# Programme

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| **MONDAY 28 NOVEMBER 2022. 17:00 – 18:00: Registration and Welcome Function, GSB (V&A Waterfront)** | |
| **TUESDAY 29 NOVEMBER 2022** | |
| **1 (08:30 -10:00)** | **Conference opening \| Multi-physics material models** |
| Tea Break (10:00 – 10:30) | |
| **2 (10:30 - 12:30)** | **Numerical aspects of material modelling I** |
| Lunch (12:30 -13:15) | |
| **3 (13:15 – 15:00)** | **Experimental identification and material characterization** |
| Tea break (15:00 – 15:30) | |
| **4 (15:30 – 17:15)** | **Micropolar, micromorphic and gradient materials** |
| **WEDNESDAY 30 NOVEMBER 2022** | |
| **5 (08:45 - 10:00)** | **Biomechanics and biomaterials** |
| Tea break (10:00 – 10:30) | |
| **6 (10:30 - 12:30)** | **Creep, damage and fatigue** |
| Lunch (12:30 -13:15) | |
| **7 (13:15 - 15:00)** | **Plasticity and viscoplasticity I** |
| Tea break (15:00 – 15:30) | |
| **8 (15:30 - 17:15)** | **Plasticity and viscoplasticity II** |
| **THURSDAY 01 DECEMBER 2022** | |
| **9 (08:45 – 10:00)** | **Numerical aspects of material modelling II** |
| Tea break (10:00 – 10:30) | |
| **10 (10:30 - 12:30)** | **Linear elasticity and viscoelasticity** |
| Lunch (12:30 -13:15) | |
| **11 (13:15 - 15:00)** | **Various topics in material modelling** |
| **Conference Dinner 18:00** | |

| TUESDAY 29 NOVEMBER 2022 | |
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| **1 (08:30 -10:00)** | **Conference opening**, *Sebastian Skatulla, Albrecht Bertram*<br><br>**Multi-physics material models**<br><br>**Nanoporous metal based composites: Giving polymers strength and making metals move**<br>*Swantje Bargmann; Jana Wilmers; Emma Griffiths; Daya Reddy*<br><br>**Surface accretion of a pre-stretched half-space: Biot's problem revisited**<br>*Giuseppe Tomassetti; Eric Puntel; Rohan Abeyaratne; Filippo Recrosi*<br><br>**On the interaction of dissipative heating and chemical ageing**<br>*Michael Johlitz; Alexander Lion; Bruno Musil* |
| Tea Break (10:00 – 10:30) | |
| **2 (10:30 - 12:30)** | **Numerical aspects of material modelling I**<br><br>**Impact of surface steel rheology on damage modes of Zinc-based galvanizing coatings**<br>*Ahmed Zouari; Kais Ammar; Houssem-Eddine Chaieb; Samuel Forest*<br><br>**A finite element model of strain-induced crystallisation**<br>*Ernesto Ismail; Daya Reddy*<br><br>**A new nonlinear oscillator for the van der Pol oscillator: accurate numerical algorithm**<br>*Modify Kaunda*<br><br>**Modelling of sea ice formation using the phase-field method**<br>*Emmanuel Omatuku; Sebastian Skatulla; Marcello Vichi; Joerg Schroeder; Tim Ricken*<br><br>**Explicit incremental solution of nonlinear multiple-degree-of-freedom systems**<br>*Modify Kaunda* |
| Lunch (12:30 -13:15) | |
| **3 (13:15 – 15:00)** | **Experimental identification and material characterization**<br><br>**Development of an open-source toolkit for processing large material test datasets**<br>*Daniel Slater; Ben Alheit; Sarah George; Ernesto Ismail*<br><br>**Scanning Electron Microscopy, Energy Dispersive X-ray Spectroscopy and statistical analysis of high- and low-pressure coatings on ceramic membrane for efficient wettability during oil-water separation**<br>*Tshepo Maome; Prof Thomas Tengen; Prof Alfayo Alugongo; Prof Baonhe Sob*<br><br>**Ceramic membrane performance improvement on fouling and degradation: a review**<br>*Tshepo Maome; Thomas Tengen; Alfayo Alugongo; Baonhe Sob* |
| Tea break (15:00 – 15:30) | |
| **4 (15:30– 17:15)** | **Micropolar, micromorphic and gradient materials**<br><br>**Towards robust modelling and simulation of strain gradient plasticity at finite deformations**<br>*Mohamed Abatour; Samuel Forest; Nikolay Osipov; Stephane Quilici; Kais Ammar*<br><br>**Configurational peridynamics**<br>*Andie de Villiers; Ali Javili; Andrew McBride; Paul Steinmann*<br><br>**Selecting generalized continuum theories for nonlinear periodic solids based on the instabilities of the underlying microstructure**<br>*Christelle J. Combescure*<br><br>**Determining the elastic threshold for problems of dissipative strain-gradient plasticity**<br>*Daya Reddy; Stanislav Sysala* |

| WEDNESDAY 30 NOVEMBER 2022 | |
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| **5 (08:45 - 10:00)** | **Biomechanics and biomaterials**<br>**A uniquely defined co-rotated intermediate configuration and its application to a novel stress-driven anisotropic growth model incorporating homeostatic surfaces**<br>*Hagen Holthusen; Christiane Rothkranz; Lukas Lamm; Tim Brepols; Stefanie Reese*<br>**A numerical framework for modelling nonlinear viscoelastic solids with application to bovine cortical**<br>*Benjamin Alheit; Ernesto Ismail; Trevor Cloete*<br>**Influence of long duration storage on the material characterization data of porcine cortical bone**<br>*Nicholas Daras; Trevor Cloete; Gerald Nurick* |
| Tea break (10:00 – 10:30) | |
| **6 (10:30 - 12:30)** | **Creep, damage and fatigue**<br>**On the efficient micromorphic regularization of anisotropic brittle damage**<br>*Tim van der Velden; Hagen Holthusen; Tim Brepols; Stefanie Reese*<br>**Crack initiation and growth in compacted graphite iron: 2D CZE-based modelling**<br>*Xingling Luo; Konstantinos P. Baxevanakis; Vadim V. Silberschmidt*<br>**On the selection of flow rule and slip system in crystal plasticity simulations of cyclic deformation in martensitic steels**<br>*Tim Fischer; Carl F.O. Dahlberg; Peter Hedström*<br>**A phenomenological crystal plasticity model introducing a coupling between viscoplastic strain and static recovery and its influence on the creep-fatigue interaction**<br>*Florent Coudon; Pascale Kanouté; Serge Kruch; Rodrigue Desmorat*<br>**Modelling local elastoplastic damage at finite strains using Newton-Raphson based computational algorithms**<br>*Paul Namalomba; Sebastian Skatulla* |
| Lunch (12:30 -13:15) | |
| **7 (13:15 - 15:00)** | **Plasticity and viscoplasticity I**<br>**Yet another elasto-plasticity formulation**<br>*Klaus Heiduschke*<br>**Numerical analysis of the thermo-mechanical theory of field dislocations in transient heterogeneous temperature fields through the finite element method**<br>*Gabriel D. Lima-Chaves; Manas V. Upadhyay*<br>**A thermo-coupled constitutive model for semi-crystalline polymers at finite strains: Application across scales**<br>*Marie-Christine Reuvers; Tim Brepols; Stefanie Reese*<br>**The evolution of Hooke's law under finite plastic deformations for fiber reinforced materials**<br>*Albrecht Bertram; Oliver Stahn; Wolfgang H. Müller* |
| Tea break (15:00 – 15:30) | |
| **8 (15:30 - 16:30)** | **Plasticity and viscoplasticity II**<br>**A study of passivation condition and non-proportional loading by a single crystal gradient plasticity theory**<br>*Habib Pouriayevali*<br>**Unified modelling of creep and plasticity**<br>*Alexander Dyck; Thomas Böhlke*<br>**Contact Resistance Influence in Numerical Simulation of Resistance Sintering**<br>*V. Bruyere; J. Amovin-Assagba; P. Namy; C. Durand; S.Roure* |

| THURSDAY 01 DECEMBER 2022 | |
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| **9 (08:45 – 10:00)** | **Numerical aspects of material modelling II**<br>**Simulating dislocation transport via a Runge-Kutta Discontinuous Galerkin finite element approach**<br>*Manas V. Upadhyay; Jeremy Bleyer*<br>**Numerical simulation of the Taylor Impact Test for laser powder bed fusion parts based on microstructural internal state variables**<br>*Amos Muiruri; Maina Maringa; Willie du Preez*<br>**The impact of electromagnetic radiation on ice detection and mitigation for wind turbine aerodynamics**<br>*Odiagbe, Franklin O.; Alugongo, Alfayo A.* |
| Tea break (10:00 – 10:30) | |
| **10 (10:30 - 12:30)** | **Linear elasticity and viscoelasticity**<br>**Stability loss under tension: analytical approach**<br>*Stanislava Kashtanova; Alexey V Rzhonsnitskiy*<br>**Preprocessing of atomistic models of dislocations based on finite deformation approach**<br>*Pawel Dluzewski*<br>**Mechanical metamaterials with negative Poisson's ratio: auxetic and filled auxetic structures**<br>*Anastasiia Tarasova; Mikhail A. Tashkinov; Ilya Vindokurov; Vadim V. Silberschmidt*<br>**The influence of a diffuse interphase on the viscoelastic behaviour of rubber blends**<br>*Jannik Voges; Martin Müller; Andrej Lang; Manfred Klüppel; Daniel Juhre*<br>**Viscoelastic properties of hollow glass microsphere filled epoxy resin syntactic foam composite material: effect of particle size variation and loading frequency**<br>*Olusegun Adigun Afolabi; Krishnan Kanny; Mohan Turup P* |
| Lunch (12:30 -13:15) | |
| **11 (13:15 - 14:30)** | **Various topics in material modelling**<br>**Modelling impact of granulometry on coffee extraction**<br>*Yogesh Harshe; Roberto Calderone; Gaylord Vicky; Yann Epars*<br>**Controlling the propagation of material instabilities through architecture**<br>*Justin Dirrenberger; Antoine-Emmanuel Viard; Samuel Forest*<br>**Autoregressive neural networks for predicting the behavior of viscoelastic materials**<br>*Lukas Maurer; Fabian Duvigneau; Daniel Juhre* |
| **Conference Dinner 18:00** | |