

Basant Lal Sharma

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EDUCATION Ph.D., Theoretical & Applied Mechanics, Minor in Mathematics, Sept '04
Cornell University, Ithaca, New York
Dissertation: "*The Kinetic Relation of a Peierls Dislocation in a Higher-Gradient Dispersive Continuum*"
Advisor: Professor Phoebus Rosakis

B.Tech., Mechanical Engineering, Aug '99
IIT Bombay, Mumbai, India
Advisor: Professor S.K. Maiti

ACADEMIC EXPERIENCE *Assistant Professor* Indian Institute of Technology Kanpur
Department of Mechanical Engineering Jan '08 – Present

Teaching "Minimizers in Mechanics and Elasticity" (ME Elective, '07-'08, 2nd semester)

Visiting Faculty Indian Institute of Technology Kanpur
Department of Mechanical Engineering Jan '07 – Dec '07

Teaching "Calculus of Variations in Mechanics" (ME Elective, '07-'08, 1st semester)

Postdoctoral Research Fellow Ecole Polytechnique, Palaiseau, France
Laboratoire de Mécanique des Solides Oct '05 – Sept '06

Research concerning development of a continuum based theory behind nucleation and propagation of defects in solid matter (Lev Truskinovsky)

Postdoctoral Research Associate Cornell University, Ithaca, NY
Theoretical & Applied Mechanics Oct '04 – April '05

Research on Coupled Oscillators (Steven H Strogatz)

Teaching Assistant Cornell University, Ithaca, NY
Theoretical & Applied Mechanics Fall '99 – Spring '04

Organising recitation sections, grading and holding office hours for Freshman and Sophomore level courses on Linear Algebra, Calculus and Differential equations, Statics and Dynamics, Mechanics of Solids; Junior level course on Differ-

ential equations, Probability and Statistics; First year Graduate level courses on Finite Element Methods, Methods of Applied Mathematics

Research Assistant
Theoretical & Applied Mechanics

Cornell University, Ithaca, NY
Summers '00 – '04

Research on Dynamics of Dislocations in Continuum framework

RESEARCH
INTERESTS

Continuum Mechanics and Thermodynamics, Dynamics of Discrete Chains and Lattices, Dislocation dynamics, Continuum modeling of Discrete Phenomena, Nonlinear Elasticity, Wave propagation in various media

PUBLICATIONS

Sharma BL, Vainchtein A, "Quasistatic evolution of steps along a phase boundary", *Continuum Mechanics and Thermodynamics*, Volume 19, Number 6, Pages 347-377, November, 2007

PAPERS
SUBMITTED

Sharma BL, "Solitary Waves in Frenkel-Kontorova Lattice" submitted to *Physica D*

Sharma BL, "Dislocation Dipole in Frenkel-Kontorova Lattice" submitted to *Continuum Mechanics and Thermodynamics*

PAPERS IN
PREPARATION

Sharma BL, Rosakis P, "Dissipation due to Dispersion and the Kinetic Relation of a Dislocation" to be submitted to the *Journal of the Mechanics and Physics of Solids*

Sharma BL, Rosakis P, "Dispersive Continuum Models and the Kinetic Relation of a Dislocation" to be submitted to the *Journal of Elasticity*

Sharma BL, "Uniform Motion of Dislocation in a Lattice Model" to be submitted soon

CONFERENCE
PRESENTA-
TIONS/POSTER

Oct '07: "On a hypothesis concerning slowly moving steps along a phase boundary"

Invited talk in *Department of Applied Mechanics, Indian Institute of Technology Delhi, New Delhi, Delhi, India*

Mar '07: "On Fracture in a Bar"

In workshop on *Mechanics of Interaction, Impacts and Separation of Solids*, 2nd - 4th March 2007, *Indian Institute of Technology Kanpur, Kanpur, U. P., India*

Nov '06: "Fast Motion of Dislocation in a Lattice Model"

Invited talk in *Department of Mechanical Engineering, Indian Institute of Technology Kanpur, Kanpur, U. P., India*

Mar '06: "Kinetics of a Dislocation: Discrete Models"

Invited talk in *Laboratoire de Mécanique des Solides, Ecole Polytechnique, Palaiseau, France*

Nov '05: "*Kinetics of a Dislocation: Continuum Models*"

Invited talk in *Laboratoire de Mécanique des Solides, Ecole Polytechnique, Palaiseau, France*

Nov '05: "*On the motion of a Peierls' Dislocation*"

Invited talk in *Department of Mathematical Sciences, Univeristy of Liverpool, Liverpool, L69 7ZL, England, UK*

Oct '05: "*Kinetics of a Dislocation in Peierls-Nabarro and Frenkel-Kontorowa Models*"

In *Theories of Microstructures and Defects*, 8-10 October 2005, Society for Natural Philosophy Meeting, Politecnico di Bari, Polignano a Mare - Bari, Italy

Sept '05: "*Energy Landscape for Phase Boundaries and Step formation*"

Poster presentation in *Multi-scale problems: modelling, analysis and applications*, 12th - 14th September 2005, University of Bath, Bath, BA2 7AY, UK

Sept '05: "*Dispersive Continuum and Peierls Dislocation*"

In *Successes and Failures of Continuous Models for Discrete Systems*, 5-8 September 2005 at the University of Bristol, Bristol BS8 1TR, UK

July '05: "*Dislocations and Plasticity*"

Invited talk in *Dynamical Problems in Mathematical Materials Science*, July 17-23, 2005 at the International Centre for Mathematical Sciences, Edinburgh, UK

Oct '04: "*Unstable Solitary Waves in One Dimensional Lattice*"

In the session on "Waves in Lattices and Arrays"; *First SIAM Nonlinear Waves and Coherent Structures*, October 2-5, 2004 at the University of Central Florida in Orlando, USA

May '04: "*Dispersion, Dissipation and the Kinetic Relation of a Dislocation*"

In the minisymposium on "Dynamics of Microstructure and Defects in Solids: Discrete and Continuum Models"; *SIAM Conference on Mathematical Aspects of Material Science*, May 23-26 2004, LA, USA

OTHER
PRESENTATIONS
AND VISITS

July-August '05: Visiting *Institute of Mathematical Sciences, Univeristy of Bath, Bath, BA2 7AY, UK*

May-June '05: Visiting *Department of Mathematics, Univeristy of Pittsburgh, Pittsburgh, PA, USA*

March '05: Visiting *Division of Applied Mathematics* for a week, *Brown Uni-*

veristy, Providence, RI, USA

March '05: "*Synchronization of Globally Coupled Oscillators without Symmetry in the Distribution of Natural Frequencies*"

Theoretical & Applied Mechanics, Cornell University, USA

June-Aug '04: Informal talks/discussion: *Dislocations and other Defects in Crystals*

Visiting *Department of Applied Mathematics* in Summer'04, *Univeristy of Crete*, Greece

April '04: "*Discrete Model and the Kinetic Relation of a Dislocation*"

Theoretical & Applied Mechanics, Cornell University, USA

Dec '03: "*Unstable Solitary Waves in One Dimensional Lattice*"

Theoretical & Applied Mechanics, Cornell University, USA

Aug '03: "*Solitary Waves in One Dimensional Lattice: Continuum Models*"

Theoretical & Applied Mechanics, Cornell University, USA

HONORS AND AWARDS

EGIDE Fellowship '05-'06, Ecole Polytechnique, Palaiseau, France

SIAM Student Travel Award for the SIAM Conference on Nonlinear Waves and Coherent Structures, 2004

SIAM Student Travel Award for the SIAM Conference on Mathematical Aspects of Materials Science, 2004

State Merit Award for P.E.T. 1995 distributed by the state Governor, MP, India, 1996

All India Talent Search Award'93 and Scholarship distributed by the Prime Minister of India, 1993 – 94

National Talent Search Scholarship, 1992

Merit Scholarship for Highest Marks, 1990 – 92

SKILLS

Computer: Knowledge of Mathematica, Matlab, Maple, C/C++; Environments of Unix, Windows, OS X

Languages: Hindi (mother tongue); also studied Russian, Sanskrit, German and French through some courses.

Extra-curricular: Fine Arts

AFFILIATIONS

Society for Natural Philosophy

REFERENCES

Phoebus Rosakis

Professor, Theoretical & Applied Mechanics

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224 Kimball Hall, Cornell University, Ithaca, NY 14853 USA

Lev Truskinovsky

Directeur de recherche, Laboratoire de Mechanique des Solides

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401-1010, Ecole Polytechnique, Palaiseau, Paris 91128 France

Steven H Strogatz

Director, Center for Applied Mathematics

Professor, Theoretical & Applied Mechanics

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223 Kimball Hall, Cornell University, Ithaca, NY 14853 USA

Timothy J Healey

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212 Kimball Hall, Cornell University, Ithaca, NY 14853 USA

Anna Vainchtein

Assistant Professor, Department of Mathematics,

E-mail: aav4@pitt.edu

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301 Thackeray Hall, University of Pittsburgh, Pittsburgh, PA 15260 USA

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