RESEARCH PROFILES

INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI

MECHANICAL ENGINEERING

Dr. Madan Mohan A

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भारतीय प्रौद्योगिकी संस्थान तिरुपति

TIRUPATI

- PhD – IISc, Bangalore
- Postdoc experience – Brunel University London
- Areas of Specialization – Atomization and Combustion

Areas of Research

- Atomization and combustion of multicomponent fuels and blends
- Atomization of viscous liquids
- Agriculture sprays

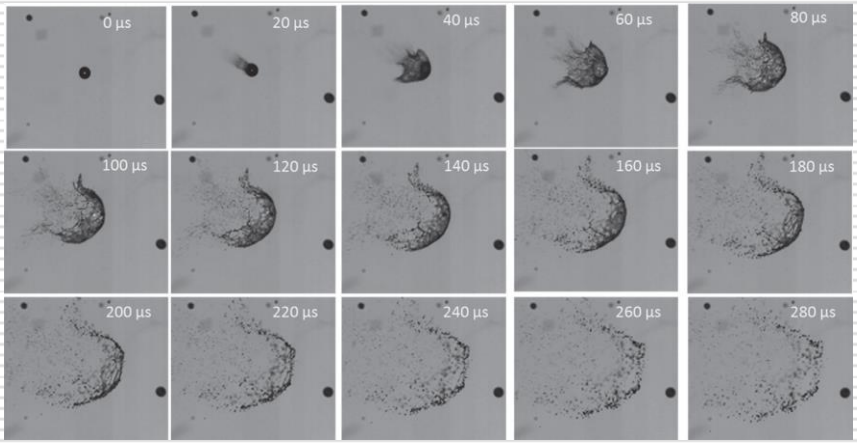

Image sequence showing micro-explosion of secondary droplets resulting from the explosion of suspended droplets. Micro-explosion of droplets start as strong puffing making droplet bag or sheet like structure before it breaks up into smaller droplets

Madan Mohan A, Lionel Ganippa, Jun Xia and Athanasios Megaritis , Puffing and micro-explosion of diesel-biodiesel-ethanol blends, Fuel, 166,59-66, 2016.

Dr. Balaji Subramanian

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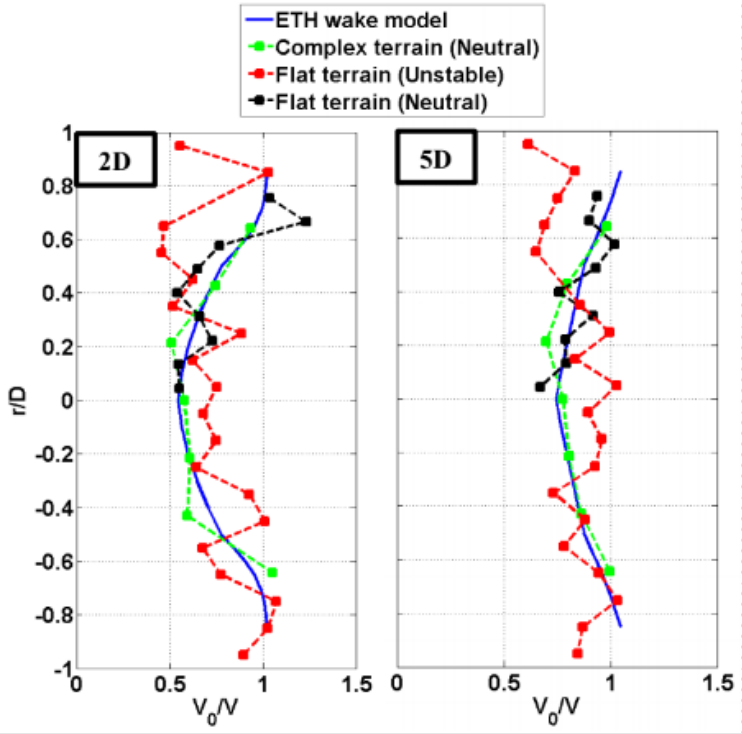
भारतीय प्रौद्योगिकी संस्थान तिरुपति

TIRUPATI

- PhD – ETH Zurich, Switzerland
- Postdoc experience – UC Santa Barbara, CA
- Areas of Specialization – Experimental and computational fluid dynamics, wind energy

Areas of Research

- Demonstrate the effectiveness of drone based wind resource assessment
- Active flow control employed in rotor to improve wind turbine efficiency
- Designing and building a 5 kW low cost horizontal axis wind turbine blade in-house



Comparison between the spatially-averaged spanwise profiles of wind speed measured using drone based wind measurement system under different atmospheric conditions and the predictions from the ETH wake model at two-diameter and five-diameter downstream of a wind turbine.

B.Subramanian, N.Chokani and R.S.Abhari, 2018, "Impact of Atmospheric Stability on Wind Turbine Wake Evolution," *Journal of Wind Engineering and Industrial Aerodynamics*, v.176, p. 74-82.

Dr. Sriram Sundar

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भारतीय प्रौद्योगिकी संस्थान तिरुपति

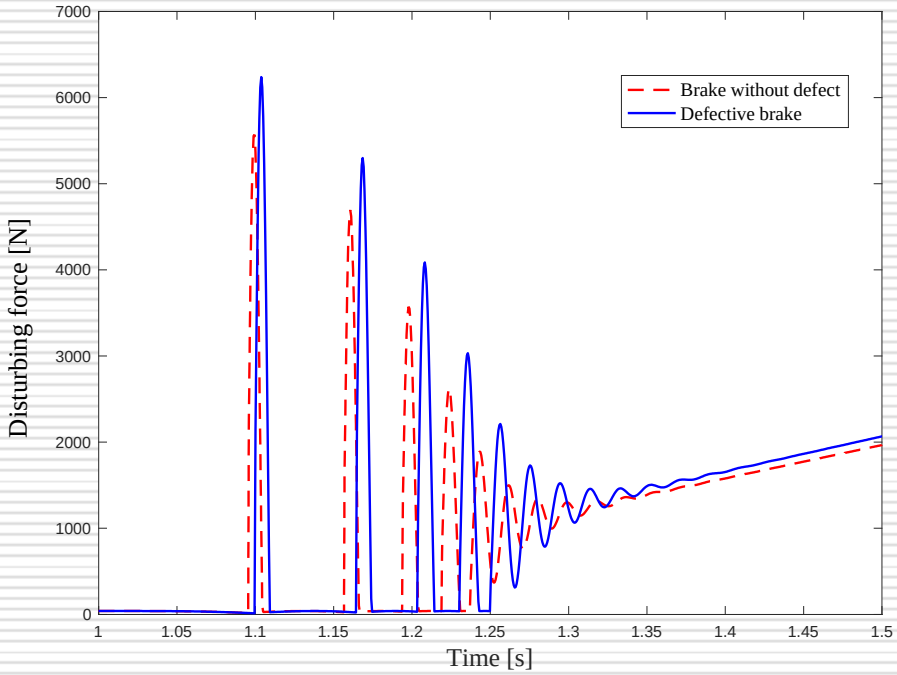
TIRUPATI

- PhD – The Ohio State University
- Areas of Specialization – Non-linear dynamics and vibrations

Areas of Research

- Dynamic analysis and tribology of combined rolling-sliding contact systems
- Contact mechanics of brake defects
- Energy and stability analysis of human body
- Ergonomics of automotive passenger

Impact of brake defect



Dr. E. Anil Kumar

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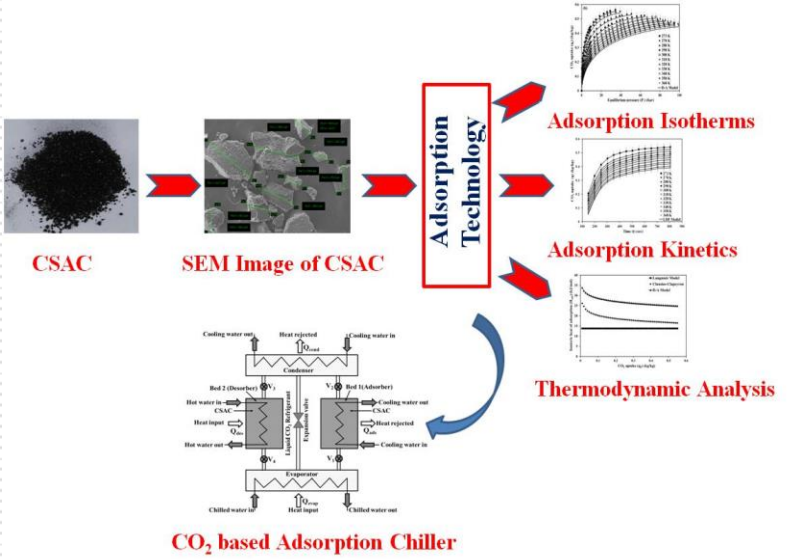
भारतीय प्रौद्योगिकी संस्थान तिरुपति

TIRUPATI

- PhD – IIT Madras
- Areas of Specialization – Hydrogen storage, metal hydrides, energy storage

Areas of Research

- Hydrogen storage – Metal hydrides
- Thermal energy storage
- Sorption heating and cooling systems
- CO_2 capture and sequestration



Development of adsorption chiller using coconut shell based activated carbon.

Vinod Kumar Singh, **E. Anil Kumar**, Bidyut Baran Saha, Adsorption isotherms, kinetics and thermodynamic simulation of CO_2-CSAC pair for cooling application, Energy, 160 (2018) 1158-1173.

Dr. D.V. Kiran

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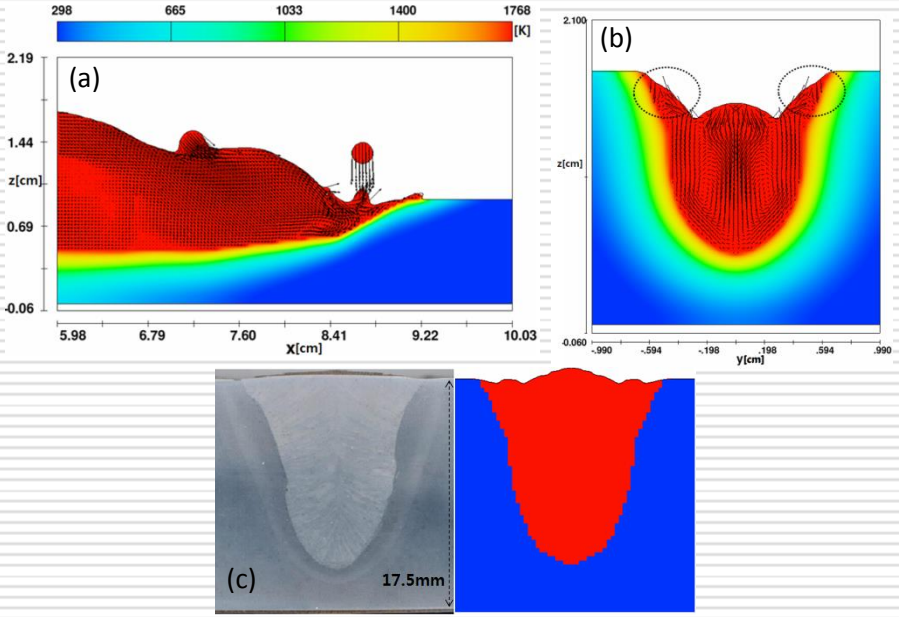
भारतीय प्रौद्योगिकी संस्थान तिरुपति

IIT TIRUPATI

- PhD – IIT Bombay, India
- Postdoc experience – KAIST, South Korea
- Areas of Specialization – Welding Engineering

Areas of Research

- Heat transfer and fluid flow analysis of fusion welding processes
- Welding Metallurgy
- Additive Manufacturing



Calculated temperature profile along (a) longitudinal section and (b) transverse section of the weld; (c) Comparison of calculated weld bead with corresponding macrograph.

D.W. Cho, D.V. Kiran, S.J. Na, Analysis of molten pool behavior by flux-wall guided metal transfer in low current submerged arc welding, *International Journal of Heat and Mass Transfer, 2017, 110, 104-112.*

Dr. P. Venkataraman

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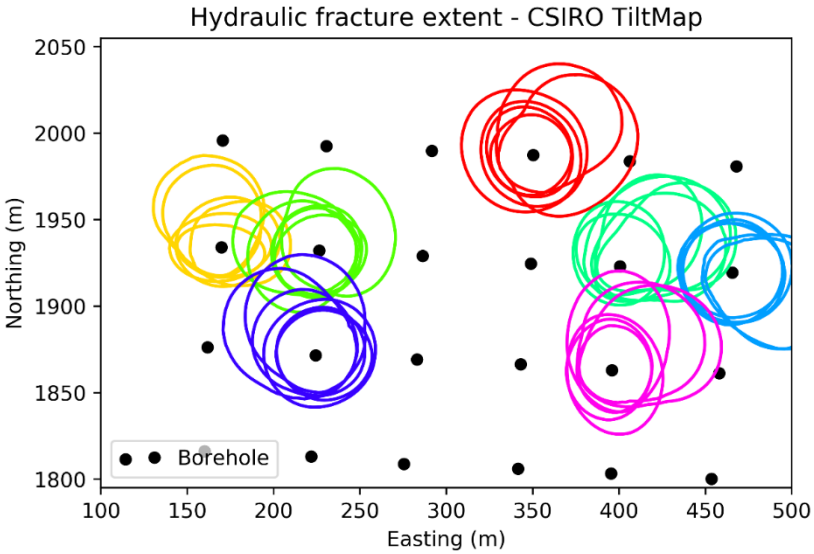
भारतीय प्रौद्योगिकी संस्थान तिरुपति

TIRUPATI

- PhD – NTU, Singapore
- Postdoc experience – CSIRO, Melbourne
- Areas of Specialization – Computational mechanics

Areas of Research

- Mapping of Hydraulic fractures from Tilt data
- Development of Multiscale algorithms
- Real time monitoring of product quality in additive manufacturing



The hydraulic fracture extent plot showing the boundary edge of the hydraulic fractures for 07 boreholes at multiple depths. The colors represent different boreholes.

V Pandurangan, A Peirce, ZR Chen, RG Jeffrey, Tiltmeter Mapping of Measured Nonsymmetric Hydraulic-Fracture Growth in a Conglomerate/Sandstone Formation Using the Implicit Level-Set Algorithm and the Extended Kalman Filter, *SPE Journal, 2018, 23 (01), 172-185*

Dr. N. Venkaiah

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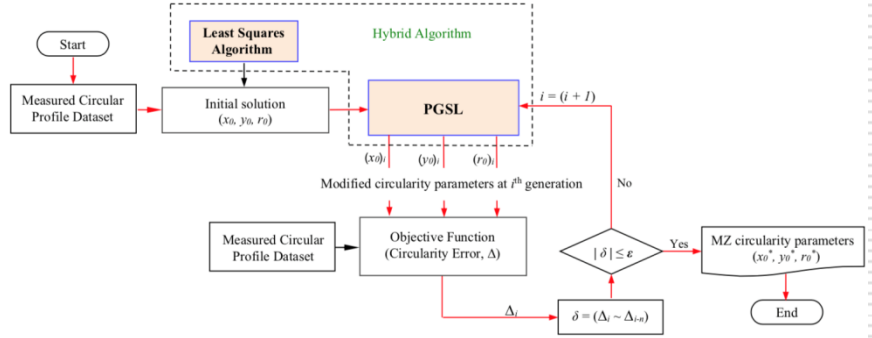
भारतीय प्रौद्योगिकी संस्थान तिरुपति

TIRUPATI

- PhD – IIT Madras, India
- Areas of Specialization – Metrology, Electric discharge machining, Additive manufacturing, Process modeling & Optimization

Areas of Research

- Modeling and optimization of electric discharge machining
- Improvement of wire-arc additive manufacturing process
- Development of computational geometrical techniques for form errors



Structure of hybrid global search algorithm for minimum zone solution

D. S. Srinivasu and N. Venkaiah, "Minimum Zone Evaluation of Roundness using Hybrid Global Search Approach", *Int. J. Advanced Manufacturing Technology*, 92, 2743-2754, 2017.

CIVIL ENGINEERING

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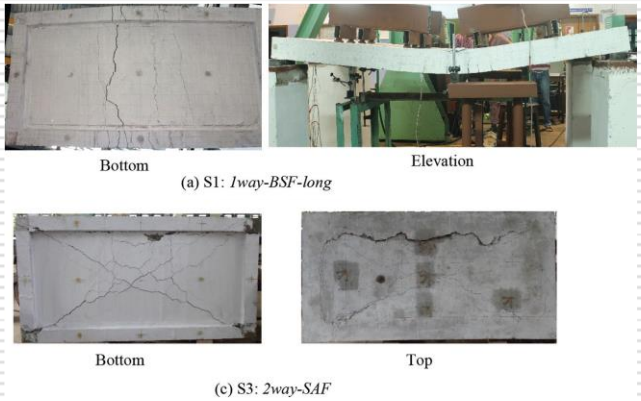
भारतीय प्रौद्योगिकी संस्थान तिरुपति

TIRUPATI

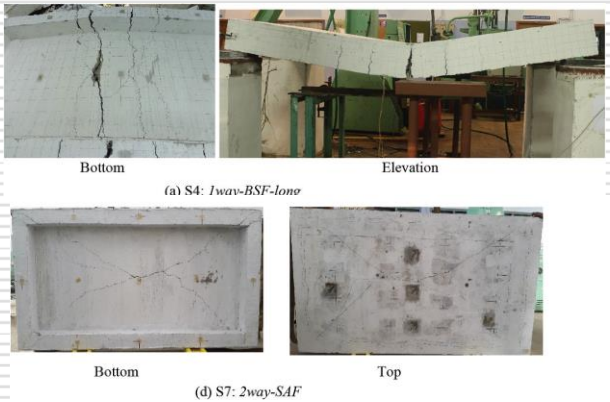
- PhD – IIT Madras
- Areas of Specialization – Structural Engineering

Areas of Research

- Economical and rational design of the beam-slab systems using yield line theory
- Experiments on beam-slab systems with and without secondary beams
- Flexural and shear behaviours of beam-columns with circular cross-section



Collapse mechanisms of beam-slab system supported on shallow beams



Collapse mechanisms of beam-slab system supported on stiff beams

Balakrishnan B. and D. Menon (2018) Strength design of rectangular RC beam-slab systems: new insights. *ACI Structural Journal,* **115(5)**. doi: 10.14359/51702246.

Dr. Shihabudheen M. Maliyekkal

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भारतीय प्रौद्योगिकी संस्थान तिरुपति

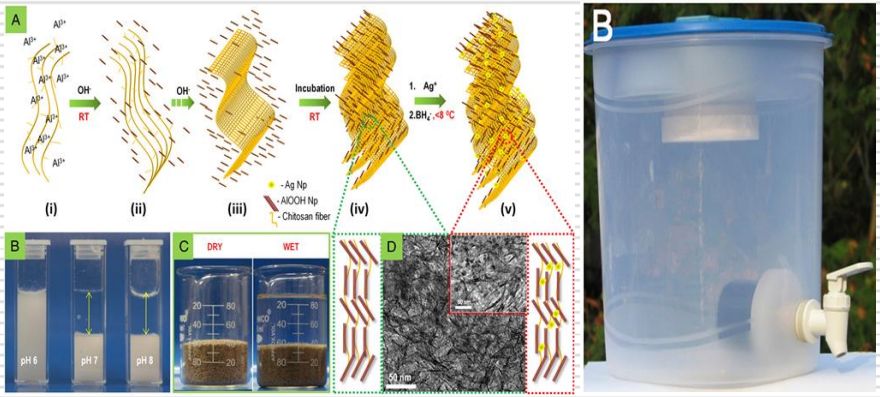
TIRUPATI

- PhD – IIT Madras, India
- Areas of Specialization – Environmental Engineering

Areas of Research

- Water and Wastewater treatment
- Advanced Materials for Environmental Remediation
- Reuse and Recycling of Materials

'Rs 120 a year' Clean Water



PNAS, 110(21), 8459–8464, 2013

Recent Publications [Selected]

[https://scholar.google.com/citations?user=QYutTIcAAAAJ]

- M. Rajamani and S.M. Maliyekkal, "Chitosan reinforced boehmite nanocomposite desiccant: A promising alternative to silica gel," *Carbohydrate Polymers* 194, 245-251, 2018
- M. Mohandoss, S.S. Gupta, R. Kumar, M.R. Islam, A. Som, A.G. Mohammed T. Pradeep, and S.M. Maliyekkal, "Self-propagated combustion synthesis of few-layered graphene: an optical properties perspective," *Nanoscale*, 10, 7581-7588, 2018.
- M., Rajamani, V.R., Mishra, S.M., Maliyekkal, Bundled-firewood like AlOOH-$CaCl_2$ nanocomposite desiccant, *Chemical Engineering Journal*, 323, 171–179, 2017.
- S. M. Maliyekkal, T. S. Sreeprasad, D. Krishnan, S. Kouser, A. K. Mishra, U. V. Waghmare, and T. Pradeep, "Graphene: A Reusable Substrate for Unprecedented Adsorption of Pesticides," *Small*, 9(2), 273-283, 2013

Patents [Selected]

- Luminescent graphene pattern, US9424505 [Status: Grant; Date: 2016-08-23]
- Organic templated nanometal oxyhydroxide, JP5908462B2 [Status: Grant; Date: 2016-04-26]
- Reduced graphene oxide based-composites for the purification of water, WO 2012028964 [Status: Application]

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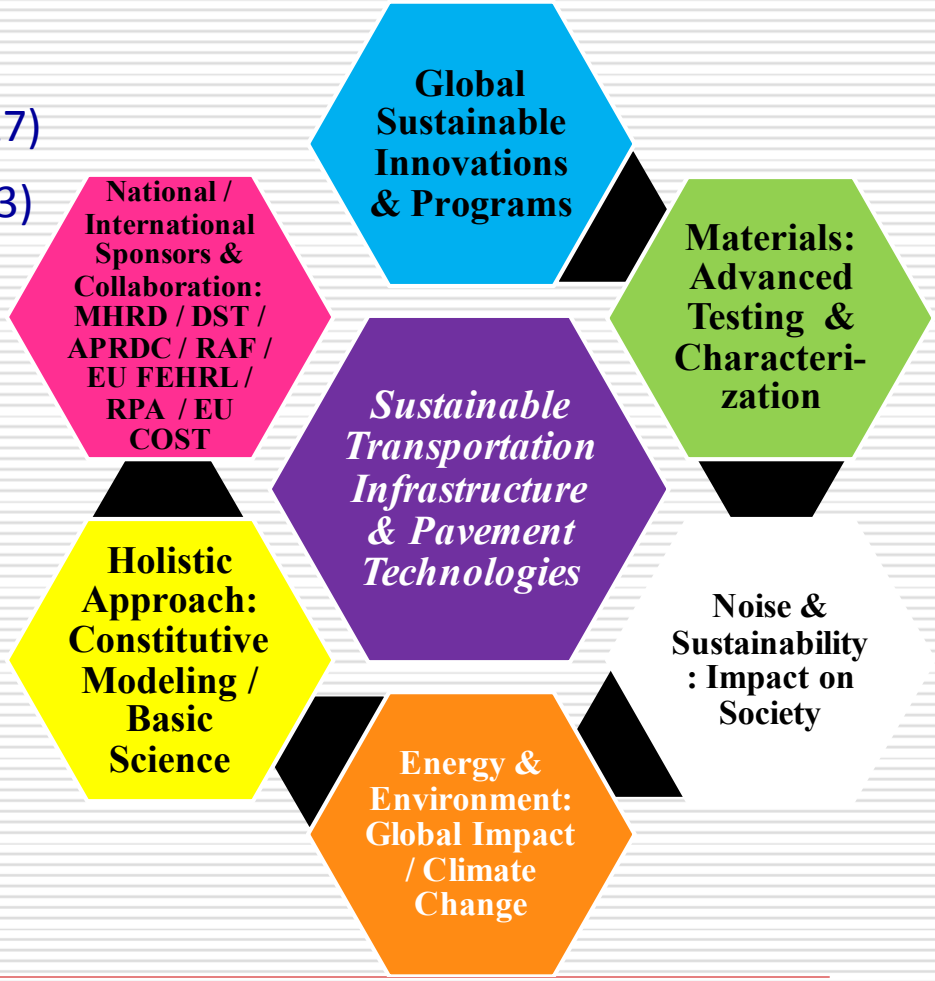
भारतीय प्रौद्योगिकी संस्थान तिरुपति

TIRUPATI

- Ph.D. – Arizona State University, USA
- Assistant Professor – IIT Kharagpur (2013-17)
- Postdoc experience – VTI, Sweden (2009-13)
- Areas of Specialization – Sustainable Pavement Technologies

Areas of Research

- Innovative Roadway Materials
- Forensic Evaluation of Pavements
- Asphalt-Rubber
- Pervious Concrete
- Pavement Asset Management
- Vehicle-Pavement Interaction



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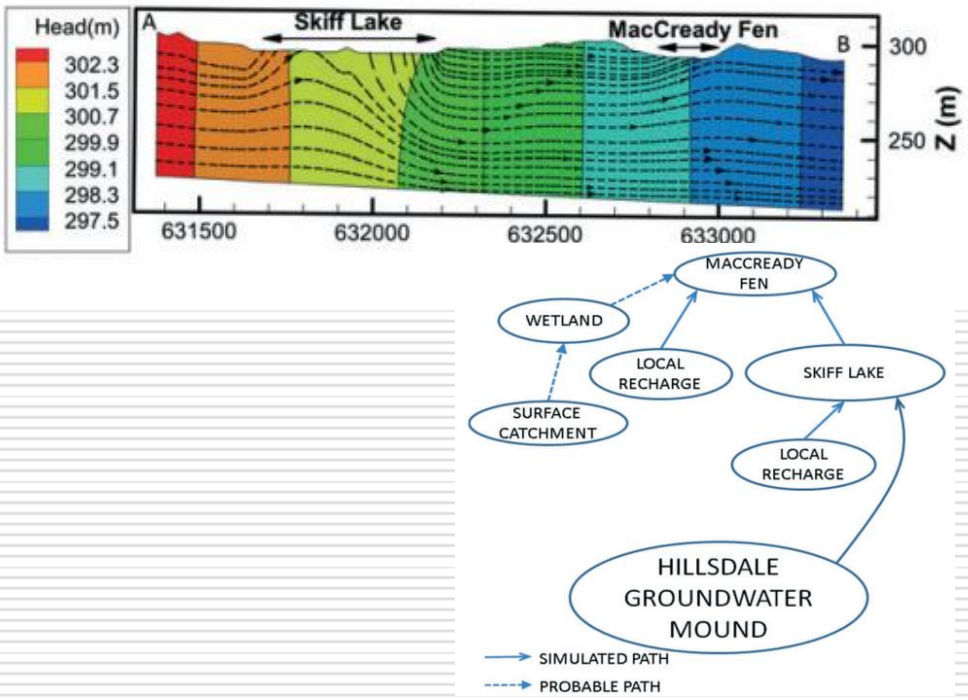
भारतीय प्रौद्योगिकी संस्थान तिरुपति

TIRUPATI

- PhD – Michigan State Univ., US
- Postdoc experience – MSU, US
- Areas of Specialization – Computational modelling of groundwater systems

Areas of Research

- Development of data-intensive hydrologic models
- Large-scale estimation of soil hydrologic properties
- Infiltration characteristics of Pervious Concrete pavements



Delivery of water to rare ecosystems called fens using multi-scale groundwater models.

Sampath, P. V., Liao, H. S., et al. (2016). Understanding fen hydrology across multiple scales. *Hydrological Processes*, *30*(19), 3390-3407.

Dr. B. Janaki Ramaiah

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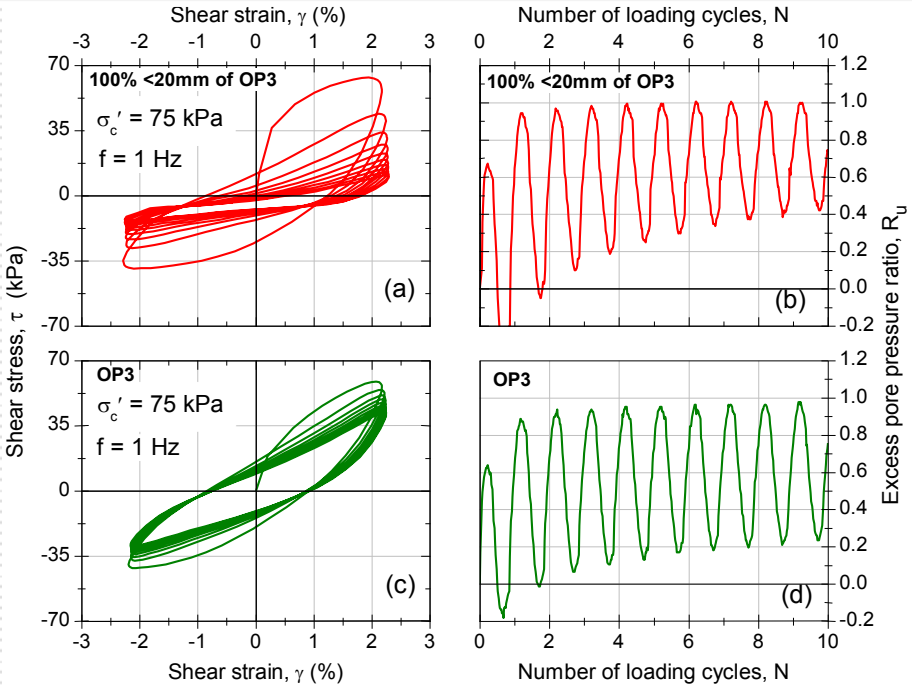
भारतीय प्रौद्योगिकी संस्थान तिरुपति

TIRUPATI

- PhD – IIT Delhi, India
- Areas of Specialization – Geotechnical Engineering

Areas of Research

- Geotechnical and Geoenvironmental Engineering, Solid Waste Landfills
- Geotechnical Earthquake Engineering
- Ground Improvement
- In-situ Testing



Effect of fibrous reinforcement (plastics) on the undrained cyclic stress-strain behavior of municipal solid waste from large-scale cyclic triaxial tests.

B.J. Ramaiah, G.V. Ramana, BK Bansal, Field and large scale laboratory studies on dynamic properties of emplaced municipal solid waste from two dump sites at Delhi, India, ***Journal of Soil Dynamics and Earthquake Engineering***, *2016, 90, 340-357.*

Dr. Romanbabu Oinam

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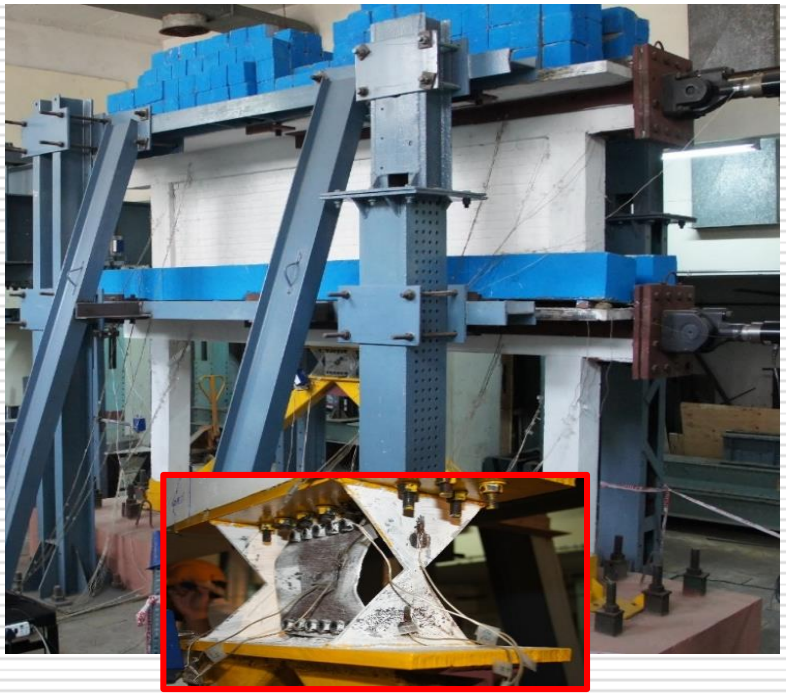
भारतीय प्रौद्योगिकी संस्थान तिरुपति

TIRUPATI

- PhD – IIT Delhi
- Areas of Specialization – Structural Rehabilitation and Retrofitting

Areas of Research

- Seismic evaluation & Retrofitting of structures
- Supplemental damping & Energy dissipating devices
- Performance-based seismic design of structures
- Fiber reinforced concrete
- Large scale testing of structures using quasi-static and pseudo-dynamic methods
- Numerical modeling of reinforced concrete and steel structures



Seismic Strengthening of Masonry-Infilled RC Frame usin Metallic Energy Dissipation Device

- Oinam, R. M., and Sahoo, D. R. (2018). “Experimental and numerical evaluation of seismic performance of existing RC frames with soft-story.” *Journal of Performance of Constructed Facilities*, ASCE.
- Oinam, R. M., and Sahoo, D. R. (2018). “Numerical evaluation of seismic response of soft-story RC frames retrofitted with passive devices.” *Bulletin of Earthquake Engineering*, 16(2), 983–1006.

Dr. A. Gowri

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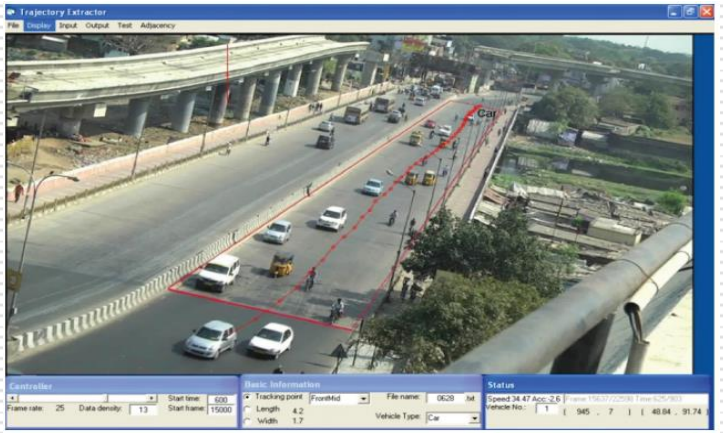
भारतीय प्रौद्योगिकी संस्थान तिरुपति

TIRUPATI

- PhD – IIT Madras
- Teaching Experience – NITK, Surathkal
- Areas of Specialization – Traffic Flow Modeling and Simulation

Areas of Research

- Traffic Operations and Management
- Tool for Vehicular Trajectory Extractor
- Modeling Mixed Traffic Characteristics
- Pedestrian Safety
- Intelligent Transportation Systems



User Interface of Vehicle Trajectory Extractor

Snapshot of Traffic Video Footage Collected using Drones

Dr. Roshan Srivastav

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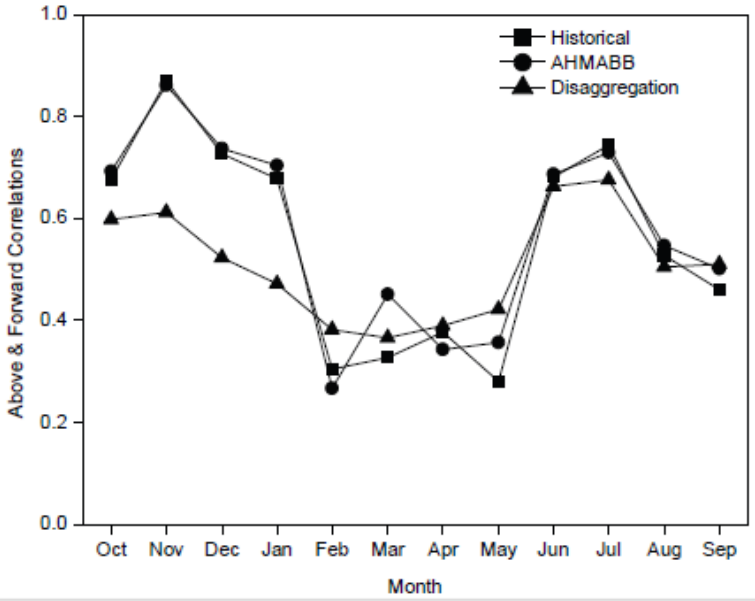
भारतीय प्रौद्योगिकी संस्थान तिरुपति

IIT TIRUPATI

- PhD – IIT Madras, India
- Postdoc experience – Western University
- Areas of Specialization – Hydroclimatology, Statistical Modelling

Areas of Research

- Statistical downscaling, weather generators and uncertainty modelling
- Stochastic hydrology
- Reservoir Operation
- Large-scale watershed modelling



The figure shows the efficacy of automated hybrid matched block bootstrap model (AHMABB) to reproduce complex dependence structure in generating (single/multi-site and multi-season) streamflows.

Srivastavs et al. (2016), Simulation-Optimization framework for multi-site multi-season hybrid stochastic streamflow modelling, Journal of Hydrology, 552, 506-531.

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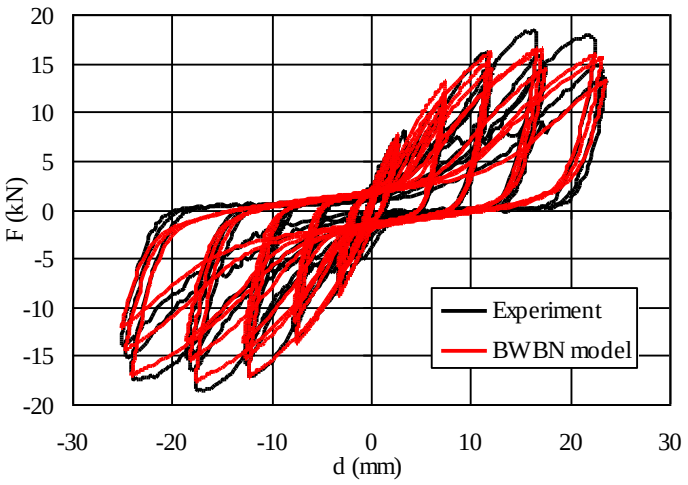
भारतीय प्रौद्योगिकी संस्थान तिरुपति

TIRUPATI

- PhD – IITM, India
- Postdoc experience –Assistant Professor, RVSCET, India
- Areas of Specialization – Structural Engineering

Areas of Research

- Stability design of Hot-rolled & cold-formed steel (CFS) members
- Performance Based Seismic Design (PBSD)
- Experimental evaluation of steel structural behavior



n	1.000
A	5.093
α	0.0896
δ_v	0.00003
δ_η	0.00042
Ψ_0	0.321
ζ_s	0.951
δ_ψ	0.00031
β	0.331
γ	-0.204
λ	6.225
p	0.0403
q	0.0620
k	0.609

The plot shows the comparison of experimental wall panel load (F)-displacement (d) response with Bouc-Wen-Baber-Noori (BWBN) hysteretic model, under cyclic loading. The parameters of BWBN model were identified using system identification technique.

M Nithyadharan, V kalyanaraman, Modelling hysteretic behavior of Cold-formed steel wall panels, Engineering Structures, *2013, 46, 643-652*

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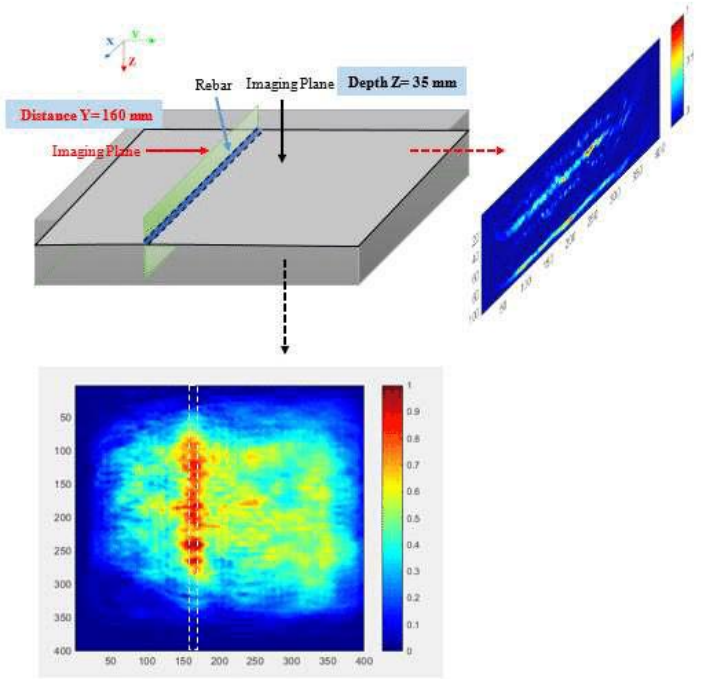
भारतीय प्रौद्योगिकी संस्थान तिरुपति

TIRUPATI

- Assistant Professor, IIT Delhi (2011-2017)
- Postdoc experience – Northeastern University, Boston; Schlumberger-Doll Research, Boston; University of Massachusetts, Amherst, USA.
- Areas of Specialization – Computational mechanics

Areas of Research

- Structural Health Monitoring and nondestructive evaluation
- Phased array ultrasonic imaging
- Structural Dynamics and vibration control



Ultrasound image of a rebar embedded in a concrete slab.

D. Ghosh, Rahul, Deboshree Roy, **A. Ganguli**, S. Tuli, A. Mukherjee, Combination of Thermal and Elastic Wave Imaging Techniques for Detection of Subsurface Defects in Concrete, NDE 2017 Conference & Exhibition of the Indian Society for NDT (ISNT), Chennai, India.

ELECTRICAL ENGINEERING

Dr. Parthajit Mohapatra

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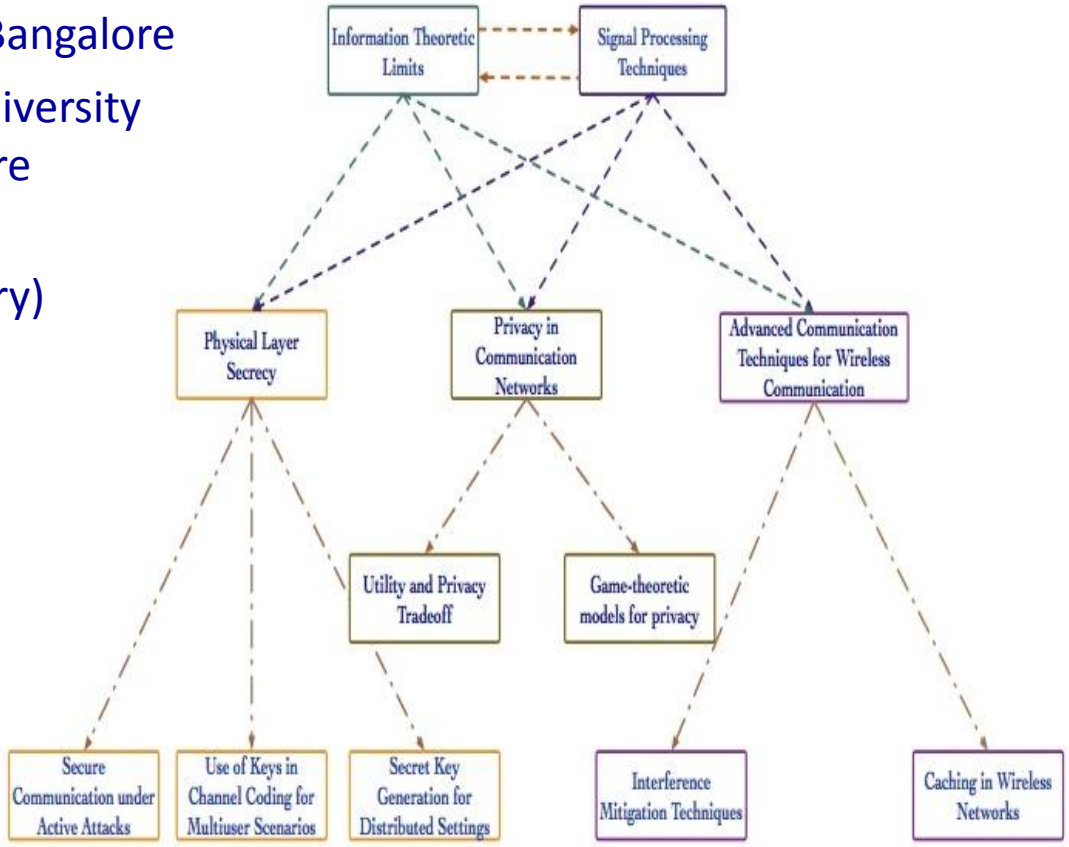
भारतीय प्रौद्योगिकी संस्थान तिरुपति

TIRUPATI

- PhD – Indian Institute of Science, Bangalore
- Postdoc experience – Singapore University of Technology and Design, Singapore
- Areas of Specialization – Wireless Communication (Information Theory)

Areas of Research

- Physical Layer Secrecy
- Advanced Communication Techniques for Wireless Networks
- Privacy in Internet of Things (IoTs)



Dr. Rama Krishna Sai Gorthi

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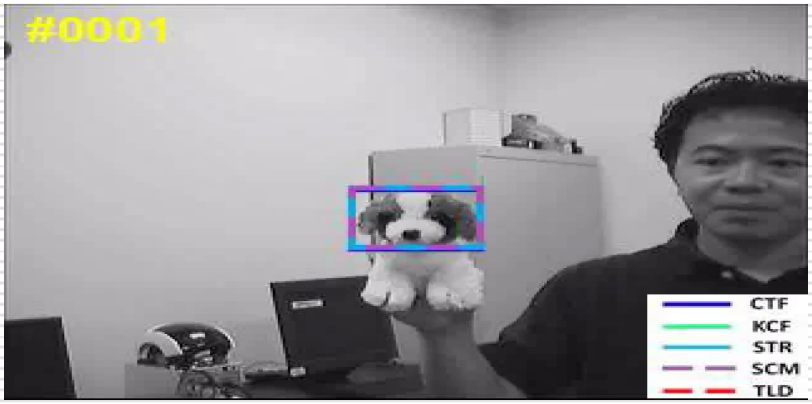
भारतीय प्रौद्योगिकी संस्थान तिरुपति

IIT TIRUPATI

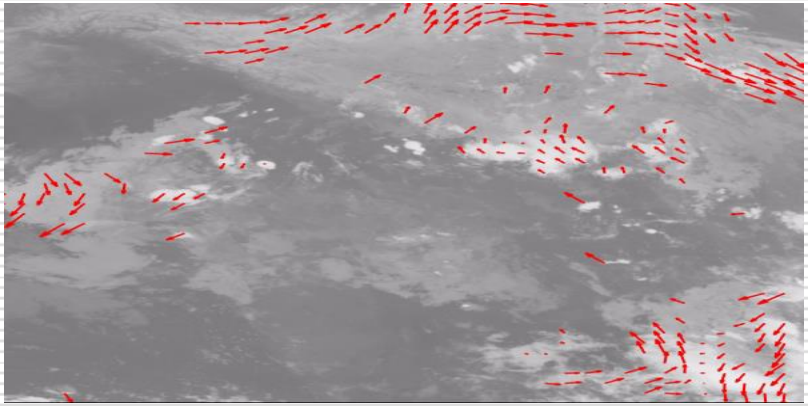
- PhD – IIT Madras, India
- Postdoc experience – INRIA, France
- Areas of Specialization – Computer Vision and Deep Learning

Areas of Research

- Visual Object Tracking
- Rotational Invariant Scene Annotation
- Image Restoration and Fringe Projection
- Cloud / Fluid Motion Estimation
- Image Classification (Satellite / Medical)



"Correlation based Tracker level fusion for Robust visual tracking", ***IEEE Trans. on Image Processing,*** Volume: 26, No. 10, 2017.



"Consistent Robust and Recursive Estimation of Atmospheric Motion Vectors From Satellite Images"***, IEEE Trans. on Geoscience & Remote Sensing, 2018.***

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भारतीय प्रौद्योगिकी संस्थान तिरुपति

TIRUPATI

- PhD – IIT Madras, M.Tech – IIT Roorkee
- Industrial experience (6 years) – ABB, APGENCO (A.P), Coromandel Fertilizers Ltd. (A.P)
- Teaching Experience (2 years)– BITS Pilani (Hyderabad Campus)
- Areas of Specialization – Control systems and Robotics

Areas of Research

- Control of Computing Systems
- Industrial Control systems and Industrial Internet of Things
- Cloud Computing and performance management
- Optimal and Robust Control
- Smart City and Smart Infrastructure

Publications (Recent):

D. Singh, J. Mukherjee, P.S. Saikrishna, R. Pasumarthy and D. Krishnamurthy, "Performance management via MPC for Web services in cloud," *2018 Annual American Control Conference (ACC)*, Milwaukee, WI, USA, 2018, pp. 5665-5670.

Saikrishna., Pasumarthy., & Bhatt, N.P.(2017). Identification and multivariable gain-scheduling control for cloud computing systems. IEEE Transactions on Control Systems Technology , 25 (3), 792–807.

PS Saikrishna, Ramkrishna Pasumarthy, Multi-objective switching controller for cloud computing systems, Control Engineering Practice, Volume 57, 2016, Pages 72-83.

COMPUTER SCIENCE AND ENGINEERING

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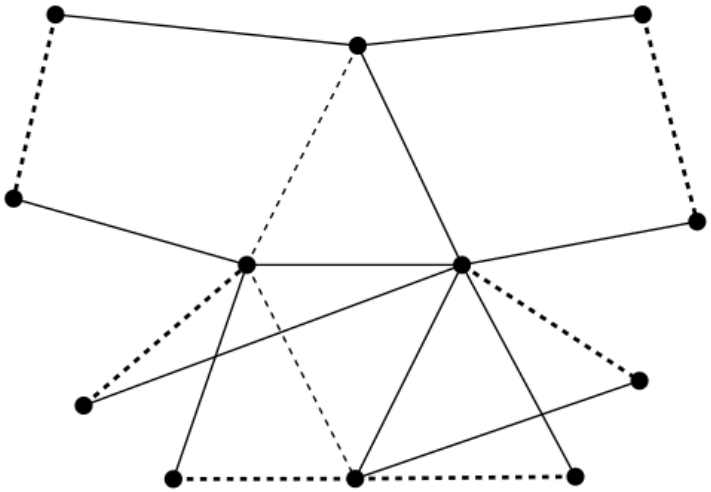
भारतीय प्रौद्योगिकी संस्थान तिरुपति

TIRUPATI

- PhD – IIT Madras
- Post PhD – Asst. Prof. at IIIT Sri City
- Areas of Specialization – Algorithmic Graph Theory

Areas of Research

- Algorithmic Engineering
- Parallel Computing
- Route Planning and Smart Transportation Algorithms



A minimum average stretch spanning tree of the underlying polygonal 2-tree

N.S.Narayanaswamy, G.Ramakrishna, On Minimum Average Stretch Spanning Trees in Polygonal 2-trees, Theoretical Computer Science (TCS) 2015 575: 56-70.

Dr. S. Raja

Asst. Professor, Dept. of Computer Science and Engineering, raja@iittp.ac.in

भारतीय प्रौद्योगिकी संस्थान तिरुपति

IIT TIRUPATI

- **Ph.D** - Institute of Mathematical Sciences, Chennai, India.
- Postdoc experience – Chennai Mathematical Institute, Siruseri, India.
- Areas of Specialization – Theoretical Computer Science

Areas of Research

- Arithmetic Circuit Complexity theory

Dr.Jaynarayan T. Tudu

Asst. Professor,

Dept. of Computer Science and Engineering

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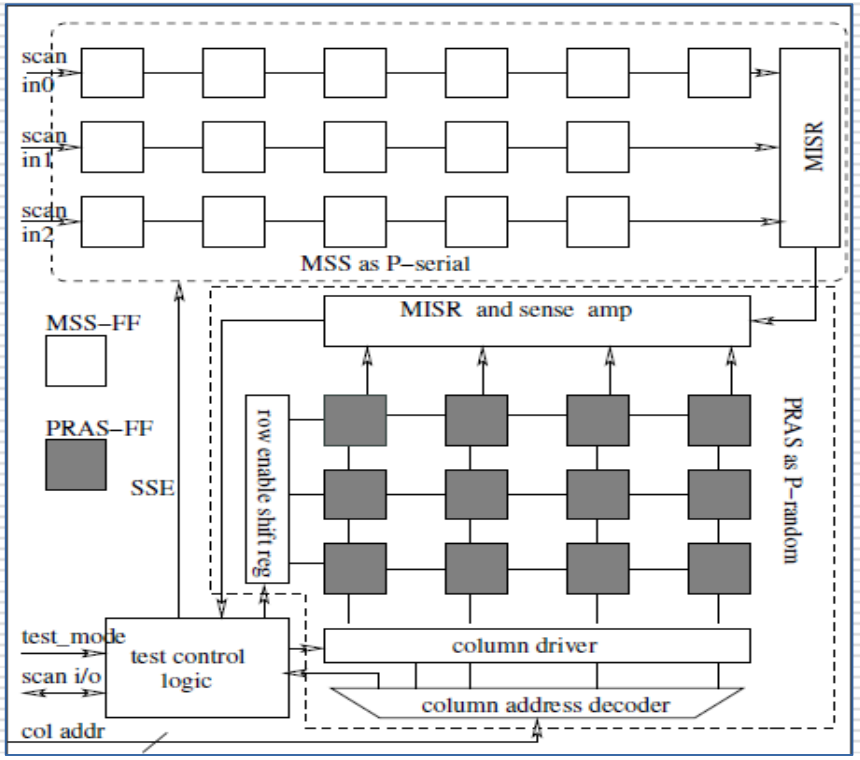
भारतीय प्रौद्योगिकी संस्थान तिरुपति

IIT TIRUPATI

- PhD – IISc Bangalore
- Postdoc experience – CADS Lab, IIT Bombay
- Areas of Specialization – Reliable Computing

Areas of Research

- Power-aware DfT Scan Architecture
- Test and Reliability for Sensor Nodes
- Post-silicon Debug and Diagnosis
- Power Estimation and Power-aware Multicore Architecture



2M-JScan: A Power-aware Configurable Scan Architecture

S. Ahlawat, **J. Tudu**, A. Matrosova and V. Singh, "A High Performance Scan Flip-Flop Design for Serial and Mixed Mode Scan Test," in IEEE Transactions on Device and Materials Reliability, vol. 18, no. 2, pp. 321-331, June 2018.

Dr. Y. Kalidas

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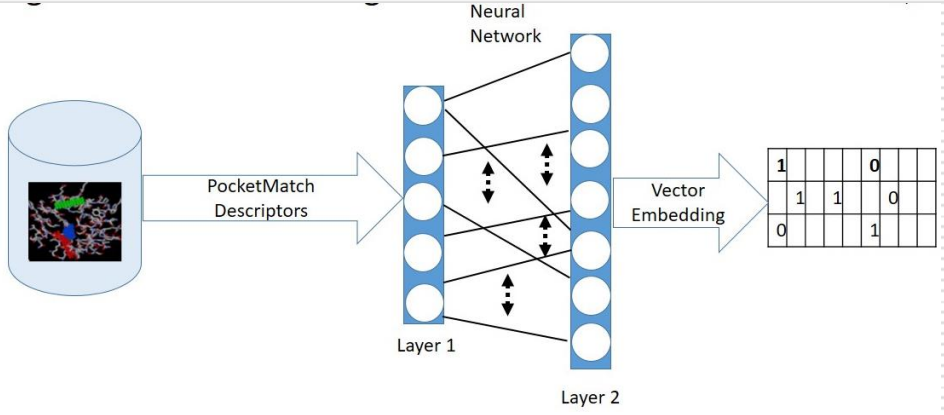
भारतीय प्रौद्योगिकी संस्थान तिरुपति

TIRUPATI

- PhD – IISc, Bangalore
- Industry experience – Amazon, Samsung Research, TCS (Bangalore)
- Areas of Specialization – Machine learning algorithms

Areas of Research

- Machine Learning Algorithms and Applications
- Document digitization – content indexing and semantic search
- Stream learning – sensor networks
- Bioinformatics – Shape encoding and search



On going work on deep learning for bioinformatics

Kalidas Yeturu and Chandra N (2008).“PocketMatch: a new algorithm to compare binding sites in protein structures”. http://proline.physics.iisc.ernet.in/pocketmatch BMC Bioinformatics, 9:543 (17 pages). Impact factor: 2.67. #Citations=101.

2004-’10 ***Ph.D. – IISc****, Bangalore*

- **2011** Best Ph.D. thesis medal – **Sir Vithal N Chandavarkar Memorial Medal**
- Title – `A Novel Algorithmic Suite for Detection, Large Scale Comparison and Design of Ligand Binding Sites in Protein Structures`

HUMANITIES AND SOCIAL SCIENCES

Dr.Rahul A. Sirohi

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भारतीय प्रौद्योगिकी संस्थान तिरुपति

IIT TIRUPATI

- PhD – University of Illinois at Urbana Champaign, USA
- Area of Specialization – Development Economics

Areas of Research

- Comparative Political Economy
- Latin American Economies
- Indian Economy
- Institutional Economics

Dr. Chandra Sekhar Bahinipati

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भारतीय प्रौद्योगिकी संस्थान तिरुपति

TIRUPATI

- PhD (Economics) – Madras Institute of Development Studies, Chennai, India
- Area of Specialization – Environmental Economics, Ecological Economics & Development Economics

Areas of Research

- Economics of Climate Change
- Risk and Vulnerability
- Natural Resource Management
- Impact Evaluation
- Diffusion of Technologies in Agriculture
- Behavioural Economics

Recent Publications

- 2018: "Incentivizing resource efficient technologies in India: evidence from adoption of micro-irrigation systems in dark zone regions of Gujarat", *Under Review*.
- 2017: "Development Interventions, adaptation decisions and farmers' wellbeing: evidence from drought-prone households in rural India", *Climate and Development*, DOI: 10.1080/17565529.2017.1410084
- 2016: "Role of climatic risks and socio-economic factors in influencing the economic impact of climatic extremes: A normalisation study in the context of Odisha, India" *Regional Environmental Change*, 16(1): 177-188.

Dr. Prabha Shankar Dwivedi

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भारतीय प्रौद्योगिकी संस्थान तिरुपति

TIRUPATI

- PhD (English) – Sagar Central University, Madhya Pradesh, India
- Area of Specialization – Comparative Literature/Literary Theory, Indology & Indian Poetic

•Areas of Research

- Comparative Literary Theory
- Comparative Literature
- Indian Poetics
- Literature in Translation

Recent Publications

- 2018: A book entitled, "Epistemology and Linguistics: Bhartrhari, Structuralism and Poststructuralism", Motilal Banarasidass Publishers, New Delhi, India. (In press)
- 2018: From Stage to Screen: A Dialectical Evaluation of the Translational Journey of Mrchchakatikam to Utsav", International Journal of Translation, Vol. 30, No. 2, (October 2018): Forthcoming.
- 2017: "Thinking Dialectically on Indian Tradition of Knowledge and Western Knowledge System with Special Reference to Bhartrhari and Saussure", Littcrit, Vol. 43 No. 1, Issue 83, (June 2017): 133-143.

Dept. Of Mathematics

Dr. Ishapathik Das

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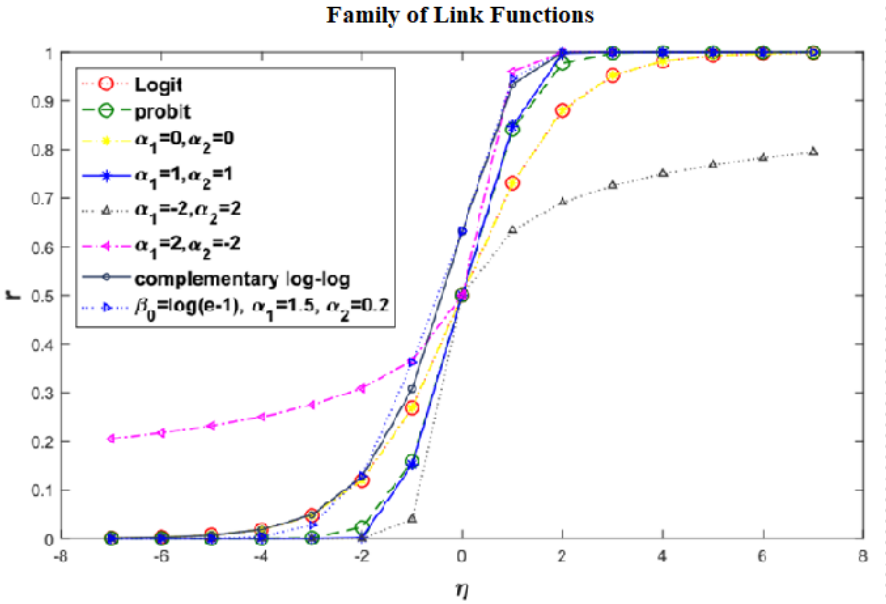
भारतीय प्रौद्योगिकी संस्थान तिरुपति

TIRUPATI

- PhD – IIT Bombay
- Postdoc – Duke University, USA
- Areas of Specialization – Statistics

Areas of Research

- Generalized Linear Models
- Clinical Trials
- Multivariate Distributions
- Design of Experiments
- Machine Learning



The figure shows that the Family of Link Functions contains Logit, Probit, and complementary log-log link functions along with an infinite number of other link functions for different link parameter values.

I. Das, Robust Benchmark Dose Estimation using an Infinite Family of Response Functions, *Human and Ecological Risk Assessment: An International Journal, 2018, 24(08), 1-6.*

Dr. S Rajesh

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भारतीय प्रौद्योगिकी संस्थान तिरुपति

TIRUPATI

- PhD – Indian Institute of Technology Madras
- Postdoc experience

  – Indian Statistical Institute Chennai Centre

Area of Research

- Metric Fixed Point Theory

Latest Publications/Preprints:

- S. Rajesh. On existence of fixed points for pointwise eventually nonexpansive mappings. Journal of Fixed Point Theory and Applications. 19 (2017), no. 3, 2177 – 2184.
- S. Rajesh, P. Veeramani. Lim's center and fixed point theorems for isometry mappings. Annals of Functional Analysis. 9 (2018), no. 2, 190 – 201.
- S.Rajesh, P.Veeramani. Best Proximity point theorems for asymptotically relatively nonexpansive mappings. Numerical Functional Analysis and Optimization. 37 (2016), no. 1, 80 – 91.
- S. Rajesh, P. Veeramani. Chebyshev center and fixed point theorems. Journal of Mathematical Analysis and Applications. 422 (2015), no. 2, 880 – 885.

Dept. Of Physics

Dr. Rudra Sekhar Manna

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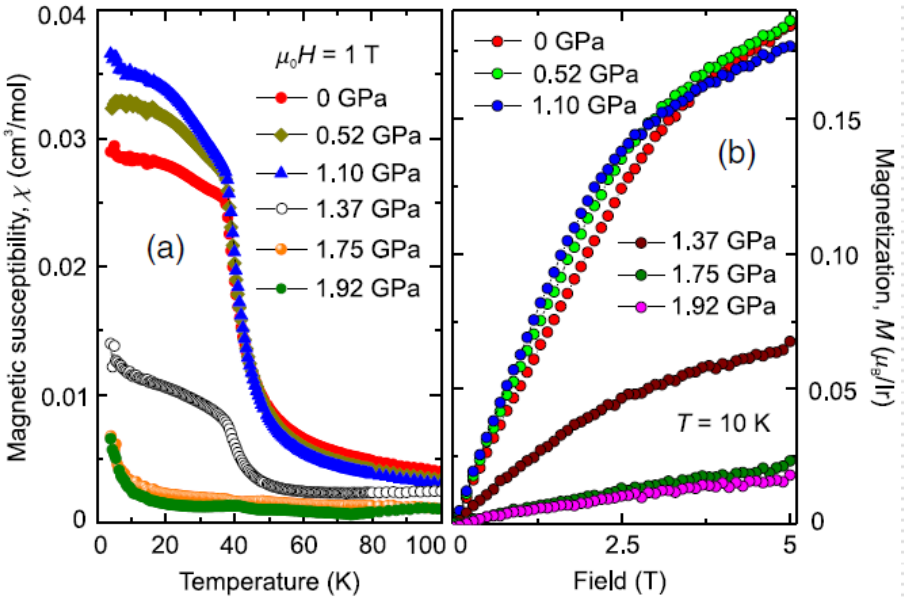
भारतीय प्रौद्योगिकी संस्थान तिरुपति

TIRUPATI

- PhD – Goethe University, Germany
- Postdoc experience – Goethe and Augsburg University, Germany
- Areas of Specialization – Experimental condensed matter physics

Areas of Research

- Experiments at extreme conditions: very low temperatures, high magnetic fields and high pressures
- Strongly correlated electron phenomena, e.g., spin-orbit coupled iridates, quantum spin-liquid, metal-insulator transition, superconductivity, and magnetism



Magnetic susceptibility (at constant field) of 3D spin-orbit coupled Mott insulator β-Li_2IrO_3 as a function of temperature at different pressures and magnetization curves (at constant temperature) as a function of field measured at different pressure. Pressure-induced classical spin-liquid state has been proposed.

M. M.$, **R. S. Manna$**, G. Simutis, J. C. Orain, T. Dey, F. Freund, A. Jesche, R. Khasanov, P. K. Biswas, E. Bykova, N. Dubrovinskaia, L.S. Dubrovinsky, R. Yadav, L. Hozoi, S. Nishimoto, A. A. Tsirlin, and P. Gegenwart, Phys. Rev. Lett. **120**, 237202 (2018) *$ = equal contribution*

Dr. B. Koteswararao

Assistant Professor,

Department of Physics

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भारतीय प्रौद्योगिकी संस्थान तिरुपति

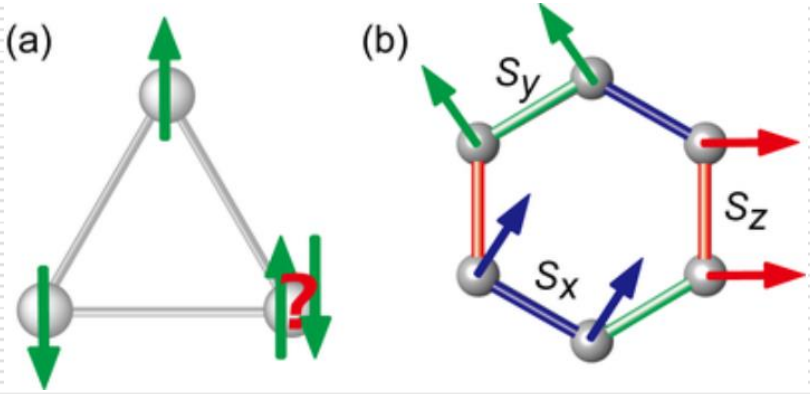
IIT TIRUPATI

- Ph.D. – IIT Bombay
- Areas of Specialization –

  Experimental Condensed Matter Physics

Areas of Research

- Geometrically Frustrated Magnets
- Multiferroics
- Low Dimensional Quantum Magnets
- Magnetic Materials with large Spin-Orbit coupling effects
- Single Crystal Growth



Magnetic frustration in two forms (a) Geometrical Frustration (b) frustration induced by Kitaev type Ising interactions

Publications

1. Kyongjun Yoo, B. Koteswararao, et al., "Magnetic field-induced ferroelectricity in S = 1/2 kagome staircase compound PbCu3TeO7", (Accepted in NPJ Quantum Materials (2018))

2. B. Koteswararao, et al. Large spontaneous exchange bias in a weak ferromagnet Pb6Ni9(TeO6)5, SCIENTIFIC REPORTS 7, 8300 (2017).

3. B. Koteswararao, et al. Bose-Einstein condensation of triplons in the S=1 tetramer antiferromagnet K2Ni2(MoO4)3: A compound close to quantum critical point, Physical Review B Rapid Communications 95, 180407(R)(2017).

Dept. Of Chemistry

Dr. Rajib Biswas

Assistant Professor, Department of Chemistry

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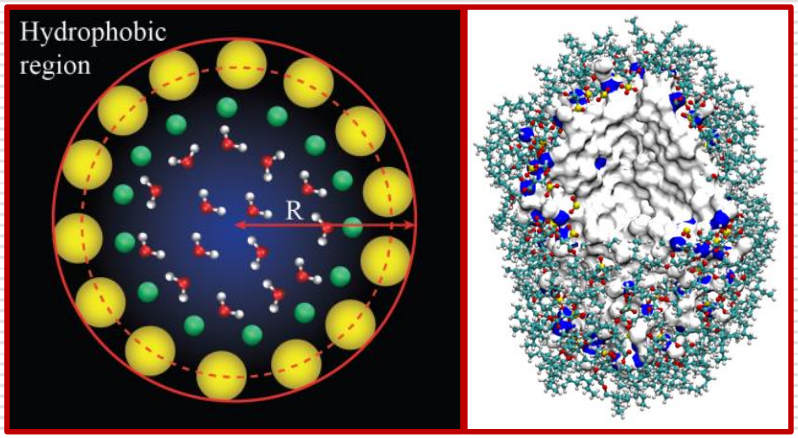
भारतीय प्रौद्योगिकी संस्थान तिरुपति

IIT TIRUPATI

- PhD – IISc, Bangalore
- Postdoc experience – U. Chicago, USA
- Areas of Specialization –Theoretical chemistry

Areas of Research

- Spectroscopic modeling of aqueous systems
- IR spectroscopy guided force-field development
- Chemical dynamics in condensed phases
- Properties of confined systems



Schematic representation of confined systems

- IR spectral assignments for the hydrated excess proton in liquid water, **R. Biswas**, *et. al. , J. Chem. Phys.* **146**, 154507 (2017)
- Molecular modeling and assignments of IR spectra of the hydrated excess proton in isotopically dilute water, **R. Biswas**, *et. al., J. Chem. Phys*. **145**, 154504 (2016).
- Role of Pre-Solvation and Anharmonicity in Aqueous Phase Hydrated Proton Solvation and Transport, **R. Biswas**, *et. al. , J. Phys. Chem. B* **120**, 1793, (2016).

Dr. Debasish Mondal

Assistant Professor, Department of Chemistry

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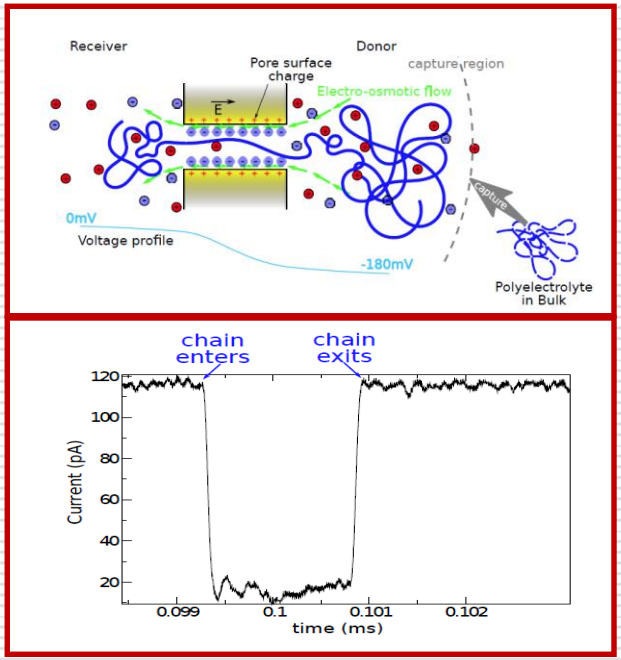
भारतीय प्रौद्योगिकी संस्थान तिरुपति

TIRUPATI

- PhD – IACS, Kolkata
- Postdoc experience – Virginia Tech, U. Mass (Amherst), LIPR-Dresden
- Areas of Specialization –Theoretical chemistry

Areas of Research

- Physics of Polymers
- Physical properties of active matter
- Principles of stochastic thermodynamics



Schematic diagram of a polymer translocation process and associated variation in current across the pore. (PC: H. Katkar)

- Pseudochemotaxis in inhomogeneous active Brownian systems, H. Vuijk, A. Sharma, **D. Mondal**, J. Sommer and H. Merlitz, *Phys. Rev. E* **97** 042612 (2018).
- Stochastic resonance during a polymer translocation process, **D. Mondal** and M. Muthukumar, *J. Chem. Phys*. **144**, 144901 (2016).
- Ratchet rectification effect on the translocation of a flexible polyelectrolyte chain, **D. Mondal** and M. Muthukumar, *J. Chem. Phys*. **145**, 084906 (2016).