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PROFESSIONAL PREPARATION

National Institute of Technology (Regional Engineering College), Srinagar, India	Civil Engineering	B.S.	1983
Indian Institute of Technology, Bombay	Civil Engineering	M.S.	1986
University of Arizona, Tucson	Civil Engineering	Ph.D.	1991

APPOINTMENTS

- Jordan A. Engberg Presidential Professor, North Dakota State University, Fargo, ND, 2015-todate
- Professor, Department of Civil Engineering, North Dakota State University, Fargo, ND, 2002-todate
- Chairman, Department of Civil Engineering, North Dakota State University, Fargo, ND, Sept. 2004-Dec 2009, 2013-August 2017
- Associate Dean of Research, College of Engineering and Architecture, North Dakota State University, Fargo, ND, Aug. 2004-Dec. 2009
- Associate Professor, Department of Civil Engineering, North Dakota State University, Fargo, ND, 1996-2002
- Project Engineer, Terra Associates Inc., Kirkland, Washington, 1992-1996
- Staff Engineer, Dames & Moore, Seattle, Washington, 1991-1992

AWARDS & HONORS

(i) Fellow - Engineering Mechanics Institute, 2015

(ii) John Booker Excellence Award, by the International Association for Computer Methods and Advances in Geomechanics (IACMAG). The citation for the award is: "For major contributions to geomechanics through development of methodologies for the role of molecular phenomena on macroscopic mechanical and permeability properties of swelling clays, for bringing molecular mechanics and dynamics to the field of geomechanics, for excellent research contributions for swelling clays, clay liner, and multiscale approach for mechanics of swelling clays and nanoclsys."

(iii) North Dakota State University, Fred Waldron Research Award, 2013

(iv) Jordan A. Engberg Endowed Presidential Professor, 2015

(v) North Dakota State University, College of Engineering and Architecture Researcher of the year Award, 2000-2001

(vi) Fellow, Faculty Institute for Excellence in Teaching, 2001

(vii) Best Paper in the area of Earth Structures published in National/International Journals or Conferences in the year 1988. Award given by the Indian Geotechnical Society.

(viii) **Plenary Keynote Lecture** at Engineering Mechanics Institute, June 2012 Conference at University of Notre Dame, "Molecular Interactions Impact the Mechanics of Nanomaterials: A Paradigm Shift in Mechanics"

(ix) **Plenary Keynote Lecture, BIOMED 2012, Innsbruck, Austria,** "Molecular Interactions: Role on the Mechanics of Biological Nanocomposites (Bone) and Tailoring them for Bone Tissue Engineering"

(x) **Guest Speaker (2013) : Warren Lecture, University of Minnesota, Minneapolis, MN "**Mechanics of Nanomaterials: The Pivotal Role of Molecular Interactions"

(xi) **Distinguished Lecture at University of Mississippi** 2011, "Molecular Interactions Control Mechanics of Nanomaterials: A Multiscale Perspective"

(xii) **Plenary Keynote Lecture at the 4th Asia-Pacific Conference on Unsaturated Soils held in New Castle, Australia: 2009,** What's up with clay and water molecules? A View Into Molecular Interactions And Molecular Responses In Swelling Clays"

(xiii) **Keynote Lecture :6th World Congress on Computational Mechanics, Beijing, China, 2004, Exploring Mineral Biopolymer Interactions to Model Mechanical Response of Interfaces in Bio-Nanocomposite, Nacre**

(xiv) **Distinguished lecture at University of Minnesota, Duluth, 2014,** Molecular Interactions Influence Swelling, Barrier, and Mechanical Properties of Swelling Clays: A Multiscale Modeling and Experimental Investigation

(xv) **Guest Speaker: MIT seminar series on geomechanics and geomaterials, MIT, Boston, MA 2003.**

PROFESSIONAL LEADERSHIP ACTIVITIES

- Associate Editor – ASCE Journal of Engineering Mechanics
- Associate Editor – ASCE Journal of Nanomechanics & Micromechanics
- Guest Editor- ASCE J. Engg. Mech.: Special issue on Mechanics of Bio and Bio. Inspired Materials.
- Chair – ASCE technical committee on Poromechanics
- Chair – ASCE technical committee on Properties of Materials
- Chair – ASCE EMI technical committee on Molecular Scale Modeling and Experimentation Committee
- Chair- NDSPE (North Dakota Society of Professional Engineers) Education Committee
- Organizing chair, Symposium on Biologically Inspired Materials, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2009, 2010, 2011.
- Editorial Board Member: International Journal of Geomechanics

PUBLICATIONS (TOTAL ABOUT 180)

BOOKS:

1. Katti, R.K., Katti, A.R., and Katti, D.R., (2000), Influence of Gravity on Granular Soil Mechanics, A.A. Balkema Inc., Hardcover, 482 pages, ISBN: 9058092178.
2. Katti, R.K., Katti, D.R., and Katti, A.R., (2002), Behaviour of Saturated Expansive Soil and Control Methods, Oxford and IBH publishing, Hardcover, 1268 pages, ISBN: 81-204-1519-1.
3. Katti, R.K., Katti, D.R., and Katti, A.R., (2005), Primer on Construction in Expansive Black Cotton Soil Deposits with C.N.S.L, Oxford and IBH publishing, 183 pages, ISBN: 81-204-1671-6

BOOK CHAPTERS

1. Chapter on – "Biomechanics of cells as potential biomarkers for diseases: a new tool in mechanobiology"; Dinesh Katti, Kalpana Katti, Md. Shahajahan Molla and Sumanta Kar, to appear in Encyclopedia of Biomedical Engineering, by Elsevier.
2. Chapter 10 - Predictive Methodologies for Design of Bone Tissue Engineering Scaffolds, Katti, D. R.; Sharma, A.; Katti, K. S., A2 - Bose, Susmita. In Materials for Bone Disorders, Bandyopadhyay, A., Ed. Academic Press: 2017; pp 453-492.

3. Chapter on "Characterizing Biointerfaces and Biosurfaces in Biomaterials Design" in 'Nanoscience and Its Applications in Biomedicine' by Springer.
4. Chapter on "Materials and engineering of joint replacement" in Recent developments in joint replacement technology by Woodhead Publishers
5. Chapter on "Biomimetic Lessons Learnt from Nature", in Biomimetics, Learning from nature, I Tech Education and Publishing KG Vienna, Austria EU
6. Chapter on "Nanocomposites for Bone Tissue Engineering", Book Series on Nanomaterials for Life Sciences, Wiley Publishers.2010, Edited by Challa S S R Kumar Chapter 10. P 367-404.
7. Chapter on Simulation Based Design of Polymer Clay Nanocomposites Using Multiscale Modeling: An Overview, in Nanostructured Materials and Nanotechnology III edited by Sanjay Mathur, Mrityunjay Singh, ceramic engineering and Science Proceedings Vol 30 issue 7, 2009.
8. Chapter on 'Mesenchymal Stem Cells in Tissue Regeneration' in "Integrated Biomaterials in Tissue Engineering" Wiley-Scrivener Publishing, USA 2012
9. Chapter on 'Biomimetics: Inspiration from Structural Organization of Biological Systems' in "natural Polymers" editors Dr. Maya John and Dr. Sabu Thomas, RSC publishers, 2012
10. Chapter on " Design of Wells"; Otto Helweg, Zohrab Samani, Jorge Garcia, Rao Govindaraju, Dinesh R. Katti; Hydraulics of Wells: Design, Construction, Testing, and Maintenance of Water Well Systems, Edited by Nazeer Ahmed, Stewart W. Taylor, and Zhuping Sheng, pp 83-121, Publisher ASCE, ISBN (print): 9780784412732|

JOURNAL PUBLICATIONS (H- INDEX=39)

1. Kar, Sumanta, Katti, Dinesh R., and Katti, Kalpana S., (2018) Spectral biomarkers of breast cancer progression on 3D in vitro model of breast cancer bone metastasis identified by Fourier transform infrared spectroscopy and principal component analysis, *under review.*

2. Kar, Sumanta, Molla, MD Shahjahan, Katti, Dinesh R., Katti, and Kalpana S., (2018) Tissue-engineered nanoclay based 3D in vitro breast cancer model for studying breast cancer metastasis to bone, *under review.*

3. Sharma, Anurag, Snead, Malcolm, Katti, Kalpana S., and Katti, Dinesh R., (2018) Mechanics of Amelogenin TRAP Protein in the Proximity of Hydroxyapatite Mineral is Altered by Interfacial Water, *under review*.

4. Katti, Dinesh R., Thapa, Keshab B., and Katti, Kalpana S., (2018), The Role of Fluid Polarity in the Swelling of Na-Montmorillonite Clay: A Molecular Dynamics and Fourier Transform Infrared Spectroscopy Study, *to appear in* ***Journal of Rock Mechanics and Geotechnical Engineering,*** V10 N6.

5. G. Padmanabhan, D. R. Katti, E. Khan, F. Peloubet and N. Leelaruban, (2018) A Unique Civil Engineering Capstone Design Course, ***International Journal of Engineering Pedagogy (iJEP),*** v8 n1,56-80.

6. MD S Molla, D. R. Katti, K. S. Katti, (2018) In vitro design of mesenchymal to epithelial transition of prostate cancer metastasis using 3D nanoclay bone-mimetic scaffolds, ***Journal of Tissue Engineering and Regenerative Medicine,*** v12 n3, 727-737.

7. D. R. Katti, K. S. Katti, (2017) Cancer cell mechanics with altered cytoskeletal behavior and substrate effects: A 3D finite element modeling study, ***Journal of the Mechanical Behavior of Biomedical Materials,*** v76, 125-134.

8. A. Sharma, MD S. Molla, K. S Katti, D. R Katti, (2017) Multiscale Model of Degradation and Healing of Bone Tissue Engineering Nanocomposite Scaffolds, ***Journal of Nanomechanics and Micromechanics*** 7(4), 04017015

9. D. R. Katti, K. Thapa, K. S. Katti, (2017), Modeling molecular interactions of sodium montmorillonite clay with 3D kerogen models, ***Fuel***, Volume 199, pp. 641–652

10. S. A. Payne, D. R. Katti and K. S. Katti, (2016) Probing Electronic Structure of Biomineralized Hydroxyapatite inside Nanoclay Galleries, ***Micron,*** Volume 90, pp.78-86.

11. K.S. Katti, MD S. Molla, F. Karandish, M. K. Haldar, S. Mallik, D. R. Katti,(2016) Sequential culture on biomimetic nanoclay scaffolds forms three dimensional tumoroids, ***Journal of Biomedical Materials Research: Part A,*** Volume 104, Issue 7, July 2016, Pages: 1591–1602

12. C. Gu, D. R. Katti, K. S. Katti, (2016) Microstructural and Photoacoustic Infrared Spectroscopic Studies of Human Cortical Bone with Osteogenesis Imperfecta, ***Journal of Minerals, Metals and Materials Society*** Volume: 68 Issue: 4 Pages: 1116-1127 Published: APR 2016

13. C. Gu, D.R. Katti, K.S. Katti, (2016) Insitu SEM and Nanomechanical properties of human OI bone, to appear in ***Bioinspired, Biomimetic and Nanobiomaterials*** (BBN).

14. K. S. Katti, C. Gu, D.R. Katti, (2015), Anisotropic properties of human cortical bone with osteogenesis imperfecta, ***J Biomechanics and Modeling in Mechanobiology,*** DOI 10.1007/s10237-015-0727-4, (in-press) (available online)

15. K. N. Alstadt, K.S. Katti and D. R. Katti, (2015), Nanoscale Morphology of Kerogen and In Situ Nanomechanical Properties of Green River Oil Shale, ***Journal of Nanomechanics and Micromechanics,*** in-press.

16. K. S. Katti, A. H. Ambre, S. Payne, D.R. Katti, Vesicular delivery of crystalline calcium minerals to ECM in biomineralized nanoclay composites (2015). ***Materials Research Express*** 2 045401

17. C. Hellmich and D.R. Katti, (2015), Multiscale Mechanics of Biological, Bioinspired, and Biomedical Materials, ***Materials Research Society Bulletin***, 40, 309-313.

18. D.R. Katti, Z.R. Patwary and K.S. Katti, (2015), Modeling Clay-Fluid Interactions in Montmorillonite Clays, ***Environmental Geotechnics***, E-ISSN 2051-803X, DOI: 10.1680/jenge.14.00027

19. K. S. Katti; A.H. Ambre; S. Payne; and D.R. Katti, (2015), Vesicular delivery of crystalline calcium minerals to ECM in biomineralized nanoclay composites, ***Materials Research Express***, 2, 045401

20. A. Sharma, S. Payne, K. S. Katti, and D. R. Katti, (2015), Evaluating Molecular Interactions in Polycaprolactone- Biomineralized Hydroxyapatite Nanocomposites using Steered Molecular Dynamics, ***JOM,*** Vol. 67, No. 4,733-743. DOI: 10.1007/s11837-015-1361-4.

21. D.R. Katti, A. Sharma, S.M. Pradhan, K.S. Katti, (2015), Carbon nanotube proximity influences rice DNA, ***J. Chemical Physics***, 455, 17-22.

22. D. R. Katti, L. Srinivasamurthy, K. S. Katti. (2015),Molecular Modeling of Initiation of Interlayer-Swelling in Na-Montmorillonite Expansive Clay, **Canadian Geotechnical Journal**, accepted, available online.

23. M. M. Yallapu, K. S. Katti, Dinesh R. Katti, Sanjay R. Mishra, S. Khan, M. Jaggi, and S. C. Chauhan, (2015), The Roles of Cellular Nanomechanics in Cancer, **Medicinal Research Reviews,** 35 (1), 198-223.

24. D. R. Katti, A. Sharma, A. H. Ambre and K. S. Katti, (2015), Molecular Interactions in Biomineralized Hydroxyapatite Between Amino Acid Modified Nanoclay: Insilico Design of Bone Biomaterials" **Materials Science and Engineering C** , Materials for biological applications, 46, 207-217.

25. A. H. Ambre, D. R. Katti, and K. S. Katti, (2015), Biomineralized Hydroxyapatite Nanoclay Composite Scaffolds with Polycaprolactone for Stem Cell Based Bone Tissue Engineering, **Journal of Biomedical Materials Research: Part A**. 103 [6] 2077-2101

26. C. Gu, D. R. Katti, K. S. Katti, (2015), Dynamic nanomechanical behavior of healthy and OI human cortical bones, to appear in **Bioinspired, Biomimetic and Nanobiomaterials**. Volume 4 Issue 1, pp. 15-25

27. S. M. Pradhan, K. S. Katti, D. R. Katti, (2015), Evolution of Molecular Interactions in the Interlayer of Na-Montmorillonite Swelling Clay with Increasing Hydration , **ASCE International Journal of Geomechanics,** DOI: 10.1061/(ASCE)GM.1943-5622.0000412

28. S. M. Pradhan, K. S. Katti, D. R. Katti, (2014), Multiscale Modeling of Collagen Fibril in Bone at Various Crosslink Densities: An Insight into its Deformation Mechanisms, **CMES (Computer Modeling in Engineering and Sciences)** SI: "Computational Mechanobiology of Soft Matters and Cells", 98(2) pp. 181-201

29. D. R Katti, H. Upadhyay, K. S Katti, (2014), Molecular Interactions of Kerogen Moities with Na-Montmorillonite: An experimental and modeling study, **Fuel**, 130, 34–45.

30. M. Abdelrahman, D. R. Katti, A. Ghavibazoo, H. B. Upadhyay, K. S. Katti, (2014), Effect of nanoclay-asphalt interactions on physical properties of asphalt, **ASCE Journal of Materials in Civil Engineering**, 26(12).

31. S.M. Pradhan, K. S. Katti and D. R. Katti (2014), A Multiscale Model of Collagen Fibril In Bone: Elastic Response, **ASCE J. of Engineering Mechanics ,** 140, pp 454-461.

32. A. H. Ambre, D. R. Katti, K. S. Katti, Nanoclays Mediate Stem Cell Differentiation and Mineralized ECM Formation on Biopolymer Scaffolds (2013) **Journal of Biomedical Materials Research: Part A** ,101A:2644–2660

33. C. Gu, D. R. Katti, K. S. Katti, (2013) Photoacoustic FTIR spectroscopic study of undisturbed human cortical bone, **Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy**, 103, 25-37.

34. R. Khanna, D.R. Katti, and K.S. Katti, (2012) In Situ Mechanical Response Of Human Osteoblasts On Chitosan-Polygalacturonic Acid-Hydroxyapatite Nanocomposites, **CMES- Computer Modeling in Engineering and Sciences Vol.87, No.6, 2012**

35. S. M. Pradhan, K. S. Katti, D. R. Katti, Dinesh, (2012), "Structural Hierarchy Controls Deformation Behavior of Collagen" **Biomacromolecules,** 13 (8), pp 2562–2569

36. D. R. Katti, K. S. Katti, R. Muniyamuthu and C. Gu (2012) Role of Polymer Interactions with Clays and Modifiers on Nanomechanical Properties and Crystallinity in Polymer Clay Nanocomposites, **Journal of Nanomaterials**, vol. 2012, Article ID 341056, 15 pages, 2012. doi:10.1155/2012/341056.

37. K. Alstadt, Kalpana S. Katti and Dinesh R. Katti,(2012) An Insitu FTIR Step Scan Photoacoustic Investigation of Kerogen and Minerals in Oil Shale, ***Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy,*** 8, 105-113

38. R. Khanna, K. S. Katti and D. R. Katti, (2012), Experiments in Nanomechanical Properties of Live Osteoblast Cells and Cell-Biomaterial Interface, ***ASME*** **Journal of Nanotechnology in Engineering and Medicine**, 2011, Vol. 2, 041005-5

39. P. Amarasinghe, K. S. Katti, D. R. Katti, (2012) An Insight Into Role Of Clay-Fluid Molecular Interactions On Permeability And Consolidation Behavior Of Na-Montmorillonite Swelling Clay **ASCE Journal of Geotechnical and Geoenvironmental Engineering**, 138 (2), 138-146.

40. A. H. Ambre, K.S. Katti, D. R Katti, (2011) In situ Mineralized Hydroxyapatite with Amino Acid Modified Nanoclays as Novel Bone Biomaterials ***Materials Science and Engineering C*** 31(5) 1017-1029.

41. S. M Pradhan, D. R Katti, K. S Katti, (2011) Steered Molecular Dynamics Study of Mechanical Response of Full Length and Short Collagen Molecules, ***ASCE Journal of Nanomechanics and Micromecha*****nics.** 1, 104-110.

42. R. Khanna, K. S. Katti and D. R. Katti, (2011) Bone Nodules on Chitosan-Polygalacturonic Acid-Hydroxyapatite Nanocomposite Films Mimic Hierarchy of Natural Bone, ***ActaBiomaterialia***, 7 (2011) 1173–1183.

43. A. H. Ambre, K.S. Katti, D. R Katti, (2010) Nanoclay Based Composite Scaffolds For Bone Tissue Engineering Applications, ***ASME Journal of Nanotechnology for Engineering and Medicine***. 1, 031013.

44. D. R. Katti, S. M. Pradhan, K. S. Katti, (2010) Directional Dependence of Hydroxyapatite-Collagen Interactions on Mechanics of Collagen, ***Journal of Biomechanics,*** 43, 1723-1730.

45. R. Khanna, K. S. Katti and D. R. Katti, (2010) In situ Degradation of Chitosan-Polygalacturonic acid/Hydroxyapatite Nanocomposites in Cell Culture Media, **International Journal of Polymer Science,** 2010, 175264, 12pages

46. D. Sikdar, D. R. Katti, K. S. Katti, R. Bhowmik (2010) Tailoring Crystallinity and Nanomechanical Properties of Clay Polymer Nanocomposites: A Molecular Dynamics Study, ***International Journal of Multiscale Computational Engineering***, 8(6), 561-584.

47. D. Verma, K. S. Katti, D. R. Katti, (2010) Osteoblast Adhesion Proliferation and Growth on Polyelectrolyte-Complex-Hydroxyapatite Nanocomposites, ***Phil. Trans. R. Soc. A*** 368, 2083–2097

48. K. S. Katti, A. Ambre, N. Peterka and D. R. Katti (2010) Use of unnatural amino acids for design of novel organomodified clays as components of nanocomposite biomaterials, **Phil. Trans. R. Soc. A** 368, 1963–1980

49. P. M. Amarasinghe, K. S. Katti, D. R. Katti, (2009), Nature of Organic Fluid-Montmorillonite Interactions: An FTIR Spectroscopic Study, ***Journal of Colloids and Interface Science*****.** 337, Pages 97-105

50. D. Verma, K. S. Katti and D. R. Katti, (2009), Polyelectrolyte-Complex Nanostructured Fibrous Scaffolds for Tissue Engineering, **Materials Science and Engineering C**. 29, 2079–2084.

51. D. R. Katti, P. Amarasinghe, K. S. Katti, M. Matar, (2009), Multiscale Modeling of Swelling Clays: A Computational and Experimental Approach, **KSCE Journal of Civil Engineering**, 13(4), 243-255

52. R. Bhowmik, K. S. Katti, D. R. Katti, (2009), Molecular interactions of degradable and non-degradable polymers with hydroxyapatite influence mechanics of polymer-hydroxyapatite nanocomposite biomaterials', **International Journal of Nanotechnology**. 6, 511-529.

53. D. Sikdar, Dinesh R. Katti, K. S. Katti and B. Mohanty, (2009), Influence of Backbone Chain Length and Functional Groups of Organic Modifiers on Crystallinity and Nanomechanical Properties of Intercalated Clay-Polycaprolactam Nanocomposites, **International Journal of Nanotechnology**,6, 568-592

54. R. Bhowmik, K.S. Katti, D. R. Katti, (2009), Mechanisms of Load Deformation Behavior of Molecular collagen Hydroxyapatite-Collagen Molecular System: A Steered Molecular Dynamics Study, ***Journal of Engineering Mechanics-ASCE***, 135 413-421**.**

55. R. Khanna, K. S. Katti, D.R. Katti, (2009) Nanomechanics of Surface Modified Nanohydroxyapatite Biomaterials ***Journal of Engineering Mechanics-ASCE***, 135 468-478**.**

56. P. M. Amarasinghe, K.S. Katti, D. R. Katti, (2008), Molecular Hydraulic Property of Montmorillonite: A Polarized FTIR Spectroscopic Study, ***Applied Spectroscopy***. 62, no. 12,1303-1313.

57. K. S. Katti, D. R. Katti, R. Dash, (2008), Synthesis and characterization of a novel chitosan/montmorillonite/hydroxyapatite nanocomposite for bone tissue engineering, ***Biomedical Materials***, 3, 034122.

58. P. Ghosh, D. R. Katti, K. S. Katti, (2008), Mineral and Protein-Bound Water and Latching Action Control Mechanical Behavior at Protein-Mineral Interfaces in Biological Nanocomposites ***Journal of Nanomaterials***. Volume 2008, Article ID 582973, 8 pages doi:10.1155/2008/582973

59. R. Bhowmik, K. S. . Katti, D. R. Katti, (2008), Influence of Mineral on the Load Deformation Behavior of Polymer in Hydroxyapatite- Polyacrylic Acid Nanocomposite Biomaterials: A Steered Molecular Dynamics Study, **Journal of Nanoscience and Nanotechnology.**.Vol 8, No 4, 2075-2084.

60. D. Sikdar, K. S. Katti, D. R. Katti, (2008), Molecular Interactions Alter Clay and Polymer Structure in Polymer Clay Nanocomposites, ***Journal of Nanoscience and Nanotechnology***. Vol 8, No.4, 1638-1657

61. D. Verma, K.S. Katti, D.R. Katti, (2008), Effect of Biopolymers on Structure of Hydroxyapatite and Interfacial Interactions in Biomimetically Synthesized Hydroxyapatite/Biopolymer Nanocomposites, ***Annals of Biomedical Engineering*** Vol. 36, No. 6, 1024–1032

62. D. Sikdar, S. Pradhan, D. R. Katti, K. S. Katti, B. Mohanty, (2008), Altered Phase Model for Polymer Clay Nanocomposites, **Langmuir,** 24, 5599-5607

63. B. Mohanty, K. S. Katti, D. R. Katti, (2008), Experimental Investigation of Nanomechanics of the Mineral-Protein Interface in Nacre, ***Mechanics Research Communications***.35, 17-23.

64. D. Verma, R. Dash, K. S. Katti, D. Schulz, A.N. Caruso, (2008), Role Of Coordinated Metal Ions On The Orientation Of Phthalocyanine Based Coatings. ***Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy,*** *7*, *1180-118.*

65. D. Sikdar, K. S. Katti, D. R. Katti, (2008), The Role of Interfacial Interactions on the Crystallinity and Nano-mechanical Properties of Clay Polymer Nanocomposites: A Molecular Dynamics Study, ***J. Appl. Pol. Sci***. 107, 3137-3148.

66. D. Verma, K.S.Katti, D.R. Katti, B. Mohanty, (2008), Mechanical Response and Multilevel Structure of Biomimetic Hydroxyapatite/ Polygalacturonic /Chitosan Nanocomposites, ***Materials Science and Engineering C***. 28 , 399–405.

67. R. Bhowmik, K. S. Katti, D. R. Katti, (2007), Mechanics of Molecular Collagen is Influenced by Hydroxyapatite in Natural Bone, ***J. Mater. Sci***. 42, 8795–8803.

68. D. Sikdar, D. R. Katti, K. S. Katti, , and B. Mohanty, (2007), Effect of Organic Modifiers on Dynamic and Static Nanomechanical Properties and Crystallinity of Intercalated Clay-Polycaprolactam Nanocomposites, ***Journal of Applied Polymer Science***. 105, 790-802.

69. Katti, D.R., Schmidt, S., Ghosh, P., and Katti, K.S ., (2007), Steered Molecular Dynamics Simulations of Dry and Hydrated Sodium Montmorillonite Interlayer, ***Canadian Geotechnical Journal***. 44, 425-435.

70. P. Ghosh, D. R. Katti, K. S. Katti, (2007), Mineral proximity influences mechanical response of proteins in biological mineral-protein hybrid system, ***Biomacromolecules***, 8, 851-856.

71. R. Bhowmik, K.S. Katti, and D.R. Katti, (2007) Molecular Modeling of polyacrylic acid- hydroxyapatite interface, ***Polymer***, 48, 664-674.

72. R. Bhowmik K.S. Katti, D. Verma and D.R. Katti, (2007), Probing Molecular Interactions in Bone Biomaterials: Through Molecular Dynamics and Fourier Transform Infrared Spectroscopy", ***MATER. SCI. ENG C*** 27(3), 352-371.

73. D. Verma, K. S. Katti, D. R. Katti, (2007), Nature of water in Nacre: a 2D FTIR spectroscopic study, ***SPECTROCHIMICA ACTA PART A* 67 (2007) 784–788.**

74. Sikdar, D., Katti, D. R., and Katti, K. S., (2006), Molecular Model for □-caprolactam Based Intercalated Polymer Clay Nanocomposite: Integrating Modeling and Experiments, ***Langmuir***, 22, 7738-7747.

75. P. Ghosh, D. R. Katti, K. S. Katti, (2006), Impact of □ -sheet conformations on the mechanical response of protein in biocomposites, ***Materials and Manufacturing Processes***, 21, 676-682.

76. K. S. Katti, Phanikumar Turlapati, Devendra Verma, Praveen Kumar Gujjula, Dinesh R. Katti, (2006) "Static and dynamic mechanical behavior of hydroxyapatite-polyacrylic acid composites under simulated body fluid", ***American Journal of Biochemistry and Biotechnology***, 2 (2), 73-79.

77. Sikdar, Debashis; Katti, Dinesh R.; Katti, Kalpana S.; and Bhowmik, Rahul, (2006), Insight into molecular interactions between constituents in polymer clay nanocomposites, ***Polymer***, 47, 5196-5205.

78. B. Mohanty, K. S. Katti, D. R. Katti, (2006), "Dynamic nanomechanical properties of nacre", ***Journal of Materials Research***, 21, 2045-2051.

79. D. Verma, K. S. Katti, D. R. Katti, (2006), Bioactivity in Insitu Polycaprolactone-Hydroxyapatite composites", ***Journal of Biomedical Materials Research78A***, 772-780.

80. K. S. Katti, B. Mohanty and D. R. Katti, (2006), Nanomechanical properties of nacre, ***Journal of Materials Research***, 21,1237-1242.

81. K. S. Katti, D. Sikdar, D. R. Katti, P. Ghosh, D. Verma, (2006) Molecular Interactions In Intercalated Organically Modified Clay In Clay-Polycaprolactam Nanocomposites: Experiments And Modeling, ***Polymer***, 47, 403-414

82. K.S. Katti and D. R. Katti, (2006), Silica-Water Interactions In Montmorillonite Using Fourier Transform Infrared Spectroscopy: Relationship To Swelling And Swelling Pressure, ***Langmuir***, 22, 532-537

83. D. VERMA, K. S. KATTI, D. R. KATTI, (2006), PHOTOACOUSTIC FTIR SPECTROSCOPIC STUDY OF UNDISTURBED NACRE FROM RED ABALONE, ***SPECTROCHIMICA ACTA*,** 64(4), 1051-1057

84. D. VERMA, K. S. KATTI, D. R. KATTI, (2006), MOLECULAR INTERACTIONS IN HYDROXYAPATITE/POLYACRYLIC ACID /POLYCAPROLACTONE COMPOSITES: A PHOTOACOUSTIC FTIR SPECTROSCOPY STUDY, ***JOURNAL OF BIOMEDICAL MATERIALS RESEARCH A*,** 77, 59-66.

85. K. S. KATTI AND D. R. KATTI, (2006), WHY IS NACRE SO STRONG AND TOUGH? INVITED PAPER: ***MATERIALS SCIENCE AND ENGINEERING C*,** 26, (8), 1317-1324.

86. Schmidt, S., Katti, D., Ghosh, P., and Katti, K., (2005), Evolution of Mechanical Response of Sodium Montmorillonite Interlayer with Increasing Hydration**,** ***Langmuir***, 21, August, 8069-8076.

87. Katti, D.R., Schmidt, S., Ghosh, P., and Katti, K.S., (2005), Modeling Response of Pyrophyllite Clay Interlayer to Applied Stress Using Steered Molecular Dynamics, ***Clays and Clay Minerals***, v52,n2, 171-178.

88. D.R. Katti, P. Ghosh, S. Schmidt and K.S. Katti, (2005) Mechanical properties of sodium montmorillonite interlayer intercalated with amino acids, ***Biomacromolecules***, 6, 3276-3282.

89. K.S. Katti, D.R. Katti, J. Tang and M. Sarikaya, Modeling Mechanical Responses In A Laminated Biocomposite, Part II, Nonlinear Responses And Nuances Of Nanostructure, ***Journal of Materials Science*** 40*, pp 1749-1755* (2005).

90. Katti, D.R., Schmidt, S., Ghosh, P., and Katti, K.S., (2005) Modeling Response of Pyrophyllite Clay Interlayer to Applied Stress Using Steered Molecular Dynamics, **Clays and Clay Minerals**. v52,n2, 171-178.

91. K.S. Katti, D.R. Katti, S. M. Pradhan, A. P. Bhosle, (2005), Platelet interlocks are the key to toughness and strength in nacre, ***Journal of Materials Research*** 20 (5) 1097-1100.

92. K. S. Katti, (2004), Biomaterials in total hip replacement, ***Colloids and Interfaces B***. Invited paper. 39, 133-142.

93. Katti, D. R., Pradhan, S. and Katti, K. S., (2004), Modeling The Organic-Inorganic Interfacial Nanoasperities In A Model Bio-Nanocomposite, Nacre, ***Reviews on Advanced Materials Science*** 6 pp. 162-168.

94. Katti, D.R., Tang, J. and Yazdani, F., (2003), The Undrained Response of Clays to Varying Strain Rates , ***, ASCE J. of Geotechnical and Geoenviro. Eng., v129, n3, pp 278-282.***

95. Padmanabhan, G. and Katti, D.R., (2002), Using Community Based Projects in Civil Engineering Capstone Courses", ***ASCE Journal of Professional Issues in Engineering Education and Practice, 128, n.1, pp.12-18.***

96. D.R. Katti, K.S. Katti, J. Sopp, and M. Sarikaya, (2001), 3D Finite Element Modeling of Mechanical Response in Nacre-Based Hybrid Nanocomposites, J. Theo. Comp. Poly. Sci. 11 (5), pp. 397-404.

97. D.R. Katti, and K.S. Katti, (2001), Modeling Microarchitecture and Mechanical Behavior of Nacre Using 3D Finite Element Techniques, Part I: Elastic Properties, ***J. Mater. Sci.,*** 36(6), 1411-1417.

98. Katti, D.R., and Shanmugasundaram, V., (2001), Effect of Controlled Swelling on the Microstructure of Saturated Expansive Soil, ***Canadian Geotechnical Journal, 38, pp 175-182.***

99. Katti ,D.R., and Desai ,C.S., (1995), Modeling and Testing of Cohesive Soil Using Disturbed-State Concept, ***Journal of Engineering Mechanics, American Society of Civil Engineers***, Vol 121, No. 5, pp 648-658.

100. Katti ,D.R., Katti , R.K., and Katti , A.R., (1994), Studies on Certain Aspects of Large Scale Caisson Foundation Models, ***Journal of The Indian Roads Congress, Vol. 52-2 pp. 207-232.***

CONFERENCE PROCEEDINGS (PARTIAL LIST)

1. D.R. Katti, K.S. Katti and L. Srinivasamurthy, Molecular modeling of onset of swelling in expansive clays, IACMAG Conference, Kyoto 2014, Japan.

2. D. R. Katti S. M. Pradhan and K. S. Katti, Collagen Mechanics: Role Of Structural Hierarchy, at BIOMED 2012 Austria

3. Katti, Dinesh R., and Katti, Kalpana, S. (2011), Molecular Interactions Influence Barrier and Mechanical Properties in Swelling Clays: A Multiscale Modeling and Experimental Investigation, Proc. GeoFrontiers 2011, Dallas, TX.

4. Katti, Dinesh R., Katti, Kalpana, S., and Patwary, Zillur, R. , (2011), Clay Fluid Molecular Interactions in Na-Montmorillonite Swelling Clays, 5th Asia-Pacific Conference on Unsaturated Soils, Pattaya, Thailand.

5. K. S. Katti, D. R. Katti, Fourier Transform Infrared Spectroscopy in clays and oil shales, Proceedings of Indian Geotechnical Conference 2010 Mumbai.

6. D. R. Katti, K. S. Katti, Multiscale Modeling of Clay Fluid Interactions, Proceedings of Indian Geotechnical Conference 2010 Mumbai.

7. D.R. Katti, K.S. Katti, P.M. Amarasinghe, S.M. Pradhan (2010) An Insight into Role of Clay-Fluid Molecular Interactions on the Microstructure and Macroscale Properties of Swelling Clays Proceedings of 5th International Conference on Unsaturated Soils.

8. A. H. Ambre, R. Khanna Mechanics of Tissue Scaffold Interactions (2010) Proceedings of 18th European Congress on Fracture : Fracture of materials from Micro to Macroscale.

9. D. R. Katti, K. S. Katti, S. M. Pradhan (2010) An Insight into Mechanics of Collagen in the Presence and Absence of Hydroxyapatite in Human Bone Proceedings of 18th European Congress on Fracture : Fracture of Materials from Micro to Macroscale.

10. Kalpana S. Katti, Avinash Ambre, Dinesh R. Katti, Design of Novel Polymer Clay Nanocomposite Biomaterials Using Amino Acids, 33rd International conference and Exposition on Advanced ceramics and Composites Meeting, Daytona Beach 2009.

11. Dinesh R. Katti, Kalpana S. Katti, (2009) **Plenary Keynote Lecture** at the 4th Asia-Pacific Conference on Unsaturated Soils held in New Castle, Australia (***paper and presentation***) What's up with clay and water molecules? A view into molecular interactions and molecular responses in swelling clays"

12. Dinesh R. Katti, Kalpana S. Katti, Priyanthi Amarasinghe and Shashindra Pradhan, (2009), Interlayer Fluid Flow and the Role of Clay-Fluid Molecular Interactions on the Swelling Behavior of Montmorillonite Clays, **4th BIOT conference**, Columbia University, NY, NY.

13. Kalpana S. Katti, Dinesh R. Katti, and Rahul Bhowmik Influence of Nanoscale Mechanics on Mechanics of Bone , World Congress on Computational Mechanics **ECCOMAS 2008**, Venice Italy

14. Dinesh R. Katti, Kalpana S. Katti, Multiscale Mechanics of Nacre: from Molecular to Macro World Congress on Computational Mechanics **ECCOMAS 2008**, Venice Italy

15. Kalpana S. Katti, Dinesh R. Katti, Arundhati Bhosle, Pijush Ghosh, Bedabibhas Mohanty, Shashindra Man Pradhan, Devendra Verma, Jingpeng Tang, Biology, the next frontier for advanced materials design: Unearthing the secrets to extraordinary mechanical properties of nacre, a biological nanocomposite, **IACMAG Conference**, Goa, India, 2008.

16. Dinesh R. Katti, Kalpana S. Katti, Steven Schmidt, Pijush Ghosh, Mohammad Matar and Priyanthi Amarasinghe, A Multiscale Computational and Experimental Investigation of Swelling Clay Behavior: Bridging Scales Using Steered Molecular Dynamics, Modified Discrete Element Method and Experiments, **IACMAG Conference**, Goa, India, 2008.

17. M. I. Matar, D. R. Katti, K. S. Katti, " Modeling the evolution of Montmorillonite Clay particulate Structure: A Discrete Element Modeling Study," **Geo Denver 2007**.

18. K. S., Katti, D. Verma, R. Bhowmik, D. R. Katti, "Bioactivity and Mechanical Behavior of Polymer-Hydroxyapatite Composite Biomaterials for Bone Tissue Engineering" Proceedings of **MSEC2006, 2006 ASME International Conference on Manufacturing Science and Engineering** October 8-11, 2006, Ypsilanti, MI

19. P. Ghosh, D. Verma, B. Mohanty, K. S. Katti, D. R. Katti, "Mechanical Properties of Biological Nanocomposite Nacre: Multiscale Modeling and Experiments on Nacre from Red Abalone" **Materials Research Symp. Proc.** Fall Meeting 2005.

20. D. Verma, R. Bhowmik, B. Mohanty, D. R. Katti, K. S. Katti , "Role of Interfacial Interactions on Mechanical Properties of Biomimetic Composites for Bone Tissue Engineering" **Materials Research Symp.** Proc. Fall Meeting 2005.

21. K. Katti, D. R. Katti, A. P. Bhosle, S. Pradhan, (2005) Experimental Studies on deformation in Nacre. Proc. Of **Microscopy Society of America**. 2005 annual meeting of Microscopy and Microanalysis Hawaii.

22. D. Verma, K. S. Katti, B. Mohanty, "Mechanical Properties of Biomimetic Composites for Bone Tissue Engineering" Proc. **Materials Research Society** Vol 844. (2005)

23. D. R. Katti, P. Ghosh, K. S. Katti, "Evaluation of Deformation Mechanisms at Mineral-Protein Composite Interface Using Steered Molecular Dynamics Simulations", Proc. **Materials Research Society** Vol 844. (2005)

24. D. R. Katti, K. S. Katti, Computational Mechanics Routes to Explore the Origin of Mechanical Properties in a Biological Nanocomposite: Nacre, Proc. **Materials Research Society** Vol 844. (2005)

25. R. Bhowmik, K. S. Katti, D. R. Katti, "Effect of Molecular Interactions at Polymer-Mineral Interfaces on Mechanical Response", Proc. **Materials Research Society** Vol 844. (2005)

26. D. R. Katti, K. S. Katti, S. Schmidt and P. Ghosh, "An insight into clay-water molecular interactions in the interlayer of Na-montmorillonite subject to external stress", Proc. Of **Poromechanics-Biot Centennial (1905-2005)**-Abousleiman, Cheng & Ulm (eds).2005

27. P. Ghosh, D. R. Katti, K. S. Katti, "Influence of Protein Structures on Mechanical Response", Proc. **Materials Research Society** Vol 844. (2005)

28. D. R. Katti, K. S. Katti, S. R. Schmidt, P. Ghosh, Effect of Hydration and External Stress on Mechanical Behavior and Molecular Interactions in Na-Montmorillonite Interlayer: A Steered Molecular Dynamics Study, Proc. **International Conference on Computational and Experimental Engineering and Sciences**, (ICCES) 2005, Chennai, India.

29. K. S. Katti, D. R. Katti, A. Bhosle, S. Pradhan, Computational Mechanics Routes to Modeling Mechanical Response in a Biomimetic Nanocomposite, Proc. **International Conference on Computational and Experimental Engineering and Sciences**, (ICCES) 2005, Chennai, India.

30. K. S. Katti and P. Turlapati, "Mechanical Responses In Biomimetic Polymer Hydroxyapatite Nanocomposites," ***Proc. Annual meeting of Society of Plastics Engineers*, ANTEC 2004**, Chicago, IL.

31. D. R. Katti, K. S. Katti, S. M. Pradhan, Multiscale Modeling of Biological Nanocomposite Nacre, *Proc. **Annual meeting of Society of Plastics Engineers***, ANTEC 2004, Chicago, IL.

32. Katti, D.R., Ghosh, P., Schmidt S. and Katti,K.S., (2004) Characteristics Of Montmorillonite Clay Amino Acid Interfaces: Evaluation Using Molecular Dynamics Simulations, 17th ASCE Engineering Mechanics Conference Delaware.

33. Katti, D.R., Schmidt, S., Ghosh, P., and Katti,K.S., (2004) Steered Molecular Dynamics Simulations Of Hydrated Montmorillonite Interlayer, 17th ASCE Engineering Mechanics Conference, Delaware.

34. Ghosh, P., Katti, D.R., and Katti, K.S., (2004) Mechanical Response Of □-Sheet Conformations In Protein: A Steered Molecular Dynamics Study, 17th ASCE Engineering Mechanics Conference, Delaware.

35. K. S. Katti, R. Bhowmik, (2004) Force Field Parameters For Hydroxyapatite To Study Hydroxyapatite-Polymer Interactions In Nanocomposite Systems, 17th ASCE Engineering Mechanics Conference, Delaware

36. K. S. Katti, D. R. Katti, S. Pradhan, A. P. Bhosle, Influence Of Nanostructure At Organic-Inorganic Interfaces In Nacre On The Mechanical Response Of Nacre, ICEM12- 12th International Conference on Experimental Mechanics 29 August - 2 September, 2004 Politecnico di Bari, Italy

37. Katti, D.R., Katti, K.S., Ghosh, P. and Schmidt, S., (2004), Exploring Mineral Biopolymer Interactions to Model Mechanical Response of Interfaces in Bio-Nanocomposite, Nacre, Proc. 6th World Congress on Computational Mechanics, Beijing, China, (Keynote Lecture).

38. Katti, D.R., Ghosh, P., and Katti,K.S., (2004) Characteristics Of Montmorillonite Clay Amino Acid Interfaces: Evaluation Using Molecular Dynamics Simulations, **17th ASCE Engineering Mechanics Conference, Delaware.**

39. Katti, D.R., Schmidt, S., Ghosh, P., and Katti,K.S., (2004) Steered Molecular Dynamics Simulations Of Hydrated Montmorillonite Interlayer, **ASCE Engineering Mechanics Conference, Delaware.**

40. Ghosh, P., Katti, D.R., and Katti,K.S., (2004) Mechanical Response Of β-Sheet Conformations In Protein: A Steered Molecular Dynamics Study, **17th ASCE Engineering Mechanics Conference, Delaware.**

41. Katti, D.R., Schmidt, S., Ghosh, P., and Katti,K.S., (2003) Molecular Modeling of Pyrophyllite Clay and Modeling Response to Applied Stress Using Molecular Dynamics, **Proc. ASCE Engineering Mechanics Conference, Seattle, WA.**

42. Katti, K.S. and Katti, D.R., (2003) Effect of Clay-Water Interactions on Swelling in Montmorillonite Clay, **Proc. ASCE Engineering Mechanics Conference,Seattle, WA.**

43. Katti, D.R. and Katti, K.S., (2003), Role of Nanostructure on Mechanical Properties of Nacre, **Proc. Second M.I.T. Conference on Computational Fluid and Solid Mechanics, MIT, MA, (invited)**

44. Katti,K.S., Bhosle, A. and Katti, D.R., (2003) Experimental Studies In The Failure Mechanisms Of A Model Bio-Nanocomposite-Nacre, **Proc. ASCE Engineering Mechanics Conference, Seattle,WA.**

45. Katti, D.R., Pradhan, S.M. and Katti, K.S. , (2003), Role Of Nanoscale Asperities In Hybrid Bio-Nanocomposites : A Multiscale Modeling Approach, **Proc. ASCE Engineering Mechanics Conference, Seattle, WA.**

46. Katti, D.R., Matar, M., Katti, R.K. and Katti, A.R., (2002) Dynamic Simulation of a Port Embankment on Liquefiable Ground and Analysis of Mitigation Alternatives: January 2001 Gujarat, India Earthquake**, Proc. 2nd Canadian Specialty Conference on Computing in Geotechnique, Winnepeg, Canada.**

47. Katti, D.R., Katti, K.S., Tang, J. and Sarikaya, M., (2002) Effect of Nanostructure in nacre: A multiscale modeling approach, **15th ASCE Engineering Mechanics Conference Proceedings, Columbia University, NY, NY.**

48. Katti, D.R., Katti, K.S., and Shanmugasundaram, V., (2002), Role Of Clay-Solvent Inter And Intraparticle Interactions On Swelling Characteristics Of Montmorillonite Nano-Meso-Micro Scale Particulate Systems**, *Materials Research Society Symposium – Proceedings,* 704, Pages 257-262.**

49. Katti, D.R., Katti, K.S., Tang, J., Sopp, J.M., and Sarikaya, M., (2001) Evaluating Effects of Nanostructural Nuances on Bulk Mechanical Properties of Nacre Using 3D Finite Element Modeling, ***Materials Research Society Symposium - Proceedings*, 677, Pages AA7.8.1-AA7.8.6.**

50. Katti, D.R., Tang, J. and Yazdani, F., (2001), Evaluation and Modeling of Response of Clays to Varying Strain Rates, **Proc. 10th. Conference – International Association for Computer Methods and Advances in Geomechanics, Tucson**, 2001.

51. Katti, D.R. and Shanmughasundaram, V.,(2001), Evolution of Microstructure During Swelling in Expansive Clays, **Proc. 10th. Conference – International Association for Computer Methods and Advances in Geomechanics, Tucson**.

52. Katti, K.S., Katti, D.R., Sopp, J.M., Mercer, W.M. and Sarikaya, M., (2001), Nano-Meso_Macro Scale Response Simulation of Biomimetic Nanocomposites, **Proc. 10th. Conference – International Association for Computer Methods and Advances in Geomechanics, Tucson**.

53. Katti, D.R., Katti, K.S.; Sopp, J., Sarikaya, M, (2000), 3D Finite element Modeling of Mechanical Response in Nacre-Based Hybrid Nanocomposites, **Proc. Materials Research Society, 2000 Annual Spring Meeting, San Francisco**.

54. Katti, D.R., Yazdani, F., and Tang, J., (2000), Modeling and Experimental Evaluation of Damage in Dense Sands", **ASCE- 14th Engineering Mechanics Division Conference, Austin.**

55. Mercer, W. N., Sopp, J.M., Fong, H, Katti, D.R., Katti, K.S. and Sarikaya, M., (2000), Nanomechanical Properties of a Biocomposite, Mollusk Shell Nacre", **Proc. Microscopy and Microanalysis, MSA 58th annual meeting.**

56. Katti, D.R. and Katti, K.S., (1999), Three Dimensional Finite Element Modeling of Microstructural Development of Nacre in Seashells and Implication on Mineralization of CaCo3", **Proc. Materials Research Society, 1999 Annual Fall Meeting, Boston**.

57. Katti, D.R., Yazdani, F., and Tang, J. (1999), Non-Associative Plasticity Model with Damage for Cohesionless Soils**, ASCE- 13th Engineering Mechanics Division Conference, Baltimore.**

58. Katti, D.R., and Desai, C.S., (1998), Modeling of Cohesive Soil Subject to Cyclic Loading Using Disturbed State Concept**, ASCE- Geotechnical Earthquake Engineering and Soil Dynamics conference, Seattle.**

59. Katti, D.R., (1998), Role of Passive Resistance Phenomenon in Expansive Soils on Equilibrium depth of Under Reamed Piles **Indian Geotechnical Conference -1998*, New Delhi, India.***

60. Katti, D.R., and Yazdani, F., (1998), Modeling of Sands Using Reference States Coupled with damage***", ASCE-12th Engineering Mechanics Division Conference, San Diego.***

61. Katti ,D.R., Katti ,R.K., and Katti ,A.R., (1997), Effective Depth of Vertical Drain Performance in Soft Marine Clay Deposits***", Indian Geotechnical Conference-1997, Baroda, India.***

62. Katti ,D.R., Katti ,R.K., and Katti ,A.R., (1996) Guidelines for Selection of Parameters for Design of Caisson Foundations for Certain Conditions", ***Deep Foundation Institute-96 Sixth International Conference and Exhibition on Piling and Deep Foundations***, Bombay.

63. Desai ,C.S., Armaleh ,S.H., Katti ,D.R. and Ma ,Y., (1991), Disturbed State Concept for Modeling Soils and joints, ***Proceedings, 7th Conf. of the Int. Assn. for Computer methods and Adv. in Geomech***., Australia.

64. Desai ,C.S., Armaleh ,S.H., Katti ,D.R. and Ma ,Y., (1991), Modeling of Solids and Contacts Using Disturbed State Concept", ***Proceedings, Third International Conference on Constitutive Laws for Engineering Materials: Theory and Applications***, Tucson.

65. Katti ,R.K., Katti ,D.R. and Katti ,A.R., (1988), Remedial measures to counteract distress to dam near Bombay", ***Conf. on Case Histories in Geotechnical Engineering, St. Louis***.

66. Katti ,D.R., (1987), Role of CNS on Passive Resistance of Saturated Expansive Soil***," 6thInternational Conf. on Expansive Soil-87***, New Delhi.

67. Katti, D.R., and Katti, R.K., (1987), Studies on Passive Resistance Development in Saturated Expansive Soil", ***6th International Conf. on Expansive Soil-87***, New Delhi.

68. Desai , C.S., and Katti , D.R., (1987), Constitutive Modeling With Extension to Expansive Soils***," 6th International Conf. on Expansive Soil-87***, New Delhi.

69. Moza , K.K., Katti , R.K., Katti ,D.R., (1987), Effect of CNS on Active Pressure Development in Expansive Soil", ***6th International Conf. on Expansive Soil-87***, New Delhi.

70. Katti, R.K., Moza, K.K. and Katti, D.R., (1987), Active Pressure Studies in Saturated Expansive Soils", ***8th Regional Conf. on SM and FE., Tokyo***, Japan.

71. Katti , R.K., Moza , K.K, Katti, D.R., (1986), Design of Retaining Walls with Backfill Consisting of Swelling Soils ", ***Proc. Indo-Soviet Workshop on experiences in large canals and hydraulic structures in Subsident, Swelling and Floating Soils-C.B.I.P***, New Delhi.

72. Katti ,R.K., Katti , D.R., Moza,K.K., (1986), Particulate and Cohesion approach to mechanics of saturated montmorillonite based expansive soil media and on its applications, ***Proc. Indo-Soviet Workshop on experiences in large canals and hydraulic structures in Subsident, Swelling and Floating Soils-C.B.I.P*** , New Delhi.

73. Katti , R.K. ,Bansod , P.S. ,Katti , D.R. , and Naresh, D.N.,(1985), Large Scale Instrumented Well Foundation Studies in Cohesive Soil Media," ***XIth International Conf. on Soil Mechanics and Foundation Engineering, San Francisco.***

74. Katti , R.K., Moza , K.K. and Katti , D.R.,(1985), Engineering Classification of Rock Mass an Approach paper , ***Proc. of Workshop on Engg. Classification of Rocks, C.B.I.P***, New Delhi.

75. Katti ,R.K., Sankaran, K.S., Sharada, S.C. and Katti, D.R. , (1985), Well Foundations", ***State of the art Paper-Commemorative volume of IGS released during XI ICSMFE , San Francisco***.

76. Katti ,D.R., Katti ,R.K.,(1985), Computer Aided Approach to Soil Mechanics Laboratory using Micro Computer, ***EPMESC International Conference, Macau***.

77. Katti , R.K., Katti , D.R., (1985), Use of Cement treated Stone Columns for Controlling of Sinking of Well Foundation in a Filled up area, ***Indian Geotechnical Conference-85***, Roorkee, India.

78. Katti , R.K., Thacker, K.C., Katti, D.R., (1985), Shear Strength Behavior of Calcareous Bombay High Soil Samples Under Cyclic Loading, ***Indian Geotechnical Conference-85***, Roorkee, India.

79. Katti ,R.K., Moza ,K.K. and Katti, D.R.,(1985), Mathematical Models for Saturated Expansive Soils with and without CNS, ***Invited Paper,9th Bangkok Geotechnical Symposium, Bangkok***, 1985.

80. Katti , R.K. ,Moza , K.K., Katti , D.R., (1984), Unconventional Behavior of Expansive Soils***, 6th Budapest Conf. on Soil Mechanics and Foundation Engineering, Budapest, Hungary***.

81. Katti , R.K. ,Katti ,D.R. ,(1984), Geological Characteristics of Deccan Trap Areas in Relation to foundation Conditions for Civil Engineering Constructions, ***Indian Geotechnical Conference-84***, Calcutta.

82. Katti , R.K. ,Suresh , B. and Katti ,D.R., (1984), Experimental Studies on Large Scale Instrumented Well Models with Cohesionless soil at Base and Cohesive Soil around Sides, ***Indian Geotechnical Conference-84***, Calcutta.

PATENTS (PROVISIONAL)

1. A new permeability device for swelling clays
2. Unnatural amino acid modified nanoclays for tissue engineered scaffolds
3. Biopolymer-hydroxyapatite composites for bone replacement

SYNERGISTIC ACTIVITIES

1. Civil engineering exposure to high school native American students via hands on laboratory experience in geotechnical engineering laboratory

2. Research experience for Undergraduates (Funded by National Science Foundation)

INVITED TALKS GIVEN

2018

Keynote lecture: International Conference on Plasticity, Damage, and Fracture 2018, San Juan, Puerto Rico.

2017

Invited lecture:_15th International Conference of the International Association for Computer Methods and Advances in Geomechanics, Wuhan, China.

2016

Keynote lecture: Indian Geotechnical Society Conference, Mumbai, India

Invited lecture: Materials Science and Technology (MS&T), 2016, Salt lake City, UT

2014

Distinguished lecture at University of Minnesota, Duluth, 2014, Molecular Interactions Influence Swelling, Barrier, and Mechanical Properties of Swelling Clays: A Multiscale Modeling and Experimental Investigation

2013

Guest Speaker (2013) : Warren Lecture, University of Minnesota, Minneapolis, MN “Mechanics of Nanomaterials: The Pivotal Role of Molecular Interactions”

Invited talk, MRS fall 2013 meeting Boston MA

Invited talk EMI 2013

2012

Plenary Keynote Lecture at Engineering Mechanics Institute, June 2012

Invited talk: BIOMED 2012, Innsbruck, Austria

Plenary Keynote Lecture, BIOMED 2012, Innsbruck, Austria

Invited talk EMI 2012

2011

Distinguished Lecture at University of Mississippi "Molecular Interactions Control Mechanics of Nanomaterials: A Multiscale Perspective"

University of Mississippi, Department of Civil Engineering, "Molecular Interactions Influence Barrier and Mechanical Properties in Swelling Clays: A Multiscale Modeling and Experimental Investigation".

Invited talk: MRS Fall 2011 Meeting, Boston, MA

Invited talk: EUROMAT 2011, Montpellier, France

Invited talk: Two Talks: Engineering Mechanics Institute Conference 2011, Boston, MA

Invited talk: Nanotechnology Conference, Fargo, ND

2009

Plenary Keynote Lecture at the 4th Asia-Pacific Conference on Unsaturated Soils held in New Castle, Australia: What's up with clay and water molecules?

Invited talk: EUROMAT 2009 Glasgow Sept 2009

Invited talk: 4th BIOT Conference, Columbia University, New York, NY

2008

Invited talk: World Congress on Computational Mechanics 2008, Venice Italy

Invited talk: American Ceramic Society Annual Meeting 2008 Daytona Florida

Invited talk: The 12th International Conference of *International Association for Computer Methods and Advances in Geomechanics (IACMAG)* October, 2008 Goa, India

2007

Invited talk 6th International Congress on Industrial and Applied Mathematics ICIAM 2007 in Zurich Switzerland

Invited talk at ASCE Engineering Mechanics 2007 meeting at Virginia Tech VA.

Invited talk at Nanotechnology and Nanoscience International conference in Gudgaon India. 2007

Invited to teach workshop on Nanocomposites at Nanoscience International conference in Gudgaon India. 2007

2006

Invited talk: World Congress on Computational Mechanics, LA.

Invited talk: European Congress on Computational Mechanics, Lisbon Portugal.

2004

Keynote Lecture :. 6th World Congress on Computational Mechanics, Beijing, China

Invited talk: ANTEC 2004, Chicago

2003

Guest Speaker: MIT seminar series on geomechanics and geomaterials, MIT, Boston, MA

Invited talk: ICFRC International Conference, Chennai, India

Invited talk: 2nd MIT Conference on Computational Solid and Fluid Mechanics

Invited talk: Annual Conference of the "Gesellschaft für Angewandte Mathematik und Mechanik", Padua, Italy

SESSION CHAIR

EMI 2001 to 2017

International Conference on Plasticity, Damage, and Fracture 2018

6th BIOT conference on poromechanics, Paris, France

MRS Fall 2017

EUROMAT 2011

EMI 2013,2012, 2011, 2010, 2008, 2007, 2006, 2005, 2004, 2003, 2002, 2001

Chair Session at GeoDenver 2007, Denver, CO.

Chair session at Nanotechnology and Nanoscience International conference in Gudgaon India. 2007

Chair session at ASCE EM 2007 meeting at Virginia Tech VA.

World Congress on Computational Mechanics, LA.

European Congress on Computational Mechanics, Lisbon Portugal.

10th. Conference – International Association for Computer Methods and Advances in Geomechanics, Tucson, AZ, 2001

Session on Granular Soils – 14th ASCE Engineering Mechanics Conference, ,Austin

TEACHING

Courses taught or currently teaching

CE 316 Soil Mechanics

CE 461/661 Foundation Engineering

CE 417/617 Slope Stability and Retaining Walls

CE 462/662 Designing with Geosynthetics

CE 464/664 Advanced Soil Mechanics

ST/ Multiscale Modeling

CE 489 Senior Design

CE 720 Continuum Mechanics (co-taught)

CE 111 Introduction to Civil Engineering (Guest lectures)

Engr 111 Introduction to Engineering (Guest Lectures)

The focus of my teaching is on student learning that includes mastery of key and fundamental aspects, ability to identify limitations and strengths of a technique or theory, need for further research or innovation and appreciation for life-long learning. My teaching is continuously evolving as I strive for better student learning. I enjoy the journey as much as I look with satisfaction at the success of the graduates.

New Courses Developed

CE 462/662 Designing with Geosynthetics : Use of polymeric materials in civil engineering has taken off in a big way in the last few decades. However, most undergraduate students graduating from civil engineering had little or no technical knowledge to effectively design civil engineering projects using these materials. This resulted in ineffective use of these materials that sometimes led to failures. In 1998, I began offering this course to undergraduate students (at that time, probably first of the very few programs to offer this course at the undergraduate level). I also modified this course to teach practicing engineers in the region. In this course, we discuss the fundamental mechanisms to design for target properties, characteristics of polymeric materials and their effectiveness and ineffectiveness for conditions expected in the field. The need for additional research in this field is also emphasized. Current research is discussed in the class.

CE 434/664 Advanced Soil Mechanics: This class deals with advanced topics in soil mechanics. The course covers unsaturated soil mechanics and evaluation of molecular interactions between clay and fluids using molecular dynamics. This is possibly the first class anywhere that study of molecular interactions in the context of geotechnical engineering is taught in an undergraduate or graduate class.

ST/ Multiscale modeling: This class deals with various approaches used to bridge various length and time scales to predict macroscale behavior of materials and to understand the underlying mechanisms.

NDSU SERVICE

UNIVERSITY

Member: University Senate

Member: University Senate Executive Committee

Member: NDSU Strategic planning committee

Member: FORWARD- Promotion to Full Professor Committee

Member: FORWARD- Internal Advisory Board

Member: NDSU Ad hoc committee: Investigation of faculty misconduct allegation

Search Committee Member – Director of International Programs

Search Committee Member– Software Coordinator – Center for High Performance Computing

Assisted CNSE for evaluation of computational hardware and software for chip packaging project

Alternate Member on Grade Appeals Board

Member: University High Performance Computing Advisory Committee

Mentor: University New Faculty Mentorship Program

Assisting the office of the President develop collaboration between institutions in India and NDSU

Member, University Senate Library Committee

Member, Selection Committee for an Endowed Chair

Moderator: FORWARD Panel on Promotion to Full Professor

COLLEGE

Member: CEA Promotion and Tenure Committee

Member: CEA Strategic Planning Committee

Chair: Search Committee for Chair of Construction Management & Engineering Department

Chair: Search Committee for Chair of Mechanical Engineering Department

Member: CEA Executive Committee

Member: CEA Research and Extension Committee

DEPARTMENT

Chair: CE Promotion and Tenure Committee

Chair: CE Search committee for geotechnical faculty

Member: CE Search committee for transportation faculty

Member: CE Search committee for structures faculty

Member: CE committee to revise faculty evaluation criteria

CE Graduate Program Coordinator

Search Committee Member, Environmental Engineering faculty position

Member: CE Laboratory and Space Committee

SELECTED RECENT PROFESSIONAL ACTIVITIES

Associate Editor: ASCE Journal of Engineering Mechanics (JEM)

Associate Editor: ASCE Journal of Nanomechanics and Micromechanics

Editor: ASCE JEM Special Issue on Biological and Biologically Inspired Materials

Chair: ASCE-EMI Biomechanics Committee (National/International)

Chair: ASCE-EMI Molecular Scale Modeling and Experimentation Committee (National/International) (founding chair)

Chair: ASCE-EMI Properties of Materials Committee (National/International)

Chair: ASCE-EMI Poromechanics committee (National/International)

Chair: NDSPE Education Committee (State)

Chair, Scholarship committee, FM Engineers Club (Local)

Member: ASCE-Engineering Mechanics Institute Operations Manual Creation Committee (one of three members). (National/International)

Member: ASCE Inelastic Committee (National/International)

Member: ASCE Biomechanics Committee (National/International)

Member: ASCE-EMI Education Committee (National/International)

Member: ASCE Poromechanics committee (National/International)

ASCE Control Group Member for the EMD Properties of Materials Committee (National/International)

Member of three-member committee tasked with creating bylaws and governing instruments for the newly formed Engineering Mechanics Institute (National/International)

Board Member of the International Association of Computer Methods and Advances in Geomechanics (International)

Organizing Chair: Organizing Chair, **Symposium on Molecular Scale Modeling and Experimentation,** 2015, 2016, 2017, ASCE EMI Conferences

Organizing Chair: Organizing Chair, **BM01—Multiscale Mechanobiology and Biomechanics—Theory, Experiments, Computations, Materials Research Society, Fall 2017 Meeting.** ASCE EMI Conferences.

Organizing Chair: Organizing Chair, **Symposium on Biologically Inspired Materials**, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017 **(created a new focus area on biological and biologically inspired materials area in the ASCE Engineering Mechanics).**

Organizing co-Chair: "Nano-Geo", Nanotechnology in Geotechnical Engineering held in conjunction with GEODENVER 2007, Denver, CO, February 2007

Symposium Organizing Committee Member – Constitutive Modeling of Soils, 2001-2002, Columbia University, New York,

Steering committee member: International Association for Computer Methods and Advances in Geomechanics conference, Australia, 2011

International Scientific Advisory Board Member: 5th Biot Conference, 2013, Vienna, Austria.

Organizing Chair: Symposium in BIOT-5 : New Frontiers in Mechanics of Cohesive Soils

Corresponding Member: ASCE Body of Knowledge Committee (National)

Reviewer: National Science Foundation Proposals

Proposal Reviewer – Hong Kong Government

Book Reviewer for Wiley – Reviewed book on foundation engineering

Reviewer: Journal papers:

1. Langmuir
2. Journal of Engineering Mechanics
3. ASTM
4. Journal of Geotechnical and Geoenvironmental Engineering
5. IACMAG
6. International Journal of Nanotechnology
7. Polymer
8. Canadian Geotechnical Journal
9. Journal of Theoretical Biology
10. Journal of American Chemical Society
11. International Journal of Computer-Integrated Design and Construction
12. International Journal of Numerical and Analytical Methods in Geomechanics
13. ASME Journal of Engineering Materials Technology

Reviewer: Conference papers for many conferences.

PROFESSIONAL/COMMUNITY

Presentation: Why are Properties of Nanomaterials so Unique?, KLJ-Engineers, 2013

Organized and Presented two workshops on fundamentals of designing with geosynthetics in Fargo and Bismarck, ND. (2003)

Organized and Presented a workshop on fundamentals of designing with geosynthetics in Carrington ND.(2002)

Organized and Presented a workshop on fundamentals of designing with geosynthetics in Grand Forks and Minot (2001)

A workshop series on designing with geosynthetics was initiated and conducted by Dinesh Katti to educate the engineers in the community (Department of Transportation, consulting engineering firms, construction firms and government officials) to effectively design and build projects using the new technology. The reason for this outreach activity was the large number of failures and misuse of this emerging technology as a result of poor knowledge and understanding of this technology by design and construction professionals.

Ph.D. external examiner, Indian Institute of Technology, Bombay, Mumbai, India.

Developed mitigation alternatives for port facilities at Adani port in India severely damaged by the January 2001 earthquake in western India.

Science fair judge

Presented a seminar on soil mechanics at the Kiwanis meeting

Television interview on our research discoveries on biomimetic nanocomposite nacre and their potential positive impact on design of new high strength and damage tolerant materials

Radio interview on nacre

Newspaper article on research findings on nacre

Television interview on the failure of I-35W bridge failure

Extended radio interviews on I-35W bridge failure

Radio interview on our research on oil shales

SELECTED RESEARCH GRANTS (TEACHING/ADMINISTRATIVE/GRADUATE STUDENT/COMPUTATIONAL SUPPORT GRANTS NOT INCLUDED)

	Title	Amount	Agency
	Reliable Prediction of Shear Strength of Swelling Clays	$200,000 +$200,000 matching	Mountain plains consortium
	An innovative approach to heal nonunion bone defects in humans	$100,000	ND Department of Commerce
	MRI: Acquisition of Data-Intensive Cyberinfrastructure for Research and Education (DICRE) at North Dakota State University	$571,429 ($400,000 NSF+$171,489 matching)	National Science Foundation

	Life-cycle Approaches to Understand the Interactions between Crops and Engineered Nanoparticles at Molecular Level	$500,000	USDA
	Multiscale Modeling and Characterization of Barrier Coatings for Flexible Electronics	$810,000	NSF-EPSCoR
	Unlocking "oil" from Oil Shales	$150,000	DoE/VPRCTT
	Modeling Effect of Molecular Interactions on Evolution of Microstructure and Swelling and Swelling Pressure Responses in Montmorillonite Expansive Clays	$209,922	National Science Foundation
	Equipment for Cell Culture Laboratory EPSCoR	$18,158	ND EPSCoR
	Cell Culture Laboratory EPSCoR	$55,150	ND EPSCoR
	Investigation of stripping in MN class 7 (RAP) as base materials	$81,656	MN-Department of Transportation
	Acquisition of a Twin Screw Extruder for Polymer/Bio Nanocomposite Research and Education	$147,583 with $103,308 from NSF and $44,275 from NDSU	National Science Foundation

	MRI: Acquisition of fourier transform infrared microspectroscopy instrumentation for advanced materials and biomaterials research and education	$192,917 with $135,041 from NSF and $57,876 from NDSU	National Science Foundation
	Acquisition of Scanning Probe Microscopy and Nanoindentation Instrumentation for Nanomaterials and Biomaterials Research and Education	$220,000 with $150,000 from NSF and $70,000 from NDSU	National Science Foundation
	Simulation Based Materials Design of Biomimetic Nanocomposites	$252,500	National Science Foundation
	Evaluation and Modeling of Interlayer Forces in Montmorillonite For Development of a Particulate Based Model For Swelling Clays	$41,313	National Science Foundation
	Acquisition of Dynamic Mechanical Material Test System	$97,463	ND EPSCoR
	Selection of Cost Effective Non-Flammable Pipe Liners	$10,500	ND-DoT
	Materials for Dowel Bar Retrofit in Pavements	$50,000	ND-DoT
	Simulation Based Design of Nanocomposites	$12,000	ND EPSCoR
	Response of Loading Rate on Soils – Doc. Dissertation	$24,000	ND EPSCoR

	Structure Property Relationships in Expansive Soils	$20,000	ND EPSCoR
	Effect of Strain Rate on Undrained Response of Clays	$10,000	ND-EPSCoR

PROFESSIONAL LICENSE

Professional Engineer, State of Washington

CONSULTING ACTIVITIES

Worked on over 125 consulting projects dealing with foundation design, liquefaction mitigation, site specific seismic analysis, design of retaining structures, earth dams etc. Clients included, AT&T, Port of Seattle, Boeing Co., Microsoft, U.S. Navy and state and federal agencies.