

# The Ninth International Conference on Structural Engineering, Mechanics and Computation

## Cape Town, South Africa, 1-3 September 2025

# PROVISIONAL PROGRAMME

### Sunday 31 August 2025: Welcome Reception
**Southern Sun Cape Sun Hotel, Cape Town**

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| 16:00-18:00 | Onsite Registration & Collection of Conference Bags |
| 17:00-17:10 | Welcome by the Conference Chair |
| 17:10-18:00 | Conference Welcome Reception |

### Monday 1 September 2025: Opening Session
**Southern Sun Cape Sun Hotel, Cape Town**

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| 07:30-10:00 | Onsite Registration & Collection of Conference Bags |
| 07:30-08:00 | Arrival Tea and Coffee |
| 08:00-08:15 | Introductory Remarks by the Conference Chair |
| 08:15-08:30 | Welcome by the UCT Vice-Chancellor |
| 08:30-10:00 | Keynote Lectures |

### Monday 1 – Wednesday 3 September 2025: Plenary & Parallel Sessions
**Southern Sun Cape Sun Hotel, Cape Town**

#### General Programme Structure

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|---|---|
| 08:00-08:30 | Tue & Wed: Arrival Tea and Coffee |
| 08:30-10:00 | Mon, Tue & Wed: Plenary Session |
| 10:00-10:30 | Tea & Coffee Break |
| 10:30-12:30 | Mon, Tue & Wed: Parallel Sessions: 5 Streams (A to E) |
| 12:30-13:30 | Lunch Break |
| 13:30-15:00 | Mon, Tue & Wed: Parallel Sessions: 5 Streams (A to E) |
| 15:00-15:30 | Tea & Coffee Break |
| 15:30-17:00 | Mon, Tue & Wed: Parallel Sessions: 5 Streams (A to E) |

## General Note

The four timetable periods of the Conference, from 1 to 3 September 2025, will be denoted as follows:

**Period 1:** 08:30-10:00; **Period 2:** 10:30-12:30; **Period 3:** 13:30-15:00; **Period 4:** 15:30-17:00

Plenary sessions will run in Period 1. Parallel sessions will run in Periods 2, 3 and 4.

## Plenary Presentations: Keynote Lectures

### Monday 1 September 2025: Period 1

**08:30-09:15** **Beyond deployables: Robotic assembly of space structures**
Professor Sergio Pellegrino, California Institute of Technology, USA

**09:15-10:00** **Analytical modelling of structural instabilities: Recent developments and outlook**
Professor Ahmer Wadee, Imperial College London, UK

### Tuesday 2 September 2025: Period 1

**08:30-09:15** **Predicting strength of butt-welded joints of high-strength steel**
Professor Guo-Qiang Li, Tongji University, China

**09:15-10:00** **Optimisation of macro-synthetic fibre-reinforced concrete as alternative railway sleepers**
Professor Olivia Mirza, Western Sydney University, Australia

### Wednesday 3 September 2025: Period 1

**08:30-09:15** **Fiber-reinforced high-performance concrete at low cycle fatigue: Modelling of damage**
Professor Jörg Schröder, University Duisburg-Essen, Germany

**09:15-10:00** **Lessons from vibration-based structural health monitoring of bridges: Insights and applications**
Professor Chul-Woo Kim, Kyoto University, Japan

## Parallel Session Presentations

**Monday 1 September, Tuesday 2 September, Wednesday 3 September: Periods 2, 3 & 4**

Five streams of parallel presentations (each allocated its own venue) will run throughout the Conference. These streams are broadly defined in terms of the topics covered, as follows:

**STREAM A:** Structural Dynamics; Dynamic Response; Vibration Analysis; Vibration Control; Fluid-Structure Interaction; Seismic Analysis; Seismic Response; Seismic Design; Buckling of Structures; Shells & Plates; Spatial Structures; Shape Optimisation

**STREAM B:** Steel Structures; Steel Connections; Steel-Concrete Composite Structures; Concrete-Filled Tubes; High Strength Steel; High Performance Steel; Stainless Steel; Aluminium Structures; Sustainable Construction; Green Technology; Reuse of Materials and Structures

**STREAM C:** Reinforced Concrete; Prestressed Concrete; Mechanics of Concrete; High Strength Concrete; High Performance Concrete; Fibre-Reinforced Concrete; FRP Composites; Cement-Based Materials; Construction Materials; Timber Structures; Mechanics of Wood

**STREAM D:** Computational Mechanics; Material Modelling; Numerical Simulations; Numerical Modelling; Damage Mechanics; Fracture; Fatigue; Blast; Biological Tissue; Biomedical Engineering; Additive Manufacturing; 3D Printing; Machine Components; Kinematics; Soil-Structure Interaction; Foundations; Geotechnical Engineering; Tunnelling; Underground Structures

**STREAM E:** Structural Optimization; Reliability; Safety; Structural Design Philosophy; Risk & Vulnerability; Wind Load; Wind Power Plants; Machine Learning; Digital Twinning; Building Performance; Glass Structures; Bridge Analysis; Bridge Design; Structural Health Monitoring; Inspection; Damage Detection; Damage Identification; Structural Assessment; Maintenance; Rehabilitation

# MATRIX OF SEMC 2025 PARALLEL SESSIONS

In the detailed Programme, the 45 parallel sessions are numbered in the format **S-DN.** With reference to the matrix below, parallel session **S-DN** lies at the intersection of the column for Stream **S** and the row for Day-Period **DN**, where **S** is A, B, C, D or E; **D** is M, T or W; **N** is 2, 3 or 4.

| | Stream A | Stream B | Stream C | Stream D | Stream E |
|---|---|---|---|---|---|
| **Mon 01 Sept** 10:30-12:30 [Day-Period **M2**] | **A-M2:** Structural Dynamics; Vibration Response; Vibration Control - I SS17: Environmental Vibrations | **B-M2:** Steel Structures; Steel Connections - I | **C-M2:** High Strength Concrete; High Performance Concrete; Fibre-Reinforced Concrete | **D-M2:** Soil-Structure Interaction; Foundations; Geotechnical Engineering - I SS09: Renew. Energy Structures | **E-M2:** Wind Power Plants; Wind Load; Safety; Risk & Vulnerability; Machine Learning |
| **Mon 01 Sept** 13:30-15:00 [Day-Period **M3**] | **A-M3:** Structural Dynamics; Vibration Response; Vibration Control - II | **B-M3:** Steel Structures; Steel Connections - II | **C-M3:** Reinforced Concrete; Prestressed Concrete - I SS05: Mechanics of Reinforced Concrete | **D-M3:** Soil-Structure Interaction; Foundations; Geotechnical Engineering - II | **E-M3:** Structural Optimization; Structural Reliability |
| **Mon 01 Sept** 15:30-17:00 [Day-Period **M4**] | **A-M4:** Dynamic Response; Fluid-Structure Interaction; Buckling of Structures I | **B-M4:** Steel Structures; Steel Connections - III | **C-M4:** Reinforced Concrete; Prestressed Concrete - II | **D-M4:** Additive Manufacturing SS07: Reducing the Carbon Footprint of Steel Structures | **E-M4:** Digital Twinning; Building Performance; Housing |
| **Tue 02 Sept** 10:30-12:30 [Day-Period **T2**] | **A-T2:** Buckling of Structures II | **B-T2:** High Strength Steel; High Performance Steel SS18: High Strength Steel | **C-T2:** Structural Applications of FRP Composites - I SS08: FRP Composites in Civil Engineering Structures | **D-T2:** Soil-Structure Interaction; Foundations; Tunnelling; Machine Parts; Kinematics | **E-T2:** Struct. Health Monitoring, Damage Detect. & Identification I SS12: Modern Technologies for Infrastructure Maintenance |
| **Tue 02 Sept** 13:30-15:00 [Day-Period **T3**] | **A-T3:** Buckling of Structures III | **B-T3:** Stainless Steel & Aluminium Structures SS03: Stainless Steel Connections | **C-T3:** Structural Applications of FRP Composites - II SS08: FRP Composites in Civil Engineering Structures | **D-T3:** Damage Modelling; Fracture & Fatigue I | **E-T3:** Struct. Health Monitoring, Damage Detect. & Identification II SS02: Structural Health Monitoring & Damage Identification |
| **Tue 02 Sept** 15:30-17:00 [Day-Period **T4**] | **A-T4:** Shells & Plates | **B-T4:** Steel-Concrete Composite Structures | **C-T4:** Structural Applications of FRP Composites - III SS08: FRP Composites in Civil Engineering Structures | **D-T4:** Fracture & Fatigue II; Blast & Impact | **E-T4:** Glass Structures SS15: Structural Applications of Glass |
| **Wed 03 Sept** 10:30-12:30 [Day-Period **W2**] | **A-W2:** Seismic Response; Seismic Design - I | **B-W2:** Sustainable Construction; Reuse of Materials and Structures - I SS14: Reuse of Steel Structures | **C-W2:** Timber Structures; Timber Technology SS19: Modern Timber Engineering in a Changing World | **D-W2:** Computational Mechanics; Material Modelling; Numerical Simulations SS04: Multiscale Models of Materials | **E-W2:** Structural Assessment; Rehabilitation |
| **Wed 03 Sept** 13:30-15:00 [Day-Period **W3**] | A-W3: Seismic Response; Seismic Design - II | **B-W3:** Sustainable Construction; Reuse of Materials and Structures - II | **C-W3:** Mechanics of Wood; Construction Materials I SS21: Fracture of Wood and Timber Structures | **D-W3:** Numerical Modelling; Biomedical Engineering I SS23: Mechanical Characterisation of Soft Tissues | **E-W3:** Historic Structures; Masonry Structures |
| **Wed 03 Sept** 15:30-17:00 [Day-Period **W4**] | **A-W4:** Spatial Structures; Shape Optimisation | **B-W4:** Sustainable Construction; Reuse of Materials and Structures - III | **C-W4:** Cement-Based Materials; Construction Materials II | **D-W4:** Biomedical Engineering II SS23: Mechanical Characterisation of Soft Tissues | **E-W4:** Bridge Analysis, Design & Construction |

# Programme for Parallel Sessions

The Programme for Parallel Sessions is presented below, stream by stream. The session code has 4 characters: the first is a letter indicating the **Stream** (A, B, C, D or E), the second is a hyphen, the third is a letter indicating the **Day** (M: Mon; T: Tue; W: Wed), and the fourth is a number indicating the **Period** (2, 3 or 4). For example, D-T3 denotes the parallel session of Stream D that runs on Tuesday in Period 3 (13:30-15:00). Period 1 (08:30-10:00) is reserved for Plenary Sessions. Excluding the Plenary Sessions, the Programme features a total of 45 Parallel Sessions.

## STREAM A

### A-M2: Structural Dynamics; Vibration Response; Vibration Control - I

Includes contributions to Special Session **SS17: Environmental Vibrations**. *Organisers:* Prof. Lars Vabbersgaard Andersen, Aarhus University, Denmark; Dr. Peter Persson, Lund University, Sweden

**10:30:** Tunable sound absorption and energy absorption of origami-inspired metastructures, Z.R. Shao, Y. Chen, P. Shi, J.L. Wei, J. Feng, P. Sareh **(Invited Paper)**
**11:00:** Vibration reduction in cross-laminated timber panels by using integrated elastomer layers, A. Bohman, L. Andersson, K. Persson, P. Persson
**11:15:** Vibration prediction and mitigation for urban railways structurally integrated with residential buildings, A. Parodi
**11:30:** Experimental analysis of collective human motion in running activities, J. Lottefier, P. Van den Broeck, K. Van Nimmen
**11:45:** Train-induced vibrations in cross-laminated timber buildings: A parametric study, K.A. Ung, F. Rasmussen, L. Andersson, P. Bucinskas, L.V. Andersen, J.-G. Kim, P. Persson
**12:00:** Comparison of analytical methods and field measurements for evaluating the insertion loss of railway vibration mitigation products, I.E. Martos, A. Parodi
**12:15:** Vibration reduction in cross-laminated timber panels by using individual concrete lamellae, K.A. Ung, A. Bohman, L. Andersson, S. Johansson, L.V. Andersen, P. Persson

### A-M3: Structural Dynamics; Vibration Response; Vibration Control - II

**13:30:** Control of the dynamic response of bridges through movable shear keys, A.J. Kappos **(Invited Paper)**
**14:00:** Measurement for pedestrian-induced vibration of the irregular spanned ring footbridge, T. Monzen, R. Yoshikawa, C. Qianghua
**14:15:** The bi-tuned semi-active TMD for tall buildings under multi-hazard loads, S. Kleingesinds
**14:30:** A study into engine- and propeller-induced vibration of a ro-ro vessel by the finite element method, N. Vladimir, I. Senjanović, Z. Wei
**14:45:** Numerical analysis of vibration characteristics in irregularly spanned ring-shaped footbridge, Q. Cai, T. Monzen

### A-M4: Dynamic Response; Fluid-Structure Interaction; Buckling of Structures I

**15:30:** The dynamic response of non-rigid linkage mechanisms using the Lagrangian approach, C.C. Gai, K.A. Seffen

**15:45:** Leveraging flexibility in the design of a wave energy converter: Strongly coupled two-way FSI numerical modeling and experimental wave tank testing, J. Andersen, F. Ferri, C. Eskilsson, S.G. Thomsen, M. Folley
**16:00:** Load-bearing capacity of steel curved plates: A numerical investigation, R. Mohammadesmaeili, A. Heidarpour
**16:15:** Contribution to lateral torsional buckling of girders with rotational restraints, A. Müller, A. Taras, M. Vild
**16:30:** Shear buckling of sinusoidal corrugated web beams with reinforced openings, H. Pasternak, Z. Li
**16:45:** Buckling behaviour of thin concrete arch dams, M.D. Letsika, A. Zingoni

## A-T2: Buckling of Structures II

**10:30:** Plastic bifurcation of rectangular plates under uniaxial and biaxial loadings, S. Shrivastava **(Invited Paper)**
**11:00:** On the elastic flexural-torsional buckling of straight members and arches, M.A. Gizejowski, J.P. Papangelis **(Invited Paper)**
**11:30:** A path-following approach for complete analyses of structural instability phenomena, A. Köllner
**11:45:** Buckling and stability of a rod deforming on a tubular surface with rigorous treatment of static friction, G.H.M. van der Heijden
**12:00:** Nonlinear buckling and vibration analysis of thin-walled fiber reinforced polymer I-section beams, P.B. Gonçalves, D. Orlando
**12:15:** Buckling analysis of composite box girders using generalized beam theory (GBT) and Ritz method, N. Kharghani, C. Mittelstedt

## A-T3: Buckling of Structures III

**13.30:** On the stability behaviour of crane runway girders influenced by residual stresses of welded rails, C. Moscoso, A. Africano, M. Kraus
**13:45:** Formulae for calculating elastic buckling loads for web crippling of rectangular hollow sections, R. Dai, L. Gardner, M.A. Wadee
**14:00:** Insights on the buckling behaviour of space frames of $D_{2h}$ symmetry: Group-theoretic formulation, C. Kaluba, A. Zingoni
**14:15:** On the flexural-torsional buckling of mid-span restrained beam-columns with a steel bisymmetric I-shape section, P. Wiedro, M.A. Gizejowski
**14:30:** Insights on the buckling behaviour of space frames of $D_{2h}$ symmetry: Effect of loading symmetry, C. Kaluba, A. Zingoni

## A-T4: Shells & Plates

**15:30:** High-pressure and long-duration blast load design for cylindrical steel tanks: A computational approach, J. Rosin, A. Stocchi
**15:45:** On the structural viability of hyperbolic shells of revolution for liquid containment: Stress analysis and buckling behaviour, H.A. Mahlelebe, A. Zingoni
**16:00:** Design strategies for catenary domes in affordable housing solutions, R. Bradley, A. Danda, K. Gcaba, M. Gohnert
**16:15:** Influence of concrete creep on performance of pre-stressed elliptical paraboloid shells, G. Sossou
**16:30:** Comparison of folded plate theory and FEA for the structural analysis of thin-walled floor slabs, M. Dombrowski, L. Braun, A. Przwarzinski, M. Schlaich

**16:45:** Bending of plates made of non-simple viscoelastic porous materials, S. De Cicco

### A-W2: Seismic Response; Seismic Design - I

**10:30:** Fragility assessment of existing low-rise steel moment-resisting frames with masonry infills under mainshock-aftershock earthquake sequences, L. Di Sarno, J. Wu **(Invited Paper)**
**11:00:** Seismic response analysis of steel piers using biaxial material tests and the three-surface model, R. Nishii, K. Sugiura, A. Sato, T. Yamamoto, T. Niina
**11:15:** Tuned inerter damper for seismic response reduction in elastoplastic buildings, A. Pandit, M. O'Shea
**11:30:** Detection and assessment of seismic response of high-speed railway bridges based on artificial intelligence and game engine, J.Q. Liu, W. Bo, X.F. Zhao
**11:45:** Numerical seismic analysis of a steel braced frame equipped with passive fire protections and firewalls, P. Covi, M.L. Tornaghi, N. Tondini
**12:00:** Numerical modelling of the southbound Stellenberg Interchange Bridge B5593 subjected to seismic excitation, W. Olivier, T.N. Haas
**12:15:** Assessment of the collapse drift capacity of slender flanged RC structural walls built with high-strength rebar, N. Samanta, K. Dasgupta, L. Di Sarno

### A-W3: Seismic Response; Seismic Design - II

**13:30:** Comparison of design equivalent seismic load and the demand of February 2023 Kahramanmaras Earthquake (Turkey) on RC buildings, A. Cengiz, T. Gurbuz
**13:45:** Comparing the seismic fragility curves of RC shear walls obtained using incremental dynamic analysis and performance based approaches, P.N. Mohan, A. Chatterjee
**14:00:** New preventive vision of the seismic risk, M. Acito, M. Buzzetti
**14:15:** Seismic evaluation of the southbound Stellenberg Interchange Bridge B5593, W. Olivier, T.N. Haas
**14:30:** Influence of high sustained axial stresses on the seismic behaviour of full-scale substandard reinforced concrete columns, S. Gundogan, U. Demir, O.T. Turan, A. Ilki
**14:45:** Seismic analysis of transmission lattice towers in South Africa, T. Haas, S. Msiwa, C. De Beer, D. Albertyn, T. Loots

### A-W4: Spatial Structures; Shape Optimisation

**15:30:** Shape optimization using the explicit Vertex Morphing method with filter kernels in mapped coordinates, D. Schmölz, B. Devresse, K.-U. Bletzinger, R. Wüchner, A. Geiser
**15:45:** Reconfigurable and temporary spatial structures: A paradigm of structural design based on CFD analyses, S. Gkatzogiannis, M.C. Phocas, E.G. Christoforou, D. Bouris
**16:00:** A node-based parameterization for bead-like features in shape optimization, B. Devresse, D. Schmölz, K.-U. Bletzinger, R. Wüchner, A. Geiser

## STREAM B

### B-M2: Steel Structures; Steel Connections - I

**10:30:** Investigating the behaviour of angle cleat hybrid steel beam-column connections at elevated temperatures, C. Quan, L. Lapira, K.A. Cashell
**10:45:** Tests on screwed connections failing in tilting/bearing under shear, H.V. Le, C.H. Pham, P. Jones, T. Clayton, M. Eckermann

**11:00:** Experiments on steel-to-concrete corner-bolted end-plates under biaxial bending, M. Sonna Donko, M. Couchaux, J.-P. Boudot
**11:15:** Eurocode 2nd generation: Advances in fatigue design of steel structures, M. Rauch
**11:30:** Comparative stress analysis of longitudinally and transversely stiffened orthotropic steel deck bridges, S. Chowdhury, A. Sharma, M.N. Keebiyage, M. Kraus
**11:45:** Towards model updating of steel bridges using strain data, C. Flack, M. Oberwestberg, S. Pitters, P.L. Niebuhr, R. Wüchner
**12:00:** Closely spaced back-to-back double-angle columns: Influence of realistic end supports on compression member capacity, M. Kettler, P. Zauchner, H. Unterweger
**12:15:** Evaluation of corrosion condition of weathering steel using alternating current impedance method, S. Kido, H. Oba, M. Matsukawa, Y. Sugimoto, H. Onishi

## B-M3: Steel Structures; Steel Connections - II

**13:30:** Carbon fibre textile counteracting the distortion of thin-walled cold-formed steel sigma beams, K. Rzeszut, M.A. Dybizbański **(Invited Paper)**
**14:00:** Impact of perforation shapes on the web crippling failure mode in C-shaped cold-formed steel beams using ANSYS workbench, S. Sreejith, M.P. Kulatunga, M. Macdonald, K. Alizadehhesari
**14:15:** Characterizing the hysteretic response of extended endplate connections based on deformation mode classification, Z. Ding, A. Elkady
**14:30:** A data registration method for a self-developed scanning robot for structural members, X. Zhao, M. Zhang, M. Su, X. Wang
**14:45:** Moment capacity of cold-formed steel hat sections, W. Zhou, J.P. Papangelis

## B-M4: Steel Structures; Steel Connections - III

**15:30:** Investigation on beam-column connection for novel composite columns with high-strength steel core, C. Schwendner, M. Mensinger, S. Ameri, J. Zehfuss
**15:45:** Fatigue strength of flange-to-web welded detail in corrugated web girders, M. Al-Emrani, F. Hlal
**16:00:** Real behaviour of selected rigid and semi-rigid steel connections, M. Rosmanit
**16:15:** Ductility of G20Mn5 cast steel and capacity safety factor for cast steel joints, S. Yan, C. Wang, X. Zhao
**16:30:** Load effects for fatigue design of web-to-flange welded detail in corrugated web girders, F. Hlal, M. Al-Emrani
**16:45:** A study of moment gradient factors for selected monosymmetric steel beams under linear moment gradients, K. Mudenda

## B-T2: High Strength Steel; High Performance Steel

Contributions to Special Session **SS18: High Strength Steel in Research, Construction and Application**. *Organisers*: Prof. Richard Stroetmann, TU Dresden, Germany ; Prof. Guo-Qiang Li & Prof. Yan-Bo Wang, Tongji University, China.

**10:30:** Challenges and new insights for the design and execution of welded joints on high-strength steels, R. Stroetmann, B. Rust, G. Penner **(Invited Paper)**
**11:00:** Experimental investigation on structural behavior of concrete-filled S690 steel tubes, S. Li, Y. Yang, J.Y.R. Liew, S.D. Pang, Z.X. Cong, Y.H. Ng
**11:15:** Steady-state temperature field analysis and softening-hardening region discussion for Q690 butt-welded joint, Z. Sun, Y.-B. Wang, G.-Q. Li, Q. Chen

**11:30:** Accuracy verification of high-strength bolt finite element models used to evaluate the performance of tensile joints, Y. Sugimoto, R. Kikuchi
**11:45:** Analysis of temperature field and hardness distribution of the heat-affected zone in high-strength steel fillet welds, Y. Gao, Z. Sun, Y.-B. Wang, G.-Q. Li, Y. Gao, R. Yan, X.L. Xhao
**12:00:** Temperature influence on hydrogen embrittlement of high-strength steel, A.H. Jabbari, Z. Silvayeh, P. Auer, J. Domitner
**12:15:** The load-bearing capacity of CFST columns with high-strength materials considering the triaxial mechanical properties of concrete, Y.-B. Wang, G.-Q. Li, C. Song, L.-J. Bao

### B-T3: Stainless Steel Structures; Aluminium Structures

Contributions to Special Session **SS03: Stainless Steel Connections under Static and Extreme Loading.** *Organisers*: Prof. Leroy Gardner, Imperial College London, UK ; Dr. Sheida Afshan, University of Southampton, UK ; Dr. Katherine Cashell, University College London, UK ; Dr. Marios Theofanous, University of Birmingham, UK

**13:30:** Material and hybrid connection behaviour of a new nickel-free stainless steel at elevated temperatures, R. Zhang, Z. Liang, C. Quan, L. Lapira, K.A. Cashell, L. Gardner
**13:45:** Ductility and energy dissipation of partially threaded and fully threaded A4-80 bolts under cyclic tension, M. Cabrera, M. Theofanous, M. Bock, H. Yuan, K. Skalomenos
**14:00:** Behaviour of stainless steel T-stubs under varying strain rates, W. Li, M. Ouyang, S. Afshan, M. Cabrera, M. Theofanous
**14:15:** Post-fire behaviour of 6082-T6 aluminium lap joints, M. Gkantou, M. Cabrera, M. Bock, M. Theofanous
**14:30:** Behaviour and design of stainless steel lap joints under high loading rates, M. Cabrera, M. Theofanous, R. Zhang, S. Dirar, L. Gardner
**14:45:** Fatigue behaviour of aluminium 6005A-T6 alloy after exposure to elevated temperatures, T. Molkens, B. Karabulut
**15:00:** Ultimate response of nickel-free stainless steel T-stubs subjected to high loading rates, M. Cabrera, M. Theofanous, W. Li, S. Afshan

### B-T4: Steel-Concrete Composite Structures

**15:30:** Numerical investigation of steel and concrete composite framed structures under a column loss scenario, N. Baldassino, G. Roverso, R. Zandonini
**15:45:** Numerical investigations on the partial shear connection theory in composite beams with transverse profiled steel sheeting at elevated temperatures, K. Tutzer, M. Stempl, M. Mensinger
**16:00:** Finite element modelling of shear stud behaviour in composite beams with parallel steel decking, J. Qureshi
**16:15:** Compressive resistance of short concrete-filled double-skin columns with outside steel and inside PVC circular tubes, Y. Essopjee, M. Dundu
**16:30:** Investigation of bond-slip behaviour in concrete-filled steel tubes, T. Dorbolò, G. Somma, N.C. Van Engelen

### B-W2: Sustainable Construction; Reuse of Materials and Structures - I

Contributions to Special Session **SS14: ReUse of Steel and Composite Structures**. *Organisers*: Prof. Markus Knobloch, Anna-Lena Bours & Sara Uszball, Ruhr University Bochum, Germany

**10:30:** On sustainability assessments for a viable reuse of structural components, S. Uszball, A.-L. Bours, M. Knobloch

**10:45:** Effect of increased imperfections on the buckling behaviour of reused steel members, B. Kövesdi, M. Radwan
**11:00:** Development and analysis of an innovative high-strength steel adaptable beam-to-column connection, A.S. de Carvalho, T. Bogdan, C. Odenbreit, J.F. Demonceau, R. Matos, R. Obiala
**11:15:** Re-use of structural steel components: Method for re-qualification in view of material properties, F. Eyben, H. Bartsch, M. Feldmann, B. Döbereiner, F. Bexter, P. Langenberg
**11:30:** An experimental test set-up to evaluate residual stresses and imperfections on historical riveted steel beams, T. Molkens, B. Kövesdi, P. Ryjácek
**11:45:** The Pavillion Petite Maison: A holistic view on the modular concept of the "Reuse Plug Play System" design for disassembly and reuse, T. Bogdan, S. Sayyareh, A.S. de Carvalho, C. Odenbreit, A. Kozma
**12:00:** Assessment of increased imperfections of tubular truss members due to service conditions, V. Szalai, A. Ciutina, A. Stratan, V. Ungureanu
**12:15:** Quantifying the impact of structural material choice and reuse on carbon emissions of flooring systems: Innovative concept and analysing tool, S. Sayyareh, T. Bogdan, C. Odenbreit, R.W.D. Siebers, T. Ummenhofer

### B-W3: Sustainable Construction; Reuse of Materials and Structures - II

**13:30:** Paper lime elements: Mechanical characteristics and load bearing behavior, S. Reich, C. Pfütze
**13:45:** Optimizing the carbon footprint of steel bridges using the principle of virtual work, J.H. Strydom, A. Elvin
**14:00:** Comparative analysis of concrete slab frame bridges and soil-steel composite bridges crossing pedestrian walkways: A cost and climate perspective, J. Lagerkvist, F. Carlsson, R. Rempling
**14:15:** Comparison in terms of $CO_2$ footprint between RC and CLT buildings, E. Runcio, G. Somma
**14:30:** Towards a structural condition assessment framework for selective reuse, E.M. Carson, J.E. van der Merwe, C.A. Davey
**14:45:** New material compositions for drywall elements, C. Pfütze, S. Reich

### B-W4: Sustainable Construction; Reuse of Materials and Structures - III

**15:30:** Optimizing cost and carbon emissions in the conceptual building design with genetic algorithms, L. Cusumano, R. Rempling, M. Granath, N. Olsson
**15:45:** Optimizing the carbon footprint including transportation emissions of steel structures, J.H. Strydom, A. Elvin
**16:00:** Concrete infrastructure in the face of climate emergency: Sustainability, resilience and adaptation challenges, F. Pacheco-Torgal
**16:15:** Application and challenges of biopolymers in sustainable construction: Through scientometric analysis and systematic review, B.B. Mitikie, W.A. Elsaigh
**16:30:** Navigating carbon dioxide challenges: From emission reduction struggles to eco-efficient construction solutions, F. Pacheco-Torgal

## STREAM C

### C-M2: High Strength Concrete; High Performance Concrete; Fibre-Reinforced Concrete

**10:30:** Challenges in the production of precast carbon-reinforced concrete elements, K. Holschemacher **(Invited Paper)**
**11:00:** A material model for the analysis of UHPFRC components under tensile loading based on a mixed stress-strain formulation, L. Gietz, U. Kowalsky, D. Dinkler

**11:15:** Internal curing of high-performance concrete using demolition construction waste, V. Bílek, L. Prochazka, R. Čajka, M. Krejsa
**11:30:** Optimised fibre reinforced polymer bridge design using variable angle tow composites, A. Madeo, F.S. Liguori, G. Zucco
**11:45:** Phase-field modelling for failure behaviour of reinforced ultra-high performance concrete under creep load, M.A. Margalho de Barros, M. Pise, D. Brands, J. Schröder
**12:00:** Improvement in the aging resistance of uncoated AR-glass textile reinforcement, F. Kufner, M. Horstmann, P. Rucker-Gramm
**12:15:** Experimental investigation of fibre reinforced engineered cementitious composite short deep beam under static and impact loading, F.Z. Gigar, Z.Y. Kuang, H. Wang, A. Khennane, N.A. Workeluel, B.H. Tekle, Z. Li
**12:30:** Crack formation behaviour of carbon-reinforced concrete for state II sealing layers, F. Kufner, M. Horstmann, P. Rucker-Gramm, J. Reymendt, J. Heckenbach, R. Scharmann

## C-M3: Reinforced Concrete; Prestressed Concrete - I

Contributions to Special Session **SS05: Mechanics of Reinforced Concrete and Construction Materials**. *Organiser*: Prof. Maria Anna Polak, University of Waterloo, Canada

**13:30:** Interface bonding in 3D-printed concrete: Experimental evaluation and numerical modeling, Z. Miri, R.M. Aurilio, M.A. Polak, H. Baaj **(Invited Paper)**
**14:00:** Investigating the strength enhancement of concrete elements with adverse geometries using permanent plastic formwork, Q. Reduan, C. Buchanan, A. Kia
**14:15:** Reinforced concrete T-beams: Cracking related to environmental loading and restraint, A. Kleynhans, E.P. Kearsley, S.A. Skorpen
**14:30:** Meta model predictions of restraint forces in RC slab structures: Model development and comparison to real scale experiments, C. Walsemann, T. Schmidt, A. Albert
**14:45:** Effect of confinement on the performance of GFRP reinforced concrete corner joints under opening loads, S. Saad, L. Bashbishi, M.A. Polak

## C-M4: Reinforced Concrete; Prestressed Concrete - II

**15:30:** Structural performance of the first precast and reinforced permeable concrete pavement, M. El-Zeadani, C. Buchanan, A. Kia
**15:45:** Experimental analysis of concrete beams retrofitted using carbon fibre reinforced polymer plates, T.M. Sibiya, J. Mahachi
**16:00:** Friction losses of post-tensioned beam: An experimental investigation, M. Serry, M. Darwish, Y. Sharkas, E.Y. Sayed-Ahmed
**16:15:** The bonding of mild steel plates to rib and block slabs for vertical shear enhancement, A. Akhalwaya, Y. Essopjee
**16:30:** Experimental study on flexural behaviour of fly-ash-based geopolymer reinforced concrete small beams, J. Chamberlain, S. Ekolu, B. Fraser, A. Wasserman, F. Solomon, A. Naghizadeh

## C-T2: Structural Applications of FRP Composites - I

Contributions to Special Session **SS08: FRP Composites in Civil Engineering Structures**. *Organisers*: Prof. John Myers, Missouri University of Science and Technology, USA; Prof. Lawrence Bank, Georgia Institute of Technology, USA; Prof. Brahim Benmokrane, University of Sherbrooke, Canada

**10:30:** 25 years of FRP research at Istanbul Technical University, A. Ilki, B. Sari, C. Goksu, C. Demir, U. Demir, E. Tore **(Invited Paper)**

**11.00:** Testing and analysis of pedestrian bridge made of discarded wind turbine blades, K. Ruane, V. Jaksic, L.C. Bank, T.R. Gentry, K. McDonald, M. Soutsos, C. Graham, E. Delaney, J. McKinley, P. Leahy, A. Nagle, E. Esmaeeli, V. Pakrashi **(Invited Paper)**
**11:30:** Flexural performance of concrete beams reinforced with GFRP, BFRP or hybrid reinforcement, Y. Elbawab, Y. Elbawab, Z. El Zoghby, O. Elkadi, M. AbouZeid, E. Sayed-Ahmed
**11:45:** Corrosion characteristics of CFRP bonded steel plate in seawater through salt water immersion test, C. Fukunaga, Y. Kitane, R. Matsumoto, Y. Miyagawa, K. Fujita, K. Shimozawa, K. Sugiura, T. Matsui
**12:00:** Investigation of the shear-slip relationship in UHPC reinforced with CFRP composites by push off tests, D. Sheferaw, M.F. Green
**12:15:** Investigation of mechanical properties of high-density polyethylene/carbon nanofibres nanocomposites produced by extrusion method, S.D. Jobe, H.M. Ngwangwa, R.T. Tebeta, D.M. Madyira, J. Letwaba, L. Maubane

## C-T3: Structural Applications of FRP Composites - II

Contributions to Special Session **SS08: FRP Composites in Civil Engineering Structures**. *Organisers*: Prof. John Myers, Missouri University of Science and Technology, USA; Prof. Lawrence Bank, Georgia Institute of Technology, USA; Prof. Brahim Benmokrane, University of Sherbrooke, Canada

**13:30:** Mitigation and repair strategies using FRCM to extend the service life of reinforced and prestressed concrete structures, J.J. Myers **(Invited Paper)**
**14:00:** Evaluation of the effectiveness of FRP composites in the seismic resilience of limited ductility columns using hybrid testing techniques, R. Al-Mahaidi, J. Hashemi, R. Kalfat **(Invited Paper)**
**14:30:** Impact load performance of UHPC beams with central openings: Experimental and numerical study**,** S.G. Angural, T.G. Aditya, S.K.S. Pachalla
**14:45:** Interface shear transfer behavior of basalt fiber-reinforced polymer (BFRP) in reinforced concrete using the push-off test, J.J. Myers, L. Coulter

## C-T4: Structural Applications of FRP Composites - III

Contributions to Special Session **SS08: FRP Composites in Civil Engineering Structures**. *Organisers*: Prof. John Myers, Missouri University of Science and Technology, USA; Prof. Lawrence Bank, Georgia Institute of Technology, USA; Prof. Brahim Benmokrane, University of Sherbrooke, Canada

**15:30:** Recent developments in the use of GFRP reinforcing bars in concrete construction and advance-ments in design codes and standards, B. Benmokrane, S.A. Hosseini, K. Mohamed **(Invited Paper)**
**16:00:** Development of fly ash geopolymer adhesive incorporating Andalusite powder to enhance thermomechanical performance under elevated temperatures for NSM CFRP strengthening application, H. Shdeifat, R. Kalfat, R. Al-Mahaidi
**16:15:** Numerical simulation of the time-dependent and rate-dependent behavior in CFRP-concrete interfaces, Y. Wang, J. Vorel, A. Cibelli, J. Belis, R. Wan-Wendner
**16:30:** Explainable machine learning prediction of the flexural capacity of UHPFRC beams, K. Silewu, C. Kahanji, L. Simwanda
**16:45:** Experimental investigation and methodology for enhancing flexural strength of reinforced concrete beams using NSM GFRP, B. Arab, E.Y. Sayed-Ahmed

## C-W2: Timber Structures; Timber Technology

Contributions to Special Session **SS19: Challenges and Opportunities for Modern Timber Engineering in a Changing World**. *Organisers*: Prof. Robert Jockwer, TU Dresden, Germany; Dr. Johann van der Merwe, University of Pretoria, South Africa

**10:30:** Derivation of material parameters for various hardwood species for use in the design approaches of Eurocode 5 for timber structures, R. Jockwer
**10:45:** Performance of CLT-concrete composite slabs made with South African timber, D.L. Teixeira, J.E. van der Merwe, C.P. Roth
**11:00:** CLT-steel composite flooring: A sustainable solution for South Africa?, S.A. Skorpen, G. Cattaert, A. Bouchair
**11:15:** The distribution of mechanical properties of South African Eucalyptus timber, O. de Lange, C.P. Roth, J.E. van der Merwe
**11:30:** Design for structural adaptation with demountable cross-laminated timber connections, V. Öberg, Y. Goto, R. Jockwer, Z. Li
**11:45:** The shear performance of South African Pine and Eucalyptus CLT, B.E. Boulle, J.E. van der Merwe, C.P. Roth
**12:00:** A comparison of test methods for bending stiffness and strength of South African plywood, T. Yang, C.P. Roth, J.E. van der Merwe
**12:15:** Evaluating models for doweled connection capacity in South African timber, L.M. Mahole, J.E. van der Merwe, C.P. Roth

## C-W3: Mechanics of Wood; Construction Materials I

Incorporating contributions to Special Session **SS21: Fracture and Thermo-Hydromechanical Behaviour of Wood and Timber Structures**. *Organiser*: Dr. Rostand Moutou Pitti, Université Clermont Auvergne, France

**13:30:** Enhancing the durability of green wood in civil engineering: 3D crack monitoring using image correlation, X-ray micro-tomography and machine learning, S.E. Hamdi, S. Ekomy Ango, C.F. Pambou Nziengui, R. Moutou Pitti, J. Gril, E. Badel, E. Toussaint
**13:45:** Assessing the impact of crack propagation in wood mechanical behaviour: Analytical and numerical models, C.F. Pambou Nziengui, S.E. Hamdi, C. Jaafari, R. Moutou Pitti
**14:00:** Fracture toughness investigation of three tropical species from Cameroun using LSA method, R. Biyo'o, A.B. Biwole, E. Yamb, B. Blaysat, T. Jailin, N. Sauvat, J. Gril, R. Moutou Pitti
**14:15:** Experimental study of the mechanical behavior of Iatandza (Albizia ferruginea) from Cameroon using the non-destructive testing and evaluation method, E. Nouemsi Soubgui, F.D. Nkontchiachou Nkana, S.B. Keumeka Jiofack, G. Mabou Ninkam, T.V. Ngo Kaljob, C.F. Pambou Nziengui, N. Sauvat, R. Moutou Pitti, J. Gril
**14:30:** Geopolymer concrete for structural engineering applications: A review, F. Solomon, S. Ekolu, A. Naghizadeh
**14:45:** Optimising the properties of fired clay bricks produced in the far west of DR Congo, B. Lewo Nkondi, B. Blaysat, N. Azama, R. Moutou Pitti

## C-W4: Cement-Based Materials; Construction Materials II

**15:30:** Comparison of the time evolution of temperatures in massive foundation structures due to the hydration of concrete made from alkali-activated materials and from cement, R. Cajka, K. Burkovic, V. Bilek, P. Mec, M. Krejsa

**15:45:** Investigation on mechanical properties of geopolymer matrix composites using alkaline activator powder, R. Horikawa, L. An, K. Sugiura, H. Shinohara
**16:00:** Recent advances on self-healing in cement-based materials through the addition of cementitious macro-capsules, G. Anglani, J.-M. Tulliani, P. Antonaci
**16:15:** Statistical evaluation of PET-fibre reinforced laterized concrete with waste ceramic as a replacement for cement, S.A. Alabi, J. Mahachi
**16:30:** A comparative study of the asphalt mix master curve generation using various temperature shifting techniques and reference temperature, M. Belhaj, J. Valentin

## STREAM D

### D-M2: Soil-Structure Interaction; Foundations; Geotechnical Engineering - I

Contributions to Special Session SS09: Renewable Energy Structures. *Organisers*: Prof. Lars Andersen, Aarhus University, Denmark; Dr. Zili Zhang, Tongji University, China. *Note*: A few other contributions to SS09 could be in related sessions elsewhere due to scheduling constraints.

**10:30:** Modelling of monopile-based offshore wind turbines: Comparison of soil–structure interaction models accounting for hysteretic soil behaviour, L.V. Andersen, M.D. Christophersen, W.H. Nguyen, M.K. Hoffmann, M. Damgaard **(Invited Paper)**
**11:00:** Recent developments regarding the design of monopiles supporting offshore wind energy converters, M. Achmus **(Invited Paper)**
**11:30:** A coupled FEM-SBM methodology for structure-soil-structure dynamic interaction problems, H. Liravi, J. Ninić, A.A. Shiraz, A. Clot
**11:45:** Application of Convected Particle Domain Interpolation Method (CPDI) for predicting dynamic installation processes of offshore monopiles by vibration and impact driving, C. Moormann, S. Giridharan, D. Stolle
**12:00:** Soil interaction modelling of large diameter offshore wind monopiles, L. Kellezi, K.A. Abhinav
**12:15:** Model testing of a cyclically loaded gravity foundation on saturated sand under partially drained conditions, N. Goldau, M. Achmus
**12:30:** A hierarchical Bayesian approach to the geotechnical site assessment for offshore wind farms, L.V. Andersen, U. Alibrandi, M. Geessink, A.B. Mikkelsen

### D-M3: Soil-Structure Interaction; Foundations; Geotechnical Engineering - II

**13:30:** Top-down-construction method with a diaphragm wall used as permanent external wall, M. Seip, S. Fischer, R. Katzenbach
**13:45:** A settlement model in a FEM framework for geotechnical engineering applications, R. van der Meij, W. Ausmann, J.A.M. Teunissen
**14:00:** Optimization of bridge foundations using the combined pile-raft foundation, S. Leppla, J.C. Paninski, M. Scholz
**14:15:** Numerical analysis of the vibration isolation effects of infilled trench barrier in unsaturated poroviscoelastic ground, S. Li
**14:30:** Impact of sand pre-shearing in direct simple shear tests on the prediction of capacity degradation of axially loaded piles, D. Hansmann, M.S. Trüe, M. Achmus
**14:45:** Research on multi-point displacement sensor based on machine vision, Z. Cheng, B. Bai, J. Liu, X. Zhao
**15:00:** Soil mechanical design of different temporary anchor systems, S. Leppla, J.C. Paninski

## D-M4: Additive Manufacturing; 3D Printing

Incorporating contributions to Special Session **SS07: Advanced Technologies for Reducing the Carbon Footprint of Steel Structures**. *Organisers*: Dr. Vittoria Laghi, University of Bologna, Italy; Alper Kanyilmaz, Politecnico of Milan, Italy; Josephine Carstensen, MIT, USA

**15:30:** Steel additive construction: New possibilities for efficient structural systems, V. Laghi, G. Gasparini
**15:45:** Reinforcing thin sheet metal in various geometries and directions with Wire Arc Additive Manufacturing (WAAM), P. Grebner, J. Lange, F. Rädel
**16:00:** Utilization of lattice discrete particle model for modelling of 3D-printed alloys, J. Vorel, A. Jíra, J. Kruis
**16:15:** Analysis of the impact of steel 3D printing in construction, V. Laghi, E. Savino, G. Gasparini
**16:30:** Compression behaviour of alumina ceramic for bio-inspired 3D-printed dental implants, E. Munenge, W. Mtetwa, H.M. Ngwangwa, T. Pandelani, L. Lebea

## D-T2: Soil-Structure Interaction; Foundations; Tunnelling; Machine Parts; Kinematics

**10:30:** Influence of train travel direction on bridge-embankment transition zones in high-speed railway ballasted tracks, A. Ahmadi, S. Larsson
**10:45:** Finite element modelling of dynamically loaded ballasted railway tracks on saturated clayey soils, C. Moormann, F. Mitlmeier, S. Freudenstein, N. Lilin
**11:00:** Using the digital twin model train the blasthole recognition algorithm, Y. Feng, X. Zhao, J. Luo, R. Ren, Y. Yang
**11:15:** Tunnel surrounding rock deformation monitoring system based on binocular vision and deep learning, B. Bai, X. Zhao, J. Luo, R. Ren, C. Li, Y. Dong
**11:30:** Verification of the stress conditions of shotcrete shells in tunnel construction, D. Zapf, F. Körner, M. Achmus, S. Sefene
**11:45:** Research on tunnel blasthole image recognition method based on light-weighting improved YOLOV7, Y. Feng, X. Zhao, J. Luo, R. Ren, Y. Li
**12:00:** Design and structural analysis of perforated gear systems in automotive transmissions, A.O. Nurudeen, S. Sreejith
**12:15:** Design of kinematic mechanism of morphing wing with functionally gradient metamaterial skin, J. Bajer, M. Hrstka, Z. Hadas, Z.S. Khodaei, M.H. Aliabadi

## D-T3: Damage Modelling; Fracture & Fatigue I

**13:30:** Numerical modelling of complex fracture patterns: From crack branching at dynamic loading to fragmentation of tempered glass, A. Kanan, M. Kaliske **(Invited Paper)**
**14:00:** Numerical modelling of the fracture toughness of structural steel, S. Lochte-Holtgreven, J.-W. Jungen
**14:15:** A composite model for evaluating fatigue life of offshore wind turbines equipped with a tuned mass damper, J. McAuliffe, B. Broderick, B. Fitzgerald
**14:30:** Thermo-oxidative degradation of carbon fiber reinforced epoxy resin: Microstructural effects, V. Lovis, P. Wriggers
**14:45:** Geometrical effects on the longitudinal attachments' fatigue resistance, G.M.K. Hofmann, M. Knobloch, U. Kuhlmann

## D-T4: Fracture & Fatigue II; Blast & Impact

**15:30:** Instrumented Charpy impact test as a tool for verifying the post-fire susceptibility of structural steel to brittle fracture, M. Maslak, M. Pazdanowski, M. Stankiewicz, P. Zajdel

**15:45:** Investigating the effect of pipe material stiffness on water leakage behaviour through longitudinal cracks in pressurized pipes: An experimental and numerical analysis, D.T. Ilunga, M.O. Dinka, D.M. Madyira
**16:00:** Study on bending fatigue strength of adhesively bonded joints considering stress ratio, V. Thay, Y. Osada, Y. Kanazawa, S. Fujikura, H. Nakamura, H. Horii
**16:15:** Application of DOProC method for stochastic prediction of fatigue damage of steel structures and bridges, M. Krejsa, R. Cajka, V. Bilek
**16:30:** Evaluating the performance and accuracy of blast gauge systems compared to pencil gauges in blast environments: A comparative study, T. Pandelani, S. Hamilton, D Modungwa, J.D. Reinecke

### D-W2: Computational Mechanics; Material Modelling; Numerical Simulations

Incorporating contributions to Special Session **SS04: Multiscale Models of Multiphase Porous Materials**. *Organisers*: Prof. Tim Ricken, University of Stuttgart, Germany; Prof. Jörg Schröder, University of Duisburg-Essen, Germany

**10:30:** Recent advances in peridynamics applied to structural problems, U. Galvanetto, V. Diana, P. Pavan, F. Scabbia, M. Zaccariotto **(Invited Paper)**
**11:00:** Modelling ice material properties and behavior for space engineering applications using molecular dynamics, A.P. Ricketts, L.S. Morrissey, R.S. Taylor
**11:15:** Towards multi-fidelity models of coupled multi-X processes in sea ice within the Antarctic marginal ice zone, R. Pathak, A. Gupte, S.M. Seyedpour, B. Kutschan, S. Thoms, T. Ricken
**11:30:** Stress-driven integral elasticity for nanobeams based on higher-order shear deformation theories, R. Barretta, F. Marotti de Sciarra, F.P. Pinnola, M.S. Vaccaro, D. Ussorio
**11:45:** Mathematical modeling and numerical simulation of atherosclerosis, M. Soleimani, P. Wriggers, P. Junker, C. Gasser, A. Haverich
**12:00:** GReS: A novel multi-physics multi-domain computational tool for geomechanical subsurface simulations, M. Ferronato, A. Franceschini, D. Moretto
**12:15:** Towards small-strain viscoelastic modeling of sea ice at the calving front within the Material Point Method, M. Kossler, J. Schröder

### D-W3: Numerical Modelling; Biological Tissue I; Biomedical Engineering I

Incorporates contributions to Special Session **SS23: Mechanical Characterisation of Soft Tissues**. *Organisers*: Prof. T. Pandelani & Prof. H. Ngwangwa, Univ. of South Africa; Prof. F. Nemavhola, Durban Univ. of Technology, South Africa; Dr. D. Modungwa, Council for Scientific and Industrial Research, South Africa; Prof. D. Desai, Tshwane Univ. of Technology, South Africa

**13:30:** Finite element modelling of 2.5D meta-structures with varying Poisson's ratios, N.A. Workeluel, D. Judge, H.B. Dura, F.Z. Gigar, A. Khennane, Z. Li
**13:45:** The thermal effect on transonic flow for various aerodynamic shapes: An analysis of heating and cooling impacts, G. Mbau, A. Netshivhulana, M. Adeoba, H. Ngwangwa, T. Pandelani
**14:00:** Simulating pelvic injuries from underbody blasts: A 2D finite element model analysis, T. Pandelani, D. Carpanen, S.D. Masouros
**14:15:** Investigations of hyperelastic constitute models of healthy and cancerous breast cells at various strain rates, L. Lebea, H. Ngwangwa, F. Nemavhola, D. Desai, D. Modungwa, T. Pandelani
**14:30:** Topography optimisation and experimental validation of an external circular fixator, W. Barros, H.M. Ngwangwa, T.A. Pandelani, F.J. Nemavhola, D. Desai, D. Modungwa
**14:45:** Environmental impact of organic materials and structures in biomedical applications: A critical review, M.I. Adeoba, T. Pandelani, H. Ngwangwa, T. Masebe

### D-W4: Biological Tissue II; Biomedical Engineering II

Contributions to Special Session **SS23: Mechanical Characterisation of Soft Tissues**. *Organisers*: Prof. T. Pandelani & Prof. H. Ngwangwa, Univ. of South Africa; Prof. F. Nemavhola, Durban Univ. of Technology, South Africa; Dr. D. Modungwa, Council for Scientific and Industrial Research, South Africa; Prof. D. Desai, Tshwane Univ. of Technology, South Africa

**15:30:** Measurement of planar stresses in porcine Achilles tendons using the VIC-EDU digital image correlation system, H.M. Ngwangwa, T.A. Pandelani, F. Nemavhola, D. Modungwa, T. Masebe
**15:45:** The effect of residual stress and surface roughness on mechanical behaviour of hybrid surface implants using finite element analysis, L. Lebea, D.A. Desai, H.M. Ngwangwa, F. Nemavhola
**16:00:** Viscoelastic modelling of right ventricular and septum myocardia of porcine heart, L. Semakane, I. Mabuda, H. Ngwangwa, T. Pandelani, F. Nemavhola
**16:15:** Characterization properties of bio-adhesive material from candelabra tree, A. Madiba, H.M. Ngwangwa, T.R. Tebeta, D.M. Madyira
**16:30:** An investigation into the effect of an acid concentration on the corrosion of alumina dental implants, W. Mtetwa, E. Munenge, L. Lebea, H.M. Ngwangwa, T. Pandelani

## STREAM E

### E-M2: Wind Power Plants; Wind Load; Safety, Risk & Vulnerability; Machine Learning

**10:30:** Wind power plants: Possibilities, challenges and limits, H. Pasternak, K. Pasternak **(Invited Paper)**
**11:00:** Wind load under anthropogenic climate change in South Africa, A.C. Kruger, J.V. Retief, M. Holický
**11:15:** Fragility of structures due to extreme actions, M. Holický, J.V. Retief
**11:30:** Wind analysis of transmission lattice towers in South Africa, T. Haas, D. Albertyn, D. Louw
**11:45:** Parametric modelling framework for assessing urban structure vulnerability to natural disasters, J. Rosin, S. Neuhäuser, J.Z. Vetter, A. Stolz
**12:00:** Analysis of current risk factors in construction projects: A legal approach, U. Quapp, J. Tamošaitienė, K. Holschemacher
**12:15:** Machine learning approaches for buildable and sustainable bridges, A. Kjellgren, R. Rempling, M. Granath, M. Johansson, H. Broo, P. Kettil

### E-M3: Structural Optimization; Structural Reliability

**13:30:** Parametric physics-informed neural networks as generalized structural surrogates for the optimization of reinforced concrete structures, T.M. Buschke, S. Gagesch, R. Wüchner
**13:45:** DeepF-fNet: A framework for vibration-based structural optimization, A. Tollardo, F. Cadini, M. Giglio, L. Lomazzi
**14:00:** Topology optimization for stiffened panels considering postbuckling, S. Chu, C.A. Featherston, D. Kennedy, H.A. Kim
**14:15:** Design constraints for segmented and prestressed bridge crane girders, J. Oellerich, M. Padhy, K.J. Büscher, M. Golder
**14:30:** Virtual element method for topology optimization of contact problems, A. Myśliński
**14:45:** Support vector machines in reliability calculations of engineering structures, M. Šomodíková, D. Lehký

## E-M4: Digital Twinning; Building Performance; Housing

**15:30:** Digital twinning in structural engineering applications, X. Shen, D.J. Wagg
**15:45:** Digital twin applications for rail infrastructure resilience, sustainability, and maintenance, N. Evbuomwan
**16:00:** Performance of reinforced concrete residential building under fire using OpenSees, M.B. Waris, M.B. Sulaiman, K. Al-Jabri, A. Al-Nuaimi
**16:15:** Autonomous night cooling system: Concept and prototype, S. Vanapalli, S. Reich
**16:30:** Convergence of frameworks on innovative housing design and construction, M.S. Monamodi Mlasi, J. Mahachi
**16:45:** Enhancing fraud prevention, title deed management, and housing development in human settlements through blockchain technology, F. Chikwira, J. Mahachi

## E-T2: Structural Health Monitoring; Damage Detection; Structural Identification - I

Incorporating contributions to Special Session **SS12: Modern Technologies for Infrastructure Inspection and Maintenance**. *Organisers*: Prof. Chul-Woo Kim, Prof. Kunitomo Sugiura & Prof. Yasuo Kitane, Kyoto University, Japan; Prof. Takeshi Kitahara, Kanto Gakuin University, Japan; Prof. Shozo Nakamura, Nagasaki University, Japan.

**10:30:** Remote bridge monitoring utilizing satellite observation digital twin, T. Miyamoto, K. Kinoshita, T. Kumura, F. Ogushi, P.J. Chun, R. Honda
**10:45:** Structural health monitoring of existing structures and infrastructures combining satellite interferometric data and on-site acquisitions, F.C. Ponzo, G. Tancredi, R. Ditommaso
**11:00:** Bridge damage detection using maximum displacement ratio, A. Hiro, C.-W. Kim
**11:15:** Investigation of regression models based on deep transfer learning for the effect of bridge temperature on the inclination of a prestressed concrete bridge, E.K. Ramasetti, R. Herrmann, S. Degener, M. Baeßler
**11:30:** A real-time strain monitoring sensor based on industrial cameras and machine vision technology, Z. Wen, W. Li, J. Luo, R. Ren, T. Xiong , B. Bai, X. Zhao
**11:45:** Identifying structural damage using a convolutional neural network from time-domain dynamic response data, B. Šplíchal, D. Lehký
**12:00:** Efficient detailed survey of cable-stayed bridge cables by combining inspection robot and eddy current testing equipment, S. Kakehashi, T. Yamaguchi, I. Hashimoto, S. Nakamura
**12:15:** Adjoint-based system identification for model validation and qualification, T.S.A. Ansari, S. Warnakulasuriya, R. Wüchner, K.-U. Bletzinger, I. Antonau, R. Löhner, H. Antil, F. Airaudo
**12:30:** Early warning and smart technologies for structural health monitoring and seismic NaTech risk management in major hazard industries, A. Marino, M. Ciucci

## E-T3: Structural Health Monitoring; Damage Detection; Structural Identification - II

Incorporating contributions to Special Session **SS02: Structural Health Monitoring and Damage Identification**. *Organisers*: Prof. Maria Pina Limongelli, Politecnico di Milano, Italy; Prof. Guido De Roeck, University of Leuven, Belgium

**13:30:** Substantial progress in vibration-based monitoring (VBM) by the application of strain mode shapes, G. De Roeck, D. Anastasopoulos, E. Reynders **(Invited Paper)**
**14:00:** Crack location by means of the use of roving loads, S. Caddemi, I. Caliò, F. Cannizzaro, I. Fiore
**14:15:** Uncertainties in the dynamic identification process of existing buildings, M. Buzzetti, M. Acito, C. Chesi
**14:30:** Road condition monitoring and identification using low-cost alternative: Pretoria inner city roads as a case study, T. Babawarun, H. Ngwangwa

**14:45:** Infrastructure inspection methodologies to define correct maintenance activities: A two-level road parking structure case study in Italy, M. Pasetto, G. Giacomello, A. Baliello
**15:00:** Variational autoencoder with reinforcement learning for arch dam anomaly detection, T. Tshireletso, P. Moyo

### E-T4: Glass Structures

Contributions to Special Session **SS15: Structural Applications of Glass**. *Organiser*: Dr. Faidra Oikonomopoulou, Technical University of Delft, The Netherlands

**15:30:** Reinforced cast glass: Embedded metal reinforcement for resilient and circular structural cast glass components, F. Oikonomopoulou, M. Ioannidis, T. Bristogianni
**15:45:** Equibiaxial bulge tests on silicone for use as structural sealant glazing, T. Reisewitz, M. Hajduk, G. Siebert
**16:00:** Deserts turned to glass: The research behind the Mirage Sculpture, T. Bristogianni, M. Ioannidis, F. Oikonomopoulou
**16:15:** Triggering bulk flaws in glass: Uniaxial tensile testing of glass using theta specimens, W. Damen, M. Overend, T. Bristogianni, F. Oikonomopoulou

### E-W2: Structural Assessment; Rehabilitation

**10:30:** An innovative passive approach for a sustainable rehabilitation of existing constructions, G.A. Ferro, D. Falliano, L. Restuccia **(Invited Paper)**
**11:00:** Assessment and structural design of post-installed rebar (PIR) connections under fire conditions, K. Nincevic, T. Swart **(Invited Presentation)**
**11:30:** Warzone bridges: Inspection of bridges damaged or destroyed by explosions, Z. Fulka, J. Valentin
**11:45:** The use of digital image correlation in the structural performance assessment of railway bridges, A.W. Bezuidenhout, M. Jogiat
**12:00:** Seismic vulnerability assessment of RC bridge piers strengthened with GFRP rebars: A case study, R. Tarantini, M. Mairone, M. Givonetti, G. Gallina, G.A. Ferro, D. Masera, M. Corrado
**12:15:** The effect of $CO_2$ loading on corrosion of steel bars within concrete containing industrial waste products, P. van Tonder, S.Y. Patel

### E-W3: Historic Structures; Masonry Structures

**13:30:** Seismic behaviour of masonry cross vaults in Medieval churches, M. Zizi, C. Chisari, M. Della Pietra, G. Iovinelli, G. De Matteis
**13:45:** Structural modifications to historic party walls, A. Mammen, J. Halpern
**14:00:** Prediction of masonry strength and earthquake resistance of historic buildings in Vienna using machine-learning algorithm, K. Deix, B. Rusnov
**14:15:** Structural behaviour of wood-geopolymer cement masonry prisms, F.Z. Gigar, A. Khennane, J.-L. Liow, Z. Li, B.H. Tekle
**14:30:** Protection and valorization of historical masonry heritage: Case studies from Southern Italy, G. De Matteis, M. Zizi, E. Spacone

### E-W4: Bridge Analysis, Design & Construction

**15:30:** A tale of two integral bridges, S. Skorpen, J. Adendorff, E. Kearsley, J. Harripershad, P. Fenton
**15:45:** Numerical simulation of full scale load tests on 50-year-old PC bridge deck beams under different loading and damage conditions, M. Anghileri, F. Biondini

**16:00:** Design of the Dhaka Elevated Expressway Project (DEEP), N.R. Featherston
**16:15:** Design and construction of the structural holding measures at Carinus Bridge (B2918) over the Berg River at Velddrif (South Africa), H. Aucamp, P.D. Ronné
**16:30:** Analysis and load testing of a 452.9m long footbridge over the Vistula River in Poland, M. Miśkiewicz, B. Sobczyk, K. Makowska-Jarosik, P. Tysiąc, B. Meronk, J. Kałuża
**16:45:** Permanent bearing design for an incrementally launched bridge with large seismic loads, N.R. Featherston

END