

NMAMLD 2026

International Conference on Nonlocal Mechanics Approaches for Modelling Localized Deformations

DAY 1
Monday, 14 December

DAY 2
Tuesday, 15 December

DAY 3
Wednesday, 16 December

CONFERENCE PROGRAMME

14–16 December 2026 · Convention Center, IIT Hyderabad

Department of Civil Engineering
Indian Institute of Technology Hyderabad
nmamld2026.com

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14–16 December 2026 · Convention Center, IIT Hyderabad

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A	Auditorium 2	PL1 to PL12, TS1A to TS5A
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Programme at a Glance

All plenary lectures are in Auditorium 2. Technical sessions run in seven halls in parallel.

DAY 1 Monday, 14 December	DAY 2 Tuesday, 15 December	DAY 3 Wednesday, 16 December
08:00–09:00 *Registration*	08:00–09:00 *Registration*	08:30–09:00 *Registration*
09:00–09:30 *Inauguration*		
09:30–10:15 **PL1** Prof. J. N. Reddy	09:30–10:15 **PL5** Prof. Dayanand Reddy	09:30–10:15 **PL9** Prof. Ramesh Talreja
10:15–11:00 **PL2** Prof. Tarun Kant	10:15–11:00 **PL6** Prof. Arun R. Srinivasa	10:15–11:00 **PL10** Prof. K. V. L. Subramaniam
11:00–11:15 *Tea Break*	11:00–11:15 *Tea Break*	11:00–11:15 *Tea Break*
11:15–12:00 **PL3** Prof. Erdogan Madenci	11:15–12:00 **PL7** Prof. K. Ravi Chandar	11:15–12:00 **PL11** Prof. Ramulu Mamidala
12:00–12:45 **PL4** Prof. Paul Steinmann	12:00–12:45 **PL8** Prof. Pedro Camanho	12:00–12:45 **PL12** Prof. Debasish Roy
12:45–13:00 *Sponsor Presentation*	12:45–13:00 *Sponsor Presentation*	12:45–14:30 *Lunch*
13:00–14:00 *Lunch*	13:00–14:00 *Lunch*	
14:00–16:20 **TS1** **Technical Session 1**	14:00–16:20 **TS3** **Technical Session 3**	14:30–16:40 **TS4** **Technical Session 4**
16:20–16:40 *Tea Break*	16:20–16:40 *Tea Break*	16:40–17:10 *Tea Break*
16:40–18:20 **TS2** **Technical Session 2**	19:00–22:00 *Gala Dinner*	17:10–18:50 **TS5** **Technical Session 5**

Technical Sessions by Venue

All halls are in the Convention Center, IIT Hyderabad.

HALL	TS1 Mon · 14:00–16:20	TS2 Mon · 16:40–18:20	TS3 Tue · 14:00–16:20	TS4 Wed · 14:30–16:40	TS5 Wed · 17:10–18:50
Auditorium 2	**TS1A** Composite Interfaces and Structural Diagnostics	**TS2A** Computational Methods for Nonlocal Fracture	**TS3A** Phase-Field Models of Thermal and Interfacial Damage	**TS4A** Seismic and Extreme Loads on Civil Structures	**TS5A** Higher-Order and Coupled-Field Response
Conference Room 2	**TS1B** Experimental Characterization of Material Degradation	**TS2B** Fatigue Life and Crack Growth	**TS3B** Higher-Order Models of Beams, Plates and Membranes	**TS4B** Fracture of Soft Solids and Bonded Interfaces	**TS5B** Higher-Order Theories for Shells and Thick Plates
Conference Room 3	**TS1C** High-Rate Testing and Predictive Impact Mechanics	**TS2C** Lightweight Structures for Aerospace Loading	**TS3C** Crystal Plasticity and Grain-Scale Localization	**TS4C** Smart Structures and Vibration Control	**TS5C** Cyclic Loading and Fracture of Concrete
Conference Room 4	**TS1D** Cracking and Load Transfer in Concrete and Masonry	**TS2D** Cellular Materials under Impact and Blast	**TS3D** Coupled Simulation and Multiscale Mechanics	**TS4D** Propellants and Impact Protection in Aerospace Laminates	**TS5D** Vibration Monitoring and Structural Acoustics
Conference Room 5	**TS1E** Damage in Printed Composites and Architected Solids	**TS2E** Finite Deformation and Fracture of Polymers	**TS3E** Rupture and Localization in Rocks and Granular Media	**TS4E** Concrete Mix Design and Structural Performance	**TS5E** Phase-Field Models of Crack Growth and Fatigue
Seminar Hall 8	**TS1F** Blast Response of Concrete Structures	**TS2F** Sandwich Panels and Composite Plate Mechanics	**TS3F** Nonlinear Response of Concrete and Masonry Structures	**TS4F** Thermomechanics of Layered and Graded Materials	**TS5F** Peridynamic Models of Brittle and Layered Solids
Seminar Hall 9	**TS1G** Nonlocal Elasticity and Length-Scale Effects	**TS2G** Data-Driven Material and Constitutive Models	**TS3G** Prediction and Optimization of Material Response	**TS4G** Nonlocal Damage and Material Interfaces	**TS5G** Rate Effects in Impact and Localized Deformation

IIT HYDERABAD

Centre for Continuing Education Building

Ground Floor

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WAY TO GO

FIND YOUR VENUE

3 3rd Floor
Conference Room 4 | Conference Room 5

2 2nd Floor
Conference Room 2 | Conference Room 3
Seminar Room 8 | Seminar Room 9

1 1st Floor
No venue

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Auditorium 2

IIT HYDERABAD

Convention Centre Building

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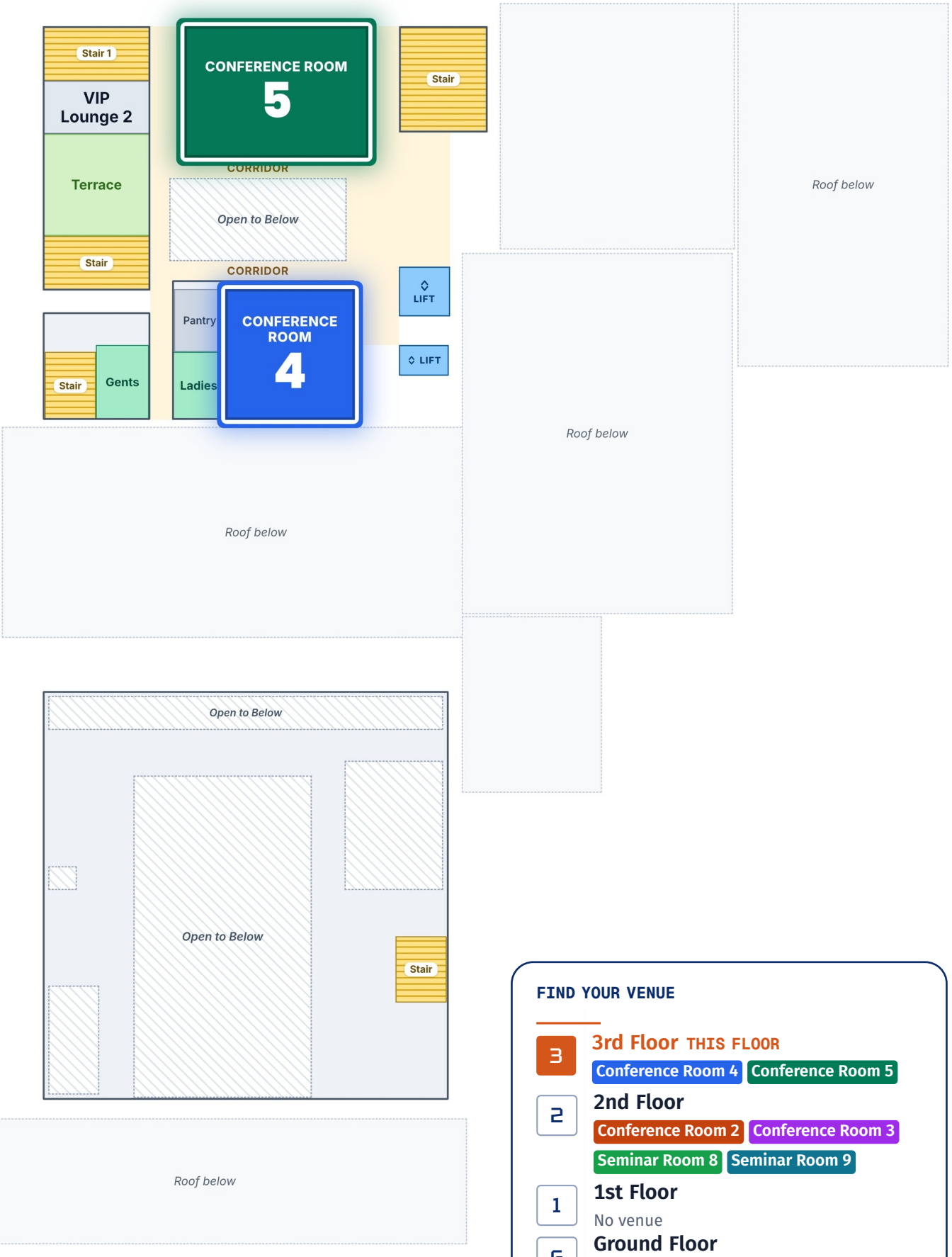
IIT HYDERABAD

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Conference Room 4 · Conference Room 5

2 2nd Floor
Conference Room 2 · Conference Room 3
Seminar Room 8 · Seminar Room 9

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Auditorium 2

DAY 1

Monday, 14 December 2026

Plenary lectures PL1 to PL4 · Technical sessions TS1 and TS2

TIME	PROGRAMME
08:00–09:00	*Registration*
09:00–09:30	*Inauguration*
Session Chair	Prof. Ramesh Talreja · PL1 and PL2
09:30–10:15 PL1	**Prof. J. N. Reddy**, Texas A&M University, USA *An overview of nonlocal models in structural mechanics*
10:15–11:00 PL2	**Prof. Tarun Kant**, IIT Bombay, India *Elastic beam-plate-shell theories without assumptions*
11:00–11:15	*Tea Break*
Session Chair	Prof. Arun R. Srinivasa · PL3 and PL4
11:15–12:00 PL3	**Prof. Erdogan Madenci**, The University of Arizona, USA *Peridynamics: Modeling beyond material failure*
12:00–12:45 PL4	**Prof. Paul Steinmann**, University of Erlangen, Germany *Integral-type nonlocal elasticity: Challenges and perspectives*
12:45–13:00	*Sponsor Presentation*
13:00–14:00	*Lunch*
14:00–16:20 TS1	**Technical Session 1** Seven parallel sessions, TS1A to TS1G · page 10
16:20–16:40	*Tea Break*
16:40–18:20 TS2	**Technical Session 2** Seven parallel sessions, TS2A to TS2G · page 18

TS1 Technical Session 1

Monday, 14 December · 14:00–16:20 IST · seven halls in parallel

CODE	SESSION THEME	LEAD LECTURES
TS1A	**Composite Interfaces and Structural Diagnostics** Auditorium 2 · Chair: Prof. P. J. Guruprasad	Prof. D. Roy Mahapatra KEYNOTE Prof. Padmanabhan Krishnan INVITED
TS1B	**Experimental Characterization of Material Degradation** Conference Room 2 · Chair: Prof. Raj Das	Prof. Raghu Prakash KEYNOTE
TS1C	**High-Rate Testing and Predictive Impact Mechanics** Conference Room 3 · Chair: Prof. S. Pradyumna	Prof. R. Velmurugan KEYNOTE
TS1D	**Cracking and Load Transfer in Concrete and Masonry** Conference Room 4 · Chair: Dr. Maganti Janardhan Yadav	Prof. G. Appa Rao KEYNOTE
TS1E	**Damage in Printed Composites and Architected Solids** Conference Room 5 · Chair: Dr. Arun C O	Dr. Sanhita Das INVITED Dr. Anshul Faye INVITED
TS1F	**Blast Response of Concrete Structures** Seminar Hall 8 · Chair: Prof. K. V. L. Subramaniam	Prof. Vasant Matsagar KEYNOTE Prof. T. Phanirama Tezeswi INVITED
TS1G	**Nonlocal Elasticity and Length-Scale Effects** Seminar Hall 9 · Chair: Dr. Archana Arbind	Dr. Senthilkumar Vaiyapuri INVITED

TS1A Auditorium 2 14:00–16:20

Composite Interfaces and Structural Diagnostics

Session Chair Prof. P. J. Guruprasad

14:00–14:30 KEYNOTE	**Prof. D. Roy Mahapatra**, IISc Bengaluru, India *Title to be announced*
14:30–14:55 INVITED	**Prof. Padmanabhan Krishnan**, VIT Vellore, India *A failure theory for the local interfacial failures in fibre-polymer composites after hygrothermal degradation and the implications at the laminate level failures*
14:55–15:10 PAPER ID: 157	**Goutham Boda, PM Mohite**, IIT Kanpur, India *Fabrication and experimental investigation of carbon-veil integrated GFRP for radar absorption*
15:10–15:25 PAPER ID: 154	**Siddalingappa Venkatappagari, Rajasekhara Reddy Mutra, Ayitha Sreenivasulu, D. Mallikarjuna Reddy**, VIT Vellore, India *Experimental investigation of load-carrying capacity in CFRP flat-joggle-flat adhesive joints: Comparison with single-lap joints and different bonding techniques*
15:25–15:40 PAPER ID: 281	**Venugopal M M**, Nitte Meenakshi Institute of Technology (NMIT), Bengaluru, India *Coupon-aware machine learning benchmark for Lamb-wave-based composite damage diagnosis*
15:40–15:55 PAPER ID: 133	**Sarath Chandra Dangeti, Sivaramakrishna Valiveti, M.S. Srinivasa Rao, CH. Rajeswari**, VNRVJIET Hyderabad, India *Development and characterization of nano-reinforced GFRP and metal matrix composites for lightweight automotive body applications*
15:55–16:10 PAPER ID: 244	**Sanjeev Kumar Sarswat, Azhar Jamil, Kunwar Masoom**, Aligarh Muslim University, Aligarh, India *Assessment of fracture data-reduction methods for mode I, mode II and mixed-mode loading of CFRP-Nomex® honeycomb sandwich structures*

TS1B Conference Room 2 14:00–16:20

Experimental Characterization of Material Degradation

Session Chair Prof. Raj Das

14:00–14:30 KEYNOTE	**Prof. Raghu Prakash**, IIT Madras, India *Use of small specimen test technique to assess the mechanical behavior of materials - correlation of results with standard specimen test data*
14:30–14:45 PAPER ID: 171	**Abhijeet Yadav, Meena Murmu**, NIT Raipur, India *Performance evaluation of concrete with partial replacement of cement by red mud and hydrated lime with basalt fiber reinforcement*
14:45–15:00 PAPER ID: 16	**S.K Pandey, M.K Samal, S.D Sajish**, HBNI, BARC & IGCAR, India *Numerical investigation of ductile damage propagation in pressure vessel steel using Johnson-Cook model and comparison with experiment*
15:00–15:15 PAPER ID: 19	**Pankaj K. Sharma, M. K. Samal, Ather Syed**, HBNI & BARC Mumbai, India *Influence of molten-glass-induced surface defects on localized deformation and damage evolution in alloy 690*
15:15–15:30 PAPER ID: 243	**Rishabh, Rohit, Anil Singh, Paras Kumar, Qasim Murtaza**, Delhi Technological University, Delhi, India *Experimental screening of molybdenum-based additives in lithium-complex grease for railway bearing applications*
15:30–15:45 PAPER ID: 117	**Ayitha Sreenivasulu, Mallikarjuna Reddy D, Siddalingappa Venkatappagari, Rajasekhara Reddy Mutra**, VIT Vellore, India *Investigation of tensile behaviour, damage and fracture mechanisms of LPBF-processed IN718 under different post-processing conditions*
15:45–16:00 PAPER ID: 173	**Piyush Gaur, Navish Jain, Hemant Chouhan**, UPES Dehradun & Ahmedabad University, India *Strain-rate-dependent constitutive modelling of UHMWPE under 9 mm ballistic impact: Comparison of damage and elastoplastic frameworks*

TS1C Conference Room 3 14:00–16:20

High-Rate Testing and Predictive Impact Mechanics

Session Chair Prof. S. Pradyumna

14:00–14:30 KEYNOTE	**Prof. R. Velmurugan**, IIT Madras, India *High strain rate studies of metallic and non metallic materials- experimentation and simulation*
14:30–14:45 PAPER ID: 269	**Shrimanti Gawande, Vatsalya Budhraja, Gaurav Tiwari**, Ramdeobaba University, Nagpur & VNIT Nagpur, India *Predictive modeling of residual velocity in hybrid alumina-aluminum armor using finite element analysis and machine learning*
14:45–15:00 PAPER ID: 194	**Mahendralal Behera, Pattabhi Ramaiah Budarapu**, IIT Bhubaneswar, India *Generative deep learning for impact simulation: Parameter-to-image synthesis using cGAN*
15:00–15:15 PAPER ID: 245	**Jagan K, Lokavarapu Bhaskara Rao**, Vellore Institute of Technology, Chennai, India *A comparative numerical computation between two spaced target systems with different material strength sequencing against high velocity impact of a spherical projectile*
15:15–15:30 PAPER ID: 272	**Phani Kutani, Ravi Mudragada, Jailsingh Bassi, Sindhuja Kashana**, Mahindra University, Anurag University & GIET Hyderabad, India *Data-driven prediction of impact resistance of UHPFRC slabs using machine learning techniques*
15:30–15:45 PAPER ID: 270	**Melekkalam Aswathi, Ravi Mudragada, Sri Kalyana Rama Jyosyula**, Mahindra University, Hyderabad, India *Drop-weight impact response of shear span-dependent UHPFRC beams*
15:45–16:00 PAPER ID: 273	**Karthik Nekkanti, Sri Kalyana Rama Jyosyula, Ravi Mudragada**, Mahindra University, Hyderabad, India *A unified input-driven rate-dependent tensile constitutive model for UHPFRC*

TS1D Conference Room 4 14:00–16:20

Cracking and Load Transfer in Concrete and Masonry

Session Chair Dr. Maganti Janardhan Yadav

14:00–14:30 KEYNOTE	**Prof. G. Appa Rao**, IIT Madras, India *Influence of tension softening of quasi-brittle material on global behaviour of RC structures*
14:30–14:45 PAPER ID: 237	**Prashanth M H, Pruthviraj S, Chandra Kishen J M**, NITK Surathkal & IISc Bangalore, India *Damage evolution and shear failure behaviour in reinforced concrete beam without shear reinforcement using size effect model through acoustic emission technique*
14:45–15:00 PAPER ID: 21	**Prashanth VP, Karthik S, Amirtham Rajagopal**, JSSSTU, DSCE & IIT Hyderabad, India *Bi-material interfaces fracture studies and failure predication of conventional and recycled aggregate concrete composite system systems using size effect analysis and digital image correlation*
15:00–15:15 PAPER ID: 262	**Hemam Amarjit Singh, Rimen Jamatia**, Indian Institute of Technology Jammu, India *Modified Hsieh-Ting-Chen (HTC) equivalent strain based localizing gradient damage model for concrete fracture simulation*
15:15–15:30 PAPER ID: 148	**Roshini Ramanathan, Keerthana Kirupakaran**, IIT Madras, India *Fracture process zone characteristics and discrete-crack modelling of plain and steel fibre-reinforced concrete*
15:30–15:45 PAPER ID: 138	**Harmin B. Budheliya, Sandip Mondal, Mahesh Gaikwad, Sanjaykumar M. Dave**, MSU Baroda & CSIR-CRRI New Delhi, India *Flexural stress response of rigid pavement slabs under varying concrete elastic modulus*
15:45–16:00 PAPER ID: 139	**Vidya Malgonda Patil, Mahesh M. Awati, Abhijeet Chandrakant Lande**, ADCET Ashta & TCE Gadag, India *Evaluation of cyclic and monotonic performance of high strength concrete beam column joints*

TS1E Conference Room 5 14:00–16:20

Damage in Printed Composites and Architected Solids

Session Chair Dr. Arun C O

14:00–14:25 INVITED	**Dr. Sanhita Das**, IIT Jodhpur, India *Non-local models for damage, intrinsic and extrinsic self-healing in amorphous materials*
14:25–14:50 INVITED	**Dr. Anshul Faye**, IIT Bhilai, India *Failure mechanics of calcified aneurysmatic tissues*
14:50–15:05 PAPER ID: 136	**Sarvesh Joshi, S. Mohammad Mousavi, Jingye Tan, Craig M. Hamel, Stavros Gaitanaros, Prashant K. Purohit, Ryan Alberdi, Nikolaos Bouklas**, Cornell, Sandia Labs, USC, Penn & DTU, USA & Denmark *Influence of heterogeneity in architected metamaterials: A gradient-enhanced continuum approach*
15:05–15:20 PAPER ID: 183	**A Chinnu, R Ramakrishnan, Shrutika Mane**, Vellore Institute of Technology, India *Experimental and numerical investigation of strain localization in 4D printed lattice structure for recoverable energy absorption*
15:20–15:35 PAPER ID: 238	**Manoj S, Sangamesh C. Godi, Shivashankar R. Srivatsa, K Dhanush, Anil Chandra A.R.**, BMS College of Engineering, Bengaluru & TUV Rheinland, India *Effect of conditioning temperature and raster orientation on the flexural behavior of 3D printed short carbon fibre-reinforced nylon (Onyx)*
15:35–15:50 PAPER ID: 239	**K Dhanush, Shivashankar R. Srivatsa, Sangamesh C. Godi, Manoj S, Anil Chandra A.R.**, BMS College of Engineering, Bengaluru & TUV Rheinland, India *Low-temperature tensile performance of 3D printed Onyx composite with uniform and sequential layer orientations*
15:50–16:05 PAPER ID: 232	**Upanshu Jha, Vishesh Prasanna Sarapure, Shubhrodeep Sen, Benedict Thomas**, VIT Vellore, India *Design and numerical investigation of amethyst starling feather-inspired lattice structures for enhanced energy absorption*

TS1F Seminar Hall 8 14:00–16:20

Blast Response of Concrete Structures

Session Chair Prof. K. V. L. Subramaniam

14:00–14:30 KEYNOTE	**Prof. Vasant Matsagar**, IIT Delhi, India *Behavior of multilayered sandwich panels under cascading impact and blast loading scenarios*
14:30–14:55 INVITED	**Prof. T. Phanirama Tezeswi**, NIT Warangal, India *Microstructure-informed nonlocal tensorial damage model for thermally degraded cementitious materials*
14:55–15:10 PAPER ID: 115	**Md Imran Mohnavi, G. Appa Rao**, IIT Madras, India *Reinforced concrete columns under close-proximity simultaneous blast along their length: A numerical assessment*
15:10–15:25 PAPER ID: 292	**William Paul CE, Kireeti Thatipalli, Saurabh Kulkarni, Amirtham Rajagopal**, DRDO & IIT Hyderabad, India *Blast-induced strain response of UHPC slabs*
15:25–15:40 PAPER ID: 286	**Prudhvi Rani Anneboina, Dharun Krishna, Rajagopal Amirtham**, Indian Institute of Technology Hyderabad, India *Theoretical and numerical analysis of ultra-high performance concrete beams under blast loading*
15:40–15:55 PAPER ID: 205	**Kangkana Kaushik Baruah, Hrishikesh Sharma**, IIT Guwahati, India *Numerical modelling of sequential warhead penetration and embedded explosion damage in reinforced concrete protective structures*
15:55–16:10 PAPER ID: 118	**Gulshan Kumar Yadav, Mukund Lahoti, Anant Mishra, Ravi Kant Mittal**, BITS Pilani & Navrachana University, India *Comparative assessment of reinforced concrete, hollow steel and concrete filled steel tube piles under blast load*

TS1G Seminar Hall 9 14:00–16:20

Nonlocal Elasticity and Length-Scale Effects

Session Chair Dr. Archana Arbind

14:00–14:25 INVITED	**Dr. Senthilkumar Vaiyapuri**, CSIR-National Institute of Data Science and AI, India *New insights in Toupin-Mindlin nonlocal/microstructure strain-gradient elasticity*
14:25–14:40 PAPER ID: 58	**Malapeta Hemasundara Rao, Shubham Desai, Sai Sidhardha**, IIT Hyderabad, India *Force-at-a-distance effects reduce stress concentration around holes: A fractional-order nonlocal elasticity study*
14:40–14:55 PAPER ID: 61	**Siva Poornan Vasudevan, Phanisri Pradeep Pratapa**, IIT Madras, India *Higher-gradient homogenization of hybrid morph origami metamaterial: Stretching and bending Poisson's ratios*
14:55–15:10 PAPER ID: 271	**Neelima Bhengra, Vivek Kumar Gupta**, Visvesvaraya National Institute of Technology, Nagpur, India *Investigation of mode-I crack in a micropolar orthotropic medium using nonlocal theory*
15:10–15:25 PAPER ID: 62	**Kanishka Bhattacharya, Amar Prakash, Venkatesan J, Ramesh Kumar V, N Anandavalli**, CSIR-SERC Chennai, India *A modified peridynamics formulation with the horizon as a localisation limiter*
15:25–15:40 PAPER ID: 15	**Gaurab Kumar Khanra, Animesh Pandey**, JNCASR Bengaluru, India *A general nonlocal beam finite element for static two-point boundary value problems of nanobeams*

TS2 Technical Session 2

Monday, 14 December · 16:40–18:20 IST · seven halls in parallel

CODE	SESSION THEME	LEAD LECTURES
TS2A	**Computational Methods for Nonlocal Fracture** Auditorium 2 · Chair: Prof. K. V. L. Subramaniam	Prof. Timon Rabczuk KEYNOTE ONLINE Prof. Marco Paggi KEYNOTE ONLINE
TS2B	**Fatigue Life and Crack Growth** Conference Room 2 · Chair: Prof. Raghu Prakash	Prof. I. V. Singh KEYNOTE
TS2C	**Lightweight Structures for Aerospace Loading** Conference Room 3 · Chair: Prof. D. Roy Mahapatra	Prof. Srikanth Vedantam KEYNOTE
TS2D	**Cellular Materials under Impact and Blast** Conference Room 4 · Chair: Prof. Vasant Matsagar	Prof. Raj Das KEYNOTE
TS2E	**Finite Deformation and Fracture of Polymers** Conference Room 5 · Chair: Prof. Manoj Pandey	Prof. Sumit Basu KEYNOTE
TS2F	**Sandwich Panels and Composite Plate Mechanics** Seminar Hall 8 · Chair: Prof. Padmanabhan Krishnan	Prof. S. Pradyumna KEYNOTE
TS2G	**Data-Driven Material and Constitutive Models** Seminar Hall 9 · Chair: Prof. Eugenio Ruocco	Prof. Hüsnü Dal KEYNOTE

TS2A Auditorium 2 16:40–18:20

Computational Methods for Nonlocal Fracture

Session Chair Prof. K. V. L. Subramaniam

16:40–17:10 KEYNOTE ONLINE
Prof. Timon Rabczuk, Bauhaus University Weimar, Germany
Nonlocal operator based computational mechanics: From variational fracture to constitutive uncertainty

17:10–17:40 KEYNOTE ONLINE
Prof. Marco Paggi, IMT Lucca, Italy
Nonlocal damage simulation in architected materials

17:40–17:55 PAPER ID: 81
Sarthak K. Vora, Srikanth Vedantam, IIT Madras, India
Reliability analysis of a brittle fracture: A probabilistic constitutive-informed particle dynamics approach

17:55–18:10 PAPER ID: 79
Kalyan N S S P, Sathvik Sanapala, Ramesh Kannan Kandasami, Alagappan Ponnalagu, Yutaka Fukumoto, IIT Madras & Okayama University, India & Japan
GPU-accelerated peridynamics coupled with the discrete element method: Implementation and applications

TS2B Conference Room 2 16:40–18:20

Fatigue Life and Crack Growth

Session Chair Prof. Raghu Prakash

16:40–17:10 KEYNOTE	**Prof. I. V. Singh**, IIT Roorkee, India *Title to be announced*
17:10–17:25 PAPER ID: 236	**Naveen Kumar, Gaurav Singh**, IIT Delhi, India *Study on crack propagation in rotating machine elements under mixed-mode fatigue loading*
17:25–17:40 PAPER ID: 324	**Ved Prakash Sharma, Suneel Choudhary, G. A. Harmain**, NIT Srinagar, India *Load ratio dependent high temperature fatigue crack growth in AA7075-T651*
17:40–17:55 PAPER ID: 218	**Velu M, Murali Akkula**, VIT Vellore, India *Experimental studies of fracture and fatigue crack growth rates of electron beam welded dissimilar titanium joints*
17:55–18:10 PAPER ID: 127	**M. L. Pavan Kishore, K. Rakesh, Ch. Siddeshwar**, ICFAI Foundation for Higher Education, Hyderabad, India *Material-dependent fatigue and structural reliability of an automotive steering knuckle: A finite element study*

TS2C Conference Room 3 16:40–18:20

Lightweight Structures for Aerospace Loading

Session Chair Prof. D. Roy Mahapatra

16:40–17:10 KEYNOTE	**Prof. Srikanth Vedantam**, IIT Madras, India *Constitutively informed particle dynamics models for prediction of failure and fatigue*
17:10–17:25 PAPER ID: 159	**Sagar VC, Ankit Patel, PM Mohite**, IIT Kanpur, India *Experimental and finite element analysis of bending-induced wrinkling and load-deflection behaviour in thin-walled inflatable cylindrical booms*
17:25–17:40 PAPER ID: 201	**Namita Nanda, Santosh Kapuria**, IIT Delhi, India *Guided wave propagation analysis in composite curved beams with stepped cross-section using a time domain spectral finite element method*
17:40–17:55 PAPER ID: 153	**Satyajeet Dash, B N Rao**, IIT Madras, India *Localized deformation associated with dynamic buckling of variable stiffness laminated composite plates*
17:55–18:10 PAPER ID: 177	**Meera G Nair, Arbind Kumar Singh**, IIT Guwahati, India *Progressive failure analysis and damage evaluation of GLARE laminates using peridynamics*

TS2D Conference Room 4 16:40–18:20

Cellular Materials under Impact and Blast

Session Chair Prof. Vasant Matsagar

16:40–17:10 KEYNOTE	**Prof. Raj Das**, RMIT University, Australia *Deformation behaviour of hybrid FCC-TPMS lattices under high strain rate loading*
17:10–17:25 PAPER ID: 279	**Amit Prakash, Shankar Krishnapillai, R. Gnanamoorthy**, Indian Institute of Technology Madras, India *Experimental study on flexural strength and energy absorption of spinodoid based cellular beams*
17:25–17:40 PAPER ID: 59	**Kaviarasu K., Alagappan P., Prosenjit Das**, IISc Bengaluru & IIT Madras, India *Numerical investigation of blast-wave infiltration, strain localization and fracture in open-cell ceramic foam*
17:40–17:55 PAPER ID: 122	**Abhishek David, Arun Kumar Singh, Vinod Kumar, Indrasen Singh**, IIT Indore, India *Load-dependent transition in the blast response of in-plane and out-of-plane honeycomb sandwich structures*
17:55–18:10 PAPER ID: 263	**Mohnish Rajpoot, Suman Chandel, Suman Kumar**, CSIR-CBRI Roorkee & AcSIR Ghaziabad, India *Localized deformation of double arrowhead auxetic panel under blast loading: A numerical investigation*

TS2E Conference Room 5 16:40–18:20

Finite Deformation and Fracture of Polymers

Session Chair Prof. Manoj Pandey

16:40–17:10 KEYNOTE	**Prof. Sumit Basu**, IIT Kanpur, India *Statistics of fracture surfaces in heterogeneous brittle solids using phase field models*
17:10–17:25 PAPER ID: 10	**Hari Kishan Adusumilli, Turaka Srinivasa Rao, Ashok Kumar Nallathambi**, NIT Tiruchirappalli, India *Elastic-viscoelastic-viscoplastic bond-associated NOSB-PD modelling of fracture initiation in notched polycarbonate specimens*
17:25–17:40 PAPER ID: 200	**Turaka Srinivasa Rao, Hari Kishan Adusumilli, Ashok Kumar Nallathambi**, NIT Tiruchirappalli, India *Effect of impactor geometry on the dynamic fracture of PMMA: A rate-dependent viscoelastic peridynamic analysis*
17:40–17:55 PAPER ID: 246	**Harini Subramanian, Shubham Prajapati**, Indian Institute of Technology Gandhinagar, India *A fully coupled constitutive model for polymers under hygrothermal conditions*
17:55–18:10 PAPER ID: 266	**Devashish Das, Sanjeev Kumar, Deep Chatterjee, Rashmi Ranjan Das**, IIT (ISM) Dhanbad, India *Experimental and numerical investigation of 3D surface flaw mechanics in PMMA and rock-like materials*

TS2F Seminar Hall 8 16:40–18:20

Sandwich Panels and Composite Plate Mechanics

Session Chair Prof. Padmanabhan Krishnan

16:40–17:10 KEYNOTE	**Prof. S. Pradyumna**, IIT Delhi, India *Fracture analysis of multi-directionally functionally graded materials*
17:10–17:25 PAPER ID: 144	**Ravi Kant Kumar, Nomendra Tomar, S. Pradyumna**, IIT Delhi, India *Dynamics analyses of functionally graded plates with auxetic sandwich core using experimentally characterized properties*
17:25–17:40 PAPER ID: 250	**Deep Chatterjee, Krishna Kumar Verma, Deepak Kumar Sah, Rashmi Ranjan Das**, IIT (ISM) Dhanbad, India *Non-local strain progressive damage-based computational failure analysis of a notched FRP composite plate using 3D orthotropic solid/shell finite elements*
17:40–17:55 PAPER ID: 329	**Ram Mohan Sharma, Prasad Onkar S**, IIT Hyderabad, India *Design and development of a modular fibre-reinforced composite structure for defence applications*
17:55–18:10 PAPER ID: 64	**Pavan Kishore M.L., Avinash M., Manmadha Chary A.**, ICFAI Tech Hyderabad, India *Fibre orientation and stacking symmetry effects on the free vibration of simply supported plates*

TS2G Seminar Hall 9 16:40–18:20

Data-Driven Material and Constitutive Models

Session Chair Prof. Eugenio Ruocco

16:40–17:10 KEYNOTE	**Prof. Hüsnü Dal**, Middle East Technical University, Turkey *Towards material digital twins: Data-driven constitutive mechanics of rubberlike materials*
17:10–17:25 PAPER ID: 284	**Janani Anbu Anandhan, Shankar Krishnapillai, Velmurugan Ramachandran**, Indian Institute of Technology Madras, India *Machine learning for constitutive tensor prediction of lattice structures*
17:25–17:40 PAPER ID: 50	**Bhukya Venkatesh, Sunny Sharma, Phanindra Paravastu**, IIT Madras, India *Physics-informed transfer learning for rapid adaptation across elasticity problems with geometric and loading variations*
17:40–17:55 PAPER ID: 242	**K. V. Mohankumar, Samiksha Shibin, Anannya Paritosh Sule, Hirdaya Pradeep**, Vellore Institute of Technology, Vellore, India *An invariant-space framework for the generation and qualification of multiaxial deformation states for constitutive modeling*
17:55–18:10 PAPER ID: 255	**Sharan Chandran, Chandaluri Sri Manaswini, Koushik Vatsavai, Mudit Bhalla**, Vellore Institute of Technology, Vellore, India *Generalizable physics-constrained machine learning for mechanical property prediction in natural-fibre-reinforced polymer composites*

DAY 2

Tuesday, 15 December 2026

Plenary lectures PL5 to PL8 · Technical session TS3 · Gala dinner

TIME	PROGRAMME
08:00–09:00	*Registration*
Session Chair	Prof. Erdogan Madenci · PL5 and PL6
09:30–10:15 PL5	**Prof. Dayanand Reddy**, University of Cape Town, South Africa *Modelling plasticity at the microscale*
10:15–11:00 PL6	**Prof. Arun R. Srinivasa**, Texas A&M University, USA *Size effect in concrete fracture*
11:00–11:15	*Tea Break*
Session Chair	Prof. Paul Steinmann · PL7 and PL8
11:15–12:00 PL7	**Prof. K. Ravi Chandar**, The University of Texas at Austin, USA *Nucleation and growth of cracks in elastomers*
12:00–12:45 PL8	**Prof. Pedro Camanho**, Universidade do Porto, Portugal *Inelastic deformation and fracture of composite material across the scales*
12:45–13:00	*Sponsor Presentation*
13:00–14:00	*Lunch*
14:00–16:20 TS3	**Technical Session 3** Seven parallel sessions, TS3A to TS3G · page 23
16:20–16:40	*Tea Break*
19:00–22:00	*Gala Dinner*

TS3 Technical Session 3

Tuesday, 15 December · 14:00–16:20 IST · seven halls in parallel

CODE	SESSION THEME	LEAD LECTURES
TS3A	**Phase-Field Models of Thermal and Interfacial Damage** Auditorium 2 · Chair: Prof. Raghu Prakash	Prof. Ravindra Duddu KEYNOTE Dr. Mohammad Masiur Rahaman INVITED
TS3B	**Higher-Order Models of Beams, Plates and Membranes** Conference Room 2 · Chair: Dr. Archana Arbind	Dr. Sushma Santapuri INVITED Dr. Prakhar Gupta INVITED
TS3C	**Crystal Plasticity and Grain-Scale Localization** Conference Room 3 · Chair: Dr. Sanhita Das	Dr. Chandra Prakash INVITED
TS3D	**Coupled Simulation and Multiscale Mechanics** Conference Room 4 · Chair: Prof. S. Pradyumna	Prof. Manoj Pandey INVITED Prof. P. J. Guruprasad INVITED
TS3E	**Rupture and Localization in Rocks and Granular Media** Conference Room 5 · Chair: Prof. Srikanth Vedantam	Prof. Maddegedara Lalith Lakshman Wijerathne KEYNOTE
TS3F	**Nonlinear Response of Concrete and Masonry Structures** Seminar Hall 8 · Chair: Prof. G. Appa Rao	Prof. S. Suriya Prakash KEYNOTE
TS3G	**Prediction and Optimization of Material Response** Seminar Hall 9 · Chair: Prof. Raj Das	Prof. Eugenio Ruocco INVITED

TS3A Auditorium 2 14:00–16:20

Phase-Field Models of Thermal and Interfacial Damage

Session Chair Prof. Raghu Prakash

14:00–14:30 KEYNOTE	**Prof. Ravindra Duddu**, Vanderbilt University, USA *Phase field modeling of fracture in glaciers and composite plates using FEniCS*
14:30–14:55 INVITED	**Dr. Mohammad Masiur Rahaman**, IIT Bhubaneswar, India *Capturing intrinsic size effects in fatigue failure using a length scale insensitive micropolar phase-field model*
14:55–15:10 PAPER ID: 41	**Sunny Sharma, Srikanth Vedantam, Balkrishna C. Rao**, IIT Madras, India *Multiscale thermal-phase-field modelling of grain morphology evolution during laser powder bed fusion of Inconel 718*
15:10–15:25 PAPER ID: 229	**Abhishek Kumar, S. Parivallal, Sundararajan Natarajan**, CSIR-SERC Chennai, AcSIR & IIT Madras, India *Hydrogen-induced strength degradation and fatigue crack initiation life in a microplasticity-coupled cohesive phase-field model*
15:25–15:40 PAPER ID: 60	**Soumyajit Ghosh, Svetha Venkatachari, Mohammad Masiur Rahaman**, IIT Delhi & IIT Bhubaneswar, India *Micropolar phase-field modeling of laminated glass subjected to fire*
15:40–15:55 PAPER ID: 44	**Lalit Kushwaha, Ushasi Roy**, IIT Kanpur, India *A coupled phase-field finite element model to simulate frictional heating in energetic materials*
15:55–16:10 PAPER ID: 168	**Krishna Lok S.**, CSIR-NAL Bengaluru, India *Nonlocal and phase-field modelling of buckling-induced damage and fatigue interaction in stiffened composite structures*

TS3B Conference Room 2 14:00–16:20

Higher-Order Models of Beams, Plates and Membranes

Session Chair Dr. Archana Arbind

14:00–14:25 INVITED	**Dr. Sushma Santapuri**, IIT Delhi, India *A gradient electromechanical theory for flexoelectric plates and soft membranes*
14:25–14:50 INVITED	**Dr. Prakhar Gupta**, IIT Hyderabad, India *Effect of higher-order boundary conditions on strain-gradient nonlinear slender structures*
14:50–15:05 PAPER ID: 134	**S L Akhil, I R Praveen Krishna**, IIST Thiruvananthapuram, India *Element-free Galerkin method for buckling analysis of stress-driven nonlocal nanobeams*
15:05–15:20 PAPER ID: 150	**Jaishree Chauhan, Manish More, Gaurav Tiwari, Tushar Saratkar**, VNIT Nagpur, India *What integral nonlocal averaging of uncoupled damage regularizes: A mesh study of ballistic plugging in Ti-6Al-4V*
15:20–15:35 PAPER ID: 63	**Shankar N. Mahendru, Tanmay K. Bhandakkar**, IIT Bombay, India *Mode-II loaded periodic array of cracks in couple stress elasticity*
15:35–15:50 PAPER ID: 163	**Amiya Das, Mayank Shekhar, Subhayan De, Mohammad Masiur Rahaman**, IIT Bhubaneswar & Northern Arizona University, India & USA *Open-source Julia implementation of reaction-diffusion level-set topology optimization using couple-stress theory*
15:50–16:05 PAPER ID: 42	**Kammari Vinodachari, Rajesh Kumar, Shuvendu Narayan Patel**, BITS Pilani, India *Dynamic instability and nonlinear response of nanoplates under non-uniform in-plane loading: A nonlocal strain gradient and surface elasticity model*

TS3C Conference Room 3 14:00–16:20

Crystal Plasticity and Grain-Scale Localization

Session Chair Dr. Sanhita Das

14:00–14:25 INVITED	**Dr. Chandra Prakash**, IIT Hyderabad, India *Competing intergranular and intragranular fracture in polycrystalline metals: A coupled crystal-plasticity and multi-phase-field framework*
14:25–14:40 PAPER ID: 54	**Ajith Kumar, Srikanth Vedantam**, IIT Madras, India *Computational mesoscale model for cyclic plasticity*
14:40–14:55 PAPER ID: 14	**Ravi Patel, Pradeep Kumar Jha**, IIT Roorkee, India *3D microstructure-based modelling of deformation and fracture behaviour in SiC/Al7075 metal-matrix composite*
14:55–15:10 PAPER ID: 305	**Shiny Kondru, Sindhura Bhagavathula, Amirtham Rajagopal**, IIT Hyderabad, India *A thermodynamically consistent phase-field model for coupled alite–belite hydration and microstructure evolution in cement paste*
15:10–15:25 PAPER ID: 23	**Sanjay Patil, Avinash Parashar**, IIT Roorkee, India *Atomistic study of the effects of vacancy defects on the shock response of zirconium crystal*
15:25–15:40 PAPER ID: 67	**G Ganga Raju, Chandrashekhar Machhindra Pilgar**, IIITDM Kancheepuram, India *Microstructure sensitive statistical disorder awared crystal plasticity model for the high entropy alloys: Application to CoCrFeNi*
15:40–15:55 PAPER ID: 39	**Newton, Anup Basak**, IIT Tirupati, India *Grain boundary network-induced martensitic phase transformations in polycrystalline materials at finite strains: A multiphase-field study*
15:55–16:10 PAPER ID: 45	**Abhishek Nath Thakur, Anup Basak**, IIT Tirupati, India *Continuum theory of martensitic nucleation, kinetics and size effects in isotropic inhomogeneous elastic-plastic solids*

TS3D Conference Room 4 14:00–16:20

Coupled Simulation and Multiscale Mechanics

Session Chair Prof. S. Pradyumna

14:00–14:25 INVITED	**Prof. Manoj Pandey**, IIT Madras, India *Modeling nonlocal interaction based strength distribution in nacre*
14:25–14:50 INVITED	**Prof. P. J. Guruprasad**, IIT Bombay, India *Dislocation mean free path and grain size effects in creep plasticity of polycrystalline metals*
14:50–15:05 PAPER ID: 52	**Balijireddy Gowtham, Mahendaran Uchimali, Srikanth Vedantam**, IIT Bhubaneswar & IIT Madras, India *A discrete particle framework for contact of deformable bodies*
15:05–15:20 PAPER ID: 155	**Telanakula Venkata Naga Nikhitha, Mayank Shekhar, Mohammad Masiur Rahaman**, IIT Bhubaneswar, India *Open-source Julia implementation of scale-dependent homogenization for non-periodic composites*
15:20–15:35 PAPER ID: 231	**B Karthikeyan, Siva Poornan Vasudevan, Phanisri Pradeep Pratapa**, IIT Madras, India *Finite deformation homogenization of origami metamaterials as higher gradient continuum*
15:35–15:50 PAPER ID: 24	**Nivedita Kumari, Sanhita Das**, IIT Jodhpur, India *A parametric investigation into the environmental dependencies of self-healing in concrete through a regularised model*
15:50–16:05 PAPER ID: 20	**Valeriy Buryachenko**, Micromechanics & Composites LLC, USA *Unified nonlocal micromechanics of composites*

TS3E Conference Room 5 14:00–16:20

Rupture and Localization in Rocks and Granular Media

Session Chair Prof. Srikanth Vedantam

14:00–14:30 KEYNOTE	**Prof. Maddegedara Lalith Lakshman Wijerathne**, The University of Tokyo, Japan *Dynamic rupture simulations of complex fault systems: Verification, laboratory scale validation and applications*
14:30–14:45 PAPER ID: 293	**Meela Yagaiah, Prudhvi Rani Anneboina, Amirtham Rajagopal**, DRDO & IIT Hyderabad, India *Evaluating the predictive capability of RHT and HJC models for penetration and failure of UHPC under projectile impact*
14:45–15:00 PAPER ID: 172	**Pushpendra Patel, Siddhi Kesharwani, Harsh Kumar Verma, Manoj Kumar Mishra, Purushottam Das**, CSIR-CIMFR Bilaspur & NIT Rourkela, India *Effects of perimeter-hole spacing and burden-to-spacing ratio on blast-induced rock mass damage around tunnel*
15:00–15:15 PAPER ID: 213	**Adil Nazir, Madhu Sudan Negi, Mousumi Mukherjee**, IIT Mandi, India *Influence of stress path on strain localization and fabric envelopes in dense sand*
15:15–15:30 PAPER ID: 156	**Cathryn Sebastian, N.S.S.P. Kalyan, Yutaka Fukumoto, Ramesh Kannan Kandasami**, IIT Madras & Nagaoka University of Technology, India & Japan *Development of a 2D hydro-mechanical coupled peridynamic solver for hydraulic fracturing*
15:30–15:45 PAPER ID: 17	**Deepak Kumar Pawar, Animesh Pandey**, JNCASR Bengaluru, India *Interaction of defects as a non-local effect in ordered granular media*
15:45–16:00 PAPER ID: 165	**Pinki Debnath, Ranjith Kunnath**, Mahindra University, Hyderabad, India *Effect of metasurface on slip rupture propagation in a layered elastic solid*

TS3F Seminar Hall 8 14:00–16:20

Nonlinear Response of Concrete and Masonry Structures

Session Chair Prof. G. Appa Rao

14:00–14:30 KEYNOTE	**Prof. S. Suriya Prakash**, IIT Hyderabad, India *Confinement-dependent plasticity constitutive model for FRP confined concrete: Capturing dilation-compaction transitions and non-uniform confinement effects*
14:30–14:45 PAPER ID: 28	**Kilaru Divya, Amirtham Rajagopal**, IIT Hyderabad & PVPSIT, India *A hydrostatic damage-based microplane damage-plasticity model for localized failure in porous concrete*
14:45–15:00 PAPER ID: 248	**Manoj Kumar Sambram, Banti A Gedam**, Sardar Vallabhbhai National Institute of Technology, Surat, India *Construction stage analysis of high-rise buildings*
15:00–15:15 PAPER ID: 46	**Sushma Dasam, Ramesh Kothakonda, Umesh Basappa**, NIT Warangal, India *Significance of pressure dependent plasticity through comparative study of pressure independent and dependent models using UMAT in Abaqus*
15:15–15:30 PAPER ID: 160	**Mustafa Mert Eyüpgiller, Takuzo Yamashita**, National Research Institute for Earth Science and Disaster Resilience, Japan *Damage plasticity modelling of a full-scale RC building: Shaking table validation and response to the 2026 Kumamoto earthquake*
15:30–15:45 PAPER ID: 234	**Likitha Manepalli, B. Murali Krishna, Yadamma Gounikadi, Sri Kalyana Rama Jyosula**, VNR VJIET, Hyderabad, India *Static load performance of 3D-printed concrete walls: Finite element assessment using concrete damaged plasticity and cohesive interlayer interfaces*
15:45–16:00 PAPER ID: 142	**Danikonda Kumar, Savya Deepika Adabala, Vyshnavi Chapala, Deepsitha Pechetty**, Sasi Institute of Technology and Engineering, India *Hybrid ANN-FEA framework for predicting the structural behaviour of fly ash-based sustainable concrete beams*

TS3G Seminar Hall 9 14:00–16:20

Prediction and Optimization of Material Response

Session Chair Prof. Raj Das

14:00–14:25 INVITED	**Prof. Eugenio Ruocco**, University of Campania Luigi Vanvitelli, Italy *Revisiting Reddy's beam theory: Poisson effects and localized stresses*
14:25–14:40 PAPER ID: 166	**Anil Kumar Manapuram, Ratna Kumar Annabattula, Aravind Rajan**, IIT Madras & VSSC ISRO, India *Uncertainty quantification of fatigue life in functionally graded materials*
14:40–14:55 PAPER ID: 143	**Mayank Shekhar, Ayyappan Unnikrishna Pillai, Subhayan De, Mohammad Masiur Rahaman**, IIT Bhubaneswar & Northern Arizona University, India & USA *SIMP-based topology optimization of micropolar solids under thermo-mechanical loading*
14:55–15:10 PAPER ID: 49	**Sonali Bhowmik, Mansi Gupta**, NIT Rourkela, India *Atomistic investigation of interfacial shear fracture in concrete through ReaxFF and deep learning molecular dynamics*
15:10–15:25 PAPER ID: 208	**Ashwani Kushwaha, Amit Singh**, IIT Bombay, India *First-principles versus machine-learned toughness anisotropy in biphenylene: Implications for phase-field fracture models*
15:25–15:40 PAPER ID: 316	**Divesh Ranjan Kumar, Khamnoy Koulavong, Subodh Kumar Suman, H. K. Ramaraju, Bounhome Chansavang**, DSCE Bengaluru, BCE Bhagalpur, Savannakhet University & National University of Laos, India & Laos *Comparative assessment of machine learning models for predicting the undrained basal stability of braced circular excavations in anisotropic and non-homogeneous clays*
15:40–15:55 PAPER ID: 169	**Saneesh A S, Bharanidaran R**, VIT Vellore, India *A deep energy method (DEM) and adaptive momentum projected-gradient (AMPG) optimizer for the topology design of multi-functional compliant mechanisms*
15:55–16:10 PAPER ID: 207	**Siva Surya Mulugundam, Sriram Nuligonda**, GITAM University, Hyderabad, India *Machine learning-based multi-property prediction of aluminium metal matrix composites using random forest and XGBoost*

DAY 3

Wednesday, 16 December 2026

Plenary lectures PL9 to PL12 · Technical sessions TS4 and TS5

TIME	PROGRAMME
08:30–09:00	*Registration*
Session Chair	Prof. Srikanth Vedantam · PL9 and PL10
09:30–10:15 PL9	**Prof. Ramesh Talreja**, Texas A&M University, USA *Microstructural considerations in manufacturing sensitive design of composite materials*
10:15–11:00 PL10	**Prof. K. V. L. Subramaniam**, IIT Hyderabad, India *Propagation of a compaction front in compressible cellular materials: Implications for blast response*
11:00–11:15	*Tea Break*
Session Chair	Prof. Vasant Matsagar · PL11 and PL12
11:15–12:00 PL11	**Prof. Ramulu Mamidala**, University of Washington, USA *Characterization of fracture toughness and fatigue crack growth threshold of EBM-PBF Ti6Al4V alloy*
12:00–12:45 PL12	**Prof. Debasish Roy**, IISc Bengaluru, India *From bond survival to fracture: A probabilistic and thermodynamic theory of quasi-brittle damage*
12:45–14:30	*Lunch*
14:30–16:40 TS4	**Technical Session 4** Seven parallel sessions, TS4A to TS4G · page 32
16:40–17:10	*Tea Break*
17:10–18:50 TS5	**Technical Session 5** Seven parallel sessions, TS5A to TS5G · page 40

TS4 Technical Session 4

Wednesday, 16 December · 14:30–16:40 IST · seven halls in parallel

CODE	SESSION THEME	LEAD LECTURES
TS4A	**Seismic and Extreme Loads on Civil Structures** Auditorium 2 · Chair: Dr. Maganti Janardhan Yadav	Dr. Takuzo Yamashita KEYNOTE
TS4B	**Fracture of Soft Solids and Bonded Interfaces** Conference Room 2 · Chair: Prof. Manoj Pandey	Prof. Mokarram Hossain KEYNOTE ONLINE
TS4C	**Smart Structures and Vibration Control** Conference Room 3 · Chair: Prof. D. Roy Mahapatra	Dr. Manoj Kumar Buragohain KEYNOTE
TS4D	**Propellants and Impact Protection in Aerospace Laminates** Conference Room 4 · Chair: Prof. Vasant Matsagar	Dr. Salil Kanj Jalan KEYNOTE
TS4E	**Concrete Mix Design and Structural Performance** Conference Room 5 · Chair: Dr. Keerthana Kirupakaran	Dr. Nitin Kumar INVITED Dr. Saurabh Shiradhonkar INVITED
TS4F	**Thermomechanics of Layered and Graded Materials** Seminar Hall 8 · Chair: Prof. T. Phanirama Tezeswi	Dr. Basant Kumar INVITED
TS4G	**Nonlocal Damage and Material Interfaces** Seminar Hall 9 · Chair: Prof. Eugenio Ruocco	Prof. Noël Challamel KEYNOTE ONLINE

TS4A Auditorium 2 14:30–16:40

Seismic and Extreme Loads on Civil Structures

Session Chair Dr. Maganti Janardhan Yadav

14:30–15:00 KEYNOTE	**Dr. Takuzo Yamashita**, National Research Institute for Earth Science and Disaster Resilience, Japan *Development of E-Simulator and recent advances in AI-based constitutive modeling and surrogate modeling*
15:00–15:15 PAPER ID: 294	**William Paul CE, Kireeti Thatipalli, Prudhvi Rani Anneboina, Amirtham Rajagopal**, DRDO & IIT Hyderabad, India *Evaluating the performance of modified CSCM and RHT material models for UHPC slabs under blast load*
15:15–15:30 PAPER ID: 275	**Srinath Gundogi, Mothilal M, Gopikrishna K**, National Institute of Technology Warangal, India *Effect of damage progression on failure probability assessment of reinforced concrete multi storied buildings under repeated earthquake events*
15:30–15:45 PAPER ID: 276	**Jagadeeshwer Kancharla, M. Mothilal, K. Gopi Krishna**, National Institute of Technology Warangal, India *Influence of pier height on the seismic response of RCC T-beam highway bridges*
15:45–16:00 PAPER ID: 278	**Sarmili Swain, K. Gopikrishna**, National Institute of Technology Warangal, India *Time-to-collapse assessment of seismically damaged reinforced concrete structures exposed to elevated fire temperatures*
16:00–16:15 PAPER ID: 302	**Pratyush Kumar, Sahil Singh, et al.**, IIT (BHU) Varanasi, India *Large-deformation finite element analysis of reinforced concrete structures subjected to blast loading*
16:15–16:30 PAPER ID: 256	**Suman Kumar, Debdutta Ghosh**, CSIR-CBRI Roorkee & AcSIR Ghaziabad, India *Modeling of localized damage in reinforced concrete (RC) elements subjected to confined contact explosions using adaptive FE-SPH techniques*

TS4B Conference Room 2 14:30–16:40

Fracture of Soft Solids and Bonded Interfaces

Session Chair Prof. Manoj Pandey

14:30–15:00 KEYNOTE ONLINE	**Prof. Mokarram Hossain**, Swansea University, UK *Fatigue-fracture characterisation for soft materials: Combining numerical simulations with experimental study*
15:00–15:15 PAPER ID: 268	**Ruhul Amin, Krishna Kumar Verma, Deep Chatterjee, Rashmi Ranjan Das**, IIT (ISM) Dhanbad, India *Numerical investigation of resin-rock interfacial debonding in resin-grouted rock bolts under axial pull-out loading*
15:15–15:30 PAPER ID: 249	**Krishna Kumar Verma, Deep Chatterjee, Rashmi Ranjan Das**, IIT (ISM) Dhanbad, India *Computational fracture mechanics of multiple voids in epoxy-bonded DCB joint: Crack interaction and critical spacing for coalescence*
15:30–15:45 PAPER ID: 161	**Kanishka Bhattacharya, Amar Prakash, Venkatesan J, Ramesh Kumar V, N Anandavalli**, CSIR-SERC Chennai, India *Hyperelastic-plastic peridynamics for large deformation, strain localisation and fracture*
15:45–16:00 PAPER ID: 140	**Radhika Chavan, Nitin Kamble, Sandeep Sarnobat, Chetan Kuthe**, D Y Patil Pune & MIT Sambhajinagar, India *Modelling for estimation of elastic constants of skeletal muscle tissue*
16:00–16:15 PAPER ID: 182	**Vidhwath K. Rameshaiah, Shivashankar R. Srivatsa, Kaushik S.**, BMSCE & Volvo, India *Investigation on influence of loading rate on bending behaviour of flexible pneumatic hoses*
16:15–16:30 PAPER ID: 224	**K. Padmanabhan**, VIT Vellore, India *Applicability of laminate level failure theories to fibre composite interfacial failures after hygrothermal degradation*

TS4C Conference Room 3 14:30–16:40

Smart Structures and Vibration Control

Session Chair Prof. D. Roy Mahapatra

14:30–15:00 KEYNOTE	**Dr. Manoj Kumar Buragohain**, DRDO, Advanced Systems Laboratory (ASL), Hyderabad, India *Filament-wound composite pressure vessels: Defect mitigation*
15:00–15:15 PAPER ID: 265	**Danish Bashir, P. M. Anilkumar, A. Haldar, B. N. Rao**, IIT Madras, IIT Delhi & IIT (BHU) Varanasi, India *Tailoring static and dynamic asymmetry in cantilever bistable piezoelectric energy harvesters*
15:15–15:30 PAPER ID: 252	**Sourov Roy, M. R. Sunny**, Indian Institute of Technology Kharagpur, India *Memory-dependent bandgap formation and vibration localization in fractional Euler-Bernoulli beams with nonlinear local resonators*
15:30–15:45 PAPER ID: 114	**Khogesh Kumar Rathore, Saurabh Biswas**, Amity University Hyderabad & IIT Jammu, India *Stability analysis of the delayed tuned mass asymmetric hysteretically damped system*
15:45–16:00 PAPER ID: 308	**Promio Charles F, S. Raja, Niranjan K Sura**, RVCE & ADA Bengaluru, India *Experimental investigation of out-of-wind-tunnel flutter characteristics of T-tail structures using piezoelectric actuators*
16:00–16:15 PAPER ID: 210	**Vinayak Chavan, Srinivasa Prasad K S**, PES University, Bengaluru, India *Active vibration control of a functionally graded material plate using artificial neural network based control*
16:15–16:30 PAPER ID: 310	**Rammohan Bhanumurthy, Promio Charles F, Pramod Kumar Verma**, RV University & RVCE Bengaluru, India *Modal behaviour of SMA-embedded bidirectional GFRP beams and attenuation of LCO-like oscillations by MFC actuation*

TS4D Conference Room 4 14:30–16:40

Propellants and Impact Protection in Aerospace Laminates

Session Chair Prof. Vasant Matsagar

14:30–15:00 KEYNOTE	**Dr. Salil Kanj Jalan**, Vikram Sarabhai Space Centre, ISRO, India *Space science through ISRO & structural dynamics of launch vehicles*
15:00–15:15 PAPER ID: 83	**Stuti Devendra Upadhyay, Raghavan Ranganathan**, IIT Gandhinagar, India *Nanoscale ballistic performance of bio-inspired CNT-PMMA Bouligand composites*
15:15–15:30 PAPER ID: 151	**Manish More, Jaishree Chauhan, Gaurav Tiwari, Tushar Saratkar**, VNIT Nagpur, India *Numerical investigation of ballistic performance of jute alumina composite structure against fragment simulating projectiles*
15:30–15:45 PAPER ID: 164	**Tushar Saratkar, Gaurav Tiwari, Jaishree Chauhan, Manish More**, VNIT Nagpur, India *Computational analysis of oblique projectile impact and damage evolution in jute/epoxy composite laminates*
15:45–16:00 PAPER ID: 132	**Nomesh Kumar, Anupam Sharma**, DRDO New Delhi, India *Nonlocal peridynamic simulation of damage evolution in composite HTPB solid propellant grains during thermal cooldown*
16:00–16:15 PAPER ID: 180	**Aditya Sinha, Pranavi Shrimali, Suresh Kumar Reddy Narala**, BITS Pilani - Hyderabad Campus, India *Development of a lightweight sandwich structure incorporating Kevlar and gyroid TPMS for high strain rate impact response*
16:15–16:30 PAPER ID: 274	**Indupriyaa.G, Karishma Addanki, S. Shreya, Lokavarapu Bhaskara Rao**, Vellore Institute of Technology, Chennai, India *Numerical investigation of ballistic impact on curved fibre metal laminate targets using different nose shaped projectiles*

TS4E Conference Room 5 14:30–16:40

Concrete Mix Design and Structural Performance

Session Chair Dr. Keerthana Kirupakaran

14:30–14:55 INVITED	**Dr. Nitin Kumar**, IIT Patna, India *Development of an OpenSees framework for detailed micro-modeling of masonry*
14:55–15:20 INVITED	**Dr. Saurabh Shiradhonkar**, IIT Roorkee, India *Challenges in experimental testing and micromodelling of RC joints with post-installed reinforcement bars*
15:20–15:35 PAPER ID: 176	**Abhijeet Yadav, Meena Murmu**, NIT Raipur, India *A critical review of superabsorbent polymer-based self-curing concrete: Internal curing mechanisms, mechanical performance and durability*
15:35–15:50 PAPER ID: 283	**Tallapalem Umamaheswara Rao, Kampa Ravinder, Sarella Venkateswara Rao**, National Institute of Technology Warangal, India *Predicting the compressive strength of geopolymer concrete using machine learning algorithms*
15:50–16:05 PAPER ID: 7	**Keerti Malipatil**, Visvesvaraya NIT, Nagpur, India *Self-compacting geo-polymer concrete using slag sand as fine aggregate*
16:05–16:20 PAPER ID: 320	**Sathvik Sharath Chandra, Rajeeth T J, Shashank Shekhar Kamal, Anshulee Patel, Atul Kumar Singh**, VVCE Mysuru, JUIDCO Ranchi, BCE Bhagalpur, NICMAR Delhi-NCR & DSCE Bengaluru, India *Interpretable gradient boosting models for predicting the compressive strength of eco-friendly concrete containing waste foundry sand: A comparative study of XGBoost and GBM*

TS4F Seminar Hall 8 14:30–16:40

Thermomechanics of Layered and Graded Materials

Session Chair Prof. T. Phanirama Tezeswi

14:30–14:55 INVITED	**Dr. Basant Kumar**, ASL, DRDO Hyderabad, India *Microstructure-informed nonlocal tensorial damage model for thermally degraded cementitious materials*
14:55–15:10 PAPER ID: 219	**Madhav Kumar Gupta, Abinash Kumar Swain, Vishwas A. Sawant**, IIT Roorkee, India *Dynamic assessment of triangular corrugated core sandwich panels under blast loads through dimensionless parameters*
15:10–15:25 PAPER ID: 301	**Nihar Ranjan Mallick, S. Chakraverty**, NIT Rourkela, India *Free vibration analysis of spatially graded time-fractional Euler–Bernoulli beams using the Adomian decomposition method*
15:25–15:40 PAPER ID: 306	**Sindhura Bhagavathula, Mrunmayee Shiradhonkar, Amirtham Rajagopal**, IIT Hyderabad, India *Martensitic microstructure evolution and stochastic fracture initiation: Application to zirconia*
15:40–15:55 PAPER ID: 235	**Sorab Khan, Amit Singh**, IIT Bombay, India *Thermal fracture analysis of interface cracks in a Fe/TEM bi-material system using the finite element analysis*
15:55–16:10 PAPER ID: 216	**Votarikari Naveen Kumar, Mulugundam Siva Surya, Basant Kumar**, GITAM University Hyderabad & ASL, DRDO Hyderabad, India *Effect of hexagonal boron nitride on the processability, thermal stability of filament wound carbon fibre/epoxy composites*
16:10–16:25 PAPER ID: 228	**Venkatraman G**, PSG College of Technology, Coimbatore, India *Nonlinear free vibration analysis of non-uniform bi-directional functionally graded micro-Euler beams in variable elastic media*

TS4G Seminar Hall 9 14:30–16:40

Nonlocal Damage and Material Interfaces

Session Chair Prof. Eugenio Ruocco

14:30–15:00 KEYNOTE ONLINE	**Prof. Noël Challamel**, University of South Brittany, France *Branching between integral (strain-driven or peridynamics), micromorphic and gradient continuum damage mechanics approaches*
15:00–15:15 PAPER ID: 56	**Ved Prakash, Upadhyayula MMA Sai Gopal, Debasish Roy**, IIT Roorkee & IISc Bengaluru, India *Nonlocal interaction of damage through covariance of random bond-breaking in quasi-brittle materials*
15:15–15:30 PAPER ID: 53	**Upadhyayula M M A Sai Gopal, Ved Prakash, Ananth Ramaswamy, Debasish Roy**, IISc Bengaluru & IIT Roorkee, India *Blast-induced fracture of quasi-brittle materials using a probabilistic continuum damage model*
15:30–15:45 PAPER ID: 226	**Rakesh Kumar, S. Mrunmayee, A. Rajagopal, Basant Kumar, J.K. Mishra, M. Nithyadharan**, IIT Hyderabad, ASL (DRDO) Hyderabad & IIT Tirupati, India *Investigation of cohesive zone modelling parameters for two dimensional rectangular CZM elements for modelling of defects in composites*
15:45–16:00 PAPER ID: 51	**Sai Kumar Bai, Ramesh KothaKonda, Umesh Basappa**, NIT Warangal, India *Understanding of nonlocal damage plasticity in concrete failure*
16:00–16:15 PAPER ID: 152	**Abhirohan Kashyap, Sushobhan Sen**, IIT Gandhinagar, India *Non-local damage evolution in concrete-dowel bar pavement systems using peridynamics*
16:15–16:30 PAPER ID: 57	**Arthesh Basak**, GITAM Visakhapatnam, India *Shear-induced nonlocal damage modeling of anisotropic composites using right-stretch structural tensors*

TS5 Technical Session 5

Wednesday, 16 December · 17:10–18:50 IST · seven halls in parallel

CODE	SESSION THEME	LEAD LECTURES
TS5A	**Higher-Order and Coupled-Field Response** Auditorium 2 · Chair: Prof. P. J. Guruprasad	Prof. Saswata Bhattacharya KEYNOTE
TS5B	**Higher-Order Theories for Shells and Thick Plates** Conference Room 2 · Chair: Dr. Prakhar Gupta	Dr. Archana Arbind INVITED
TS5C	**Cyclic Loading and Fracture of Concrete** Conference Room 3 · Chair: Dr. Saurabh Shiradhonkar	Dr. Keerthana Kirupakaran INVITED
TS5D	**Vibration Monitoring and Structural Acoustics** Conference Room 4 · Chair: Prof. Srikanth Vedantam	Dr. B. Radhika INVITED
TS5E	**Phase-Field Models of Crack Growth and Fatigue** Conference Room 5 · Chair: Dr. Chandra Prakash	Dr. Raghu Piska INVITED
TS5F	**Peridynamic Models of Brittle and Layered Solids** Seminar Hall 8 · Chair: Dr. Senthilkumar Vaiyapuri	Dr. Arun C O INVITED
TS5G	**Rate Effects in Impact and Localized Deformation** Seminar Hall 9 · Chair: Prof. T. Phanirama Tezeswi	Dr. Pattabhi Ramaiah Budarapu INVITED

TS5A Auditorium 2 17:10–18:50

Higher-Order and Coupled-Field Response

Session Chair Prof. P. J. Guruprasad

17:10–17:40 KEYNOTE	**Prof. Saswata Bhattacharya**, IIT Hyderabad, India *Phase-field modelling of microstructural evolution and mechanics: Challenges and future perspectives*
17:40–17:55 PAPER ID: 9	**Turaka Srinivasa Rao, Hari Kishan Adusumilli, Arockia Rajan A, Ashok Kumar Nallathambi**, NIT Trichy & IIT Madras, India *Stabilized non-ordinary state-based peridynamic modelling of crack-induced magneto-electro-mechanical response in piezoelectromagnetic composites*
17:55–18:10 PAPER ID: 195	**Swapnaswadhina Sahoo, Pattabhi Ramaiah Budarapu**, IIT Bhubaneswar, India *Coupled electro-thermal-mechanical modeling and data-driven risk assessment of internal short circuits in lithium-ion batteries*
18:10–18:25 PAPER ID: 181	**Shubham Desai, Sai Sidhardh**, IIT Hyderabad, India *Modeling and experimental validation of nonlocal piezoelectric response using fractional calculus*
18:25–18:40 PAPER ID: 43	**Subrata Mondal**, IIT Kharagpur, India *Wave propagation in coupled nonlocal thermomechanical systems*

TS5B Conference Room 2 17:10–18:50

Higher-Order Theories for Shells and Thick Plates

Session Chair Dr. Prakhar Gupta

17:10–17:35 INVITED	**Dr. Archana Arbind**, IIT Kharagpur, India *A general higher-order shell theory using orthonormal frame and its application to isotropic, anisotropic and morphoelastic hyperelastic shell*
17:35–17:50 PAPER ID: 220	**Venu Shankabattula, Abinash Kumar Swain, Vishwas A Sawant**, IIT Roorkee, India *Geometrically nonlinear isogeometric analysis of metal foam sandwich plates using a layerwise shear deformation theory*
17:50–18:05 PAPER ID: 162	**Dolly Tiwari, Archana Arbind**, IIT Kharagpur, India *General higher-order 1D theory for general hyperelastic soft tubular structures*
18:05–18:20 PAPER ID: 146	**Kundan Kumar Chandrakar, Prashik Malhari Ramteke**, NIT Raipur, India *Finite element static deflection analysis of bi-directional functionally graded cylindrical shells with through-central crack*
18:20–18:35 PAPER ID: 247	**Uttam Kumar Pandit**, Indian Institute of Technology Kanpur, India *Size-dependent free vibration and forced dynamic response of functionally graded sandwich nano-beams*

TS5C Conference Room 3 17:10–18:50

Cyclic Loading and Fracture of Concrete

Session Chair Dr. Saurabh Shiradhonkar

17:10–17:35 INVITED	**Dr. Keerthana Kirupakaran**, IIT Madras, India *Micromechanics of fatigue fracture in concrete: Experimental insights and analytical modelling*
17:35–17:50 PAPER ID: 175	**Richa Gupta, Alfia Bano, G.D. Ramtaker**, NIT Raipur, India *Fatigue and cyclic performance of reinforced concrete circular columns: A nonlinear finite element investigation using ABAQUS*
17:50–18:05 PAPER ID: 47	**Ram Lal Riyar, Sonali Bhowmik**, NIT Rourkela, India *Structural integrity of polypropylene-enforced steel slag concrete under static and fatigue fracture loading*
18:05–18:20 PAPER ID: 48	**Mohammad Azhar U Din Mir, Rajneesh Sharma**, IIT Mandi, India *Inverse characterization of the post-yield hardening-softening function for foam concrete*
18:20–18:35 PAPER ID: 174	**Richa Gupta, Alfia Bano, G.D. Ramtaker**, NIT Raipur, India *Cyclic and fatigue behaviour of reinforced concrete circular columns: A literature review*

TS5D Conference Room 4 17:10–18:50

Vibration Monitoring and Structural Acoustics

Session Chair Prof. Srikanth Vedantam

17:10–17:35 INVITED	**Dr. B. Radhika**, NIT Calicut, India *Monitoring the unseen - detecting time-dependent variations in dynamical systems*
17:35–17:50 PAPER ID: 251	**Sidhartha Kumar, Pritam Bari, Husain Kanchwala**, IIT Delhi & BITS Pilani, India *A coupled structural-acoustic model of a rotating tyre for analysis of tyre cavity resonance*
17:50–18:05 PAPER ID: 222	**Sandeep Rajan Nagarajan, Sakthivel Palanivelu**, VIT Vellore, India *Acoustic source quantification and acoustic path characterization for synthesis of perception of noise at operator's ear location of an agricultural tractor using Q-Source*
18:05–18:20 PAPER ID: 254	**Sakthivel Palani, Sandeep Rajan Nagarajan, Sakthivel Pazhanivelu**, Vellore Institute of Technology, Vellore, India *Assessment of whole-body vibration and interior noise perception of a driver in a passenger car*
18:20–18:35 PAPER ID: 241	**Bharat C S, Shashiraj, Vasudev Prashant**, BMS College of Engineering, Bengaluru & PESCOM IND, India *Design improvement and comparative FSI-non-FSI analysis of a hydrodynamic precision spindle for ball bearing noise testing*

TS5E Conference Room 5 17:10–18:50

Phase-Field Models of Crack Growth and Fatigue

Session Chair Dr. Chandra Prakash

17:10–17:35 INVITED	**Dr. Raghu Piska**, BITS Pilani, Hyderabad Campus, India *Phase field model for modeling fracture in solids subjected to static and dynamic loads*
17:35–17:50 PAPER ID: 227	**Rakesh Kumar, S. Mrunmayee, A. Rajagopal, Basant Kumar, M. Nithyadharan, J.K. Mishra**, IIT Hyderabad, ASL (DRDO) Hyderabad & IIT Tirupati, India *Calibration of non local parameters for modelling of defects in composite by using non local gradient enhanced cohesive zone modelling method*
17:50–18:05 PAPER ID: 217	**Chandra Prakash, Jayaprakash**, IIT Hyderabad, India *Microscale damage modeling of CFRP using an explicit phase field approach under dynamic loading conditions*
18:05–18:20 PAPER ID: 277	**Paturi Mythili, Shreya R D, Geetha K N**, Amrita Vishwa Vidyapeetham, Bengaluru, India *Effect of temporal observation sparsity on fatigue-threshold detection in phase-field fatigue simulations*
18:20–18:35 PAPER ID: 131	**Kalyan Boyina, Raghu Piska, Anna Mariya Shajan**, BITS Pilani Hyderabad & MACE Kerala, India *Anisotropic fracture resistance phase field model for transversely isotropic polycrystals under dynamic loading*

TS5F Seminar Hall 8 17:10–18:50

Peridynamic Models of Brittle and Layered Solids

Session Chair Dr. Senthilkumar Vaiyapuri

17:10–17:35 INVITED	**Dr. Arun C O**, IIT Palakkad, India *A correction-free bond-based peridynamic framework with a cubic kernel for brittle and quasi-brittle fracture*
17:35–17:50 PAPER ID: 233	**N.S.S.P. Kalyan, Jean-François Molinari**, EPFL & IIT Madras, Switzerland & India *Energy evolution and strain-rate dependence in peridynamic modelling of dynamic fragmentation*
17:50–18:05 PAPER ID: 12	**Amish Kumar Aman, Arun C. O.**, IIT Palakkad, India *Numerical investigation of dynamic fracture in brittle materials using cubic bond-based peridynamics*
18:05–18:20 PAPER ID: 8	**Ashok Kumar Nallathambi, Turaka Srinivasa Rao, Hari Kishan Adusumilli**, NIT Tiruchirappalli, India *Rate-dependent ordinary state-based peridynamic modelling of low-velocity impact fracture in laminated glass with surface flaws*
18:20–18:35 PAPER ID: 212	**Vatsalya Budhraja, Gaurav Tiwari**, Ramdeobaba University, Nagpur & VNIT Nagpur, India *Numerical investigation of high-velocity projectile impact on laminated glass windshields for high-speed trains using LS-DYNA*

TS5G Seminar Hall 9 17:10–18:50

Rate Effects in Impact and Localized Deformation

Session Chair Prof. T. Phanirama Tezeswi

17:10–17:35 INVITED	**Dr. Pattabhi Ramaiah Budarapu**, IIT Bhubaneswar, India *From high-fidelity impact simulation to AI-enabled predictive mechanics*
17:35–17:50 PAPER ID: 158	**Amar Kawale, Gaurav Tiwari, Ayan Khan, Tushar Fulzele, Nishant Chikhalkar, Himanshu Landge**, VNIT Nagpur, India *Localized deformation, damage evolution and energy absorption of aluminium and 3D-printed PLA rectangular tube under axial crushing*
17:50–18:05 PAPER ID: 147	**Srishti Mishra, Abhishek Singh, Srihari Dodla**, IIT (BHU) Varanasi & DRDO, India *Microstructure-resolved multiscale modeling of localized deformation and damage in tungsten heavy alloy under high-strain-rate impact*
18:05–18:20 PAPER ID: 55	**Praveen Kumar, Pradeep Seshadri, P Alagappan**, IIT Madras, India *A novel material characterization technique using shock tube*
18:20–18:35 PAPER ID: 264	**Maitri Kathayat, Suman Chandel, Suman Kumar**, CSIR-CBRI Roorkee & AcSIR Ghaziabad, India *Numerical investigation of re-entrant auxetic lattice-reinforced UHPC under impact and blast loading*