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### Education

B.S.	Physics	Zhejiang University, China	1981
Ph.D.	Physics & Biophysics	Carnegie Mellon University	1987
Postdoc.	Physics	University of Illinois at Urbana-Champaign	1987-91

### Professional Experience

Professor of Physics, Oklahoma State University	2006-Present
Associate Professor of Physics, Oklahoma State University	2001–2006
Assistant Professor of Physics, Oklahoma State University	1997–2001
Instructor of Physiology and Biophysics, Albert Einstein College of Medicine	1993–1997
Associate Director, Regional Center for Time-resolved Synchrotron Spectroscopy (BNL)	1994-1996
Research Assistant Professor of Physics, Univ. of Illinois in Urbana-Champaign	1992
Postdoctoral Research Associate, Univ. of Illinois at Urbana-Champaign	1987-1991

### Professional Affiliations

American Physical Society  
Biophysical Society  
American Association for the Advancement of Science  
American Chemical Society

### Awards and Honors

Distinguished lecture, Oklahoma Medical Research Foundation	2006
Fellow, American Physical Society	2003
Junior Faculty Award for Scholarly Excellence, Oklahoma State University	2000
Biophysical Society Travel Award	1986
The second best female physics student selected nationwide from China (Via CUSPEA program: China-US Physics Examination for Admission)	1981

### Synergistic Activities

Member, Nominating Committee of American Physical Society	2008-2010
Chair, Membership Committee of the Oversea Chinese Physicists Association (OCPA)	2007-2008
Member, Strategic Planning Committee of Physics Department, Oklahoma State U.	2006-2007
Member, Biological Physics Prize Selection Committee of American Physical Society (APS)	2005–2008
Chair, the APS Committee on the Status of Women in Physics (CSWP)	2005
Program Chair of CSWP, 2005 March Meeting of American Physical Society	2004–2005
Member, Maria Goeppert-Mayer (MGM) Award Selection Committee of American Physical Society	2004–2006
Organizer, chair and Co-PI, the American Physical Society workshops on “Professional Skill Developments for Women Physicists”	2004–2005
Member, Nomination Committee of the Division of Biological Physics (DBP) of American Physical Society	2004
Member, Steering Committee for the APS DBP workshop “Opportunities in Biology for Physicists II”	2004
Member, Search Committee for the Vice President of Oklahoma State University for Research and Technology Transfer	2003
Organizer, three APS DBP symposia at the APS March Meetings	2002,2005,2007
Member, Technical Design Committee for the OSU new interdisciplinary research building	2006-2007
Member, Planning Committee for the OSU new interdisciplinary research building	2005–2006
Chair, Search Committee for Radiation Physics Faculty Position, Oklahoma State Univ.	2004–2005

Reviewer for U.S. National Science Foundation (NSF), American Chemical Society Petroleum Research Fund, Netherlands Organization for Scientific Research (NWO)

## Invited presentations

1. Invited: *"Ruling Proteins with Protons"*, Physics Colloquium, Ohio State University, Columbus, Ohio (April 29, 2008)
2. Invited: *"Advanced infrared spectroscopy of protein structure and function"*, Institute of Chemistry, Chinese Academy of Sciences, Beijing, China (July 26, 2007)
3. Invited: *"Quantum Study on Intra-protein Proton Transfer"*, Institute of Physics, Chinese Academy of Sciences, Beijing, China (July 23, 2007)
4. Invited, *"Advanced infrared spectroscopy of protein structure and function"*, Department of Physics, Zhejiang University, China (July 12, 2007)
5. Invited: *"Advanced infrared spectroscopy of protein structure and function"*, physics colloquium, University of Oklahoma, Norman, Oklahoma (April 12, 2007)
6. Invited (international), *"Advanced Infrared Spectroscopy for Time-Resolved Structural Investigation of Protein Structure and Function"*, the 2007 APS March Meeting, Denver, CO (March 7, 2007)
7. Invited: *"Advanced infrared spectroscopy of protein structure and function"*, physics colloquium, University of Arkansas, Fa Arkansas (February 9, 2007)
8. Invited (international): *"Proton transfer and protein quake in activation of photoactive yellow protein"*. The third Asian and Oceania Conference on Photobiology (AOCP), Beijing, China (November 19, 2006)
9. Invited: *"Toward Time-resolved Structural Characterization of Proteins in Action"*. 2006 Free Electron Laser Workshop, Univ. of Wisconsin at Madison (October 19, 2006)
10. Invited: *"Explore Protein Structural Dynamics: Experimental and Computational Developments in Time-resolved FTIR Spectroscopy"*, The OCPA5 International Conference on Physics Education and Frontier Physics, Taipei, Taiwan (June 29, 2006)
11. Invited: *"Light on Roles of Hydrogen Bonding and Proton Transfer in Receptor Activation"*, Institute of Physics of Chinese Academy of Science, Beijing, China (June 2006)
12. Invited: *"In Search of Fundamental Principles in Receptor Activation"* Institute of Biophysics of Chinese Academy of Science Beijing, China (June 2006)
13. Invited (*Distinguished Lecture*): *"In Search of Fundamental Principles in Receptor Activation"*, Research Forum at Oklahoma Medical Research Foundation (OMRF), Oklahoma City, OK (May 4, 2006)
14. Invited: *"Insight into Receptor Activation of Photoactive Yellow Protein"*, Biophysics Seminar at the University of Freiburg in Germany. (December 2005)
15. Invited: *"Photons and Protons in the Functionality of Proteins"*, physics/chemistry joint colloquium at Oklahoma State University. (November 2005)
16. Plenary talk (International): *"The Status of Women in Physics in USA"* Second IUPAP Conference on Women in Physic, Rio de Janeiro, Brazil May 23, 2007 (IUPAP: International Union of Pure and Applied Physics)
17. Invited: *"'See' Proteins in Action Using Infrared Light"*. The 2005 American Physical Society March Meeting, Los Angeles (March 2005)
18. Invited: *"Impacts of Crystallization on Protein Structural Dynamics"*, the 2004 OCPA International Conference on Physics Education and Frontier Research Shanghai, China (OCPA: Oversea Chinese Physicist Association) (June 2004)
19. Invited: *"'See' Proteins in Action Using Infrared Light"* presented at Theoretical Biophysics Center, Peking University, Beijing, China. (July 2004)
20. Invited: *"'See' Proteins in Action Using Infrared Light"*, T.D. Lee lecture series, Graduate College, Chinese Academy of Sciences, Beijing, China (July 2004)
21. Invited: *"'See' Proteins in Action Using Infrared Light"*, Physics Colloquium, Carnegie Mellon University, Pittsburgh, PA (April 2004).
22. Invited: *"'See' Proteins in Action Using Infrared Light"* Physics Colloquium, City College of New York, NYC (April 2004)
23. Invited: *"'See' Proteins in Action Using Infrared Light"*, Theoretical Biophysics Group, Los Alamos National Laboratory (April 2004)
24. Invited: *"'See' Proteins in Action Using Infrared Light"*. *Colloquium*, Department of Physics, Chemistry and Biology, Illinois Institute of Technology (February 2004)
25. Invited: *"'See' Proteins in Action Using Infrared Light"* Seminar, Department of Biochemistry, University of Oklahoma Health Science Center (February 2004)

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26. Invited: "'See' Proteins in Action Using Infrared Light", Institute of Biophysical Dynamics Seminar, the University of Chicago (February 2004).
  27. Invited: "Biological Physics of Proteins", Physics Colloquium, Zhejiang University, Hangzhou, China, June 2002
  28. Invited: "Proton Transfer and Electrostatic Epicenter in Biological Signal Transduction", Institute of Physics, Chinese Academy of Sciences, Beijing, China, June 2002
  29. Invited: "From Proton Hop to Protein Quake in Photoreceptor Activation" Physics colloquium, Purdue University, April 2002
  30. Invited (International): "Electrostatic Interactions in Photoreceptor Activation", the 10th International Conference on Retinal Proteins, Seattle, Washington, USA, August 2002.
  31. Invited (International): "Proton Transfer and Protein Quake in Photoreceptor Activation", the 2002 American Physical Society March Meeting, Indianapolis, March 2002
  32. Invited: "From Proton Translocation to Photoreceptor Activation" Theoretical Biophysics Seminar, University of Illinois at Urbana-Champaign, 2001.
  33. Invited: "Proton Hops and Protein Quakes in Photoreceptor Activation" Minisymposium on Protein Structure and Function, Oklahoma State University, June 2000.
  34. Invited (International): "Light on the Mechanism of receptor activation in photoactive yellow protein", the Netherlands' Royal Academy Colloquium on "Photoreceptor Proteins: Structure, Photochemistry, and Dynamics" Amsterdam, the Netherlands, November 2000.
  35. "Light on Protein Physics", Modern Physics seminar, Zhejiang University, Hangzhou, China, May 1998
  36. Invited (International): "Proton Transfer in Proteins", The 3rd International Biological Physics Symposium, Santa Fe, New Mexico, USA, September 1998

### Publication List (peer-reviewed)

1. Xie, A.H., J.F. Nagle, & R.H. Lozier. Flash Spectroscopy of Purple Membrane. 1987. *Biophys. J.* 51: 627-635.
2. Iben, I.E.T., D. Braunstein, W. Doster, H., Frauenfelder, M.K. Hong, J.B. Johnson, S. Luck, P. Ormos, A. Schulte, P.J. Steinbach, A. Xie, & R.D. Young. Glassy Behavior of a Protein. 1989. *Phys. Rev. Lett.* 62:1916-1919. (In alphabetic order except the first author)
3. Xie, A. Quantum Efficiencies of Bacteriorhodopsin Photochemical Reactions. 1990. *Biophys. J.* 58:1127-1132.
4. Frauenfelder, H., N.A. Alberding, A. Ansari, D. Braunstein, B.A. Cowen, M.K. Hong, I.E.T. Iben, J.B. Johnson, S. Luck, J.R. Mourant, P. Ormos, L. Reinisch, R. Scholl, A. Schulte, E. Shayamsunder, L.B. Sorensen, P.J. Steinbach, A. Xie, R.D. Young, & K.T. Yue. Proteins and Pressure. 1990. *J. Phys. Chem.* 94:1024-1037 (in alphabetic order except for the first author).
5. Hong, M.K., D. Braunstein, B.R. Cowen, H. Frauenfelder, I.E.T. Iben, J.R. Mourant, P. Ormos, R. Scholl, A. Schulte, P.J. Steinbach, A. Xie, & R.D. Young. *Conformational Substates and Motions in Myoglobin.* 1990. *Biophys. J.* 58:429-436.
6. Steinbach, P.J., A. Ansari, J. Berendzen, D. Braunstein, K. Chu, B. Cowen, D. Ehrenstein, H. Frauenfelder, J.B. Johnson, D.C. Lamb, S. Luck, G.U. Nienhaus, P., Ormos, R. Philipp, A. Xie, & R. Young. Ligand Binding to Heme Proteins: The Connection between Protein Dynamics and Function. 1991. *Biochemistry* 30:3988-4001 (in alphabetic order except for the first author).
7. Lozier, R.H., A. Xie, J. Hofrichter, & M. Clore. Reversible Steps in the Bacteriorhodopsin Photocycle. 1992. *Proc. Natl. Acad. Sci. USA.* 89:3610-3614.
8. Kovacs, I., G.U. Nienhaus, R. Philipp, & A. Xie. Pressure Effects on the Dark-Adaption of Bacteriorhodopsin. 1993. *Biophysics J.* 64:1187-1193.
9. Yan, B., A. Xie, G.U. Nienhaus, Y. Katsuta, & J.L. Spudich. Steric Constraints in the Retinal Binding Pocket of Sensory Rhodopsin I. 1993. *Biochemistry* 33:10244-10232.
10. Chance, M.R., M.D. Wirt, E.M. Scheuring, L.M. Miller, & A. Xie. *Time-Resolved X-ray Absorption Spectroscopy on a 5μs time-scale.* 1993. *Rev. Sci. Inst.* 64:2035-2036.
11. Xie, A., W.D. Hoff, A.R. Kroon, & K.J. Hellingwerf. Glu46 Donates a Proton to the 4-Hydroxycinnamate Anion Chromophore during the Photocycle of Photoactive Yellow Protein. 1996. *Biochemistry* 35:14671-14678 (accelerated publication).
12. Haran, G., K. Wynne, A. Xie, M.R. Chance, & R.M. Hochstrasser. Excited State Dynamics of Bacteriorhodopsin Revealed by Transient Stimulated Emission Spectra. 1996. *Chem. Phys. Lett.* 261:389-395.
13. Scheuring, E.M., W. Clavin, M.D. Wirt, L.M. Miller, R.F. Fischetti, Y. Lu, N. Mahoney, A. Xie, J.J. Wu, & M.R. Chance. *Time Resolved X-ray Absorption Spectroscopy of Photo Reduced Base-Off Cob(I) alamin Compared to the Co(II) Species in Clostridium Thermoaceticum.* 1996. *J. Phys. Chem.* 100:3344-3348.
14. Van Thor, J.J., A.J. Pierik, I. Nugteren-Roodzant, A. Xie, & K.J. Hellingwerf. Characterization of the Photoconversion of Green Fluorescent Protein with FTIR Spectroscopy. 1998. *Biochemistry* 37:16915-16921.

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15. Austin, R.H. & **A. Xie**. Picosecond IR Dynamics: lessons learned. 1998. *Nuc. Instru. and Meth. Physics. Res. A*. 407: 504-508.
  16. **Xie, A.**, Q. He, L. Miller, B. Scavi, M.R. Chance. Far Infrared Spectroscopy of Functionally Important Low Frequency Modes in Proteins. 1999. *Biopolymers* 49:591-603.
  17. Hoff, W.D., **A. Xie**, I.H.M. Van Stokkum, X-J Tang, J. Gural, A. R. Kroon, & K.J. Hellingwerf. Global Conformational Changes upon Receptor Stimulation in Photoactive Yellow Protein. 1999. *Biochemistry* 38: 1009-1017.
  18. **Xie, A.**, A. van der Meer, W.D. Hoff, R.H. Austin. Long-lived Amide I Vibrational Modes in Myoglobin. 2000. *Phys. Rev. Lett.* 84:5435-5438.
  19. **Xie, A.**, L. Kelemen, J. Hendriks, B.J. White, K.J. Hellingwerf, & W.D. Hoff. Formation of a New Buried Charge Drives a Large-amplitude Protein Quake in Photoreceptor Activation. 2001. *Biochemistry* 40:1510-1517 (*accelerated publication*).
  20. **Xie, A.**, A. van der Meer, R.H. Austin. Excited State Lifetimes of Far-infrared Collective Modes in Proteins. 2002. *Phys. Rev. Lett.* 88: 018102-1-4.
  21. R. H. Austin, **A. Xie**, L. van der Meer, M. Shinn, G. Neil. Self-trapped States in Proteins. 2003. *J. of Physics: Condensed Matter*. 15: S1693--S1698.
  22. Edwards, G.S., R.H. Austin, ... **A. Xie**. Free-electron-laser-based biophysical and biomedical instrumentation. 2003. *Rev. Sci. Instrum.*, 74: 3207-3245. (Authors are alphabetically ordered except for the first.)
  23. Nie, B., Stutzman, J., **A. Xie**. A Vibrational Spectral Maker for Probing the Hydrogen Bonding Status of Protonated Asp and Glu Residues. 2005. *Biophys. J.* 88: 2833–2847.
  24. Austin, R.H., **A. Xie**, L. van der Meer, B. Redlich, P-A Lindgard, H. Frauenfelder, D. Fu. Picosecond Thermometer in the Amide I Band of Myoglobin. 2005. *Phys. Rev. Lett.*, 94:128101.
  25. Kumauchi, M, M. Hara, P. Stalcup, **A. Xie**, WD Hoff. Identification of six new photoactive yellow proteins: diversity and structure-function relationships in a bacterial blue light photoreceptor. 2008. *Photochem. Photobiol.* in press.

#### Manuscripts in preparation:

26. Nie, B, A. Thubagere, Z Kang, **A. Xie**. *Vibrational structural markers for structural characterization of tyrosine in proteins.*
27. **A. Xie**, Manda E., Y. Li, B. Nie, W.D. Hoff, R. Martin. *Nature of proton transfer in proteins.*

#### Current Collaborators

- Robert H. Austin, Professor of Physics, Princeton University.
- Wouter D. Hoff, Associate Professor of Microbiology, Oklahoma State University
- Klaas J. Hellingwerf, Professor of Chemistry and Microbiology, University of Amsterdam
- Kaan Kalkan, Assistant Professor of Mechanical Engineering, Oklahoma State University
- Richard L. Martin, Theoretical Chemistry and Molecular Physics, Theoretical Division, Los Alamos National Laboratory
- Ben McMahon, Theoretical Biology and Biophysics, Theoretical Division, Los Alamos National Lab

#### Former Collaborators

- Robin Hochtrasser, Donner Professor of Physical Sciences, Director of the Regional Laser and Biomedical Technology Laboratory, University of Pennsylvania
- Steven Kent, Professor of Biochemistry, the University of Chicago
- Britta Redlich, FOM Institute of Plasma Physics, Nieuwegein, the Netherlands
- John L. Spudich, Professor and Robert A. Welch Distinguished Chair in Chemistry, Department of Biochemistry and Molecular Biology, University of Texas-Houston Medical School,
- Xun-Jun Tang, Department of Biochemistry, Albert Einstein College of Medicine
- Alexander van der Meer, FOM Institute of Plasma Physics, Nieuwegein, the Netherlands