CURRICULUM VITAE

Nilanjan Mitra

Associate Research Professor
Hopkins Extreme Materials Institute
Johns Hopkins University
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Associate Professor
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Indian Institute of Technology Kharagpur
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EDUCATION

Ph.D. – Civil Engineering, 2001-January 2007. (Emphasis: Computational Structural Mechanics)
University of Washington, Seattle, Washington, USA
Doctoral Dissertation: ***An analytical study of reinforced concrete beam-column joint behavior under seismic loading.***

M. Tech. – Ocean Engineering, 1999-2001, (Emphasis: Applied Mechanics)
Indian Institute of Technology, Kharagpur, India & Technische Universität, Darmstadt, Germany
Thesis: ***On the control of vortex excited vibrations of bundled conductors in overhead transmission lines.***

B.E. – Civil Engineering, 1994-1998, (Emphasis: Structural Engineering)
Bengal Engineering & Science University, Shibpur, West Bengal, India

NATIONALITY: Indian

US Green card holder: Permanent Resident Status

EMPLOYMENT HISTORY

Associate Research Professor in **Johns Hopkins University** (2020 -)

Visiting Associate Research Professor in **Hopkins Extreme Materials Institute, Johns Hopkins University** (2019)

Associate Professor in **Indian Institute of Technology Kharagpur** (2016 -)

Assistant Professor in **Indian Institute of Technology Kharagpur** (2009-2015)

Faculty in **CalPoly, San Luis Obispo** (2006 – 2009)

BOOK/BOOK-CHAPTER PUBLICATION

Mitra, N. "Marine Sandwich Structures" in "Wiley Encyclopedia of Composites – 2nd Edition"; 5 volume set edited by Luigi Nicolais and Assunta Borzacchiello and Stuart M. Lee, Published by John Wiley and Sons Inc. [**ISBN-10:** 0470128283; **ISBN-13:** 978-0470128282]

Mitra, N. "Explosion-induced shock waves through a medium and associated structural response" in "Blast Mitigation strategies in marine composite and sandwich structures"; - Springer transactions in civil and environmental engineering-1st Edition. Edited by Srinivasan Gopalakrishnan and Yapa Rajapakse, Published by Springer Nature Singapore Pte. Ltd. [**ISBN-10:** 9811071691; **ISBN-13:** 978-98110716910]

REFERRED JOURNAL PUBLICATION

1. *Pal, S., Mitra, N. (2021). "Shock wave propagation through air: A reactive molecular dynamics study." ***Proceedings of the Royal Society of London A: Mathematical, Physical and Engineering Sciences****, Accepted.*
2. *Sarkar, P.K., Mitra, N. (2021). "Thermal conductivity of cement paste: Influence of macro-porosity." ***Cement and Concrete Research***, *Accepted*.
3. *Rawat, S., Mitra, N. (2020). "{10-12} twinning in single crystal titanium under shock loading" ***Philosophical Magazine***, *doi: 10.1080/14786435.2021.1873449*.
4. *Sarkar, P.K., Mitra, N. (2021). "Molecular deformation response of portlandite under compressive loading." ***Construction and Building Materials***, *274, 122020*.
5. *Rawat, S., Mitra, N. (2021). "Evolution of microstructural deformation mechanisms under equal-channel angular extrusion loading conditions: A molecular dynamics case study of single crystal titanium." ***Philosophical Magazine***, *101(4), 435-449*.
6. *Kasu, S.R., Mitra, N., Reddy, M.A. (2020). "Influence of polyester microfiber reinforcement on flexural fatigue characteristics of concrete." ***Road Materials and Pavement Design***, *doi: 10.1080/14680629.2020.1808521*.
7. *Pal, S., Mitra, N., *Sarkar, P.K., *Prasad, D. (2020). "Stretch induced helix to extended-coil transition of crystalline \alpha phase isotactic polypropylene: A molecular dynamics study." ***Polymer Crystallization***, *3(4), e10143*.
8. *Deb, S., Mitra N., Basu Majumdar, S., Roy D. (2020). "Rate of hydration of lignocellulosic fiber reinforced hydrated cement." ***ACI Materials Journal,*** *117(6), 177-186*.
9. *Sindhu, P.S., Ghindani, D., Mitra, N., Prabhu, S.S. (2020). "Morphological changes in Epoxy resin (DGEBA/TETA) exposed to low temperatures." ***Journal of Adhesion Science and Technology***, 34(20), 2262-2273.
10. *Ghoshal, R., and Mitra, N. (2020). "Underwater Oblique shock wave reflection from submerged hydraulic structures." ***Ocean Engineering,*** 209, 107324.
11. *Rawat, S., Mitra, N. (2020). "Twinning, phase transformation and dislocation evolution in single crystal Titanium under uniaxial strain conditions: A molecular dynamics study." ***Computational Materials Science***, 172, 109325.
12. *Deb, S., Mitra N., Maitra, S., Basu Majumdar, S. (2020). "Comparison of mechanical performance and life cycle cost of natural and synthetic fiber reinforced cementitious composites." ***Journal of Materials in Civil Engineering ASCE,*** 32(6), 04020150.
13. *Deb, S., Mitra N., Basu Majumdar, S. (2020). "Influence of surface morphology of fibers on the tensile and flexural ductility of polypropylene reinforced cementitious composites." ***Journal of Materials in Civil Engineering ASCE,*** 32(4), 04020042.
14. Mitra, N., *Patra A., *Singh, S.P., *Mondal S., Datta, P.K., Varshney, S.K. (2020). "Interfacial delamination in glass-fiber/polymer-foam-core sandwich composites using Singlemode-multimode-singlemode optical fiber sensors: Identification based on experimental investigation." ***Journal of Sandwich Structures and Materials***. 22(1). 40-54.
15. *Sarkar, P.K., Mitra N., *Prasad, D. (2019). "Molecular level deformation mechanism of Ettringite." ***Cement and Concrete Research***, 124, 105836.
16. *Kasu, S.R., *Deb, S., Mitra, N., Reddy, M.A., Reddy, K.S. (2019). "Influence of aggregate size on flexural fatigue response of concrete." ***Construction and Building Materials***, 229, 116922.
17. Dey, U., Mitra, N., and Taraphder, A. (2019). "High temperature - High pressure phase transformation of Cu." ***Computational Materials Science,*** 170, 109154.
18. *Prasad, D., Mitra, N., and Bandopadhyay, S. (2019). "Intermolecular dynamics of water: Suitability of Reactive Interatomic Potential." ***The Journal of Physical Chemistry B***, 123, 6529-6535.

19. Mitra, N., *Prasad, D., and Banerjee, S. (2019). "Identification of molecular vibrations associated with tacticity in polypropylene: Density functional theory based simulations." ***Journal of Polymer Science, Part B: Polymer Physics***, 57(20), 1378-1385.

20. *Sarkar, P.K., and Mitra N. (2019). "Compressive response of tricalcium aluminate crystal: Molecular Dynamics investigations." ***Construction and Building Materials***, 224, 188-197.

21. Mitra, N., *Sarkar, P.K. and *Prasad, D. (2019). "Intermolecular dynamics of ultraconfined interlayer water in Tobermorite: influence on mechanical performance." ***Physical Chemistry Chemical Physics***, 21, 11416.

22. Mitra, N., *Patra A., *Mondal, S., and Datta, P.K. (2019). "Interfacial delamination crack profile estimation in polymer foam-cored sandwich composites." ***Engineering Structures,*** 189, 635-643.

23. *Sarkar, P.K., and Mitra N. (2019). "Role of confined interstitial water in compressive response of calcium sulfate ($CaSO_4$. n H_2O) [n = 0, 0.5, 1.0]." ***Journal of Solid State Chemistry,*** 274, 188-198.

24. *Sindhu, P.S., *Prasad, D, Peli, S., Mitra, N., Datta, P.K. (2019). "Terahertz spectroscopy of diglycidylether of bisphenol A: Experimental investigations and Density functional theory based simulations." ***Journal of Molecular Structure***, 1184, 114-122.

25. Bisht, A., *Neogi, A., Mitra, N., Jagadeesh, G., Suwas, S. (2019). "Investigation of the elastically shock-compressed region and elastic-plastic shock transition in single crystalline copper to understand the dislocation nucleation mechanism under shock compression." ***Shock Waves***, 29(7), 913-927.

26. *Sarkar, P.K., and Mitra N. (2019). "Gypsum under tensile loading: A molecular dynamics study." ***Construction and Building Materials,*** 201, 1-10.

27. *Prasad, D., and Mitra N. (2019). "An atomistic study of phase transition in cubic diamond Si single crystal subjected to static compression." ***Computational Materials Science,*** 156, 232-240.

28. Mitra N., *Sarkar, P.K., *Deb, S., Basu Majumdar, S. (2019). "Multiscale estimation of elastic constants of hydrated cement." ***Journal of Engineering Mechanics ASCE,*** 145(4), 04019014.

29. *Deb, S., Mitra N., Basu Majumdar, S., Maitra, S. (2018). "Improvement in tensile and flexural ductility with addition of different types of polypropylene fibers in cementitious composites." ***Construction and Building Materials***, 180, 405-411.

30. *Deb, S., Samuelraj, I.O., Mitra N., Jagadeesh, G. (2019). "Microstructural response of shock loaded concrete, mortar and cementitious composite materials in a shock tube setup." ***Journal of Materials in Civil Engineering ASCE,*** 31(4), 04019029.

31. Mitra, S., Mitra, N., Lakshminarayana, K.S.V. (2018). "Pedestrian injury severity in the event of collision with a truck: are energy absorbing adaptive deformable fronts suitable?" ***International Journal of Vehicle Safety,*** 10(3), 235-252.

32. *Sarkar, P.K., and Mitra N. (2018). "Molecular mechanisms of Tricalcium Aluminate under tensile loads." ***Computational Materials Science,*** 154, 547-556**.**

33. *Ghoshal, R., and Mitra, N. (2018). "Underwater Oblique shock wave reflection." ***Physical Review Fluids.*** 3, 013403.

34. *Neogi, A., Mitra, N., Talreja, R. (2018). "Cavitation in epoxies under composite-like stress state." ***Composites Part A***. 106, 52-58.

35. *Rawat, S., Mitra, N. (2018). "Evolution of tension twinning in single crystal Ti under compressive uniaxial strain conditions." ***Computational Materials Science***. 141, 302-312.

36. *Rawat, S., and Mitra, N. (2018). "Molecular dynamics investigation of c-axis deformation of single crystal Ti under uniaxial stress conditions: Evolution of compression twinning and dislocations." ***Computational Materials Science***. 141, 19-29.

37. *Neogi, A., and Mitra, N. (2017). "A metastable phase of shocked bulk single crystal copper: an atomistic simulation study." ***Scientific Reports***. 7, 7337.

38. *Neogi, A., and Mitra, N. (2017). "Shock induced deformation response of single crystal copper: Effect of crystallographic orientations." ***Computational Materials Science***. 135, 141-151.

39. *Neogi, A., and Mitra, N. (2017). "Evolution of dislocation mechanism in single crystal Cu under shock loading in different directions." ***Modelling and Simulation in Materials Science and Engineering***. 25, 025013.

40. *Rawat, S., and Mitra, N. (2017). "Compression twinning and structural phase transformation of single crystal titanium under uniaxial compressive strain conditions: Comparison of interatomic potentials." ***Computational Materials Science***. 126, 228-237.

41. *Ghoshal, R., and Mitra, N. (2016). "Underwater explosion induced shock loading of structures: Influence of water depth, salinity and temperature." ***Ocean Engineering.*** 126, 22-28.

42. *Patra, A., and Mitra, N. (2016). "Mixed mode fracture of sandwich composites: performance improvement with multiwalled carbon nanotube sonicated resin." ***Journal of Sandwich Structures and Materials***. 20(3), 379-395.

43. *Neogi, A., and Mitra, N. (2016). "Shock compression of poly-vinyl-chloride." ***Journal of Applied Physics***. 119, 165903.

44. *Neogi, A., and Mitra, N. (2016). "Shock induced Phase transition in water: Molecular Dynamic investigation." ***Physics of Fluids***. 28, 027104.

45. *Ghoshal, R., and Mitra, N. (2015). "High-intensity air-explosion-induced shock loading of structures: consideration of a real-gas in modeling a nonlinear compressible medium." ***Proceedings of the Royal Society of London A: Mathematical, Physical and Engineering Sciences***, 471, 20140825.

46. Mondal, S., *Patra, A., Chakraborty, S., Mitra, N. (2015). "Dynamic performance of sandwich composite plates with circular hole/cut-out: A mixed experimental–numerical study." ***Composite Structures,*** 131, 479-489.

47. *Patra, A., and Mitra, N. (2014). "Interface fracture of sandwich composites: Influence on MWCNT sonicated epoxy resin." ***Composites Science and Technology,*** 101, 94-101.

48. *Neogi, A., and Mitra N. (2014). "On shock response of nano-void closed/open cell Copper material: Non-equilibrium molecular dynamic simulations." ***Journal of Applied Physics,*** 115(1), 013504.

49. *Ghoshal, R., and Mitra, N. (2014). "On core compressibility of sandwich composite panels subjected to intense underwater shock loads." ***Journal of Applied Physics,*** 115(2), 024905.

50. *Ghoshal, R. Mitra, N. (2012). "Non-contact near field underwater explosion induced shock wave loading of submerged rigid structures: nonlinear compressibility effects in fluid structure interaction." ***Journal of Applied Physics,*** 112(2), 024911.

51. Mitra, N., *Raja, B.R. (2012). "Improving delamination resistance capacity of sandwich composite columns with initial face/core debond." ***Composites Part B: Engineering***, 43(3), 1602-1612.

52. Kang, T.H.-K., Mitra, N. (2012). "Prediction of performance of exterior beam-column connections with headed bars subjected to load reversal." ***Engineering Structures,*** 41, 209-217.

53. Mitra, N. and Samui, P. (2012). "Prediction of Inelastic mechanisms leading to seismic failure of interior reinforced concrete beam-column connections." ***ASCE Practice Periodical on Structural Design and Construction,*** 173(3), 110-118.

54. Mitra, N. (2012). "Failure Initiation of reinforced concrete beam-column connections – Binomial logistic regression based probabilistic model." ***Advances in Structural Engineering***, 15(1), 121-137.

55. Mitra, N., Mitra, S. and Lowes, L. N. (2011). "Probabilistic model for failure initiation of reinforced concrete interior beam-column connections subjected to seismic loading." ***Engineering Structures,*** 33, 154-162.

56. Mitra, N. (2010). "A methodology for improving shear performance of marine grade sandwich composites: Sandwich Composite panel with Shear-key." ***Composite Structures,*** 92, 1065-1072.

57. Kang T. H.-K., Shin M., Mitra N. and J. F. Bonacci (2009). "Seismic Design of Reinforced Concrete Beam-Column Joints with Headed Bars." ***ACI Structural Journal,*** 106(6), 868-877.

58. Martin, J., Stanton, J., Mitra, N., and Lowes, L. N. (2007). "Experimental testing to determine concrete fracture energy using simple laboratory test setup." ***ACI Materials Journal,*** 104(6), 575-584.

59. Mitra, N., and Lowes, L.N. (2007). "Evaluation, calibration and verification of a reinforced concrete beam-column joint model." ***Journal of Structural Engineering ASCE***, 133(1), 105-120.

60. Lowes, L. N., Altoontash, A., and Mitra, N. (2005). "Closure to "Modeling Reinforced Concrete Beam-Column Joints Subjected to Cyclic Loading" by Lowes, L.N. and Altoontash, A." ***Journal of Structural Engineering ASCE***, 131(6), 993-994.

61. Hagedorn, P., Mitra, N., and Hadulla, T. (2002). "Vortex-excited vibrations in bundled conductors: A mathematical model." ***Journal of Fluids and Structures***, 16(7), 843-854.

*** Indicates my students (past/present).**

ORAL PRESENTATIONS & CONFERENCE PROCEEDINGS

- Mitra, N., (2020). "A new metastable phase of shock compressed Copper", ***American Physical Society March Meeting, Denver, March 2020.***
- Mitra, N., Pal, S. (2020). "Shock compression of dry air", ***American Physical Society March Meeting, Denver, March 2020.***
- Suma-Sindhu, P., Mitra, N. (2019). "Epoxy resin (DGEBA/TETA) under extreme environment.", ***American Society for Composites: 34th Technical Conference, Georgia, Atlanta, September 2019.***
- Suma-Sindhu, P., Mitra, N. (2019). "Mitigation of mechanical property degradation of epoxy resin subjected to UV with addition of different nanofillers.", ***American Society for Composites: 34th Technical Conference, Georgia, Atlanta, September 2019.***
- Mitra, N., Prasad, D. (2019). "Role of hydrogen bonding in phase transformation of bulk liquid water to ice VII under shock loading", ***American Physical Society March Meeting, Boston, March 2019.***
- Mitra, N., Prasad, D. (2019). "Anisotropy in shock compression of different polymorphs of SiC", ***American Physical Society March Meeting, Boston, March 2019.***
- Mitra, N., Deb, S., Basu Majumdar, S. (2019). "Modulating the rate of hydration in cement with addition of fibers", ***Transportation Research Board meetings, Washington DC, January 2019.***
- Mitra, N., Prasad, D. (2018). "Shock induced phase transformation of single crystal Silicon – Molecular Dynamic Investigations", ***American Physical Society March Meeting, Los Angeles, March 2018.***
- Deb, S., Sarkar P., Mitra, N., BasuMajumdar S. (2017). "Elastic property estimation of the hydrated cement paste", ***ASCE Engineering Mechanics Institute Conference, San Diego, June 2017.***
- Neogi, A., Mitra, N. (2017). "Shock induced phase transition of single crystal copper", ***AIP Conference Proceedings 1832(1) 030011.***
- Rawat, S., Mitra, N. (2017). "Twinning assisted α to ω phase transition in titanium single crystal", ***AIP Conference Proceedings 1832(1) 030018.***
- Neogi, A., Mitra, N. (2017). "Effects of crystal orientation on shock induced dislocation dynamics on single crystalline copper", ***TMS 2017, 146th Annual Meeting and Exhibition, San Diego, CA, Feb 26 – Mar 2, 2017.***
- Neogi, A., Mitra, N. (2017). "Orientational dependence of shock induced phase transition of single crystal copper", ***TMS 2017, 146th Annual Meeting and Exhibition, San Diego, CA, Feb 26 – Mar 2, 2017.***
- Rawat, S., Mitra, N. (2017). "Behaviour of single crystal titanium under high strain rate deformation: a molecular dynamics study", ***TMS 2017, 146th Annual Meeting and Exhibition, San Diego, CA, Feb 26 – Mar 2, 2017.***
- Neogi, A., Rawat, S., Mitra, N. (2017). "Molecular dynamics simulations of shock induced deformation twinning of FCC single crystal copper", ***American Physical Society March Meeting, New Orleans, March 2017.***
- Neogi, A., Mitra, N. (2017). "Anisotropic shock response of single crystal titanium: Molecular dynamics investigations", ***American Physical Society March Meeting, New Orleans, March 2017.***
- Mondal, S., Chakraborty, S., Mitra, N. (2016). "Estimation of elastic parameters of sandwich composite plates using gradient based finite element model updating approach", ***ASME 2016 Conference on Smart Materials, Adaptive Structures and Intelligent Systems, Stowe, Vermont, September 2016.***

- Patra, A., Mitra, N. (2016). "Influence of multiwalled carbon nanotube on interfacial fatigue performance of glass epoxy polyvinyl chloride core sandwich composite", ***American Society for Composites: 31st Technical Conference, Virginia, September 2016.***
- Mitra, N. (2016). "Interfacial delamination of sandwich composite panels: Real time detection and methodologies for performance improvement", ***11th International conference on Sandwich Structures, Florida, March 2016.***
- Mitra, N., Neogi, A. (2016). "Atomistic simulation of shock induced structural phase transition of single crystal copper", ***American Physical Society March Meeting, Baltimore, March 2016.***
- Neogi, A., Mitra, N. (2016). "Atomistic simulation of shock induced dislocation dynamics and evolution of different plasticity mechanisms in Single crystal copper", ***American Physical Society March Meeting, Baltimore, March 2016.***
- Patra, A., Mitra, N. (2015). "Influence of multiwalled carbon nanotube on mixed mode fracture of sandwich composite", ***American Society for Composites: 30th Technical Conference, Michigan, August 2015.***
- Mitra, N. (2015). "Explosion induced shock wave through a medium and structural response", ***Indo-USA workshop on recent advances in blast mitigation strategies for civil and marine structures, Bangalore, India, August 2015.***
- Mitra, N. (2015). "Intense shock wave through water and impulse transmission in submerged structures", ***30th International Symposium on Shock waves, Tel Aviv, Israel, July 2015.***
- Mitra, N., Neogi, A. (2015). "A molecular dynamic investigation for shock induced phase transition of water", ***19th biennial American Physical Society of Shock compression of condensed matter, Tampa, Florida, June 2015.***
- Neogi, A., Mitra, N. (2015). "Molecular dynamic study of shock wave response of bulk amorphous polyvinyl chloride: effect of chain length and force field", ***19th biennial American Physical Society of Shock compression of condensed matter, Tampa, Florida, June 2015.***
- Mitra, N. (2012). "Binomial logistic regression model for probabilistic assessment of failure of reinforced concrete beam-column joints subjected to seismic action", ***15th World Conference in Earthquake Engineering, Lisbon, Portugal, September 2012.***
- Mitra, N., Ghoshal, R. (2012) "Nonlinear compressibility effects of medium in simulation of submerged rigid plates subjected to underwater explosion", ***10th World Congress on Computational Mechanics, Sao Paulo, Brazil, July 2012.***
- Lakshminarayana, K.S.V., Mitra, S. and Mitra, N. (2011) "Trucks with Different External Frontal Frames: Comparing Vulnerable Road User's Injury Severities Using Madymo", ***3rd International Conference on Road Safety and Simulation, Indianapolis, Indiana, USA, September 2011.***
- Mitra, N. (2011). "Marine grade sandwich composite panel with shear keys." ***16th International Conference on Composite Structures, Porto, Portugal, 201.***
- LaFave, J.M., Shin, M. and Mitra, N. (2009). "Behavior and design of reinforced concrete beam column connections with joint eccentricity". ***Structures Congress, Austin , Texas, USA 2009***.
- Kang, T.H.K., Mitra, N. and Shin, M. (2009). "Headed reinforcement applications for reinforced concrete beam-column connections". ***Structures Congress, Austin Texas, USA 2009***.
- Mitra, N. (2008). "Uncertainty in analytical structural response associated with high level modeling decisions" ***14th. World Conference in Earthquake Engineering, Beijing, China,*** Paper no. 14-0110.
- Mitra, N., and Lowes, L.N. (2008). "Factors influencing analytical continuum simulation of three-point bend test of a concrete notched beam" ***14th. World Conference in Earthquake Engineering, Beijing, China***, Paper no. 05-01-0175.
- Mitra, N. (2008). "Continuum model for RC interior beam-column connection regions" ***14th. World Conference in Earthquake Engineering, Beijing, China***, Paper no. 14-0111.
- Bhattacharya, S., Dash, S.R., Mitra, N., Adhikari, S. and Blakeborough, A. (2008). "Investigation of bending-buckling interaction of piles in liquefiable soils" ***14th. World Conference in Earthquake Engineering, Beijing, China***, Paper no. 04-02-0106.
- Mitra, N., Lowes, L. N. (2007). "A macroscopic model for beam-column joint regions" ***ACI Spring Convention***, April 22-26, 2007.
- Lowes, L.N., Mitra, N., Theiss, A. and Paspuleti, C. (2006). "Modeling nonductile RC components and application to the PEER Van-Nuys test-bed." ***8th. National Conference in Earthquake Engineering, San-Francisco, California***, April 2006, Paper No. 1792.
- Mitra, N., and Lowes, L.N. (2006). "Modeling the behavior of reinforced concrete beam-column building joints subjected to earthquake loading." ***8th. National Conference in Earthquake Engineering, San-Francisco, California***, April 2006, Paper No. 530.

- Mitra, N., and Lowes, L.N. (2004). "Evaluation and advancement of a reinforced concrete beam-column joint model." ***13th. World Conference in Earthquake Engineering, Vancouver, British Columbia, Canada,*** Paper No. 1001.
- Mitra, N., and Lowes, L.N. (2004). "Evaluation and advancement of a RC beam-column joint model." ***5th. International PhD. Symposium in Civil Engineering, Delft, The Netherlands***, Eds. Walraven, J., Blaauwendraad, J., Scarpas, T., and Snijder, B., Balkema Publishers, 325-333.

MAJOR FUNDED PROJECTS (Current and Completed)

- Physics of shock wave propagation through air and water medium – P.I., Funding Source: Office of Naval Research Global, 2018-2021 – Completed. [**ONR #N62909-18-1-2057**] Amount: USD 98,286.
- Development of smooth particle hydrodynamics (SPH) capability for naval applications – Co-P.I., Funding Source: Naval Research Board, India, 2018-2021 – Ongoing. Amount: INR 47,35,966.
- Cavitation bubble dynamics near wettability tailored surfaces – Co-P.I., Funding Source: Naval Research Board, India, 2019-2022 – Ongoing. Amount: INR 80,10,300.
- Engineered cementitious composites – a replacement of conventional concrete for sustainable infrastructure – P.I., Funding Source: Ministry of Human Resources India, 2014-2019 – Completed. Amount: INR 73,24,000.
- Response mitigation of structures subjected to projectile impact using sandwich composite technology – P.I., Funding Source: Challenge Seed Grant IIT Kharagpur, 2014-2017 – Completed. Amount: INR 25,00,000.
- Real time detection of face/core debond initiation and interfacial delamination propagation morphology in sandwich composite panels using fiber-optic Bragg grating sensors – P.I., Funding Source: Indian Space Research Organization, India, 2014-2017 – Completed. Amount: INR 49,80,000.
- Underwater non-contact explosive response of marine grade sandwich composite panels – P.I., Funding Source: Naval Research Board, India, 2011-2015 – Completed. [**NRB-226/HYD/10-11**] Amount: INR 72,50,000.
- Assessment of various strategies of seating arrangements for Indian Rail Coaches from the viewpoint of occupants safety – Co P.I., Funding Source: Research Design and Standards Organization, Ministry of Rail, India, 2012-2014. – Completed. Amount: INR 29,52,400.
- Improving mechanical performance and delamination resistance in sandwich composite panels – P.I., Funding Source: Dept. of Science and Technology, India, 2011-2014 – Completed. [**SR/S3/MERC-035/2010**] Amount: INR 24,60,000.
- Reduction of skin-core delamination from the core in the composite sandwich panels for naval structures – P.I., Funding Source: Office of Naval Research, USA, 2009 – Completed. [**ONR # N00014-08-1-1209**] Amount: USD 65,000.
- A novel model for sandwich panels in marine structures: face plate with shear keys – P.I., Funding Source: Office of Naval Research, USA, 2008 – Completed. [**ONR #N00014-07-1-1152**] Amount: USD 56,000.

PhD and PostDoc Student Guidance

PhD Students (under single guidance):

- ***Dr. Ritwik Ghoshal*** (Degree conferred 2015). Non-contact explosion induced shock wave response of structures. *Currently* – Assistant Professor at Indian Institute of Technology Kharagpur, India in Department of Ocean Engineering (after 1 year postDoc at NUS, Singapore).
- ***Dr. Alak Patra*** (Degree conferred 2018). Identification and mitigation of interfacial delamination in sandwich structures. *Currently* – Associate Professor in SRM University, Chennai.
- ***Dr. Anupam Neogi*** (Degree conferred 2018). Materials under extreme conditions: An atomistic study of shock compression. *Currently* – PostDoc student in Interdisciplinary Centre for Advanced Materials Simulation, Ruhr University, Bochum, Germany (after postdoc at University of Rochester, USA)
- ***Dr. Prodip Sarkar*** (Degree conferred 2020). Structure property relationship of cement constituents under various loading conditions: An Atomistic approach. *Currently* – PostDoc student with me.

- ***Sutapa Deb*** (Submitted thesis for review to External Examiners in December 2019). Fiber reinforced Cementitious composite materials.
- ***Suma Sindhu*** (Ongoing, will submit in July 2021). *Topic* – Thermoset polymers under extreme conditions: An Experimental investigation.
- ***Dipak Prasad*** (Ongoing). *Topic* – Density functional theory based calculations and simulations of chemical reactions.

PhD Students (under shared guidance):

- ***Sridhar Reddy Kasu*** (Ongoing, will submit in May 2021) [Shared with Prof. A. Reddy]. *Topic* – Concrete for pavement applications.
- ***Tushar Naik*** (Ongoing) [Shared with Prof. K. Deb]. *Topic* – Impact and Blast performance on soil-structure interaction problems.
- ***Charitha Mudi*** (Ongoing) [Shared with Prof. A. Shaw]. *Topic* – Impact and Blast performance of ceramics.
- ***Amrita Samal*** (Ongoing) [Shared with Prof. A. Shaw]. *Topic* – Structural health monitoring of old masonry structures.

PostDoc Students:

- ***Sunil Rawat*** (PhD in Physics from BARC, India – Atomistic Simulation group)
- ***Shyamal Mondal*** (PhD in Physics from IIT Kgp – Photonics group)
- ***Satya Pratap Singh*** (PhD in Physics from IIT Kgp – Photonics group)
- ***Kajal Mondal*** (PhD in Physics from IIT Kgp – Photonics group)

CONTRIBUTIONS to OPEN SOURCE PROGRAMMING

- Introduced *Shear-panel, Pinching4*, *Bar-Slip, Concrete04 material* models and *Beam-Column Joint* element models in OpenSees environment (http://opensees.berkeley.edu) as a graduate student working under Prof. Laura Lowes at University of Washington, Seattle, USA.

AWARDS

- DAAD Fellowship (German Govt.) for Research Stay (2 months) at Darmstadt Technological University, Germany.
- Raman Fellowship (by Ministry of Human Resources, India) for 6 month research at Carnegie Mellon University, USA.
- DAAD fellowship (German Govt.) for Research at Masters level (9 months) at Darmstadt Technological University, Germany.

PROFESSIONAL EXPERIENCE (non Academic)

- *RIBE Electroarmaturen, GMBH and Co., Germany – Research Trainee, Jan 2001-Feb 2001*
- *Consulting Engineering Services (India) Ltd. – Structural Design Engineer, 1998- 1999*
- *Stup Consultants Ltd, India. – Trainee Engineer, Summer 1997*

Major Consultancy Experience

- Assessment of structural health of silo for storage of cement, Salboni, West Bengal.
- Vetting design of Railway loco-shed floors at Bondamumda, Rourkella, Odisha.
- Vetting design of box culvert bridge structure, Santragachi, West Bengal.
- Vetting design of FRP cooling towers, Paharpur, West Bengal.
- Vetting design of multimodal port Terminal at Haldia, West Bengal
- Vetting design of Railway Workshop at Badnera, Gujarat.
- Feasibility study of Iso-kinetic stack sampling in existing stacks of Kolaghat thermal Power station, West Bengal.

- Vetting design of Pultruded FRP cooling towers for Indian Farmers Fertilizers cooperative limited at Kalol, Gujarat
- Vetting design of canal structure for Teesta Irrigation project, West Bengal.
- Determination of chemical composition of different powder cement samples, LASA Associates for Majerhat project, West Bengal.
- Assessment of structural soundness after an explosion of a Magazine building at Chandipur, Balasore, Odisha.

INSTITUTE ADMINISTRATIVE POSITION

Vice Chairman (Civil) Civil Construction of Maintenance: (October 2016 - August 2019). *Responsibilities*: Oversee all new construction and maintenance works of IIT Kharagpur covering a 2000 acre campus area (which includes not only 19 departments, 13 centers, 12 schools but also housing for all faculties – around 550, students and staff). The total strength of people (inclusive of students, faculties and staff) is around 20,000.