

Curriculum Vitae

Krishna Prasad Neupane
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EDUCATION **Ph.D., Physics**, (In progress, expected in Fall, 2008)
Kent State University, Department of Physics, Kent, OH 44242
Advisor: Prof. Samuel Sprunt

Summary of PhD Project:

Dynamic light scattering studies of: biaxial nematic liquid crystalline tetrapode and bent-core molecules, viscoelastic measurements of lyotropic chromonic and some calamitic nematic liquid crystals, and flexo-electric effect in bent-core liquid crystals. Induced optical birefringence in high magnetic fields, light scattering, and a. c. calorimetry studies to characterize the isotropic-nematic phase transition.

M.Sc., Physics, September 1999
Tribhuvan University, Central Department of Physics, Kathmandu, Nepal

B.Sc., Physics, Chemistry & Math, September 1996
Tribhuvan Multiple Campus, Tribhuvan University, Tansen, Nepal

RESEARCH EXPERIENCE

- Studies of thermotropic nematic biaxiality (in bent-core, tetrapodic, and mixture of rod and discs type of mesogens) using dynamic light scattering.
- Studies of isotropic-tetrahedric and isotropic-nematic phase transition in bent-core liquid crystals using:
 - dynamic light scattering measurement
 - magnetic field induced birefringence measurement in high magnetic field in National High Magnetic Field Laboratory (Tallahassee, FL)
 - a. c. calorimetric measurement (at Worcester Polytechnic Institute, Worcester, MA).
- Studies of lyotropic chromonic liquid crystals to study viscoelastic coefficients using dynamic light scattering.
- Studies of bent-core liquid crystals to measure flexo-electricity using dynamic light scattering.
- Studies of freely suspended liquid crystal films using dynamic light scattering based on newly developed ultrafast, pico/nano-second digital correlator.
- Studies of the characterization of the size distribution of nanoparticles and their aggregates in solution using dynamic light scattering.
- Experimentation with nanoparticle tracking and Fluorescence Correlation Spectroscopy.

RESEARCH INTEREST

Optical spectroscopy / Dynamic light scattering studies, Optical Characterization of soft matter and Medical Physics.

WORK EXPERIENCE

Graduate Research Assistant, June 2006 - May 2007, August 2008 to present

Graduate Teaching Assistant, June 2002 - May 2006 and June 2007 - August 2008, *Kent State University*, Department of Physics, Kent, OH 44242

TA responsibilities:

- Reviewed course material and solved problems in weekly tutorial session.
- Instructed labs and graded lab report and homework.
- Upgraded experiments, lab manual and updated homework online.

Lecturer, April 2001 – June 2002, *Pulchowk Campus: Institute of Engineering, Tribhuvan University*, Kathmandu, Nepal

- Taught Mechanics, Electrodynamics, and Modern Physics for B. E. Students.

Part Time Assistant Lecturer, August 1999 – June 2002, *Tri-Chandra M. Campus, Tribhuvan University*, Kathmandu, Nepal

- Taught Mechanics, Classical Mechanics, Thermodynamics, Electrodynamics and laboratories to undergraduate students.
- Supervised and evaluated undergraduate physics students.

Physics Teacher, August 2000 – May 2002, *Pennwood Academy*, Gyaneshwor, Kathmandu, Nepal

- Taught physics to O and A Level students of *General Certificate of Education of Cambridge University, U.K.*

Physics Teacher, November 1998-June 2001, *Mahendra Bhawan Girl's Higher Secondary School*, Gyaneshwor, Kathmandu, Nepal

- Taught physics at 10+2 level students.

COMPUTER SKILLS

- Competence in programming and computer interfacing experiments and data acquisition using **Lab View** (National Instruments).
- Computer operating systems: **Linux/Unix, Windows, Mac.**
- Languages: **C, C++, Java.**
- Applications software: **MATLAB, Mathematica, MathCAD, C-Plot, Origin, Dynals etc.**

PUBLICATIONS

- *Biaxiality and the nature of the uniaxial-biaxial transition in nematic liquid crystalline tetrapodes: A dynamic light scattering study*, **K. Neupane**, S. W. Kang, T. Meyer, G. H. Mehl, D. W. Allender, S. Kumar, and S. Sprunt. **(To be submitted to *Physical Review E*).**
- *On the connection between orientational fluctuations and the giant flexoelectric response in bent-core nematic liquid crystals*, M. Majumdar, **K. Neupane**, J.T. Gleeson, A. Jáklí, and S. Sprunt. **(To be submitted to *Physical Review E*).**
- *Viscoelastic Properties of Smectic Liquid Crystal Determined by Polarized Surface Light Scattering from a Thick Free-standing Films*, S. Sharma, **K. Neupane**, A. Adorjan, A. R. Baldwin, and S. Sprunt. **(To be submitted to *Physical Review E*).**

- *Elasticity and Viscosity of a Lyotropic Chromonic Nematic Studied with Dynamic Light Scattering*, Yu. A. Nastishin, **K. Neupane**, A. R. Baldwin, O. D. Lavrentovich, and S. Sprunt. (**Submitted to *Physical Review Letters***).
Reprint: <http://arxiv.org/abs/0807.2669>
Reprint: e-LCC: http://www.e-lc.org/docs/2008_07_15_15_23_06/
- *Observation of a possible tetrahedric phase in a bent-core liquid crystal*, D. Wiant, **K. Neupane**, S. Sharma, N. Pradhan, J. T. Gleeson, A. Jákli, G. Iannacchione, and S. Sprunt. ***Physical Review E* 77, 061701 (2008)**.
- *High Field Magneto-Optical Studies of Liquid Crystals and Complex Fluids*, S. N. Sprunt, J. T. Gleeson, A. Jákli, D. Wiant, **K. Neupane**, MAG LAB REPORTS, Special Edition, 14, 38 (2007) p 38 .
<http://www.magnet.fsu.edu/mediacenter/publications/reports/maglabreports-2007-v14-i2.pdf>
- *Dynamic Light Scattering Study of Biaxial Ordering in a Thermotropic Liquid Crystal*, **K. Neupane**, S. W. Kang, S. Sharma, D. Carney, T. Meyer, G. H. Mehl, D. W. Allender, S. Kumar, and S. Sprunt. ***Physical Review Letters* 97 207802 (2006)**.
- *Critical Behavior at the Isotropic-to-Nematic Phase Transition in a Bent-Core Liquid Crystal*, D. Wiant, S. Stojadinovic, **K. Neupane**, S. Sharma, K. Fodor-Csorba, A. Jákli, J. T. Gleeson, and S. Sprunt. ***Physical Review E* 73, 030703(R) (2006)**.
Reprint: e-LCC. http://www.e-lc.org/docs/2005_11_23_10_05_03
- *One Nanosecond Photon Correlation Spectroscopy on Smectic Liquid Crystal Films*, S. Sharma, **K. Neupane**, A. Adorjan, A. R. Baldwin, and S. Sprunt. ***Physical Review Letters* 94, 067801 (2005)**.
Reprint: *Virtual Journal of NanoScience and Technology*, Vol. 11, Issue 8.
<http://scitation.aip.org/dbt/dbt.jsp?KEY=VIRT01&Volume=11&Issue=8>

PRESENTATIONS

- Poster: *Light Scattering Study of Biaxiality in Nematic Liquid Crystal Tetrapodes*. **K. Neupane**, S.W Kang, S. Sharma, T. Meyer, G. H. Mehl, D. W. Allender, S. Kumar, and S. Sprunt. 22nd International Liquid Crystal Conference, Jeju Island, Korea, June 29 - July 4, 2008. (PHA32)
- Poster: *Light Scattering Study of Lyotropic Chromonic Nematic*. Yu. A. Nastishin, **K. Neupane**, A. R. Baldwin, O. D. Lavrentovich, and S. Sprunt. 22nd International Liquid Crystal Conference, Jeju Island, Korea, June 29 - July 4, 2008. (LY09)
- Poster: *Flexoelectric effect in nematic bent-core liquid crystals measured by Dynamic Light Scattering*. M. Majumdar, **K. Neupane**, J. T. Gleeson, A. Jákli, and S. Sprunt. 22nd International Liquid Crystal Conference, Jeju Island, Korea, June 29 - July 4, 2008. (PHA33)
- Poster: *Understanding recent Light Scattering Data on Smectic Films through a Discrete Model of Layer Dynamics*. I. Oliveira, S. Sharma, **K. Neupane**, A. Baldwin, and S. Sprunt. 22nd International Liquid Crystal Conference, Jeju Island, Korea, June 29 - July 4, 2008. (DYN25)

- Oral: *Light Scattering Study of Biaxiality in Nematic Liquid Crystal Tetrapodes*. **K. Neupane**, S.W Kang, S. Sharma, D. Carney, T. Meyer, G. H. Mehl, D. W. Allender, S. Kumar, and S Sprunt. APS March Meeting 2008, New Orleans, Louisiana, USA (V8.00005).
- Oral: *Flexoelectric effect in a bent-core liquid crystal measured by Dynamic Light Scattering*. M. Majumdar, **K. Neupane**, J. T. Gleeson, A. Jákli and S. Sprunt. APS March Meeting 2008, New Orleans, Louisiana, USA (W8.00006).
- Oral: *Light Scattering Study of Biaxial Nematic Phases in Thermotropic Liquid Crystals*. **K. Neupane**, S. W. Kang, G. H. Mehl, D. W. Allender, S. Kumar, and S. Sprunt. Liquid crystal day, October 12, 2007, Liquid Crystal Institute, Kent, OH 44242.
- Poster: *Flexoelectric effect in a bent-core liquid crystal measured by Dynamic Light Scattering*, M. Majumdar, **K. Neupane**, J. T. Gleeson, A. Jákli, and S. Sprunt. Liquid crystal day, October 12, 2007, Liquid Crystal Institute, Kent, OH 44242.
- **Invited Talk:** *Dynamic Light Scattering Studies of Flexoelectricity^a and Biaxiality^b in certain Non-Calamitic Nematic Liquid Crystals* by S. Sprunt. Collaborators: ^aM. Majumdar, **K. Neupane**, J. T. Gleeson, S. Sprunt, J. Harden, and A. Jákli; ^b**K. Neupane**, S. W. Kang, G. H. Mehl, D. W. Allender, S. Kumar, and S. Sprunt. 9th European Conference in Liquid Crystals, July 2-6, 2007, Lisbon, Portugal.
- **Invited Talk:** *Dynamic Light Scattering Studies of Flexoelectricity^a and Biaxiality^b in certain Non-Calamitic Nematic Liquid Crystals* by S. Sprunt. Collaborators: ^aM. Majumdar, **K. Neupane**, J. T. Gleeson, S. Sprunt, J. Harden, and A. Jákli; ^b**K. Neupane**, S. W. Kang, G. H. Mehl, D. W. Allender, S. Kumar, and S. Sprunt. Workshop at Ferroelectric phenomena in liquid crystals, Liquid Crystal Institute, Kent, OH 44242, June19-28, 2007.
- Poster: *Dynamic Light scattering study of biaxial nematic ordering in thermotropic liquid crystalline Tetrapodes*, **K. Neupane**, S. W. Kang, T. Meyer, G. H. Mehl, D. W. Allender, S. Kumar, and S. Sprunt. Gordon Research Conference on Liquid Crystals, June 10-15, 2007, Colby-Sawyer College, New London, NH.
- Poster: *Dynamic Light Scattering Study of Flexoelectric Effect in a Bent-Core Liquid Crystal*, M. Majumdar, **K. Neupane**, J. T. Gleeson, A. Jákli, and S. Sprunt. Gordon Research Conference on Liquid Crystals, June 10-15, 2007, Colby-Sawyer College, New London, NH.
- **Invited Talk:** *Thermotropic Biaxial Nematic Phase in Bent-Core and Tetrapodic Mesogens* by S. Kumar. Collaborators: S. W. Kang¹, **K. Neupane**, L. Joshi, Q. B. Wang, S. Sharma, S. Sprunt, R. Dong, V. Prasad, K. A. Suresh, T. Meyer, G. H. Mehl, M. Lehmann. Gordon Research Conference on Liquid Crystals, June 10-15, 2007, Colby-Sawyer College, New London, NH.
- Oral: *Observation of a possible tetrahedric phase in bent-core Liquid Crystals*, D. Wiant, **K. Neupane**, S. Sharma, A. Jákli, J. Gleeson, and S. Sprunt. APS March Meeting 2007, Denver, Colorado USA, (H30.00005).
- Oral: *Giant Flexoelectricity of bent-core nematic liquid crystals*, J. Harden, B. Mbanga, M. Majumdar, **K. Neupane**, N. Eber, K. Fodor-Csorba, S. Sprunt, J. T. Gleeson and A. Jákli. APS March Meeting 2007, Denver, Colorado USA, (H30.00006).
- Poster: *Fluctuation in liquid crystal films probed by sub-nanosecond photon correlation spectroscopy*, S. Sharma, **K. Neupane**, A. Baldwin, and S. Sprunt. 21st International Liquid Crystal Conference, 2006, Keystone, Colorado USA, (DFCT-23).

- Poster: *Light scattering study of biaxial nematic phases reported in thermotropic liquid crystals*, **K. Neupane**, S. Sharma, S. W. Kang, G. H. Mehl, S. Kumar, and S. Sprunt. 21st International Liquid Crystal Conference, 2006, Keystone, Colorado USA, (BIAXP-5).
- Poster: *Critical behavior at the isotropic to nematic phase transition in a bent-core liquid crystal*, D. Wiant, S. Stojadinovic, **K. Neupane**, S. Sharma, K. Fodor-Csorba, A. Jákli, J. Gleeson, and S. Sprunt. 21st International Liquid Crystal Conference 2006, Keystone, Colorado USA, (FERRP-53).
- Oral: *The nature of phases, phase transitions, and defects in achiral bent-core and Ge-tetrapodic mesogens exhibiting the biaxial nematic phase*. S. W. Kang, **K. Neupane**, V. Pandya, L. Joshi, Q. Wang, S. Sharma, D. Finotello, S. Sprunt, S. Kumar, G. H. Mehl, V. Prasad. 21st International Liquid Crystal Conference 2006, Keystone, Colorado USA (BIAX-O4).
- Poster: *Critical behavior at the isotropic to nematic phase transition in a bent-core liquid crystals*, D. Waint, **K. Neupane**, S. Stojadinovic, S. Sharma, K. Fodor-Csorba, A. Jákli, J. T. Gleeson, and S. Sprunt. APS March Meeting, 2006, (J1.00202).
- **Invited Talk:** *More examples of the biaxial nematic phase* by S. Kumar. Collaborators: S. W. Kang, Q. Wang, L. Joshi, B. R. Acharya, A. Primak, **K. Neupane**, S. Sharma, D. Finotello, S. Sprunt, K. A. Suresh, M. Lehmann, G. H. Mehl, S. T. Shin, V. Prasad. 2nd International Symposium on Biaxial Nematics, Southampton, UK, Jan 27, 2006.
- Poster: *Dynamics of Freestanding Smectic Films Studied by Ultrafast Photon Correlation Spectroscopy*, S. Sharma, **K. Neupane**, A. Baldwin, and S. Sprunt. Gordon Research Conference on Liquid Crystals, June 19-24, 2005, Colby-Sawyer College, New London, NH.
- Poster: *One Nanosecond Photon Correlation Spectroscopy on Smectic Liquid Crystal Films*, S. Sharma, **K. Neupane**, A. Baldwin, and S. Sprunt. Liquid crystal day, April 22, 2005, Liquid Crystal Institute, Kent, OH 44242.
- Oral: *One Nanosecond Photon Correlation Spectroscopy on Smectic Liquid Crystal Films*, S. Sprunt, S. Sharma, **K. Neupane**, A. Baldwin, and S. Sprunt. 20th International Liquid Crystal Conference, July 2-7, 2004, Liubljana, Slovenia.
- Oral: *One Nanosecond Photon Correlation Spectroscopy*, S. Sprunt, S. Sharma, A. Adorjan, **K. Neupane**, A. Baldwin. APS March meeting, 2004, (B22.009).

TRAINING AND OTHER EXPERIENCE

- Participated in a workshop: *Ferroelectric Phenomena in Liquid Crystals* organized by Liquid Crystal Institute and Department of Mathematical Sciences, Kent State University, Kent, OH 44242, June 19 – 28, 2007.
- Conducted Leadership in *The Orientating New Teaching Assistants Program* conducted by Division of Research and Graduate Studies, Kent State University, Kent, OH 44242, August 2005.
- Participated in: *Teacher Training Programme in Physics*, Organized by the Directorate of Curriculum and Training, Higher Secondary Education Board, Lalitpur, Kathmandu, Nepal, June 11 – 17, 1999.

- Participated in a workshop: *Linking Science Education for Higher Secondary to three years Bachelor Programme*, Organized by Research Center for Educational Innovation & Development, Kathmandu, Nepal, May 20 – 23, 2000.

PROFESSIONAL MEMBERSHIP

Student member of American Physical Society (APS)

Life Member of Nepal Physical Society (NPS)

Student Member of American Association of Physicists in Medicine (AAPM)

REFERENCES

Available on request.