The Sixth International Conference on Structural Engineering, Mechanics and Computation

Cape Town, South Africa, 5-7 September 2016

FINAL PROGRAMME

Welcome Reception: Sunday 4 September
Leslie Social Sciences Building, Upper Campus, University of Cape Town

16:00-18:30 Onsite Registration & Collection of Conference Bags
17:00-18:15 Conference Welcome Reception

Opening Ceremony: Monday 5 September
River Club Conference Centre, Observatory, Cape Town

07:30-10:00 Onsite Registration & Collection of Conference Bags
07:30-08:00 Tea and Coffee
08:00-08:10 Introductory Remarks by the Conference Chair: Prof. Alphose Zingoni
08:10-08:20 Welcome Address by UCT Deputy Vice-Chancellor: Prof. Danie Visser
08:20-08:30 Presentation of SEMC 2016 Young Researcher Awards and the CAS Bathe Award 2016

Conference Dinner: Tuesday 6 September
Kelvin Grove Club, Newlands, Cape Town: 19:00-22:30

Plenary & Parallel Session Presentations: Monday 5 – Wednesday 7 September
River Club Conference Centre, Observatory, Cape Town

General Structure of Programme of Presentations for All 3 Days

08:30-10:00 Plenary Session: 2 Keynote Lectures (45 minutes each)
10:00-10:30 Tea & Coffee Break
10:30-12:30 Period 1 Parallel Sessions: 6 Streams (A to F)
12:30-13:15 Lunch Break
13:15-15:00 Period 2 Parallel Sessions: 6 Streams (A to F)
15:00-15:15 Tea & Coffee Break
15:15-17:00 Period 3 Parallel Sessions: 6 Streams (A to F)

Plenary Session Presentations

Monday 5 September: 08:30-10:00: Room A
Chair: Prof. M.A. Bradford, University of New South Wales, Australia

08:30-09:15: Prof. Kim Rasmussen, University of Sydney, Australia
Keynote Lecture 1: On the next generation of design specifications for steel structures

09:15-10:00: Prof. Klaus-Jürgen Bathe, Massachusetts Institute of Technology, USA
Keynote Lecture 2: The finite element method with "overlapping finite elements"

Tuesday 6 September: 08:30-10:00: Room A
Chair: Prof. B. Benmokrane, University of Sherbrooke, Canada

08:30-09:15: Prof. Amr Elnashai, Pennsylvania State University, USA
Keynote Lecture 3: Hybrid analytical-experimental simulation in earthquake response assessment

09:15-10:00: Prof. Jian-Fei Chen, Queen's University of Belfast, UK
Keynote Lecture 4: Challenges in the numerical simulation of debonding failures in FRP-strengthened RC structures

Wednesday 7 September: 08:30-10:00: Room A
Chair: Prof. K.J. Bathe, Massachusetts Institute of Technology, USA

08:30-09:15: Prof. Adnan Ibrahimbegovic, Universite de Technologie de Compiegne, France
Keynote Lecture 5: Computations, testing, uncertainty propagation and size effect in localized failure of massive composite structures

09:15-10:00: Prof. Guido De Roeck, Catholic University of Leuven, Belgium
Keynote Lecture 6: Advances and challenges in structural health monitoring

Parallel Session Presentations

These will run on each day from 10:30 until 17:00. After the morning plenary session, the rest of the day (on Monday, Tuesday & Wednesday) is divided into three time periods:

Period 1 (10:30-12:30); **Period 2** (13:15-15:00); **Period 3** (15:15-17:00)

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

STREAM A: Dynamic Response; Vibration Analysis; Vibration Control; Vibration Serviceability; Human-Induced Vibrations; Non-Linear Mechanics; Fluid-Structure Interaction; Seismic Response; Seismic Analysis; Earthquake-Resistant Design

STREAM B: Material Modelling; Multi-Scale Modelling; Composite Materials; Porous Media; Numerical Schemes; Numerical Simulations; FEM Formulations; Damage Mechanics; Damage Modelling; Fracture; Fatigue; Biomechanics; Wind Loading; Response of Structures to Wind; Performance of Structures in Fire; Design for Fire Resistance

STREAM C: Stability of Beams; Thin-Walled Sections; Cold-Formed Steel Structures; Stainless Steel Structures; Aluminium Structures; General Steel Structures; Steel-Concrete Composite Construction; Steel Joints; Steel Connections; Glass Structures

STREAM D: Plates; Shells; Membranes; Sustainable Lightweight Structures; Laminated Structures; Composite Structures; Sandwich Structures; Timber Structures; Manufacturing Processes; Assembly Processes; Optimization; Renewable Energy Structures; Structural Case Studies; Design Considerations; Engineering Education

STREAM E: Reinforced Concrete Structures; Prestressed Concrete; High Strength Concrete; High Performance Concrete; Structural Use of FRP Composites; Fibre-Reinforced Concrete; Mechanics of Concrete; Properties of Concrete; Construction Materials; Construction Technology

STREAM F: Structural Health Monitoring; Damage Detection; System Identification; Structural Assessment; Failure Analysis; Repair; Strengthening; Retrofitting; Soil-Structure Interaction; Foundations; Geotechnical Engineering; Masonry Structures

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, E or F), the second is a hyphen, the third is a letter indicating the **day** (Mon, Tue or Wed), and the fourth is a number indicating the **period** (1, 2 or 3). For example, D-T3 denotes the parallel session of Stream D that runs on Tuesday in Period 3 (15:15-17:00). Excluding the 3 Plenary Sessions, the Programme therefore features a total of 54 Parallel Sessions.

STREAM A

A-M1: Dynamic Response, Vibration Analysis, Vibration Control
Chair: Prof. S. Shrivastava, McGill University, Canada

10:30: Eccentric-wing flutter stabilizer: Analysis and wind tunnel tests, U. Starossek, H. Ziems, T. Ferenczi (Invited Paper)

11:00: Novel results on decentralized *H*-infinity controller design for structural vibration control of large buildings, F. Palacios-Quiñonero, J. Rubió-Massegú, J.M. Rossell, H.R. Karimi

11:15: A response spectrum approach for structures with dampers modelled using fractional order derivatives, Z. Pawlak, R. Lewandowski

11:30: Railway induced vibrations in beam bridges including soil-structure interaction through coupled boundary-element finite-element analyses, M.D. Martínez-Rodrigo, A. Doménech, A. Romero, P. Galvín

11:45: On the dynamic modeling and analysis of an asymmetric Stockbridge damper, N.K. Vaja, O.R. Barry, E.Y. Tanbour

12:00: The "bang-bang" control law for mitigation of suspension bridge vibrations due to wind actions, L. Martinelli, M. Domaneschi

12:15: On the accuracy of lumped mass models for free vibration of beams, A.W. Ruffels, A. Zingoni

A-M2: Dynamic Response, Vibration Analysis, Vibration Control
Chair: Prof. U. Starossek, Technical University of Hamburg, Germany

13:15: Assessment of intelligence quotient of smart structures, R.L. Chen, M. Zhang (Invited Paper)

13:45: Active vibration control of a smart sandwich plate, Y.T. Aksoy, M. Sahin

14:00: Dynamic response and vibration control of tensegrity systems under seismic excitation, X.D. Feng, M.S. Miah, Y.W. Ou, S.H. Guo

14:15: Vibration of structures with variable stiffness, E. Demirkan, N. Kadioglu

14:30: Analysis of the transition between tubular modular track and ballasted track, D. Visser, J.A.vB. Strasheim, P.J. Gräbe

14:45: Active vibration suppression of a smart beam via a controller designed by using linear quadratic regulator method, O. Akin, M. Sahin

A-M3: Dynamic Response, Vibration Analysis, Vibration Control
Chair: Prof. R. Karoumi, KTH Royal Institute of Technology, Sweden

15:15: A simplified equation of motion for free rocking rigid blocks, C. Casapulla, A. Maione

15:30: Bridge dynamics in the 21st century, R.N.T. Teixeira

15:45: Extracting bridge frequencies from dynamic responses of two passing vehicles, C.W. Kim, S. Inoue, K. Sugiura, P.J. McGetrick, M. Kawatani

16:00: Series multiple tuned mass dampers for vibration control of high-speed railway bridges, V. Kahya, O. Araz

16:15: Dynamic analysis of rectangular plate structures with arbitrary edge supports subjected to harmonic point excitation force or enforced boundary displacement, D.S. Cho, J.H. Kim, T.M. Choi, B.H. Kim, N. Vladimir

16:30: Dynamic behaviour of plane linkages under random loadings using Monte Carlo technique, F. Masithulela

16:45: Structural dynamic assessment of a footbridge under human-induced loadings, J.G.S. da Silva, G.L. Debona, C.M.R. Gaspar

A-T1: Vibration Serviceability, Human-Induced Vibrations
Incorporates Special Session SS17: Vibration Serviceability
Organiser: Prof. Alex Pavic, University of Exeter, UK
Chair: Prof. A. Pavic, University of Exeter, UK

10:30: Uncoupled approaches for walking-induced vertical vibration of a lively footbridge, E. Lai, M.G. Mulas

10:45: Dynamic performance of a footbridge with tuned mass dampers exposed to pedestrian traffic, K. Van Nimmen, G. Lombaert, G. De Roeck, P. Van den Broeck

11:00: Modelling effect of supporting frame on vibration serviceability of floors, A.F. Hameed, A. Pavic

11:15: Human-structure interaction: Standing people subjected to vertical structural vibration, R. Hashim, Q. Zhang, D. Zhou, P. Mandal, T. Ji

11:30: Reliability based design for vibration control of light steel floor structures, E. van der Klashorst, C. Viljoen, J.V. Retief

11:45: Experimental investigation of vibrations on sluices with large segment gates, E. Popović

12:00: Improved footfall model for vibration of high frequency floors, A.S. Mohammed, A. Pavic, V. Racic

12:15: Evaluation of dynamic response of a footbridge to human movement and traffic-induced vibrations, J.M. Dulinska, I.J. Murzyn, K. Pluta

A-T2: Non-Linear Mechanics
Incorporates Special Session SS16: Non-Linear Dynamics & Stability
Organiser: Dr. Jiri Naprstek, Academy of Sciences of the Czech Republic, Czech Republic
Chair: Dr. J. Naprstek, Academy of Sciences of the Czech Republic, Czech Republic

13:15: Dynamic behaviour and stability of a ball rolling inside a spherical surface under external excitation, J. Naprstek, C. Fischer (Invited Paper)

13:45: Nonlinear road-vehicle systems under filtered and periodic noise excitations, W.V. Wedig

14:00: On the formation of bubbles in the frequency response curves of nonlinear oscillators, G. Gatti

14:15: Elastic postbuckling response of bilaterally constrained non-prismatic columns, S. Liu, R. Burgueño

14:30: A corotational finite element to model galloping vibrations of overhead electrical lines, F. Foti, L. Martinelli, F. Perotti

14:45: Some considerations on dynamic stability, A. Feriani, A. Carini

A-T3: Non-Linear Mechanics, Fluid-Structure Interaction
Chair: Prof. R. Burgueño, Michigan State University, USA

15:15: Analytical modelling of structural components and systems vulnerable to interactive buckling: Recent developments, M.A. Wadee, F. Madrazo-Aguirre, P. Li, J. Yu (Invited Paper)

15:45: Nonlinear mechanics of prestressed stayed columns with multiple bays, J. Yu, M.A. Wadee

16:00: Development of a novel method for slip velocity of fluid structure interactions by employing effects of electrostatic attraction on the surface of nano-scale particles, M. Mahdavi, M. Sharifpur, J.P. Meyer

16:15: Developing tools for assessing the fluid structure interaction of passive adaptive composite foils, L. Marimon Giovannetti, J. Banks, S.W. Boyd, S.R. Turnock

16:30: Reduction of computational cost in fluid-structure interaction modelling using piston theory, M.-C. Meijer

16:45: Reduced order modeling for the numerical optimization of fluid-structure interaction problems, M. Schäfer, N. Aghajari

A-W1: Seismic Response, Seismic Analysis, Earthquake-Resistant Design
Chair: Prof. A. Elnashai, Pennsylvania State University, USA

10:30: Designing coastal structures for tsunami loads, I.N. Robertson (Invited Paper)

11:00: Seismic performance of dual eccentrically braced steel frames equipped with fluid viscous dampers, H.A. Mociran

11:15: Vulnerability assessment of concrete buildings with different heights to near-source earthquakes using improved performance criteria, A.M. Mwafy, B. Almurad, A. Ashri

11:30: Ductility reduction factor of steel sheet shear wall used in steel framed house, K. Sakuragi, A. Sato

11:45: Nonlinear interaction of initial leaning of RC slender tower with its seismic response, P. Bońkowski, Z. Zembaty, M.Y. Minch

12:00: Numerical investigation on the effects of non-structural components on the elastic fundamental period of buildings, R. Ditommaso, F.C. Ponzo, G. Auletta, C. Iacovino

12:15: Effect of soil modelling on the seismic response of buildings, M. Tanganelli, S. Viti

A-W2: Seismic Response, Seismic Analysis, Earthquake-Resistant Design
Chair: Prof. I.N. Robertson, University of Hawaii, USA

13:15: Influence of 2D versus 3D modeling on the seismic performance of dual eccentrically braced steel frames, H.A. Mociran, A.G. Popa

13:30: Study on seismic behavior of steel frames based on high strength steel, G. Li, G. Zhang, Z. Yang

13:45: Influence of properties of elastomeric bearings on dynamic behavior of an integral bridge under a seismic shock, D. Jasinska, J.M. Dulinska

14:00: Effects of near-fault ground motions on earthquake-induced pounding response of RC buildings with plan irregularity, M. Akköse, F. Sunca

14:15: Inelastic dynamic analysis of a prestressed reinforced concrete frame, J.A. Vasquez, J.C. de la Llera, M. Rendel

14:30: Effects of reinforced concrete mansard roofs on the seismic behavior of plan-symmetric reinforced concrete buildings, G. Alioğlu, H.S. Şengel, U. Albayrak

14:45: Alternative models of RC frames with partial-height infill panels, S. Germani, T. Rotunno, M. Tanganelli, S. Viti

A-W3: Seismic Response, Seismic Analysis, Earthquake-Resistant Design
Chair: Prof. A. Ilki, Istanbul Technical University, Turkey

15:15: Damage-resistant segmental double-skin bridge column with replaceable energy dissipaters, A. Moustafa, M.A. ElGawady

15:30: Evaluation of seismic performance of semi-rigid connected prefabricated structures, F. Sunca, M. Akköse

15:45: Earthquake analysis of a high-rise building in Dubai strengthened by FVD dampers, I.M. Ezz El-Arab

16:00: Investigation on improvement of seismic performance of mid-rise buildings with geosynthetics, A. Edinçliler, M. Sekman

16:15: Effect of soil modeling on site response analysis, M. Tanganelli, S. Viti, D. Forcellini, V. D'Intisonante, M. Baglione

STREAM B

B-M1: Material Modelling, Multi-Scale Modelling, Porous Media
Incorporates Special Session SS04: Multiscale Modelling and Theory of Porous Media
Organisers: Prof. Jörg Schröder, Univ. of Duisburg-Essen & Prof. Tim Ricken, TU Dortmund, Germany
Co-Chairs: Prof. J. Schröder, Univ. of Duisburg-Essen & Prof. T. Ricken, TU Dortmund, Germany

10:30: Simulation technology applied to coupled problems in continuum mechanics, W. Ehlers, A. Wagner (Invited Paper)

11:00: Multiscale materials modelling: Procedures, examples and challenges, S. Schmauder, D. Rapp, P. Binkele, D. Molnar (Invited Paper)

11:30: A continuum mechanical multi-phase model for steel solidification, L. Moj, T. Ricken

11:45: Heat transfer in fibrous porous media, M. Mierzwiczak, K. Mrozek, P. Muszynski

12:00: Wave propagation in strongly heterogeneous fluid saturated porous medium: Asymptotic analysis and computational issues, E. Rohan, V.H. Nguyen, S. Naili

12:15: Macroscopic characterization of porous unit cells within the framework of the theory of porous media, S. Maike, J. Bluhm, J. Schröder, D. Brands, T. Ricken

B-M2: Material Modelling, Multi-Scale Modelling, Porous Media
Incorporates Special Session SS04: Multiscale Modelling and Theory of Porous Media
Organisers: Prof. Jörg Schröder, Univ. of Duisburg-Essen & Prof. Tim Ricken, TU Dortmund, Germany
Co-Chairs: Prof. J. Schröder, Univ. of Duisburg-Essen & Prof. T. Ricken, TU Dortmund, Germany

13:15: Geometrically nonlinear and coupled thermopiezomechanical modeling and analysis of smart FGM plates and shells, R. Schmidt, M.N. Rao, K.U. Schröder (Invited Paper)

13:45: Higher order refined computational models for the thermo-elastic analysis of FGM plates, K. Swaminathan, D.M. Sangeetha

14:00: Macroscopic yield curves based on statistically similar RVEs for 3D dual-phase steel microstructures, L. Scheunemann, J. Schröder, D. Brands

14:15: Multiscale homogenization of magneto-electric porous two-phase composites, M. Labusch, J. Schröder, D.C. Lupascu

14:30: On the mechanical behaviour of transparent structural silicone adhesive, M. Drass, J. Schneider

14:45: Simulation of ionic electroactive polymers (EAPs) by considering a thermodynamical consistent model within the framework of the theory of porous media, S. Serdas, J. Bluhm, J. Schröder

B-M3: Biomechanics, Soft Materials
Incorporates Special Session SS04: Multiscale Modelling and Theory of Porous Media
Organisers: Prof. Jörg Schröder, Univ. of Duisburg-Essen & Prof. Tim Ricken, TU Dortmund, Germany
Chair: Prof. W. Ehlers, University of Stuttgart, Germany

15:15: Advances in WYPIWYG constitutive modeling of soft materials, M. Miñano, J. Crespo, M. Latorre, F.J. Montáns

15:30: Biomimetic composites derived from an impact resistant crustacean, N.A. Yaraghi, N. Guarín-Zapata, L.K. Grunenfelder, R. Wuhrer, P.D. Zavattieri, D. Kisailus

15:45: A micromorphic continuum formulation for cardiac tissue mechanics, M. von Hoegen, S. Skatulla, J. Schröder

16:00: Tensile tests of porcine pericardial tissue for aortic heart valve leaflets, A. Mężyk, P. Jureczko, T. Machoczek, A. Konopelska, M. Pawlak

16:15: Towards real-time modelling of the heart using the proper orthogonal decomposition with interpolation approach, R.R. Rama, S. Skatulla, C. Sansour

16:30: Indentation tests of porcine pericardial tissue for aortic heart valve leaflets, A. Mężyk, T. Machoczek, P. Jureczko, J. Gniłka, W. Klein

16:45: An initial biphasic model of the human heart aimed at computational investigation of rheumatic heart disease, G. Hopkins, S. Skatulla, L. Moj, T. Ricken, N. Ntusi, E. Meintjes

B-T1: Numerical Modelling, Numerical Simulations, FE Formulations
Chair: Prof. F.J. Montáns, Universidad Politécnica de Madrid, Spain

10:30: Real-time simulation of deformable structures by means of conventional hardware tools: Formalisms and applications, M.W. Zehn, D. Marinkovic (Invited Paper)

11:00: A comparative study of the consistency of Galerkin-type and least-squares finite element formulations for bifurcation problems, K. Steeger, J. Schröder

11:15: Simulation of hydraulic fracture propagation using unstructured triangular mesh elements, J.A.L. Napier, E. Detournay

11:30: Utilisation of PID controller in explicit solver, J. Vorel, M. Marcon, R. Wendner, D. Pelessone, G. Cusatis

11:45: An optimisation approach towards locking-free isotropic shell elements**,** Y. Liang, B.A. Izzuddin

12:00: Numerical simulation of the preloading procedure of bolted assemblies considering plastic material behaviour, C. Lorenz, N. Stranghöner

12:15: Probabilistic structural modelling in parallel systems, M. Krejsa, R. Cajka, P. Janas, J. Brozovsky, V. Krejsa

B-T2: Numerical Modelling, Damage Modelling
Chair: Prof. G.N. Nurick, University of Cape Town, South Africa

13:15: Steel and composite structures modelling with experimental, numerical and computational intelligence techniques, P.C.G. da S. Vellasco, L.R.O. de Lima, S.A.L. de Andrade, M.M.B.R. Vellasco, L.A.P.S. da Silva (Invited Paper)

13:45: NURBS-augmented finite element method (NAFEM) for bending of thin arbitrary plates, B.P. Mishra, M. Barik

14:00: Generalization of Buckingham's Theorem for non-linear bodies with internal constraint, A. Baratta, I. Corbi, O. Corbi

14:15: Finite element modelling of damage and failure in fiber reinforced composites, A.D. Sáez, A.P.C. Duarte, N. Silvestre

14:30: Parametric study of an automotive crash absorber: From analytical to FE analysis, I. Lo Presti, M. Vezzali, F. Di Pietro, A. Baldini

B-T3: Performance of Structures in Fire, Design for Fire Resistance
Incorporates Special Session SS05: Behaviour of Structures in Fire. Organisers: Prof. Mario Fontana, ETH Zürich, Switzerland & Prof. Markus Knobloch, Ruhr-Univ. Bochum, Germany
Co-Chairs: Prof. M. Fontana, ETH Zurich & Prof. M. Knobloch, Ruhr-Univ. Bochum

15:15: Levels of analyses for fire design: From material to structures, M. Knobloch, R. Ebel (Invited Paper)

15:45: Probabilistic measures of earthquake effects on fire performance of tall buildings, N.E. Khorasani, T. Gernay, M. Garlock

16:00: Load-bearing behaviour of 10.9 bolts under combined tension and shear during and after fire, J. Lange, A.K. Kawohl

16:15: Relationships between fire proofing material amount and seismic structural resistant margins for steel buildings, F. Ozaki, K. Hamaguchi

16:30: The influence of hot dip galvanization to the temperature development of unprotected steel members in fire, M. Mensinger, C. Gaigl

16:45: The effect of high strain rate on tensile properties of S355 steel at high temperature, D. Forni, B. Chiaia, E. Cadoni

17:00: Consolidated fire testing: Coupled thermo-mechanical modelling for analysis of the global structural fire behavior, P. Schulthess, M. Neuenschwander, M. Knobloch, M. Fontana

B-T3-X: Material Modelling, Multi-Scale Modelling, Porous Media
Additional Papers of Special Session SS04: Multiscale Modelling and Theory of Porous Media Organisers: Prof. Jörg Schröder, Univ. of Duisburg-Essen & Prof. Tim Ricken, TU Dortmund, Germany
Co-Chairs: Prof. J. Schröder, Univ. of Duisburg-Essen & Prof. T. Ricken, TU Dortmund, Germany

15:15: A two-scale homogenisation approach for fluid saturated porous media based on TPM and FE method, F. Bartel, T. Ricken, J. Schröder, J. Bluhm

15:30: On a multiscale and multiphase model for the description of growth in biological tissue using the example of the human liver, N. Waschinsky, D. Werner, T. Ricken, H.G. Holzhütter, M. König, U. Dahmen, O. Dirsch

15:45: A three-phase two-scale FE-model for diffusion-driven metallic alloy solidification processes, C. Henning, T. Ricken, I. Steinbach

B-W1: Damage Modelling, Fracture, Fatigue
Chair: Prof. M.W. Zehn, TU Berlin, Germany

10:30: On embedded discontinuity finite elements for modelling fractures in 2d solids and frames, B. Brank

10:45: Derivation and validation of synthetic S/N curves for shear keys in grouted connections, S. Lochte-Holtgreven, P. Schaumann, J. Kulikowski

11:00: The role of loading path in ductile fracture, F. Šebek, J. Petruška, P. Kubík

11:15: Repaired crack in AA7075-T6 structures subjected to biaxial tensile stresses, M. Khodja, G. Govender, G. Corderley, H. Fekirini

11:30: Influence of the multi-axis state of stress on fatigue, S. Vejvoda

11:45: Fatigue strength of preloaded hot-dip galvanized bolt assemblies with very large diameters, P. Schaumann, R. Eichstädt

12:00: Predicting the head-area slopes of round leaks in pipes subject to elastic deformations, R. Nsanzubuhoro, J.E. van Zyl, A. Zingoni

B-W2: Wind Loading, Response of Structures to Wind
Incorporates Special Session SS12: Wind Effects on Structures
Organiser: Prof. Vincent Denoël, University of Liege, Belgium
Chair: Prof. V. Denoël, University of Liege, Belgium

13:15: Applications of the multiple timescale spectral analysis in wind engineering, V. Denoël (Invited Paper)

13:45: Partial factors for wind actions considering hidden safety due to time invariant components, M. Holický, J.V. Retief, C. Viljoen

14:00: Wind on bridges in the time domain, C. Katz

14:15: Structural dynamic analysis of a steel-concrete composite building under nondeterministic wind loadings, J.G.S. da Silva, R.R. Barboza

14:30: Wind action and its adverse effects on operations of South African harbours, A.M. Goliger, T. van Wyk, R.A. Bradley, D. Bilse, M. Ruthenavelu

14:45: Stochastic rotational stability of tower cranes under gusty winds, H. Vanvinckenroye, V. Denoël

B-W3: Wind Loading, Response of Structures to Wind
Chair: Prof. A.A. El Damatty, University of Western Ontario, Canada

15:15: Random properties of wind actions, M. Holický (Invited Paper)

15:45: Effect on structural reliability of uncertain estimates of characteristic extreme wind loads, S.G. Reid, A. Naess

16:00: Application of Monte Carlo method for the reliability treatment of wind load variables using Bayesian hierarchical models, J. Botha, J.V. Retief, C. Viljoen

16:15: Structural analysis of wind turbine inner core based on local wind conditions, F. Masithulela

STREAM C

C-M1: Stability of Beams and Thin-Walled Sections
Incorporates Special Session SS13: Steel Structures: Nonlinear Behaviour and Design
Organisers: Prof. Ahmer Wadee & Prof. Leroy Gardner, Imperial College London, UK
Chair: Prof. M.A. Wadee, Imperial College London, UK

10:30: Generalized Ayrton-Perry approach for the evaluation of beam-column resistance, M.A. Gizejowski, Z. Stachura (Invited Paper)

11:00: Local torsional restraints of I-beams and its effect on lateral torsional buckling, R. Stroetmann

11:15: Postbuckling strength of slender elliptical hollow sections in compression, F. McCann, C. Fang, L. Gardner, N. Silvestre

11:30: Buckling of inhomogeneous Timoshenko beam using an enhanced exponential collocation method, E. Ruocco, D. Di Giacinto, V. Minutolo

11:45: Effective length factors for the lateral torsional buckling of cantilever beams, B.W.J. van Rensburg, S.A. Skorpen

12:00: Imperfection sensitivity in I-section struts experiencing local and strong-axis global buckling mode interaction, E.L. Liu, M.A. Wadee

12:15: Elastic flexural-torsional buckling of beams and beam-columns as a basis for stability design of members with discrete rigid restraints, M.A. Gizejowski, Z. Stachura, J. Uziak

C-M2: Stability of Beams and Thin-Walled Sections
Incorporates Special Session SS13: Steel Structures: Nonlinear Behaviour and Design
Organisers: Prof. Ahmer Wadee & Prof. Leroy Gardner, Imperial College London, UK
Chair: Prof. L. Gardner, Imperial College London, UK

13:15: Lateral buckling of high-strength steel beams, M.A. Bradford, X. Liu (Invited Paper)

13:45: Analysis of straight bar behaviour verified by numerical or experimental tests, J.B. Obrebski (Invited Paper)

14:15: Modal decomposition of buckled shapes: The method of the equivalent nodal forces, J. Becque, X. Li

14:30: Numerical study of buckling resistance of steel I-section members under two directional bending, M.A. Gizejowski, Z. Stachura, R.B. Szczerba, M.D. Gajewski

14:45: A study of the elastic lateral-torsional buckling behaviour of hot-rolled steel beams with flange upstands, K. Mudenda, A. Zingoni

C-M3: Steel Joints, Steel Connections
Chair: Prof. M.A. Gizejowski, Warsaw University of Technology, Poland

15:15: Ultra low cycle fatigue of welded steel joints under multiaxial loading, A. de Castro e Sousa, A. Nussbaumer

15:30: Elastic buckling characteristics of L-shaped beam-column connection panels for H-section members, Y. Utsuki, K. Ikarashi

15:45: Numerical investigation of innovative modular beam-to-fabricated-column connections under monotonic loading, N. Sadeghi, A. Heidarpour, X.L. Zhao, R. Al-Mahaidi

16:00: Finite element modelling of thin sheet steel screw connections, E. Rautenbach, B.W.J. van Rensburg

16:15: Effect of span length on alternate path capacity of welded unreinforced flange-bolted web connections, F.H. Rezvani, H.R. Ronagh, A.E. Jeffers

16:30: Virtual work optimization of structures with semi-rigid connections: Computational examples, A. Elvin, J.H. Strydom

16:45: Gusseted rafter-to-column connections of double-bay single channel portal frames, B. Tshuma, M. Dundu

C-T1: Cold-Formed Steel Structures
Incorporates Special Session SS03: Cold-Formed Steel Systems and Components
Organiser: Prof. Kim Rasmussen, University of Sydney, Australia
Chair: Prof. K. Rasmussen, University of Sydney, Australia

10:30: GBT-based buckling analysis of circular hollow section steel members and structural systems, D. Camotim, C. Basaglia, N. Silvestre, L. Palermo Jr. (Invited Paper)

11:00: Mechanical properties of cold-formed high strength steel at elevated temperatures, H.T. Li, B. Young (Invited Paper)

11:30: Experimental studies on the shear strength of light-gauge beams with stiffened large web openings, A. Sato, S. Mori, T. Ono, K. Fujihashi

11:45: Experimental investigations of thin-walled channel beams with bend web, M. Grenda, P. Paczos

12:00: On the Direct Strength Method (DSM) design of cold-formed steel beams experiencing local-distortional interaction, A.D. Martins, D. Camotim, P.B. Dinis

12:15: Review on recent research on rack structures in China, X.Z. Zhao, L.S. Dai, C. Ren

C-T2: Cold-Formed Steel Structures
Incorporates Special Session SS03: Cold-Formed Steel Systems and Components
Organiser: Prof. Kim Rasmussen, University of Sydney, Australia
Chair: Prof. K. Rasmussen, University of Sydney, Australia

13:15: Direct strength method for web crippling design: ITF load conditions, P. Natário, D. Camotim, N. Silvestre

13:30: Lateral-torsional buckling resistance of cold-formed high strength steel rectangular hollow beams, A.T. Tran

13:45: Eaves connections of double-bay portal frames with staggered single channel cold-formed rafters, B. Tshuma, M. Dundu

14:00: Finite element modeling and parametric study of cold-formed steel portal frames, H.B. Blum, K.J.R. Rasmussen

14:15: Experimental investigation on steel storage rack beam-to-upright connections under cyclic loading, L.S. Dai, X.Z. Zhao

14:30: Countersunk bolted moment connections in cold-formed steel, J. Becque, I. Hajirasouliha

14:45: Tilt bearing capacity of single-shear single-row bolted connections in cold-formed steel, M.E. Uz, L.H. Teh

C-T3: Stainless Steel, Aluminium Structures
Chair: Prof. D. Camotim, Technical University of Lisbon, Portugal

15:15: Web bearing design of aluminium alloy hollow sections, M.N. Su, B. Young

15:30: Austenitic laser welded I section submitted to torsion and combined torsion plus bending: Assessment of the design rules, K. Lauwens, Y. Liang, O. Zhao, B. Rossi

15:45: Experimental study of ferritic stainless steel tubular section beam-columns subjected to moment gradients, O. Zhao, L. Gardner, B. Young

16:00: Lateral torsional buckling of welded duplex stainless steel I section beams, M. Fortan, O. Zhao, B. Rossi

16:15: Local buckling behaviour of stainless steel circular hollow sections under combined axial compressive load and bending moment, O. Zhao, L. Gardner, B. Young

16:30: An assessment of the tension capacity of ferritic and duplex stainless steel elements, R. Freire, A.T. da Silva, P. Vellasco, L. Lima, J. Santos, S. Andrade

C-W1: General Steel Structures
Chair: Prof. B. Young, University of Hong Kong, China

10:30: Residual stresses and imperfections in welded high-strength I-shape sections, H. Pasternak, B. Launert, T. Kannengiesser, M. Rhode (Invited Paper)

11:00: Optimizing the design of steel bridges using the principle of virtual work, J.H. Strydom, A. Elvin

11:15: Nonlinear inelastic analysis of steel frameworks with non-prismatic members and semi-rigid connections, I.V. Marchis, C.G. Chiorean

11:30: Development of an optimized set of welded steel I-sections, N. Tredoux, H. de Clercq

11:45: On the characteristics of brace-frame interaction in diagonally and X-braced moment resisting frames, M. Lotfollahi, M.M. Alinia, E. Taciroglu

12:00: Design and analysis of structural steel tower assembly subject to high axial and transverse stresses using BS EN1993-1-1 and BS EN1993-1-5, M. Wilson, J. Anderson

12:15: Load bearing behaviour of simply supported runway beams, A. Walter, R. Ebel, M. Knobloch

C-W2: Steel Structures, Steel-Concrete Composite Construction

Chair: Prof. P.C.G. da S. Vellasco, State Univ. of Rio de Janeiro, Brazil

13:15: Predicting the failure load of steel columns weakened to facilitate demolition of a structure, W.J. van Jaarsveldt, R.S. Walls

13:30: Experimental investigation of concrete-filled high strength steel square hollow section members subjected to bending, Y.Q. Deng, B. Young

13:45: Finite element modeling of short RuCFST, A.P.C. Duarte, N. Silvestre, B.A. Silva, J. de Brito, E. Júlio, J.M. Castro

14:00: A computer method for nonlinear inelastic analysis of composite steel-concrete frameworks with partial shear connection, C.G. Chiorean, S.M. Buru

14:15: Comparison of theoretical to experimental load bearing resistance of composite slabs, C.P.C. Bruwer

14:30: Study of mechanical performance of concrete-filled steel tubular joints, J. Chen, J. Chen, W. Jin

14:45: Design of concrete-filled steel tubular CHS connections in tension, J. Chen, F. Xu, Y. Ye, W.L. Jin

C-W3: Glass Structures

Chair: Prof. J. Lange, TU Darmstadt, Germany

15:15: Modelling structural behaviour of a dry-assembled glass block bridge with soft PVC interlayer, A.H. Snijder, M. Aurik, F. Veer, C. Louter, R. Nijsse

15:30: Exploring multi-span reinforced glass beams: Experiments and numerical modelling, K. Martens, R. Caspeele, J. Belis

15:45: Load-bearing adhesive connections in Spannglass beams: Experimental study on glass beams with post-tensioned reinforcement, M. Engelmann, B. Weller

16:00: Design and production of a structural cast glass element for a transparent dome, T. Bristogianni, R. Nijsse, F. Oikonomopoulou, F.A. Veer

16:15: Restoring and structurally reinforcing historic monuments by glass, F. Oikonomopoulou, F.A. Veer, T. Bristogianni, C. Groot, R. Nijsse, K. Karron

STREAM D

D-M1: Shells Structures

Incorporates Session Session SS07: Design, Modelling and Analysis of Thin Shell Structures
Organisers: Prof. Krzysztof Magnucki & Dr. Paweł Jasion, Poznan University of Technology, Poland
Chair: Dr. P. Jasion, Poznan University of Technology, Poland

10:30: Buckling and post-buckling analysis of untypical shells of revolution, P. Jasion, K. Magnucki (Invited Paper)

11:00: Controlled elastic instabilities in cylindrical shells for energy harvesting devices, N. Hu, S. Liu, R. Burgueño

11:15: Practical methodology of path-tracing analysis for buckling process in cylindrical shells, T. Kobayashi, Y. Mihara, F. Fujii

11:30: Tailoring and controlling the elastic postbuckling response of cylindrical shells, N. Hu, R. Burgueño

11:45: On the feasibility of the parabolic ogival cross-section for liquid-filled toroidal vessels, N. Enoma, A. Zingoni

12:00: Elastic buckling and post-buckling behaviour of shells of revolution with special meridian, M. Grygorowicz, P. Jasion, K. Magnucki

12:15: Stresses in multi-shell toroidal pressure vessels, N. Enoma, A. Zingoni

D-M2: Shells, Sustainable Construction, Lightweight Structures
Chair: Prof. David Kisailus, University of California at Riverside, USA

13:15: Bionics: Learning from nature for sustainable lightweight structures, B. Baier, E.F. Nunes (Invited Paper)

13:45: Structural experiments with ice composite shells, J. Belis, K. Martens, B. Van Lancker, A. Pronk

14:00: Design considerations for catenary earth shells, R.A. Bradley, M. Gohnert, Y. Mistry, A.M. Goliger, I. Bulovic

14:15: Biomimicry and locally responsive construction: Lessons from termite mounds for structural sustainability, N. Claggett, A. Surovek, B. Streeter, S. Nam, P. Bardunias, B. Certin

14:30: Retractable structure for emergency buildings, E.F. Nunes

14:45: Shells of cracked reinforced concrete chimneys, silos and cooling tower walls as a problem of durability exploitation, M. Maj

D-M3: Shell Structures, Plate Structures
Chair: Prof. Rüdiger Schmidt, RWTH Aachens, Germany

15:15: Recent large cooling towers with special emphasis on buckling safety, D. Jun, R. Harte, M. Andres, W.B. Krätzig, R. Wörmann (Invited Paper)

15:45: Free vibration of paraboloidal dome shell with arbitrary parabola meridian, B. Sun

16:00: Free and forced vibration behaviour of cooling towers subjected to wind loading, G.T. Kucherera, A. Zingoni

16:15: Geometric and material nonlinear design of stiffened plates for APC equipment, T. Shabeeb, N. Swaminathan, R.K. Annabattula

16:30: Finite element buckling analysis of thin plates with complicated geometry, S. Panda, M. Barik

16:45: Stability behaviour of cooling towers subjected to wind loading, G.T. Kucherera, A. Zingoni

D-T1: Laminated, Composite & Sandwich Structures
Incorporates Session Session SS01: Modelling and Optimization of Composite Structures
Organisers: Prof. Aurelio Araujo & Prof. Jose Madeira, Technical University of Lisbon, Portugal
Co-Chairs: Prof. A.L. Araujo & Prof. J.F.A. Madeira, Technical University of Lisbon, Portugal

10:30: Multiobjective optimization for vibration reduction in composite plate structures using constrained layer damping, J.F.A. Madeira, A.L. Araújo, C.M. Mota Soares, C.A. Mota Soares (Invited Paper)

11:00: Anisotropic plastic plate bifurcation and the buckling paradox, S. Shrivastava (Invited Paper)

11:30: Vibroacoustic behavior of a laminated plate with frequency dependent viscoelastic core: Finite element and experimental analysis, W. Larbi

11:45: A geometrically exact formulation for thin laminated composite shells, M. Pasquali, P. Gaudenzi

12:00: Vibration and buckling of laminated composite and sandwich beams with a shear-deformable layered finite element, V. Kahya

12:15: Diaphragm action of sandwich panels with regard to the bearing capacity of the longitudinal joints, C. Kunkel, J. Lange

D-T2: Laminated, Composite & Sandwich Structures; Design Optimisation
Incorporates Session Session SS01: Modelling and Optimization of Composite Structures
Organisers: Prof. Aurelio Araujo & Prof. Jose Madeira, Technical University of Lisbon, Portugal
Co-Chairs: Prof. A.L. Araujo & Prof. J.F.A. Madeira, Technical University of Lisbon, Portugal

13:15: Homogeneity of magnetic field influence on buckling of three layer polyethylene plate, M. Grygorowicz, P. Kędzia

13:30: Experimental assessment of the utilisation of corrugated cardboard as a core material for sandwich panels, A. von der Heyden, J. Lange

13:45: Buckling of three layer rectangular polyethylene plate with ferrofluid under magnetic field, M.J. Smyczyński, M. Grygorowicz, P. Kędzia

14:00: Prediction of in-situ strength of thermoplastic composite laminate by simulation of the automated tape laying process using PAMFORM, J.E. Haverkamp, S. Shroff

14:15: Delamination detection in composite laminates using auto-regressive models of vibration signals, D. Nardi, M. Pasquali, L. Lampani, P. Gaudenzi

14:30: On the design optimization of surgical plates, S.M. Park, J. Park, S. Shin, D. Lee, G. Noh

14:45: On filtered conservatism in direct topology design, D. Munro, A.A. Groenwold

D-T3: Manufacturing Processes, Assembly Processes
Chair: Dr. S. Skatulla, University of Cape Town, South Africa

15:15: Coordinate measurement-based volumetric error model and its application for selective assembly of machine tools, T. Bartkowiak, A. Gessner

15:30: Simulation of the thermoforming process using the ANSYS Polyflow software, P. Poszwa, M. Szostak

15:45: Numerical-experimental correlation of thin-wall hollow section aluminium castings for car body applications, L. Cavazzoni, F. Calacci, A. Merulla, G. Miscia

16:00: Simulation research on a new effective cooling system of injection mold, P. Muszyński, K. Mrozek, M. Mierzwiczak

16:15: Application of multi-scale areal curvature analysis to contact problem, T. Bartkowiak, R. Staniek

16:30: Simulations and verifications of selective induction heating of injection mold cavity insert, K. Mrozek, R. Staniek

16:45: Simulation of the injection molding process of bus seats using the MoldFlow programme, M. Szostak, P. Poszwa

D-W1: Renewable Energy Structures, Buildings, Special Structures
Co-Chairs: Prof. M. Holicky, Czech Tech. Univ. in Prague, Czech Republic & Prof. J.V. Retief, Univ. of Stellenbosch, South Africa

10:30: Challenges for tower structures of multi-megawatt class wind turbines, M. Rauch, M. Knobloch

10:45: Optimised design of wind turbine gravity foundations, P.B. Loubser, A.R. Jacobs

11:00: Structural design optimization of wind turbine tower for developing countries, P.S. Caixote, Y. Suzuki, M. Matsumura, K. Sugiura, R. Ogawa

11:15: Risk assessment of precast reinforced concrete buildings against blast loads: Case study, T.H. Almusallam, Y.A. Al-Salloum, H.M. Elsanadedy, R. Iqbal, H. Abbas, N.A. Siddiqui

11:30: Structural performance of hybrid tall buildings designed using ultra-lightweight floor slabs, M. Ajmal, D. Ahmed, A. Asiz

11:45: Design of a four-span self-anchored arch-supported stress ribbon footbridge, J. Anderson, M. Wilson

12:00: Underground structures in urban areas, R. Katzenbach, S. Leppla

D-W2: Design Considerations, Timber Structures
Mr. P. Loubser, Technical Executive: Structures, Gibb, South Africa

13:15: PwC Tower: Multi-disciplinary design solutions through parametric modelling, R.C. le Roux

13:30: EN1990 Eurocode: Partial factors for process loads in industrial equipment, T. Shabeeb, N. Swaminathan, R.K. Annabattula, J. Wiström

13:45: Design philosophy of a restraining system for an underwater sheetpile retaining wall, Y. Essopjee, R.A. Forbes, J. Lombard

14:00: Towards a structural fire loading code for buildings in South Africa, R.S. Walls, M. Botha

14:15: Quasi-brittleness of glued laminated timber beams subjected to bending, L. Blank, R. Jockwer, A. Frangi, G. Fink

14:30: Sonic testing on cross laminated timber panels, G. Concu, B. De Nicolo, R. Riu, N. Trulli, M. Valdes, M. Fragiacomo

14:45: Numerical investigations on post-tensioned timber frames, J. Ogrizovic, F. Wanninger, A. Frangi

D-W3: Design Philosophies, Engineering Education
Chair: Prof. A. Bulgakov, Southwest State University, Russia

15:15: Civil and structural engineering philosophies used in African brewery projects, N.R. Featherston

15:30: Burden or motivation: How new management at universities influences structural engineering education, U. Quapp, K. Holschemacher

15:45: Teaching structural analysis and design: Evaluation and student feedback on various techniques and interventions, R.S. Walls

16:00: A proposal on a new curriculum for the smart eco-efficient built environment, F. Pacheco-Torgal

16:15: E-Learning in the structural engineering education, A. Bulgakov, B. Hauptenbuchner, S. Emelianov

STREAM E

E-M1: Reinforced Concrete Structures, Prestressed Concrete
Chair: Prof. R.I. Gilbert, University of New South Wales, Australia

10:30: Bond of reinforcement in lightweight concrete, K. Holschemacher, A. Ali, S. Iqbal (Invited Paper)

11:00: Experimental and numerical investigation of the bearing capacity of transversely prestressed concrete decks, S. Amir, C. van der Veen, J.C. Walraven, A. de Boer

11:15: Advanced numerical models in the analysis of RC slabs under small and large displacements: FEM and AEM, L.A. Bredean, M.D. Botez, A.M. Ioani

11:30: Quantification of model uncertainty of EN1992 crack width prediction model, C.H. McLeod, C. Viljoen, J.V. Retief

11:45: Experimental investigation of large-scale concrete members using symmetry conditions, L. Bocklenberg, P. Mark, M.A. Ahrens

12:00: Strain and deflection analysis in plain concrete beams and reinforced concrete beams by applying Digital Image Correlation, C.A. Mejía, E.O.L. Lantsoght

12:15: Modeling of symmetrically and asymmetrically loaded reinforced concrete slabs, E.O.L. Lantsoght, A. De Boer, C. Van der Veen

E-M2: High Strength Concrete, High Performance Concrete
Incorporates Special Session SS06: High-Performance & Ultra High-Performance Concrete
Organiser: Prof. Ekkehard Fehling, University of Kassel, Germany
Chair: Prof. E. Fehling, University of Kassel, Germany

13:15: Structures made of ultra high performance concrete: Actual developments in research and practice, E. Fehling (Invited Paper)

13:45: Experimental and numerical investigations on I-shaped UHPC beams with combined reinforcement under shear load, J. Thiemicke, E. Fehling

14:00: Advancements in high performance aerogel concrete, M. Schnellenbach-Held, T. Welsch

14:15: Experimental investigations on the direct-shear capacity of cracked UHPFRC, M. Ismail, E. Fehling

14:30: Multifunctional prefabricated walls made of UHPC and foam concrete, A. Wetzel, C. Umbach, E. Fehling, B. Middendorf

14:45: Substitution of steel components by UHPC, P. Hadl, G. Vojvodic, H. Kim, N.V. Tue

15:00: Investigations on the scattering in the post-cracking tensile behaviour of UHPFRC, P. Hadl, H. Kim, N.V. Tue

E-M3: Reinforced Concrete Structures, Prestressed Concrete
Chair: Prof. K. Holschemacher, Leipzig University of Applied Sciences, Germany

15:30: Numerical analysis of failure mechanism of eccentrically compressed reinforced concrete columns, A. Szcześniak, A. Stolarski

15:45: Effect of torsion on shear capacity of slabs, D.A. Valdivieso, T.A. Sanchez, E.O.L. Lantsoght

16:00: Punching shear strength of reinforced recycled concrete slabs, L. Francesconi, L. Pani

16:15: Investigation of the reliability of the Eurocode 2 model for early age cracking of liquid retaining structures in South Africa, E. Mwamba, C.H. McLeod

16:30: Precast reinforced concrete demountable system of multi-storey buildings, J. Witzany, R. Zigler, A. Polák

E-T1: Structural Use of FRP Composites
Incorporates Session Session SS08: Structural Use of FRP Composites. Organisers: Prof. Lawrence Bank, City College of New York, USA & Prof. Jian-Fei Chen, Queen's University of Belfast, UK
Co-Chairs: Prof. L. Bank, City Coll. of NY, USA & Prof. J.F. Chen, Queen's Univ. of Belfast, UK

10:30: Concrete containing coarse aggregate recycled from scrap FRP rebars, L.C. Bank, A. Yazdanbakhsh (Invited Paper)

11:00: Effect of distinct environmental actions on the durability of RC slabs strengthened with prestressed CFRP laminate strips, J. Sena-Cruz, L. Correia, G. Escusa, E. Pereira, J. Michels, P.M. França

11:15: Bond behaviour of CFRP-to-timber interface, X. Li, F. Zhang, Q. Xu, J.F. Chen, K. Harries

11:30: Pultruded FRP composites for modular structural assembly: Applications to space frame structures and built-up composite beam system, Y. Bai, S. Satasivam, X. Yang, C. Caprani

11:45: Dynamic aspects of the debonding failure mechanism in FRP plated beams with redundancy, G. Mulian, O. Rabinovitch

12:00: Finite element analyses of EB-FRP to concrete joints, J.P. Lin, Y.F. Wu

12:15: Effects of loading rate on impact response of axially loaded reinforced concrete members and performance enhancement by AFRP, T. Gurbuz, A. Ilki, D.P. Thambiratnam, N. Perera

E-T2: Structural Use of FRP Composites
Incorporates Session Session SS08: Structural Use of FRP Composites. Organisers: Prof. Lawrence Bank, City College of New York, USA & Prof. Jian-Fei Chen, Queen's University of Belfast, UK
Co-Chairs: Prof. L. Bank, City Coll. of NY, USA & Prof. J.F. Chen, Queen's Univ. of Belfast, UK

13:15: Experimental study of fatigue behaviour of BFRP-concrete bond interfaces, J.H. Xie, J.F. Chen, H. Zhang, K.H. Huang

13:30: A comparative study of flexural behavior of reinforced masonry walls strengthened with near-surface mounted FRP bars or externally bonded FRP sheets, Z.K. Al-Jaberi, J.J. Myers

13:45: Shear performance of rectangular section RC beams strengthened with near-surface-mounted GFRP bars, H. Zhang, C. Sun, J. Li, C. Li

14:00: Tests of new type of precast sandwich panel with FRP connectors, W.C. Xue, Y. Li, J.L. Yang, K. Fu, Z.J. Li

14:15: Concrete DIF and its application in modelling the behaviour of FRP-concrete bond, X.Q. Li, J.F. Chen

14:30: Catenary action of GFRP sandwich panels with CFRP catcher system, A. Benko, P.J. Heffernan

14:45: Topological optimization for the design of the reinforcement in no-tension beams, A. Baratta, I. Corbi, O. Corbi

E-T3: Structural Use of FRP Composites
Incorporates Session Session SS08: Structural Use of FRP Composites. Organisers: Prof. Lawrence Bank, City College of New York, USA & Prof. Jian-Fei Chen, Queen's University of Belfast, UK
Co-Chairs: Prof. L. Bank, City Coll. of NY, USA & Prof. J.F. Chen, Queen's Univ. of Belfast, UK

15:15: Utilizing FRP composites to restore load rating of timber bridges, V. Gopu

15:30: Flexural and shear-punching strengthening of RC beams and slabs using hybrid NSM-ETS technique with innovative CFRP laminates, J. Barros, M. Rezazadeh, I. Costa, H. Baghi, M.R.M. Hosseini, M. Mastali, J. Laranjeira

15:45: FEM analysis of bonding defects in FRP external reinforcements of RC elements, D. Meloni, B. De Nicolo

16:00: Physical property and microstructural analysis of GFRP reinforcing bars embedded in concrete, W. Wang, J.J. Myers

16:15: Pull-out test of FRP anchors in clay bricks, Y. Tao, X.L. Zheng, Q.X. Shi, J.F. Chen

16:30: Use of fibre-reinforceed polymer (FRP) rebars for building durable concrete infrastructure, B. Benmokrane, H.M. Mohamed

E-W1: Mechanics of Concrete, Properties of Concrete
Chair: Prof. M. Schnellenbach-Held, University of Duisburg-Essen, Germany

10:30: Control of cracking caused by early-age deformation in edge-restrained concrete walls, R.I. Gilbert (Invited Paper)

11:00: Bond performance of deformed bars in concrete subjected to lateral pressure and reversed loading, Z.M. Wu, X.X. Li

11:15: Achieving high strength/high performance concrete from coral-limestone aggregates using ordinary Portland cement, fly ash and superplasticizer, A.L. Mrema, S.H. Bungara

11:30: Some remarks on exothermic processes during forming of large-scale concrete foundations, M. Maj, A. Ubysz

11:45: Effect of the MgO content in clinker on compatibility between cement and polycarboxylate superplasticizer, H. Ai, X. Liu, H. Lu, S. Zhu, J. Qu

12:00: Effect of Acacia Karoo Gum on carbonation and chloride penetration in concrete, R. Mbugua, R. Salim, J. Ndambuki

12:15: Fracture properties of fly ash concrete, P. Lv, X. Xi, Q. Jiang, H. Shibani, S. Yang

12:30: Effects on concrete properties by ASR deterioration under different exposure conditions, S. Alaud, G.P.A.G. van Zijl

E-W2: Construction Technology, Construction Materials
Chair: Prof. O. Rabinovitch, Technion - Israel Institute of Technology, Israel

13:15: Analysis and measurement of the effect of shield advance in the close proximity and transverse to a tunnel using fibre optic measurements, N. Horichi, Y. Oku, L.F. Boswell, S. Chang, A. Koizumi (Invited Paper)

13:45: Modular construction kit for the Quickway system, J. Oppeneder, L. Sparowitz, P. Hadl, B. Freytag, N.V. Tue

14:00: Innovative production technology of binding and building composite materials on the basis of glass wastes, A. Bulgakov, V. Erofeev, A. Bogatov, V. Smirnov, R. Schach

14:15: Multi-performance optimisation framework for the selection of structural alternatives based on sustainable qualities, S. Eleftheriadis, D. Mumovic, P. Duffour, P. Greening

14:30: Characteristics of bituminous binders utilizing pulverized rubber and its use for bitumen modification, L. Soukupová, J. Valentin, K. Miláčková

14:45: Effect of rejuvenation on cold recycled and multiple cold recycled asphalt mixtures, J. Suda, J. Valentin, A. Kotoušová

E-W3: Construction Technology, Construction Materials
Chair: Prof. A. Mrema, University of Dar es Salaam, Tanzania

15:15: Excavation of rock using blasting techniques: A review of blasting guidance, Z. Cabarkapa, S. Binzet, U. Ozer, A. Karadogan

15:30: *FlexiArch*: Rapid method of constructing arches, A. Gupta, D. Robb, A. Long, D. McPolin, S. Nanukuttan

15:45: The hybrid concrete construction method applied to the construction of a 15,000-ton precast coal bunker for Shondoni Mine, B. Vermeulen

16:00: The compressive strength of cement stabilized backfill: Polystyrene beads composites, F.N. Okonta

16:15: Combined effect of new type of cellulose fibers and reclaimed asphalt on performance characteristics of stone mastic asphalt mix, P. Vacková, J. Valentin, P. Mondschein

16:30: Strength properties of rice husk ash-lime mortars, A.L. Mrema, H.A. Mboya

16:45: The strength of compacted backfill: Polymer composite, F.N. Okonta

STREAM F

F-M1: Structural Health Monitoring, Damage Detection, System Identification
Incorporates Special Session SS02: System Identification and Structural Health Monitoring
Organiser: Prof. Guido De Roeck, University of Leuven, Belgium
Chair: Prof. G. De Roeck, University of Leuven, Belgium

10:30: Structural health monitoring from discrete binary data through pattern recognition, H. Salehi, R. Burgueño, S. Das, S. Biswas, S. Chakrabartty

10:45: Comparing case studies of a new structural identification framework based on model falsification reasoning, R. Pasquier, I.F.C. Smith

11:00: Resilience assessment of a fully automated modal-based SHM system by shaking table tests, C. Rainieri, D. Gargaro, G. Fabbrocino

11:15: Non-linear damping identification in tuned liquid column dampers, K. Dziedziech, W.J. Staszewski, T. Uhl, A. Ghosh, B. Basu

11:30: Experimental determination of modal parameters for lightweight structures, T. Nestorović, M. Trajkov

11:45: Probabilistic reliability assessment using statistical analysis of structural monitoring, M. Krejsa, R. Cajka

12:00: Damage quantification in steel and reinforced concrete beams, Z.X. Tan, D.P. Thambiratnam, T.H.T. Chan, H. Abdul Razak

12:15: Evaluation of flexibility-based damage indices using different modal response data, A.P. Adewuyi, S.O. Franklin, Z.S. Wu

F-M2: Structural Health Monitoring, Damage Detection, System Identification
Chair: Prof. I. Smith, EPFL, Switzerland

13:15: Structural health monitoring of the Gaertnerplatz Bridge over the Fulda River in Kassel considering environmental conditions, M. Link, M. Weiland, E. Fehling

13:30: Monitoring cultural heritage buildings: The Santa Maria del Carrobiolo bell-tower in Monza (Italy), A. Saisi, F. Busatta, C. Gentile, A. Ruccolo

13:45: Damage detection by drive-by monitoring using the vertical displacements of a bridge, D. Martínez, E.J. OBrien, E. Sevillano

14:00: Numerical identification of advanced progressive collapse resisting mechanisms for RC framed structures, L.A. Bredean, M.D. Botez, A.M. Ioani

14:15: Wave-structure dynamic interaction of Vega Platform, M. Rizzo, O. Spadaccini

14:30: Damage assessment of concrete gravity dams using vibration characteristics, N.T. Le, D.P. Thambiratnam, T.H.T. Chan, A. Nguyen, B.K.T. Huynh

14:45: Load tests of deteriorated steel pipe, B. Kunecki, L. Janusz, L. Korusiewicz

F-M3: Structural Assessment, Failure Analysis, Repair, Strengthening, Retrofitting
Incorporates Special Session SS18: Dynamic Assessment, Control & Monitoring of Structures
Organisers: Dr. Fulvio Busatta, Prof. Luca Martinelli, Dr. Marco Domaneschi, Politecnico di Milano, Italy
Co-Chairs: Dr. F. Busatta, University of Cape Town, South Africa & Prof. L. Martinelli, Politecnico di Milano, Italy

15:15: Structural assessment of historical buildings by monitoring and numerical methods: The case of Castelvecchio (Verona), F. Lorenzoni, M. Caldon, C. Modena, M.R. Valluzzi

15:30: Structural assessment of an existing concrete bridge based on distributed strain measurement data, A.P. Adewuyi, S.O. Franklin, Z.S. Wu

15:45: Experimental investigation of gothic revival vault structures, J. Piehler, M. Hansen, G. Kapphahn

16:00: Assessing damage intensity based on a non-model damage feature on a long-span suspension bridge model, L. Martinelli, M. Domaneschi, M.P. Limongelli

16:15: Lessons learned from the dynamic assessment of railway bridges for heavy haul transport in South Africa, F. Busatta, P. Moyo

16:30: Historical reinforced concrete arch bridges: Dynamic identification and seismic vulnerability assessment, M. Acito, C. Chesi, C. Lazzarin, E. Richermo

16:45: Experimental testing and FE model validation of a historic RC high-rise building in Milan, M. Acito, C. Chesi, V. Lavermicocca, V. Sumini, F. Cavagnera

F-T1: Structural Assessment, Failure Analysis, Repair, Strengthening, Retrofitting
Co-Chairs: Dr. F. Busatta, University of Cape Town, South Africa & Dr. F. Lorenzoni, University of Padova, Italy

10:30: Transmission line failures during tornadoes and downbursts, A. El Damatty, A. Elawady, M. Hamada (Invited Paper)

11:00: The assessment of concrete strength in existing Italian infrastructures, A.P. Fantilli, B. Frigo, B. Chiaia

11:15: Structural retrofitting for altered service conditions: Case study of a bridge over the Vaal River in Warrenton, South Africa, T. Massingue

11:30: Seismic assessment and rehabilitation of XVth century Küçük Mustafa Paşa Bath, C. Demir, M. Comert, A. Ilki, P.O. Celik

11:45: Structural assessment of Berth 209 in accommodating bigger vessels, M. Letsie, A. Qumba, P.I. Mazibuko

12:00: Performance of retrofitted steel structures subjected to fatigue loading, O. Mirza, F. Mashiri, D. Schroot

12:15: Silo structural assessment: A detailed approach, N. Brahimi, S. Piot, M.O. Mmusi

F-T2: Soil-Structure Interaction, Foundations, Geotechnical Engineering
Co-Chairs: Prof. Z. Cabarkapa, Geotechnical Consulting Group, UK & Prof. M. Pulsfort, Bergische University of Wuppertal, Germany

13:15: New findings concerning the spreading of fresh concrete in bored piles, C. Fierenkothen, M. Pulsfort (Invited Paper)

13:45: Optimised design of foundation systems for high-rise structures, R. Katzenbach, S. Leppla

14:00: Soil-structure interface studies for offshore piles, G. Baykal

14:15: Finite element modelling of confined concrete piles with FRP tubes in sandy soil under static loading, A.M. El-Nemr, O. Ashour, G.M. Hekal

14:30: Numerical simulations of soil-structure interaction for ordinary buildings, D. Forcellini, S. Gobbi, D. Mina

14:45: Dynamic response of confined concrete piles with FRP tubes in sandy soil using finite element modelling, A.M. El-Nemr, O. Ashour, G.M. Hekal

F-T3: Strengthening, Renovation, Failure Analysis, Material Characterisation
Chair: Prof. G. Mulas, Politecnico di Milano, Italy

15:15: Effect of externally bonded steel plates on the bearing capacity of composite slabs, C.P.C. Bruwer

15:30: Static behaviour of steel plate-strengthened reinforced concrete slabs in bending, A.M. Olajumoke, M. Dundu

15:45: A semi-composite pipe structure in renovation design of ageing sewers, Z. Shi, M. Nakano, T. Kouchi

16:00: Structural behaviour of a newly designed rail vehicle including failure analysis: Finite element analysis and strain gauge measurements, F. Masithulela

16:15: Mechanical characterization of European species: Picea-Alba mill and Douglas fir, C.F. Pambou Nziengui, R. Moutou Pitti, G. Godi, E. Fournely, F. Dubois

F-W1: Soil-Structure Interaction, Foundations, Geotechnical Engineering
Incorporates Special Session SS09: Offshore Foundations
Organiser: Prof. Lars Andersen, Aalborg University, Denmark
Co-Chairs: Prof. M. Achmus, Leibniz University of Hannover, Germany
& Prof. L. Andersen, Aalborg University, Denmark

10:30: Foundations model for transportation infrastructure in mining site areas, K. Kłosek

10:45: Critical velocity of a load moving on a beam supported by a foundation of finite depth, Z. Dimitrovová

11:00: Cost assessment of an isolated bridge with soil-structure interaction, D. Forcellini

11:15: Finite element analysis of tubular track system, K.J.S. Verlinde, J.A.v.B. Strasheim

11:30: Effect of slope height and horizontal forces on the bearing capacity of strip footings near slopes in cohesionless soil, S. Krabbenhøft, L. Damkilde, K. Krabbenhøft

11:45: A macro model description of the non-linear anchor block foundation behavior, J. Tistel, G. Grimstad

12:00: Optimization of geotechnical structures for limit states of serviceability and ultimate loads, J. Grabe, K.F. Seitz

12:15: Incorporating wind-wave misalignment and load directionality into the design of offshore wind turbine foundations, L. Arany, J.H.G. Macdonald, S.J. Hogan, S. Bhattacharya

F-W2: Offshore Foundations: Special Session SS09
Organiser: Prof. Lars Andersen, Aalborg University, Denmark
Chair: Prof. L. Andersen, Aalborg University, Denmark

13:15: Dynamic soil-structure interaction of monopod and polypod foundations, L.V. Andersen (Invited Paper)

13:45: Literature review on cyclic lateral loading effects of mono-bucket foundations, L.R. Kapitanov, P. Duroska, C.A. Garcia, M.M. Puigvert, L.B. Ibsen, M.J. Vahdatirad

14:00: Reliability analysis of bottom-fixed offshore wind turbines considering soil-pile interaction and scouring depth, J.H. Yi, S.B. Kim, G.L. Yoon

14:15: Efficient response recovery procedures for detailed design of jacket foundations, M.B. Nielsen, J.F. Jensen, D. Augustyn, R.R. Pedersen

14:30: Holding capacity analysis of suction anchors based on the coupled Eulerian-Lagrangian method, J.S. Park, J. Won, Y.S. Joo, K.M. Lee, M. Ryu

14:45: Numerical modeling of the behavior of bucket foundations in sand under cyclic tensile loading, M. Achmus, P. Gütz

15:00: A load-displacement based approach to assess the bearing capacity and deformations of mono-bucket foundations, M.J. Vahdatirad, A. Troya Diaz, L.B. Ibsen, S.A. Nielsen, L.V. Andersen, S. Firouzianbandpey, D.V. Griffiths

F-W3: Masonry Structures
Chair: Prof. J. Myers, Missouri Univ. of Science & Technology, USA

15:30: Experimental research into the response of masonry segmental barrel vaults to static and dynamic loading, J. Witzany, R. Zigler, J. Kubát, K. Kroftová, M. Šmidtová

15:45: Modelling and analysis of 2D-solids with internal friction and sliding mode, A. Baratta, I. Corbi, O. Corbi

16:00: Compressive strength of masonry with soft layers in bed joint, N. Mojsilović, M. Petrović, R. Büchler

16:15: Energy efficient masonry units using sustainable techniques, A.A. Gheni, M.E. ElGawady, J.J. Myers

16:30: Torsion-bending moment interaction in the frictional contact of tuff blocks: Experimental and analytical results, C. Casapulla

16:45: Analysis of stresses in curved multi-layered structures, A. Baratta, I. Corbi, O. Corbi

END