DNA Looping*”, Feb 18-22, 2006, Salt Lake City, UT, Biophysical Society. **(Poster)**

Wilson, D., T. Lillian, **S. Goyal**, N. C. Perkins, A. Tkachenko and J. C. Meiners, “*Modeling Entropic Cost of DNA Looping*”, Feb 18-22, 2006, Salt Lake City, UT, Biophysical Society. **(Poster)**

Goyal, S., S. Blumberg, J. C. Meiners and N. C. Perkins, “*Modeling the Sequence-Dependent Energetics of Protein-Mediated DNA Loops*”, Feb 12-16, 2005, Long Beach, CA, Biophysical Journal, Vol. 88, pp. 61A. **(Poster)**

Goyal, S., S. Blumberg, J. C. Meiners and N. C. Perkins, “*Modeling the Sequence-Dependent Energetics of Protein-Mediated DNA Loops*”, May 23, 2005 Research Symposium, held by the UM-NASA Bioscience and Engineering Institute (UMNBEI) **(Poster)**

Goyal, S. and N. C. Perkins, “*Nonlinear dynamic strand model with coupled tension and torsion*”, Nonlinear Vibrations, July 25-28, 2004, Blacksburg, VA. **(Presented by Goyal, S.)** [\[PDF\]](#)