

Basant Lal Sharma

CONTACT INFORMATION

Department of Mechanical Engineering
Indian Institute of Technology Kanpur
Kanpur
Uttar Pradesh - 208016
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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
Department of Mechanical Engineering

Indian Institute of Technology Kanpur
Jan '07 – Present

Teaching and Research

Postdoctoral Research Fellow
Laboratoire de Mécanique des Solides

Ecole Polytechnique, Palaiseau, France
Oct '05 – Sept '06

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

Postdoctoral Research Associate
Theoretical & Applied Mechanics

Cornell University, Ithaca, NY
Oct '04 – April '05

Research on Kuramoto Model of Coupled Oscillators (Strogatz, SH)

Teaching Assistant
Theoretical & Applied Mechanics

Cornell University, Ithaca, NY
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 Differential 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

- (1) Continuum Mechanics and Thermodynamics, Lattice Dynamics, Dislocations, Brittle Fracture, Solid-Solid Phase transformation, Wave Scattering, Nonlinear Elasticity, Tight binding theory of electronic structure, Phonons.
- (2) Geometric Algorithms, Symplectic Algorithms, Structure of Hamiltonian Systems, Toeplitz Operator Theory, Fourier Analysis, Special Functions.

PUBLICATIONS

- (1) Sharma BL, Maurya G, “*Discrete scattering by a pair of parallel defects*, **Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences**, 2019, 1–21
- (2) Eremeyev V, Sharma BL, “*Anti-plane surface waves in media with surface structure: discrete vs. continuum model*, **International Journal of Engineering Science**, Volume 143, 2019, 33–38
DOI 10.1016/j.ijengsci.2019.06.007
<https://www.sciencedirect.com/science/article/pii/S0020722519311838>
- (3) Sharma BL, “*On electronic conductance of partially unzipped armchair nanotubes: further analysis*, **The European Physical Journal B**, Volume 92, Number 1, 2019, 1:19
DOI 10.1140/epjb/e2018-90391-2
<https://link.springer.com/article/10.1140/epjb/e2018-90391-2>

- (4) Sharma BL, “*Conductance of discrete bifurcated waveguides as three terminal junction*”, **arXiv:1808.02834**, 2018, 25 pages
<https://arxiv.org/abs/1808.02834>
- (5) Sharma BL, “*Kinematically restricted phonon transmission in partly-unzipped tubes of square and triangular lattices*”, **arXiv:1808.01873**, 2018, 24 pages
<https://arxiv.org/abs/1808.01873>
- (6) Sharma BL, “*Electronic transport across a junction between armchair graphene nanotube and zigzag nanoribbon*”, **The European Physical Journal B**, Volume 91, Number 5, 2018, 84
DOI 10.1140/epjb/e2018-80647-2
<https://link.springer.com/article/10.1140%2Fepjb%2Fe2018-80647-2>
- (7) Sharma BL, “*On prototypical wave transmission across a junction of waveguides with honeycomb structure*”, **Zeitschrift für angewandte Mathematik und Physik**, Volume, 2017, 1–27
DOI 10.1007/s00033-018-0909-x
<https://link.springer.com/article/10.1007%2Fs00033-018-0909-x>
- (8) Sharma BL, “*On scattering of waves on square lattice half-plane with mixed boundary condition*”, **Zeitschrift für angewandte Mathematik und Physik**, Volume 68:120, 2017, 1–24
DOI 10.1007/s00033-017-0854-0
<https://link.springer.com/article/10.1007/s00033-017-0854-0>
- (9) Sharma BL, “*On linear waveguides of zigzag honeycomb lattice*”, **Waves in Random and Complex Media**, Volume 28, Issue 1, Pages 1–39, 2017
DOI 10.1080/17455030.2017.1331061
<http://www.tandfonline.com/doi/full/10.1080/17455030.2017.1331061>
- (10) Sharma BL, “*On linear waveguides of square and triangular lattice strips: an application of Chebyshev polynomials*”, **Sādhanā**, Volume 42, Issue 6, Pages 901–927, June, 2017
DOI 10.1007/s12046-017-0646-4,
<https://link.springer.com/article/10.1007/s12046-017-0646-4>
- (11) Sharma BL, “*Continuum limit of the discrete Sommerfeld problems on square lattice*”, **Sādhanā**, Volume 42, Issue 5, Pages 713–728, May, 2017
DOI 10.1007/s12046-017-0636-6,
<http://link.springer.com/article/10.1007/s12046-017-0636-6>
- (12) Sharma BL, “*On energy balance and the structure of radiated waves in kinetics of crystalline defects*”, **Journal of the Mechanics and Physics of Solids**, Volume 96, November 2016, Pages 88–120
DOI 10.1016/j.jmps.2016.05.036,
<http://www.sciencedirect.com/science/article/pii/S0022509615303513>
- (13) Sharma BL, “*Wave propagation in bifurcated waveguides of square lattice strips*”, **SIAM Journal on Applied Mathematics**, Volume 76, Number 4, Pages 1355–1381, Apr, 2016
DOI 10.1137/15M1051464,
<http://epubs.siam.org/doi/abs/10.1137/15M1051464>
- (14) Sharma BL, “*Edge diffraction on triangular and hexagonal lattices: Existence, uniqueness, and finite section*”, **Wave Motion**, Volume 65, 55–78, Apr 2016
DOI 10.1016/j.wavemoti.2016.04.005,
<http://www.sciencedirect.com/science/article/pii/S0165212516300105?np=y>
- (15) Sharma BL, “*Diffraction of waves on triangular lattice by a semi-infinite rigid constraint and crack*”, **International Journal of Solids and Structures**, Volume 80, 465–85, Dec, 2015
DOI 10.1016/j.ijsolstr.2015.10.008,
<http://www.sciencedirect.com/science/article/pii/S0020768315004242>
- (16) Sharma BL, “*Diffraction of waves on square lattice by semi-infinite rigid constraint*”, **Wave Motion**, Volume 59, 52–68, Dec, 2015
DOI 10.1016/j.wavemoti.2015.07.008,
<http://www.sciencedirect.com/science/article/pii/S0165212515001146>
- (17) Sharma BL, “*Discrete Sommerfeld diffraction problems on hexagonal lattice with a zigzag semi-infinite crack and rigid constraint*”, **Zeitschrift für angewandte Mathematik und Physik**, Volume 66, Number 6, Pages 3591–3625, Sep, 2015
DOI 10.1007/s00033-015-0574-2,
<http://link.springer.com/article/10.1007/s00033-015-0574-2#>
- (18) Sharma BL, “*Near-tip field for diffraction on square lattice by rigid constraint*”, **Zeitschrift für angewandte Mathematik und Physik**, Volume 66, Number 5, Pages 2719–2740, Mar, 2015
DOI 10.1007/s00033-015-0508-z,
<http://link.springer.com/article/10.1007/s00033-015-0508-z>
- (19) Sharma BL, “*Near-tip field for diffraction on square lattice by crack*”, **SIAM Journal on Applied Mathematics**, Volume 75, Number 4, Pages 1915–1940, Aug, 2015
DOI 10.1137/15M1010646,
<http://epubs.siam.org/doi/ref/10.1137/15M1010646>

- (20) Sharma BL, “*Diffraction of waves on square lattice by semi-infinite crack*”, **SIAM Journal on Applied Mathematics**, Volume 75, Number 3, Pages 1171–1192, June, 2015
DOI 10.1137/140985093,
<http://epubs.siam.org/doi/ref/10.1137/140985093>
- (21) Sharma BL, Vainchtein A, “*Quasistatic propagation of steps along a phase boundary*”, **Continuum Mechanics and Thermodynamics**, Volume 19, Number 6, Pages 347–377, November, 2007
DOI 10.1007/s00161-007-0059-4,
<http://link.springer.com/article/10.10072Fs00161-007-0059-4>

ILLUSTRATIVE
MEDIA COVERAGE

- (1) “*Unzipping graphene nanotubes into nanoribbons*”, eurekaalert.org, 5 June 2018:
https://www.eurekaalert.org/pub_releases/2018-06/s-ugn060518.php
- (2) “*Unzipping graphene nanotubes into nanoribbons*”, phys.org, 5 June 2018:
<https://phys.org/news/2018-06-unzipping-graphene-nanotubes-nanoribbons.html>
- (3) “*Unzipping graphene nanotubes into nanoribbons: Elegant mathematical solution explains how flow of electrons changes when carbon nanotubes turn into zigzag nanoribbons*”, www.sciencedaily.com, ScienceDaily, 5 June 2018:
<https://www.sciencedaily.com/releases/2018/06/180605103416.htm>
- (4) “*Unzipping graphene nanotubes into nanoribbons*”, <http://www.springer-sbm.com/>, 5 June 2018:
<https://www.springer.com/gp/about-springer/media/research-news/all-english-research-news/unzipping-graphene-nanotubes-into-nanoribbons/15819602>
- (5) “*Unzipping graphene nanotubes into nanoribbons*”, <http://nano-magazine.com/>, 7 June 2018:
<https://nano-magazine.com/news/2018/6/7/unzipping-graphene-nanotubes-into-nanoribbons>

PAPERS SUBMITTED

- (1) Maurya G and Sharma BL, “*Wave scattering on square lattice due to staggered array of finite cracks*”, submitted, 2018, 1–21

MENTORED PH.D.
THESES

- (1) Maurya, G, “On some problems involving multiple scattering due to edges”, Dec 2018, IIT Kanpur, Kanpur

MENTORED
M.TECH. THESES

- (1) Ahmad, S, “One dimensional continuum models of lattice defects”, M. Tech. thesis (dual), IIT Kanpur, Kanpur, June 2017
- (2) Pathak, A, “Application of Homotopy based continuation method for the determination of mechanical equilibria”, M. Tech. thesis, IIT Kanpur, Kanpur, June 2016
- (3) Kedia, AK, “On Bulk Modes of a Semi-Infinite Two Dimensional Square Lattice”, M. Tech. thesis, IIT Kanpur, Kanpur, July 2013
- (4) Gautam, DK, “On Numerical Implementation of a Finite Difference Method for Transient Anti Plane Dynamics of Semi Infinite Linear Elastic Continuum”, M. Tech. thesis, IIT Kanpur, Kanpur, Aug 2012
- (5) Singh, P, “On a Numerical method for finding Mechanical Equilibria of Nonlinearly interacting Particles in Two Dimensions”, M. Tech. thesis, IIT Kanpur, Kanpur, Aug 2012
- (6) Prakash, U, “On Deformation of a Semi Infinite Lattice due to Forces applied on the Boundary using a Semi Analytical method”, M. Tech. thesis, IIT Kanpur, Kanpur, Aug 2012
- (7) Chaurasia, V, “On Hamiltonian Dynamics of a Chain of Rigid Bodies”, M. Tech. (dual) thesis, IIT Kanpur, Kanpur, May 2012
- (8) Jhanwar, R, “On certain conservative and discrete models for a chain of particles and rigid bodies, M. Tech. (dual) thesis, IIT Kanpur, Kanpur, Aug 2011
- (9) Goyal, R, “Application of Symplectic Algorithms to Some Simple Hamiltonian Models of Reconstructive Phase Transformations and Dislocations”, M. Tech. (dual) thesis, IIT Kanpur, Kanpur, July 2009

CO-MENTORED
THESIS

- (1) Khan, MK, “Study and validation of solutions to the forward problem of electrical impedance tomography”, M. Tech. (dual) thesis, IIT Kanpur, Kanpur, May 2014 (P. Munshi)
- (2) Shaw, SK, “Study of extraordinary fracture energy of double network hydrogels using shear lag model”, M. Tech. thesis, IIT Kanpur, Kanpur, May 2012 (S. Mahesh)

B.TECH. PROJECTS

- (1) 2011-12: Anurag Agarwal, Milan Singh, Shivam Sharma
- (2) 2018-19: Mayank Kumar Yadav, Hakam Ram, Arpit Agrawal
- (3) 2018-19: Brajesh Kumar, Deepak Shakyawar, Suyash Sinha

COURSES TAUGHT

- (1) '18-'19, 2nd semester
Leave for a semester
- (2) '18-'19, 1st semester
Instructor: "Mathematics for Engineers" (ME681A)
150 mins/week, PG compulsory course
- (3) '17-'18, 2nd semester
Instructor: "Wave propagation in solids" (ME723A)
150 mins/week, PG elective course
Tutorial: "Mechanics of Solids" (ESO202A)
50 mins/week, UG compulsory course (problem solving session)
- (4) '17-'18, 1st semester
Instructor: "Dynamics" (ESO209A)
120 mins/week, UG compulsory course
Tutorial: "Dynamics" (ESO209A)
50 mins/week, UG compulsory course (problem solving session)
- (5) '16-'17, 2nd semester
Instructor: "Introduction to Continuum Mechanics" (ME622A)
150 mins/week, PG elective course
Tutorial: "Mechanics of Solids" (ESO202A)
50 mins/week, UG compulsory course (problem solving session)
- (6) '16-'17, 1st semester
Instructor: "Introduction to Solid Mechanics" (ME621A)
150 mins/week, PG compulsory course
Tutorial: "Mechanics of Solids" (ESO202A)
50 mins/week, UG compulsory course (problem solving session)
- (7) '15-'16, 2nd semester
Instructor: "Dynamic Fracture Mechanics" (ME722A)
150 mins/week, PG elective course
Tutorial: "Engineering Graphics" (TA101A)
150 mins/week, UG compulsory course (problem solving session)
- (8) '15-'16, 1st semester
Instructor: "Introduction to Solid Mechanics" (ME621A)
150 mins/week, PG compulsory course
Tutorial: "Mechanics of Solids" (ESO202A)
50 mins/week, UG compulsory course (problem solving session)
- (9) '14-'15, 2nd semester
Instructor: "Difference Equations for Engineers" (ME682A)
150 mins/week, PG elective course
- (10) '14-'15, 1st semester
Instructor: "Advanced Mechanics of Solids" (ME321A)
120+150 mins/week, UG compulsory course
- (11) '13-'14, Sabbatical Leave for 10 months
- (12) '12-'13, 2nd semester
Instructor: "Difference Equations for Engineers" (ME682)
150 mins/week, PG elective course
Tutorial: "Engineering Graphics" (TA101)
150 mins/week, UG compulsory course (problem solving session)
- (13) '12-'13, 1st semester
Instructor: "Mathematics for Engineers" (ME681)
150 mins/week, PG compulsory course
- (14) '11-'12, 2nd semester
Instructor: "Calculus of Variations" (ME624)
150 mins/week, PG elective course
Tutorial: "Engineering Graphics" (TA101)
150 mins/week, UG compulsory course (problem solving session)
- (15) '11-'12, 1st semester
Instructor: "Introduction to Continuum Mechanics" (SE394)
150 mins/week, UG elective course
Tutorial: "Introduction to Continuum Mechanics" (SE394)
100 mins/week, UG elective course (problem solving session)
- (16) '10-'11, 2nd semester
Instructor: "Hamiltonian Mechanics & Symplectic Algorithms" (ME726)
150 mins/week, PG elective course
Tutorial: "Mechanics of Solids" (ESO204)
100 mins/week, UG elective course (problem solving session)

- (17) '10-'11, 1st semester
Instructor: "Mathematics for Engineers" (ME681)
150 mins/week, PG compulsory course
- (18) '09-'10, 2nd semester
Instructor: "Calculus of Variations" (ME624)
150 mins/week, PG elective course
Tutorial: "Mechanics of Solids" (ESO204)
100 mins/week, UG elective course (problem solving session)
- (19) '09-'10, 1st semester
Tutorial: "Mechanics of Solids" (ESO204)
100 mins/week, UG elective course (problem solving session)
- (20) '08-'09, summer semester
Instructor: "Introduction to Continuum Mechanics" (SE394)
150 mins/week, UG elective course
- (21) '08-'09, 2nd semester
Instructor: "Theory of Martensitic Phase Transformation" (ME698G)
150 mins/week, UG elective course
Tutorial: "Engineering Graphics" (TA101)
150 mins/week, UG compulsory course (problem solving session)
- (22) '08-'09, 1st semester
Instructor: "Introduction to Continuum Mechanics" (SE394)
150 mins/week, UG elective course
Tutorial: "Mechanics of Solids" (ESO204)
100 mins/week, UG compulsory course (problem solving session)
- (23) '07-'08, 2nd semester
Instructor: "Minimizers in Mechanics and Elasticity" (ME624)
150 mins/week, PG elective course
Tutorial: "Probability and Statistics" (ESO209)
100 mins/week, UG compulsory course (problem solving session)
- (24) '07-'08, 1st semester
Instructor: "Calculus of Variations in Mechanics" (ME698C)
150 mins/week, PG elective course
- (25) '06-'07, 2nd semester
Tutorial: "Engineering Graphics" (TA101)
150 mins/week, UG compulsory course (problem solving session)

SEMINARS,
CONFERENCE
PRESENTATIONS

- (1) (upcoming) Aug'19: ".."
Invited talk in "*Factorisation of matrix functions: New techniques and applications [WHTW01]*", Cambridge University, UK.
- (2) May'19: "*On the discrete scattering effects due to edges in certain simple structures*"
Invited talk at *the institute of Applied and Computational Mathematics* in the Foundation of Research and Technology, Crete, Greece.
- (3) May'19: "*Discrete Sommerfeld problems and nanoscale transport: some lessons from elementary mathematical techniques*"
A three day series of lectures on theoretical results involving lattices. Invited talks at Faculty of engineering, Politecnico di Bari, Polignano a Mare - Bari, Italy.
- (4) May'19: "*Steady state kinetics of lattice defects: prototype models and energy balance*"
A three day series of lectures on theoretical results involving lattices. Invited talks at Faculty of engineering, Politecnico di Bari, Polignano a Mare - Bari, Italy.
- (5) May'19: "*Discrete scattering by a crack*"
A three day series of lectures on theoretical results involving lattices. Invited talks at Faculty of engineering, Politecnico di Bari, Polignano a Mare - Bari, Italy.
- (6) May'19: Invited weeklong series of lectures "Waves on lattices: case of scattering due to crack on square lattice". Faculty of Civil and Environmental Engineering, Gdansk University of Technology, Gdansk, Poland.
- (7) Apr'19: "*On analysis and applications of discrete scattering theory involving edges*"
Invited talk at the Glasgow Computational Engineering Center, University of Glasgow, Glasgow, UK.
- (8) Apr'19: "*On the discrete scattering effects due to edges in certain simple structures*"
Invited talk (ACM Research Seminar) at the School of Engineering, Cardiff University, Cardiff, Wales, CF10 3AT, UK.
- (9) Apr'19: "*On the discrete scattering effects due to edges in certain simple structures*"
Invited talk at the Department of Mathematics, Keele University, Keele, Staffordshire, UK, ST5 5NH.

- (10) Apr'19: *“Wave propagation in lattices and structured media”*
Invited talk at the Center for Mechanics of Solids, Structures and Materials (CMSSM), The University of Texas at Austin, Austin, Texas, USA.
- (11) Apr'19: *“On the analysis and applications of discrete scattering theory in bifurcated lattice waveguides”*
Invited talk at the Center for Materials, Paris Mines Tech, Evry, Paris, France.
- (12) Apr'19: *“On the analysis and applications of discrete scattering theory in bifurcated lattice waveguides”*
Invited talk at the Center for Morphology of Materials, Paris Mines Tech, Fontainebleau, France.
- (13) Mar'19: *“On the discrete scattering effects due to edges in certain simple structures”*
Invited talk at Dipartimento di Ingegneria Meccanica, Chimica e dei Materiali, Università di Cagliari, Italy.
- (14) Jan '19: *“On an elementary analysis and some applications of scattering theory involving edges in a discrete framework”*
Invited talk at Tata Institute of Fundamental Research, Centre for Applicable Mathematics, Sharada Nagar, Chikkabommasandra, Bangalore 560065, India.
- (15) Oct '18: *“On some examples of discrete scattering in simple structures and their applications in mechanics and physics”*
Invited talk at the workshop ‘Dynamic phenomena in media with microstructure’ (supported by Israel Science Foundation), 07–12 of October 2018, Faculty of Engineering, Tel Aviv University, Israel.
- (16) Jun '17: *“Some reflections on the discrete aspects of solid mechanics”*
Invited talk at IITH Solid Mechanics Symposium, June 19-20, 2017, Indian Institute of Technology Hyderabad, Hyderabad, Telangana, India
- (17) Apr '15: *“Dislocation kinetics in lattice models”*
Invited talk in Pravartana'15, April 25-27, 2015, Indian Institute of Technology Kanpur, Kanpur, U. P., India
- (18) Apr '15: *“Scattering of waves by line defects on two dimensional lattices”*
Invited talk in Department of Mechanical Engineering, Indian Institute of Technology Kanpur, Kanpur, U. P., India
- (19) Feb '15: *“Fourier Series”*
Invited talk in “Mechanics School @ IITK” under the TEQIP program of the Technology Knowledge Incubation Cell, 20-24 February, 2015, Indian Institute of Technology Kanpur, Kanpur, U. P., India
- (20) Oct '14: *“Discrete Sommerfeld Problems”*
Invited talk in Mathematics Colloquium, Department of Mathematics, Indian Institute of Technology Kanpur, Kanpur, U. P., India
- (21) Mar '11: *“Liouville-Arnold Theorem”*
Invited talk in Analysis Seminar of Department of Mathematics, Indian Institute of Technology Kanpur, Kanpur, U. P., India
- (22) Oct '09: *“On nonlinear elastostatics”*
Invited talk in informal analysis group in *Department of Mathematics, Indian Institute of Technology Kanpur, Kanpur, U. P., India*
- (23) 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*
- (24) 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*
- (25) 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*
- (26) Mar '06: *“Kinetics of a Dislocation: Discrete Models”*
Invited talk in *Laboratoire de Mécanique des Solides, Ecole Polytechnique, Palaiseau, France*
- (27) Nov '05: *“Kinetics of a Dislocation: Continuum Models”*
Invited talk in *Laboratoire de Mécanique des Solides, Ecole Polytechnique, Palaiseau, France*
- (28) Nov '05: *“On the motion of a Peierls’ Dislocation”*
Invited talk in *Department of Mathematical Sciences, Univeristy of Liverpool, Liverpool, L69 7ZL, England, UK*
- (29) 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
- (30) 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

- (31) 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
- (32) 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
- (33) 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 TALKS AND VISITS

- (1) Jun'19: Visiting *Department of Applied Mathematics* in University of Crete 25 May-31 May 2019 , Greece
- (2) May'19: Visiting University of Bari 21 May-25 May 2019 , Italy
- (3) May'19: Visiting Faculty of Civil and Environmental Engineering, Gdansk University of Technology, Gdansk, 6 May-20 May 2019 , Poland
- (4) Apr-May'19: Visiting Glasgow Center of Computational Engineering, School of Engineering, University of Glasgow 30 Apr-5 May 2019 , UK
- (5) Apr'19: Visiting Department of Civil Engineering, University of Cardiff 28 Apr-29 Apr 2019 , UK
- (6) Apr'19: Visiting Department of Mathematics, University of Keele 25 Apr-27 Apr 2019 , UK
- (7) Apr'19: Visiting Department of Aerospace Engineering and Engineering Mechanics, University of Texas at Austin 10 Apr-24 Apr 2019 , USA
- (8) Apr'19: Visiting Department of Mathematics, University of Aberystwyth 3 Apr-10 Apr 2019 , UK
- (9) Mar'19: Visiting University of Cagliari 21 Mar-28 Mar 2019 , Dipartimento di Ingegneria Meccanica, Chimica e dei Materiali, Università di Cagliari, Italy
- (10) Dec'18-Jan '19: Visiting Tata Institute of Fundamental Research , Centre for Applicable Mathematics, Sharada Nagar, Chikkabommasandra, Bangalore 560065, India
- (11) June '17: Visiting *Department of Mechanical & Aerospace Engineering, IIT Hyderabad*, Telangana, India
- (12) 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
- (13) July-August '05: Visiting *Institute of Mathematical Sciences, Univeristy of Bath*, Bath, BA2 7AY, UK
- (14) May-June '05: Visiting *Department of Mathematics, Univeristy of Pittsburgh*, Pittsburgh, PA, USA
- (15) March '05: Visiting *Division of Applied Mathematics* for a week, *Brown Univeristy*, Providence, RI, USA
- (16) March '05: *“Synchronization of Globally Coupled Oscillators without Symmetry in the Distribution of Natural Frequencies”*
Theoretical & Applied Mechanics, Cornell University, USA
- (17) June-Aug '04: Informal talks/discussion: *Dislocations and other Defects in Crystals*
Visiting *Department of Applied Mathematics* in Summer'04, *Univeristy of Crete*, Greece
- (18) April '04: *“Discrete Model and the Kinetic Relation of a Dislocation”*
Theoretical & Applied Mechanics, Cornell University, USA
- (19) Dec '03: *“Unstable Solitary Waves in One Dimensional Lattice”*
Theoretical & Applied Mechanics, Cornell University, USA
- (20) Aug '03: *“Solitary Waves in One Dimensional Lattice: Continuum Models”*
Theoretical & Applied Mechanics, Cornell University, USA

MISCELLANEOUS

- (1) Sharma BL, “*Glimpse of discrete mechanics*”, Directions IITK, May 2014, 76–86
<http://home.iitk.ac.in/~bls/Homepage/directions1.pdf>
- (2) Jan 2019: The paper “On linear waveguides of square and triangular lattice strips: an application of Chebyshev polynomials” in *Sādhanā*, Volume 42(6), June 2017, Pages 901-927 has been **downloaded 2.2K times**
- (3) Jan 2019: The paper “Continuum limit of the discrete Sommerfeld problems on square lattice” in *Sādhanā*, Volume 42(5), Apr 2017, Pages 713-728 has been **downloaded 3K times**
- (4) May 2016: Nomination for C.N.R. Rao award at IITK.
- (5) Nov 2015: The article (as recorded on 24 Nov 2015) ‘Diffraction of waves on square lattice by semi-infinite rigid constraint’ in: *Wave Motion* 59 (2015), pp. 52-68, featured in the ‘Most Downloaded Wave Motion Articles’ (downloaded from ScienceDirect in the ‘last’ 90 days) at the second position during last November.

REVIEWER

- (1) The European Physical Journal B
- (2) Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences
- (3) Continuum Mechanics and Thermodynamics
- (4) Zeitschrift für angewandte Mathematik und Physik
- (5) Philosophical magazine
- (6) *Sādhanā*
- (7) SIAM Journal on Applied Mathematics
- (8) Acta Mechanica
- (9) Oxford University Press

HONORS AND AWARDS

- (1) MATRICS Project MTR/2017/000013: ”Wave propagation in lattice waveguides with defects”: Mathematical Research Impact Centric Support (MATRICS) to the Science and Engineering Research Board (SERB) for funding
- (2) Director’s letter for excellence in teaching (SE394 in the 2008-I semester)
- (3) EGIDE Fellowship ’05-’06, Ecole Polytechnique, Palaiseau, France
- (4) SIAM Student Travel Award for the SIAM Conference on Nonlinear Waves and Coherent Structures, 2004
- (5) SIAM Student Travel Award for the SIAM Conference on Mathematical Aspects of Materials Science, 2004
- (6) State Merit Award for P.E.T. 1995 distributed by the state Governor, MP, India, 1996
- (7) All India Talent Search Award’93 and Scholarship distributed by the Prime Minister of India, 1993–94
- (8) National Talent Search Scholarship, 1992
- (9) 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

ADMIN. WORK

Department level:

DPGC 2015-16

DUGC 2009-10, 2015-16

Acting DUGC convener April 29 to May 15, 2010

Condemnation committee convener 2014-15

Others: M.Tech. interview/written examinations, QIP MTech interview committees, PhD. examination committees, Junior technician examination committees

Institute level:

SLC 2014-15, 2015-16, 2016-17,

Acting SLC convener 24/5/2017 to 25/6/2017

SLC generalia committee Dec 2015, May 2016, August 2017

Cadence medal committee May 2007

GATE/ME question setters committee

GATE/XE question setters committee

Others: JEE representative, JEE counselling, GATE representative

Other committees outside department:

M.Tech. interviews (external): Computer Science and Engineering

PhD. interviews (external): Mathematics & Statistics

PhD. defense/examination committee: Mathematics & Statistics, Physics

Other PhD. examination committees: Mathematics & Statistics, Electrical Engineering,

M.Tech defense/examination committees (external): Aerospace Engineering, Civil Engineering, Computer Science and Engineering, Chemical Engineering, Environmental Engineering and Management Programme, Nuclear Engineering and Technology