Donald J. Jacobs, Ph.D.
Department of Physics and Optical Science
University of North Carolina at Charlotte
9201 University City Blvd.
Charlotte, NC 98223

US Citizen, Born Nov,1963
Tel: (704) 687-2552
Fax: (704) 687-3160
Email: djacobs1@email.uncc.edu

EDUCATION

1985-1992 **Ph.D. Physics**, Purdue University, West Lafayette, Indiana
- Advisor: Hisao Nakanishi. Thesis: *Brownian Motion in Disordered Media*
- Edward F. Akeley Memorial Award for outstanding theoretical Physics Thesis
- David Ross Summer Fellowship

1985-1991 **M.S. Physics**, Purdue University, West Lafayette, Indiana

1983-1985 **B.S. Physics**, Union College, Schenectady, New York
- *Magna Cum Laude*, Honors Thesis Advisors: Profs Seyyfie Maleki and Gary Reich.
- Thesis*: Monte Carlo Simulation of Multistate Percolation Models*

1981-1983 **A.S. Engineering Science,** Fulton-Montgomery Comm. College, Johnstown, New York
- Who's Who Among Students in American Junior Colleges (1982-1983)

POSITIONS

2005-present Assistant Professor of Physics; University of North Carolina at Charlotte
- Expertise in Computational, Statistical and Biological Physics.
- Investigating stability, flexibility, dynamics and electrostatics in proteins and polypeptides.
- Interested in Computational Biology to facilitate high throughput rational design in biopolymers.
- MEMBER OF BIOINFORMATICS CENTER, INTERDISCIPLINARY BIOLOGY PROGRAM and FOCUS LEADER FOR THE CENTER FOR BIOMEDICAL ENGINEERING SYSTEMS

2005-present Associate Professor of Physics; California State University, Northridge (CSUN)
- Unpaid leave from the University granted
- Sabbatical leave granted for fall 2005 based on Outstanding Scholarly Merit **(unused)**

1999-2005 Assistant Professor of Physics; California State University, Northridge (CSUN)
- Played a key role in developing a novel interdisciplinary Biomedical Physics (BMPH) undergraduate BA-program and serve as the program coordinator.

1999-2001 Acting president to MolFlex LLC
- Company model replaced with academic software model, with FIRST-software distributed through Website initially at Michigan State University and currently at Arizona State University.

1998-1999 President and Director of Research, MolFlex LLC
- Creation of spin off company in partnerships with M. F. Thorpe and L. A. Kuhn.
- Principle Investigator on SBIR NIH-R43-GM58337-01 Phase I to MolFlex LLC.
- Oversaw development of beta-version of FIRST-software (2 employees).

1998-1999 Assistant Research Professor of Physics, Michigan State University
- Writing and filing US patent # 6014449 *Computer Implemented System for Identifying Rigid and Flexible Regions in Macromolecules*, (owned by Michigan State University).

1994-1998 Research Associate, Michigan State University
- Advisor: M.F. Thorpe. Research included constraint theory, rigidity percolation, algorithm development (2D and 3D pebble games to test for properties of generic rigidity) and the study of mechanical stability in polymeric and amorphous chalcogenide glasses.

1994-1996 Part-time Instructor (50% time), Michigan State University
- Split 50% research associate and 50% Instructor. Teaching responsibilities involved running non-traditional peer-active problem solving sessions, lectures and I contributed many new problems to the CAPA (Computer Assisted Personalized Assignments) system.

1992-1994 Postdoctoral Researcher, Inst. of Theoretical Physics, Univ. of Utrecht, The Netherlands
- Advisor: M.H. Ernst. Investigated long-time domain growth, phase separation in binary fluids using cellular automata, lattice Boltzmann and studied the associated dynamical chaos.

FUNDING SUPPORT

Pending:

Predicting protein stability and flexibility
Jacobs, D.J. (PI) Reviewed July, 2005
NIH-R01 Priority score of 172 and at 13.5 percentile
Role: Principle investigator $1,726,046 over 5 yrs

Using Information Visualization to Identify Sequence Pattern Signatures for Alpha Helix Stability within Model HP-Polypeptides
Yang, J. (PI) Computer Science Department, UNC Charlotte
UNC Charlotte internal Faculty Research Grants
Role: Co-investigator $12,000 over 18 months

Current:

None:

Completed:

Internal CSUN Support (all grants listed below provided 3 units of release time)

Investigation of conformational flexibility in protein structure
Source: University Wide Probationary Faculty Competition

Monte Carlo simulation of protein fold dynamics using a skeletal model
Source: University Wide Research, Scholarship and Creative Activity Competition.

Characterizing Conformational Flexibility in Dihydroflate Reductase using a 1 nanosecond MD simulation
Source: College of Science and Mathematics Research Competition.

Does Network Rigidity Explain the Cooperative Hydrogen Bond Interactions within Proteins?
Source: University Wide Research, Scholarship and Creative Activity Competition.

An Exact Model Solution for the alpha-helix to Coil Transition: Investigation of Cooperative Hydrogen Bond Interactions Mediated Via Network Rigidity
Source: College of Science and Mathematics Research Competition.

Investigation of the Alpha-Helix to Coil Transition in Heterogeneous Peptides
Source: University wide Probationary Faculty Competition.

External Support (while CSUN Faculty)

Dihedral-angle characterization of conformational flexibility in protein structure
S06 GM48680-0952; Zavala, M.E. (Adm. Director) 2002-2005
NIH-SCORE $370,328
Role: Principle Investigator

Bioinformatic study correlating protein flexibility with function
Jacobs, D.J. (PI) 2003-2004
CSUPERB-Joint Venture Matching Grant $(25,000 + $75,000)
Role: Principle investigator (CSUPERB + Industrial match)

Dihedral Angle Characterization of Conformational Flexibility in Hinge-bending Proteins Deduced from Hydrogen Bond Interactions
CC5141 Jacobs, D.J. (PI) 2000-2004
Research Corporation $31,218
Role: Principle investigator

Development of a Coherent Biomedical Physics Program
Strategic work-force initiative, Blanco, Jacobs, Lee 2000-2002
University Wide Competition for State Lottery Funds $72,880
Role: Principle Program Developer

External Support (prior to arriving at CSUN)

Real-time Protein Domain and Flexibility Identification
R43 GM58337-01 MolFlex, Jacobs, D.J. (PI) 1998-1999
NIH-SBIR $100,000
Role: Principle investigator

Floppy Modes in Glasses: The Pebble Game
DMR 96 32182 Thorpe, M.F. (PI) 1996-1999
NSF $169,000 over 3 yrs.
Role: Key personnel

PATENTS AND SCIENTIFIC SOFTWARE

- D.J. Jacobs and M.F. Thorpe, *Computer Implemented System for Identifying Rigid and Flexible Regions in Macromolecules*, US patent # 6014449, filed February 20, (1998).
- D.J. Jacobs, L.A. Kuhn and M.F. Thorpe, (and now many others): FIRST, distributed by M.F. Thorpe at ASU, at Web site: http://firstweb.asu.edu/

PUBLICATIONS (# indicates CSUN student, $ indicates Research Associate)

Peer Reviewed: (25 total)

1. D.R. Livesay and D.J. Jacobs, *Conserved quantitative stability/flexibility relationships (QSFR) in an orthologous RNase H pair*. Proteins: Structure, Function, and Bioinformatics, **In Press**
2. D. J. Jacobs and S. Dallakayan$, *Elucidating Protein Thermodynamics from the Three Dimensional Structure of the Native State Using Network Rigidity*. Biophysical Journal. 88, 1-13 (2005)
3. D.R. Livesay, S. Dallakayan$, G.G. Wood$ and D.J. Jacobs, *A flexible approach for understanding protein stability*. FEBS Letters, 576, 468-476 (2004)
4. M.S. Lee#, G.G. Wood$ and D.J. Jacobs, *Investigations on the alpha-helix to coil transition in HP-heterogeneous polypeptides using network rigidity*. J. Phys. Cond. Mat. 16, S5035-S5046 (2004)
5. B.M. Hespenheide, D.J. Jacobs and M.F. Thorpe, *Structural rigidity in the capsid assembly of cowpea chlorotic mottle virus*. J. Phys. Cond. Mat. 16, S5055-S5064 (2004)
6. D.J. Jacobs and G.G. Wood$, *Understanding the α-Helix to Coil Transition in Polypeptides Using Network Rigidity: Predicting Heat and Cold Denaturation in Mixed Solvent Conditions*. Biopolymers, 75 1-31 (2004).
7. D.J. Jacobs, S. Dallakayan$, G.G. Wood$ and A. Heckathorne#, *Network rigidity at finite temperature: Relationships between thermodynamic stability, the nonadditivity of entropy, and cooperativity in molecular systems*. Phys Rev E 68, 061109 (2003).
8. D.J. Jacobs, A. Rader, L.A. Kuhn and M.F. Thorpe, *Graph Theory Predictions of Protein Flexibility*. Proteins: Structure, Function, and Genetics 44: no. 2, 150-155 (2001). **(Featured on cover page of issue)**
9. M.F. Thorpe, A. Rader, M. Lei, D.J. Jacobs, L.A. Kuhn, *Predicting Flexibility in Proteins using Constraint Theory*. Journal of Molecular Graphics and Modeling 19, 60-69, (2001).
10. M.F. Thorpe, D.J. Jacobs, M.V. Chubynsky and J.C. Phillips, *Self organization in network glasses*. J. Non-Crystalline Solids Volumes 266-269, pages 859-866 (2000).
11. P.M. Duxbury, D.J. Jacobs, M.F. Thorpe and C. Moukarzel, *Floppy Modes and the Free Energy: Rigidity and Connectivity percolation on Bethe Lattices*. Phys. Rev. E 59, 2084-2092 (1999).
12. D.J. Jacobs, *Generic Rigidity in Three-dimensional Bond-bending Networks*. J. Phys. A Math. Gen. 31, 6653-6668 (1998).
13. D.J. Jacobs and M.F. Thorpe, *Comment on "Infinite-Cluster Geometry in Central-Force Networks"*, Phys. Rev. Lett. 80, no. 24, 5452 (1998).
14. D.J. Jacobs and B. Hendrickson, *An Algorithm for Two Dimensional Rigidity Percolation: The Pebble Game*. J. Comput. Phys. 137, 346-365 (1997).

15. D.J. Jacobs and M.F. Thorpe, *Generic Rigidity Percolation: The Pebble Game*. Phys. Rev. E 53, 3682-3693 (1996).
16. D.J. Jacobs and M.F. Thorpe, *Generic Rigidity: The Pebble Game*. Phys. Rev. Lett. 75, 4051-4054 (1995).
17. J.R. Dorfman, M.H. Ernst, R. Nix and D.J. Jacobs, *Mean Field Theory for Lyapunov Exponents and Kolmogorov-Sinai Entropy in Lorentz Lattice Gases*, Phys. Rev. Lett. 74, 4417-4410 (1995).
18. J.R. Dorfman, M.H. Ernst and D.J. Jacobs, *Dynamical Chaos in the Lorentz Lattice Gas*. J. Stat. Phys. 81, 497-513 (1995).
19. S. Mukherjee, D.J. Jacobs and H. Nakanishi, *Diffusion on Loopless Critical Percolation Cluster*. J. Phys. A 28, 291-296 (1995).
20. D.J. Jacobs, S. Mukherjee and H. Nakanishi, Diffusion on DLA cluster in Two and Three Dimensions, J. Phys. A 27, 4341-4348 (1994).
21. D.J. Jacobs, and A. Masters, *Domain Growth in a One-dimensional Diffusive Lattice Gas with Short Range Attraction*. Phys. Rev. E 49, 2700-2710 (1994).
22. D.J. Jacobs and H. Nakanishi, *A Persistent Random Walk Model for the Frequency-Dependent Electrical Conductivity*. Physica A 197, 204-222 (1993).
23. S. Muralidhar, D.J. Jacobs, D. Ramkrishna and H. Nakanishi, *Diffusion on Percolation Clusters: Influence of Cluster Anisotropy*, Phys. Rev. A 43, 6503-6517 (1991).
24. S. Muralidhar, D. Ramkrishna, H. Nakanishi and D.J. Jacobs, *Anomalous Diffusion: A Dynamic Perspective*. Physica A 167, 539-553 (1990).
25. D.J. Jacobs and H. Nakanishi, *Autocorrelation Functions for Discrete Random Walks on Disordered Lattice*, Phys. Rev. A 41, 706-719 (1990).

In preparation:

1. J. Hules[#], D.R. Livesay, M.L. Tasayco and D.J. Jacobs, *Elucidating Quantitative Flexibility/Stability Relationships within Thioredoxin and its Fragments Using a Distance Constraint Model*, **to be submitted** to Protein Science.
2. D. H. Huynh[#], S. Dallakyan[$] and D.J. Jacobs, Connection Between Thermodynamics and Flexibility in Bacterial Periplasmic Binding Proteins. In Preparation, **to be submitted** to Journal of Molecular Biology.

Proceedings and Chapters in Books: (11 total)

1. M. Chubynsky, B. Hespenheide, D.J. Jacobs, L.A. Kuhn, M. Lei, S. Menor, A.J. Rader, M.F. Thorpe, W. Whiteley and M.I. Zavodszky, *Constraint Theory Applied to Proteins*. **To be published** in the proceedings of the Indo-US Biopolymer workshop by Nova Publishers (2004).
2. M.F. Thorpe, Mykyta Chubynsky, Brandon Hespenheide, Scott Menor, Donald J. Jacobs, L.eslie A. Kuhn, Maria I. Zavodszky, Ming Lei, A.J. Rader and Walter Whiteley *Flexibility in Biomolecules,* **Current Topics in Physics**, Editors R.A.. Barrio and K.K. Kaski, Imperial College Press (London, 2005), Chapter 6, 97-112
3. D.J. Jacobs, *Understanding Protein Stability and Flexibility Using Network Rigidity*, Conference Proceedings of the Second International Conference on Multiscale Materials Modeling. Editor: Nasr M. Ghoniem, ISBN 0-9762064-1-2, Printed by Mechanical and Aerospace Engineering Department, UCLA 386-388 (2004)
4. M.F. Thorpe, M.V. Chubynsky, D.J. Jacobs, J.C. Phillips, *Non-Randomness in Network Glasses and Rigidity*, Glass Physics and Chemistry, Proceedings of the International Conference: Thermodynamics and Chemical Structure of Melts and Glasses. Nauka/Interperiodica International Acad. Pub. Co. 27, no 2, 160-167 (2001).
5. M.F. Thorpe, M.V. Chubynsky, D.J. Jacobs and J.C. Phillips, *Rigidity and Flexibility in Network Glasses*. in Panellhnio Sunedrio Fusikhs Stereas Katastasews xv, ed. by Aristeidhz Zdetshz Praktika Patra, 171-181 (2000).
6. M.F. Thorpe, M.V. Chubynsky, D.J. Jacobs and J.C. Phillips, *The Intermediate Phase in Challcogenide Glasses in 13th Conference on Glass and Ceramics,* Edited by B. Samuneva, S. Bachvarov, I. Gutzov and Y. Dimitriev, (Publishing House Science Invest) Vol 1, Glass, 44-54 (1999).

7. D.J. Jacobs, L.A. Kuhn and M.F. Thorpe, *Flexible and Rigid Regions in Proteins*. 357-384 "Rigidity Theory and Applications", Eds: M.F. Thorpe and P.M. Duxbury, Plenum Publishing , NY (1999).
8. M.F. Thorpe, D.J. Jacobs, N.V. Chubynsky and A.J. Rader, *Generic Rigidity of Network Glasses*. 239-277 "Rigidity Theory and Applications", Eds: M.F. Thorpe and P.M. Duxbury, Plenum Publishing , NY (1999).
9. M.F. Thorpe, D.J. Jacobs and B.R. Djordjevic, *The Structure and Rigidity of Network Glasses*., A chapter in "Insulating and Semiconducting Glasses", editor: Punit Boolchand, World Scientific Publishing Co., Inc. (1998).
10. M.F. Thorpe, B.R. Djordjevic and D.J. Jacobs, *The Structure and Mechanical Properties of Networks*. In Amorphous Insulators and Semiconductors. Eds: M.F. Thorpe and M.I. Mitkova [NATO ASI Series 3] High Technology - Vol. 23 Kluwer Academic Publishers, 289-328 (1997).
11. M.F. Thorpe, D.J. Jacobs and B.R. Djordjevic, *Generic Rigidity Percolation*. Condensed Matter Theories, Vol. II Edited by E.V. Ludena, P. Vashishta and R.F. Bishop, Nova Science Publishers, 401-424 (1996).

SYNERGETIC ACTIVITIES

Supervised Research Associates:

Dr. Sargis Dallakyan (Currently at Scripps Institute as permanent staff Scientific Programmer, Level III)
Dr. Gregory G. Wood (Currently at CSU Channel Island as tenure track Assistant Professor)

Referee Experience:

Journals	26 manuscripts reviewed in order of most frequent: Physical Review Letters, Phys. Rev. E, J. Phys. Condensed Matter, Phys. Rev. B, The Royal Society, Biopolymers, ICARCUS
Grants	3 NSF proposals: (1) ITR-ASE (2004), (2) DMR (2005)
Books	3 Physics textbooks: Two calculus-based introductory books and biophysics book by Phil Nelson.

Professional Societies

American Physical Society, Biophysical Society, American Chemical Society, Sigma Xi Scientific Research Society, American Academy of Nanomedicine

Collaborators: (# indicates collaborations jointly with D.R. Livesay on QSFR-studies)

Dennis R. Livesay (Cal Poly Pomona)
Michael Thorpe (Arizona State University)
#Maria Luisa Tasyaco (City College of New York)
Jing Yang (UNC Charlotte)
#Nick Pace (Texas A&M University)
#Frank Robb (Univ. Maryland Biotech. Institute)
#Dennis Maeder (Univ. Maryland Biotech. Institute)
Bill Klug (UCLA)

Supervised Independent Studies:

Undergraduate Mahnaz Asghaei, Berrie Goldman, Aaron Halverson, Chekuri Sahithi and Mychica Simmons

Graduate Ammar Durghalli

Past Supervised Student Research:

Undergraduate Laura Gomez, Jeremy Hules, Chad Yamasaki, Rolando Maldonado, Arnulfo Martinez, Jamie Osorio and Trang Tong

Graduate Non-Thesis projects: Vahan Minassian, Tirso Silva and Carlos Soria

Alicia Heckathorne (M.S. Degree in 2002. *Now is a professional Bowler*)
1. M.S. Thesis: *A New Approach to the Alpha Helix Coil Transition Using Network Rigidity*

Dang Huynh (M.S. Degree from Biology, 2002. *Continued on to Yale for a Ph.D.*)
2. M.S. Thesis: *Comparison of Conformational Flexibility in Proteins Exhibiting Hinge-Bending Motions*

Jeremy Hules (M.S. Physics degree 2005. *LA Unified certified school teacher for grades 7-12*)
3. M.S. Thesis: *Quantitative Flexibility and Stability Relationships Within the Protein Thioredoxin*

Dundar Karabay (M.S. Physics degree, 2005. *Continued on to Univ. Cal. Riverside for a Ph.D.*)
4. M.S. Thesis: *Calculating Thermodynamic Properties of Protein Backbone Hydrogen Bonds Predicted by a Quantum Mechanical Model*

Moon Lee (M.S. Physics degree, 2005. *Continuing on into chemistry MS program*)
5. M.S. Thesis: *Investigations on thermodynamic characteristics of helix-coil transition in HP-heterogeneous polypeptides using network rigidity*

Current Supervised Student Research:

Shelley Green (Continuing Masters Degree at CSUN, target date of thesis defense, Spring 2006)
6. M.S. Thesis: *Investigating Protein Flexibility using Normal Modes from a Long-range DCM Elastic Network*

Biomedical Physics Courses Developed:

1. BMPH 304 Physics of the Body (Junior level)
2. BMPH 360 Measurements in Biomedical Physics (Junior level: participated in overall advisement)
3. BMPH 405 Biomedical Physics I (Senior level)
4. BMPH 406 Biomedical Physics II (Senior level)
5. PHYS 595MB Molecular Biophysics (dual Senior and Graduate levels)

RESEARCH PRESENTATIONS (# indicates student, $ indicates Research Associate)

Invited Colloquia or Seminars:

Predicting Protein Stability and Flexibility

- Department of Physics and Optical Science Colloquium, UNCC. March 7, 2005.
- Biophysics Seminar, Physical Optics Corporation, Los Angeles, June 29, 2005

Predicting Protein Stability from a Free Energy Decomposition

- Physics and Astronomy Colloquium, CSUN Nov 12, 2003.
- Biophysics Seminar, Physics Department, Arizona State University. March 4, 2004.
- Computer Science Seminar, Rensselaer Polytechnic Institute. April 16, 2004.
- Seminar, IRG Materials Research Lab UCSB, April 28, 2004.
- Seminar, RISE-program, CSUN. June 28, 2004.

Understanding Protein Flexibility, Stability and Folding from a Mechanical Point of View

- Physics and Astronomy Colloquium, CSUN. Feb 13, 2002.
- Condensed Matter Seminar, Physics and Astronomy, UCLA. April 26, 2002.
- Chemistry Department Colloquium, California State Polytechnic University, Pomona. May 7, 2002.
- Chemical Engineering Department, Colorado State University. June 28, 2002.
- Biophysics Seminar, Physics and Astronomy Department, Michigan State University, Aug 9 2002.
- Seminar Series, Chemistry Department, University of California, Irvine. Sept 6, 2002.
- Seminar Series, Department of Mechanical Engineering, Yale University, Dec 18, 2002

Conformational Flexibility in Protein Structure: Can it be Used Like a Fingerprint?

- NASA-JPL PAIR program at CSUN. Oct 2, 2001.

Characterizing Conformational Flexibility in Proteins

- Department of Chemical Engineering, Colorado State University. June 13, 2001.
- Seminar, RISE-program, CSUN. June 29, 2001.

Characterizing Conformational Flexibility in Proteins with a FlexPrint: Working Toward a Finger Printing System

- Graduate Student Seminar: Methods in Computational Biology Group, UCLA. July 11, 2000.

Generic Rigidity in Two and Three Dimensions and its Applications to Network Glasses and Protein Structure

- Mathematical Physics Institute at CSUN. Sept 27, 1999.

Invited Talks at Science and Mathematics Meetings:

1. *Predicting Protein Stability Using Network Rigidity at Finite Temperatures*
   Second International Conference on Multiscale Materials Modeling (MMM-II), in focus session "Multiscale Modeling of Biomaterials" at UCLA, Los Angeles, CA in Oct. 11-15, (2004).

2. *Protein Stability and Flexibility: Application to Network Rigidity*
   Modeling Protein Flexibility and Motions Workshop at Banff International Research Station for Mathematical Innovation and Discovery (BIRS), Banff Canada, (Jul. 17-22, 2004).
3. *Network Rigidity at Finite Temperatures and Free Energy Landscapes*
   American Mathematical Society, Lawrenceville, NJ, in focus session: Geometry of Protein Modeling, (April 17-18, 2004).
4. *Predicting Protein Stability from a Free Energy Decomposition*
   Mathematics and Computer Science Workshop: The Geometry of Modeling Proteins, Bellairs Research Institute of McGill University, Holetown, Barbados, West Indies (Jan. 16-23, 2004).
5. *Generic rigidity of glasses and proteins*
   Mapping Materials Problems to Graph Algorithms, SIAM Annual conference, Atlanta GA (May 1999).
6. *Graph rigidity: Applications to material science and proteins*
   Canadian Mathematical Society, Kingston, Ontario (Dec 1998).
7. *Real-time protein domain evaluator and design tool*
   DIMACS – Combinatorial Clustering & Multi-Domain Protein Structure Analysis, Rutgers University, NJ (June 1998).
8. *Identifying floppy and rigid regions in proteins*
   Fundamental Materials Research Series: Rigidity theory and Applications, Traverse City, MI (June 1998).
9. *Generic Rigidity: The Pebble Game*
   Focus Session on Network Glasses, American Physical Society, St. Louis MO (March 1996).

Contributed Talks at Scientific Meetings: (since January 2000, presenter in **bold**)

1. Poster: **D.R. Livesay** and D.J. Jacobs, *Conserved quantified stability/flexibility relationships (QSFR) in an Orthologous RNase H pair*. Gordon Proteins Research Conference, Plymouth, NH, June 2005.
2. Talk: **D. J. Jacobs**, J. Hules[#], S. Green[#] and D. R. Livesay, *Quantifying Stability-Flexibility Relationships in Proteins*. 2005 American Physical Society March Meeting, LA CA March 21-25 (2005).
3. Poster: **Donald J. Jacobs**, S. Dallakyan[$], G. Wood[$] and Dennis R. Livesay, *The Mechanics of Protein Stability and Flexibility*. 49th Biophysical Society Annual Meeting, Long Beach, CA (Feb 12-16, 2005).
4. Poster: **Dundar Karabay**[#] *Thermodynamic Properties of Protein Backbone Hydrogen Bonds Predicted by a Quantum Mechanical Model*. 49th Biophysical Society Annual Meeting, Long Beach, CA (Feb 12-16, 2005). Non-specified Authors: Sargis Dallakyan[$] and Donald J. Jacobs.
5. Poster: **Moon S. Lee**[#], Gregory Wood[$] and Donald J. Jacobs, *Bioinformatic and Statistical Analysis of Thermodynamic Stability of Alpha-Helix to Coil Transition in Polyppeptides.* 49th Biophysical Society Annual Meeting, Long Beach, CA (Feb 12-16, 2005).
6. Poster: **Sargis Dallakyan**, Donald J. Jacobs and Dang. Huynh[#], *Quantifying Thermodynamic Stability and Flexibility in Bacterial Periplasmic Binding Proteins.* 49th Biophysical Society Annual Meeting, Long Beach, CA (Feb 12-16, 2005).
7. Poster: Donald J. Jacobs, Sargis Dallakyan[$], Gregory Wood[$] and **Dennis R. Livesay**. *Protein Thermodynamics from the 3D topological structure of the Native State*. 18th Symposium of the Protein Society, San Diego, CA (Aug. 14-18, 2004) & 17th Annual CSU Biotechnology Symposium (LA, CA Jan 14-15, 2005).
8. Poster: **Donald J. Jacobs**, Sargis Dallakyan[$], Gregory Wood[$] and Dennis R. Livesay. *Protein Thermodynamics from the 3D topological structure of the Native State*. Biopolymers Gordon Research Conference, Salve Regina University, Newport, RI (June 13-18 2004).
9. Poster: Dundar Karabay[#], **Sargis Dallakyan**[$] and Donald J. Jacobs. *Enthalpies and entropies for hydrogen bonds in proteins from quantum mechanics*. 48th Biophysical Society Annual Meeting, Baltimore, MD (Feb 14-18, 2004).
10. Poster: **Donald J. Jacobs**, Sargis Dallakyan[$], Gregory Wood[$] and Dennis R. Livesay. *Protein Thermodynamics from the 3D topological structure of the Native State*. 48th Biophysical Society Annual Meeting, Baltimore, MD Feb 14-18, (2004).
11. Talk: **Gregory Wood**[$], Sargis Dallakyan[$] and Donald J. Jacobs. *Protein Thermodynamics from the 3D Topological Structure of the Native State*, American Physical Society, Annual March Meeting, Montreal, Quebec Canada (March 22-26, 2004).

12. Poster: **G. Wood**[$], A. Heckathorne[#] and D. J. Jacobs. *Network Rigidity Calculations of Cold Denaturation*, American Physical Society, Annual March Meeting, Montreal Quebec, Canada (March 22-26, (2004).
13. Talk: **Chubynsky, M.V.**, Thorpe, M.F., Michigan State University, Jacobs, D.J., California State University, Northridge, Whiteley, W., York University Canada, *Rigidity of central-force elastic networks in three dimensions,* American Physical Society, Annual March Meeting, Austin Convention Center; Austin, TX (March 3-7, 2003).
14. Poster: Alicia Heckathorne[#], Greg Wood[$] and **Donald J. Jacobs**, *Understanding folding and stability from a mechanical point of view: The alpha-helix to coil transition revisited*. 47th Biophysical Society Annual Meeting, San Antonio, Texas (March 1-5, 2003).
15. Poster: Alicia Heckathorne[#] and **Donald J. Jacobs**, *The Alpha Helix to Coil Transition Revisited*, Biopolymers Gordon Research Conference, Salve Regina University, Newport RI, (June 16-21, 2002).
16. Poster: **Dang H. Huynh**[#], Jaime D. Osorio[#], Laura I. Gomez[#], Arnulfo Martinez[#] and D. J. Jacobs, *Comparison of Conformational Flexibility in Four Homologous Periplasmic Binding Proteins.* 46th Biophysical Society annual meeting. San Francisco, CA (Feb 23-27, 2002).
17. Poster: (*award winning*) **Dang Huynh**[#], J.D. Osorio[#], Laura I. Gomez[#], Arnulfo Martinez[#] and Donald J. Jacobs, *Comparison of Conformational Flexibility in Four Homologous Periplasmic Binding Proteins.* SACNAS (Society for Advancement of Chicanos and Native Americans in Science) National Conference, Phoenix Arizona, (Sept. 27-30, 2001).
18. Poster: **D.J. Jacobs** and Jeremy Hules[#], *Characterization of Conformational Flexibility in Hinge-Binding Proteins: Hierarchical Flexibility Maps in Terms of Dihedral Angle Internal Coordinates*. Protein Flexibility and Folding Workshop. Traverse City, MI (Aug 2000).
19. Poster: **D. J. Jacobs**, *Characterizing the Degree of Flexibility in Proteins*, Quantitative Challenges in the Post-Genomic Sequence Era. A workshop and symposium. San Diego, CA (Jan 2000).

Community Outreach:

Spring 2001	**Public Presentation:** D. J. Jacobs, *Analysis of Carey Hart's 360 degree mid-air vertical rotation on a motorcycle*, Appeared on "Ripley's Believe It or Not" television show.
2001, 2002	Volunteer at CSUN-LAB School Fall October Fest Fund-Raiser
Spring 2004	Judge in Natural Science and Mathematics, 2004 Statewide CSU Student Research Symposium
2003-2004	2 Science workshop at Chime Elementary School (Friction and Simple Machines)

COURSES TAUGHT (since 8/1999, # indicates new courses that I developed)

1.	PHYS 100A	Freshmen Algebra-based Introductory Course (Mechanics, Sound, Thermodynamics)
2.	PHYS 100AL	Corresponding Lab to PHYS 100A
3.	PHYS 100B	Freshmen Algebra-based Introductory Course (Electromagnetism, Electricity, Optics, Modern)
4.	PHYS 220A	Freshmen Calculus-based Introductory Course (Mechanics)
5.	#BMPH 304	Junior-level: Transition course covering physical modeling as applied to Physics of the Body.
6.	PHYS 389	Junior-level: Core Course: Applied Mathematics course for Physicists
7.	PHYS 405	Former BMPH 405, Final Course: Special topics course pertaining to Biological Physics.
8.	#BMPH 405	Senior-level: Core course: Part I on Biophysics, Thermodynamic principles and applications
9.	#BMPH 406	Senior-level: Core course: Part II on Biophysics, Statistical Mechanics, with more applications
10.	PHYS 431	Senior-level: Core course in Thermal and Statistical Physics
11.	PHYS 496	Senior-level: Advanced Research Computational Lab
12.	PHYS 3121	Senior-level: Classical Mechanics
13.	PHYS 630	Graduate-level: Core Course in Statistical Physics
14.	PHYS 650	Graduate-level: Core Course in Quantum Mechanics