AFRICOMP 7, 2026 - Programme

PROGRAMME OVERVIEW

TUESDAY, 24/02/2026, 17:00 – 18:30: Registration and Welcome Function, GSB (V&A Waterfront)

WEDNESDAY, 25/02/2026		
Session	**Venue A**	**Venue B**
1 (08:30 - 10:00)	**Conference Opening & KEYNOTE LECTURES**	
Tea Break (10:00 – 10:30)		
2 (10:30 - 12:30)	**Biological Systems**	**Manufacturing and Process Engineering**
Lunch (12:30 -13:30)		
3 (13:30 – 15:00)	**Computat. Modelling of Biological Soft Tissues (1)**	**Material Design and Modelling (1)**
Tea break (15:00 – 15:30)		
4 (15:30 – 17:30)	**Computat. Modelling of Biological Soft Tissues (2)**	**Material Design and Modelling (2)**

THURSDAY, 26/02/2026		
5 (8:30 - 10:00)	**KEYNOTE LECTURES**	
Tea break (10:00 – 10:30)		
6 (10:30 - 12:30)	**Numerical Simulation Methods**	**Inverse Problems, Optimization and Design**
Lunch (12:30 -13:30)		
7 (13:30 - 15:00)	**Multi-scale and Multi-physics Problems (1)**	**Flow Problems (1)**
Tea break (15:00 – 15:30)		
8 (15:30 – 17:00)	**Multi-scale and Multi-physics Problems (2)**	**Flow Problems (2)**
Conference Dinner 18:00, Kirstenbosch National Botanical Gardens		

FRIDAY, 27/02/2026		
9 (8:30 – 10:00)	**KEYNOTE LECTURES**	
Tea break (10:00 – 10:30)		
10 (10:30 - 12:30)	**Granular Materials and Bulk Handling**	**Data Science and Machine Learning**
Lunch (12:30 -13:30)		
11 (13:30 - 15:00)	**Damage, Fracture and Failure**	**Bridging Physics and Data: AI Methods in Solid and Fluid Mechanics**
Tea break (15:00 – 15:30)		
12 (15:30 - 17:30)	**Structural Mechanics, Stability and Dynamics**	**Various Topics on Computational Mechanics**
Closing Function 17:30 – 18:00		

WEDNESDAY, 25 FEBRUARY 2026

Session 1 (08:30 - 10:00)	Venue A
Conference Opening: *Sebastian Skatulla, Chairman AFRICOMP, University of Cape Town*
KEYNOTE LECTURES
Towards an Improved Understanding of The Role of Flow in Blood Clot Formation, *Malebogo Ngoepe*
Accelerated development of materials using high-throughput strategies and AI/ML, *Surya Kalidindi*
Tea Break (10:00 – 10:30)
Session 2 (10:30 – 12:30)

Biological Systems | Venue A	Manufacturing and Process Engineering | Venue B
Validating AmHC as a Cancer Therapy Through in Vitro Experiments and Multiphysics Simulation *Kamogelo Millicent Mmereke, Thanyani Pandelani, Tracy Masebe*	**Simulation of High-Pressure-Torsion Within the Material-Point-Method** *Dominik-Oliver Cloidt, Marvin Koßler, Rainer Niekamp, Jörg Schröder*
Experimental–Computational Assessment of Hybrid III Lower Limb Response during Underbody Blast Loading, *Karabelo Sekhuthe, Dithoto Modungwa, Mangalani Miyambo, David Reinecke, Pandelani Thanyani*	**Impact of Optimized Computational Modelling on Manufacturing Feasibility and Hydrodynamic Performance of Polymeric Heart Valve Prostheses** *L Masheane*
Computational Framework for Coil Embolisation in Arteriovenous Malformations *Jordan Bougardt, Malebogo Ngoepe, Fabian Holzberger, Markus Muhr, Barbara I. Wohlmuth, Randall T. Paton, Cecil M. Pule, Karabo Moisane, Jay Pillai, Wei Hua Ho*	**Analysis of Residual Stress and Optimisation of Friction Welded Ti6Al4V Alloy** *MC Zulu, PM Mashinini, T. Ntsoane, A.Venter, R. van der Merwe, D. Marais*
A Novel Algorithmic Formulation of Trabecular Bone Remodelling Using a Three-Scale Model *Areti Papastavrou, Peter Pivonka, Paul Steinmann*	**Mixing-Based Estimation of Alloy Thermophysical and Optical Properties for CFD Simulations** *Raymond Botete, Deborah Blaine, Gerhard Venter*
Validation of Mechanical Properties of Diamond Lattice Structure Produced Through Lithography-Based Ceramic Manufacturing for Bone Regeneration Scaffold *Morakane Moletsane, Lehlohonolo Monaheng, Willie du Preez, Deon de Beer, Shathani Nkhwa*	**Embedded FEM–Based Simulation Framework for the Qualification of Repair and Remanufacturing Processes** *Michele Chiumenti, Carlos Augusto Moreira, Manuel Caicedo, Runeal Ramma*
A Quantitative Understanding of Glymphatic Transport and Deposition of Amyloid Using Image-Based Subject-Specific Modelling *Shaolie S. Hossain, Derya Bakiler, Michael J. Johnson, Michael R.A. Abdelmalik, Frimpong A. Baidoo, Andrew Badachhape, Thomas J.R. Hughes*	**Physics by Design** *Daniel N. Wilke* **Computational Strategies and Experimental Validation for Economical Development of Polymeric Heart Valves in Resource-Constrained Environments** *Lebohang Masheane, W. Du Preez, J. Combrinck*

Lunch (12:30 -13:30)

Session 3 (13:30 -15:00)	
Computational Modelling of Biological Soft Tissues (1)	**Material Design and Modelling (1) | Venue B**
Grail-Heart: A Graph Neural Network Framework for Inverse Modelling of Cell-Cell Communication in Cardiac Tissues *Tumo Kgabeng, Lulu Wang, Harry Ngwangwa, Thanyani Pandelani*	**Limpet Teeth: A Role Model Material Combining Auxetic Properties with High Strength and Stiffness** *Swantje Bargmann, S.-H. Oh, J. Kim, Y. Liu, M. Wurmshuber, X. Peng, J. Seo, J. Jeong, Z. Wang, J. Wilmers, C. Soyarslan, J. Kim, B. Kittiwirayanon, J. Jeong, H.-J. Kim, Y. H. Huh, D. Kiener, H. Gao*
Computational Modelling of Thermal-Mechanical Coupling in Soft Biological Tissues: A Multiphysics Approach *Thandiwe Radebe*	**Data-adaptive spline-based viscoelasticity for soft solids** *Simon Wiesheier, Miguel Angel Moreno-Mateos, Paul Steinmann*
Development of a Transient Finite Volume 1D Thermofluid Network Modelling Methodology for the Human Cardiovascular System *Nicola Cilliers, Ryno Laubscher, Pieter Rousseau*	**What Can Molecular Dynamic Simulations Tell Us About the Deformation Behaviour of Glassy Amorphous Polymers?** *Sumit Basu*
Comparative Pulmonary Trauma Induced by Homemade and Military Explosives: A Biomechanical Perspective on Blast Exposure *Karabelo Sekhuthe, Pholisa Ngcebesha, Mzwandile Mokalane, David Reinecke, Pandelani Thanyani*	**Mullins Softening with Neural Network Constitutive Models** *Dominik K. Klein, Jonas Fey, Oliver Weeger*
Material Characterisation and Durability Testing of Pig Aortic Valves, *Edward Matjeke*	**Comparative Analysis of Modelling Techniques for Pressure Vessels Undergoing Metal Loss Failures** *Ifeanyi E. Kalu, Schalk Kok, Helen M. Inglis*
Tea Break (15:00 – 15:30)	
Session 4 (15:30 – 17:30)	
Computational Modelling of Biological Soft Tissues (2)	**Material Design and Modelling (2) | Venue B**
Exploring Brain Mechanics. A Journey From the Cellular via the Tissue to the Organ Level, *Paul Steinmann*	**Manufacturing Effects on the UC Topology of 3D Printed Lattice Metamaterials for Wave Attenuation** *Rachele Zuppi, Alessandra Paoloni, Luca Parente, Daniela Addessi*
Scientific Machine Learning and Uncertainty Quantification for Aortic Hemodynamics and Wall Mechanics *Sascha Ranftl*	**Logarithmic Strain-Rate Based Finite-Strain Hyper-Viscoelastic Framework for Antarctic Ice Shelves** *Maxime Nutte, Sebastian Skatulla, Carlo Sansour*
Computational Modelling Approaches to Understanding Lower Limb Injury in Underbody Blast *Lebone Mokgotho*	**Numerically Assessing the Midpoint Material Response of the Clamped Circular Plate Subjected to Blast Loading and Validating the Model Using the High-Speed Digital Image Correlation Technique** *Mzwandile Mokalane, Dawood A. Desai, Karabelo Sekhuthe, David Reinecke*
Computational Biomechanics of Ocular Trauma: A Finite Element Analysis for Personal Protective Equipment Design *Wilfried Barros*	
Studying the Effect of Intramyocardial Biomaterial Injectates on Cardiac Myofibroblast Mechanics to Guide Scar Development in Myocardial Infarcts *Ngaka J. Nchejane, Kevin L. Sack, Y. Dodzi Motchon, Juliet Nagawa, Mazin S. Sirry, Tamer Abdalrahman, Neil H. Davies, Thomas Franz*	**Thermodynamically Consistent Modelling of Viscoelastic-Plastic Behaviour in SLS-Processed Polyamide 12** *Michael Johlitz, Dominik Hahne, Alexander Lion*
	The Power of Auxetics: How Can Structural Effects Contribute to the Design of Metamaterials? *Tim Ricken, Maximilian Brodbeck, Nicolas Grünfelder, Benjamin Dieckgraeff, Krishaa Madhikarmi*
A Biomechanical Framework for Simulating Tumor-Induced Brain Herniation *Nicole Tueni, Silvia Budday*	**Automated and Differentiable Constitutive Modelling in JAX,** *Bleyer Jeremy*

THURSDAY, 26 FEBRUARY 2026

Session 5 (8:30 -10:00) KEYNOTE LECTURES
Neural operator learning for computational solid mechanics, *Laura de Lorenzis*
The Art and Science of Mismatch: Aligning Data, Models, Latent Spaces, Fidelity and Engineering Objectives, *Daniel N. Wilke*
Tea Break (10:00 – 10:30)
Session 6 (10:30 – 12:30)

Numerical Simulation Methods | Venue A	Inverse Problems, Optimization and Design | B
Variation in the Porosity of a Packed Bed of Spheres Accounting for Overlaps Between Spheres *CG du Toit* **Development and Implementation of Numerical Models for Annual Performance Prediction of a 50 MWe CSP Plant Using a Natural Draft Air-Cooled Condenser** *Tristan O. Nel, Johannes P. Pretorius, Pieter G. Rousseau* **Numerical Investigation of Transverse Isotropy in Continuum-Kinematics-Inspired Peridynamics** *J Stadler, A.M. De Villiers, A. Javili, G. Limbert, A.T. McBride, P. Steinmann* **A Gradient-Enhanced Approach for Stable Finite Element Approximations of Convection-Diffusion Equations** *Daya Reddy, Soheil Firooz, Paul Steinmann* **SPH Simulations of Integral Fractional K-BKZ Viscoelastic Models** *Luca Santelli, Adolfo Vazquez-Quesada, Marco Ellero* **Dynamic Modelling and Sensitivity Analysis of Pitting Growth Effects in a Spur Gearbox** *Yakeu Happi Kemajou Herbert, Prof. Bernard Xavier Tchomeni, Alfayo Anyika Alugongo*	**Non-Smooth Optimization Meets Automated Material Model Discovery** *Moritz Flaschel, Trevor Hastie, Ellen Kuhl* **Multi-Thickness Topology Optimization: Maximizing Performance and Manufacturability** *Gabriel Stankiewicz, Chaitanya Dev, Paul Steinmann* **A Hybrid Approach to Heat Exchanger Design: Calibrating Empirical Correlations with a Cell-by-Cell Numerical Solver** *Tinashe Ngwenya* **Estimation of Parameters for Prediction of Vortex-Induced Vibrations by Means of Bayesian Methods** *Bernt J. Leira, Svein Sævik, Jie Wu* **Enhancement of Damping of Railway Sleeper Using Waste Tire Rubber Particles to Promote Sustainability** *Mbatha Abednigo Jabu*

Lunch (12:30 -13:30)

Session 7 (13:30 -15:00)	
Multi-scale and Multi-physics Problems (1) │ A	**Flow Problems (1) │ Venue B**
Multifield Thermoplasticity and Its Application to Linear Friction Welding Ross A. Williams, Andrei G. Shvarts, Chris Pretty, Andrew McBride, Łukasz Kaczmarczyk **Novel Modelling Approaches to Simulate Innovative Mineral Composites** Michael Kaliske **Using Multi-Physics Digital Twins for Brake Wear Prognosis of a Mining Vehicle** Luke van Eyk, Brian Ellis, Stephan Schmidt, Stephan Heyns **Multi-Scale Digital Twin Framework for Physics-Informed Fault Diagnosis and Prognosis of Helical Gears** Brian Ellis, P.S. Heyns, Stephan Schmidt **The Influence of Scale-Size Effects on Effective Coefficients and Multi-Continuum Homogenization** Grigor Nika	**Numerical Investigation Into the Effect of Throat Passage Width on sCO2 Axial Turbine Stage Performance Using Computational Fluid Dynamics Simulations** Nicholas Cato, Dr. Johannes Pretorius, Dr. Adam Venter, Prof. Ryno Laubscher **Development of Performance and CFD Simulation Models for Surrogate-Based Optimisation of Natural Draft Direct Dry Cooling Tower Shell Shape** Robert Cheesman-Hooper, Johannes Pretorius, Rashid Haffejee **Microfluidic Simulation of Surface Acoustic Waves for Separation of Al2O3 and Fe3O4 in Water** Active O. Mathedimosa, Thokozani J. Kunene **Numerical and Experimental Analysis of Electromagnetic Nanofluids Using Double-Coil Helmholtz Coil in Microchannels** Benedict Mavodze, Thokozani Justin Kunene **Instability and Mixing in Confined Buoyant Plumes** Nigel C. Dhlamini, H. D. Lim, Wei Hua Ho
Tea Break (15:00 – 15:30)	
Session 8 (15:30 – 17:00)	
Multi-scale and Multi-physics Problems (2) │ A	**Flow Problems (2) │ Venue B**
Multi-Scale Phenomena in eVTOL Vertiport Flow-Acoustic Interactions Vladimir Golubev **Coupled Multiphysics Models for Feed Throughput Estimation in Electric Arc Furnaces** Myren Rajh, Willem Roos, Alfred Bogaers **Nonlinear Dynamics of a Human Arm Model with Electromechanical Actuation Under Variable Load** Bernard Xavier Tchomeni Kouejou **Multifield Finite Strain Thermoplasticity: Theory and Numerics** Andrew McBride, Ross Williams, Lukasz Kaczmarczyk, Paul Steinmann, Chris Pretty, Chris Pearce	**Wind Resource Assessment Using OpenFOAM at a Potential South African Wind Farm Site** Ayoub Rawoot, Adam J Venter, Andrew Gill, Milan A Swart **Optimizing Perforated Plates for Flow Uniformity in Shock Tube Reactive Film Cooling** Tinashe Ngwenya **Modelling of the Fluid Structure Interaction of the Horizontal Axis Bio-Inspired Wind Turbine Blade and Effect** on Annual Energy Production Arinao Netshivhulana, Harry Ngwangwa, Thanyani Pandelani, Dithoto Modungwa, Fulufhelo Nemavhola **A Theory for Three-Dimensional Wave Breaking Based on Crest Instability of Short-Crested Waves** Frederic Dias
**Conference dinner 18:00, Kirstenbosch National Botanical Gardens	Bus departure: 17:00**	

FRIDAY, 27 FEBRUARY 2026

Session 9 (8:30 -10:00) KEYNOTE LECTURES

SA Agulhas II – Flagship for Vessel 4.0, *Annie Bekker*

The Engineer Will See You Now: Fixing What Medicine Can't, *Karol Miller*

Tea Break (10:00 – 10:30)

Session 10 (10:30 – 12:30)

Granular Materials and Bulk Handling | Venue A	Data Science and Machine Learning | Venue B
Towards the Efficient DEM Modelling of Interlocking Particles *Andre Katterfeld, Mohsin Ajmal* **Modelling the Transition From Compacted to Free-Flowing Behavior in Stockpiled Bulk Materials Using Rocky DEM** *Ben McPherson, David Bradney* **Coupling the Material Point Method and the Finite Volume Method** *Corne Coetzee, Matthew Purvance* **Calibration of a Coupled CFD-DEM Model** *Corne Coetzee, Jacob Wasserfall, Christiaan Meyer* **Statistical Evaluation of Computational Approaches for Wet Granular Systems Using PEPT Experiments** *Taswald Llewelyn Moodley, Indresan Govender, Sandile Nkwanyana* **Modelling and Experimental Analysis of Granular Flow in Flexible Intermediate Bulk Containers (FIBCs)** *Mitchell Boots, Mark Jones, Peter Robinson* **Coupled CFD-DEM Simulation for Studying the Greenhouse Gas Emissions of the Compost Turner** *Andre Katterfeld, Ibtihaj Faridi, Max Cichocki, Christian Landschützer, Eva Buchmayer, Fabian Theurl* **Dynamics of a Nutating Mill with Charge-Structure Interaction,** *Christo Janse van Vuuren, Johann Bredell, Corné Coetzee*	**Machine Learning and Finite Element Modelling for Predicting Outcomes for PPCM Patients Without and with Left Ventricular Assist Device** *Juliet Nagawa, Kevin L. Sack, Sarah Kraus, Mazin Sirry, Ntobeko A.B. Ntusi, Neil H. Davies, Karen Sliwa, T. Franz* **Innovative Hybrid Data Generation for Evolving Rail Damage: Utilizing Variational Autoencoders in Ultrasonic Guided Wave Inspection Simulations** *Dineo A. Ramatlo, Daniel N. Wilke, Phillip W. Loveday* **Structuring Latent Spaces: A Primer to the LS-PIE Framework** *Jesse N. Stevens, Daniel N. Wilke, Isaac I. Setshedi* **Context-Aware Vibration-Compensated Head Gesture Recognition for Turret Control on Mobile Platforms** *Lonwabo Rooibaard, Dithoto Modungwa, Thanyani Phandelani, Malusi Sibiya* **Performance Optimization of Edge AI for Low-Power Acoustic UAV Detection: A Comparative Study on Arduino Nano 33 BLE Sense** *Lonwabo Rooibaard, Dithoto Modungwa, Malusi Sibiya, Thanyani Phandelani* **Lagrangian Neural Networks for Nonholonomic Mechanics** *Viviana A. Diaz* **Computational Modelling of Circulatory Stasis in Aviation Environments: The Dfpas Insole for Flight Crew Health** *Kingsley Essel Arthur* **Closing the Gaps: Off-Line Parameter Estimation in UAVs Under Sensor Noise, Bias and Blackout** *Makhosazana Moyo, Jimoh Pedro*

Lunch (12:30 -13:30)

Session 11 (13:30 -15:00)

Damage, Fracture and Failure | Venue A

Finite Viscoelastic Modelling of Ice Shelves Using an Exponential Update Scheme and Glen' Flow Law
J. Schröder, M. Koßler, R. Müller, A. Humbert

Modelling of the Footloose Rampart Effect in Ice Shelves Using a Multiplicative Viscoelastic Material Model
Marvin Koßler, Sebastian Skatulla, Jörg Schröder

Logarithmic Strain-Based Glen's Flow Law for Glaciological Applications, *Paul Namalomba, Sebastian Skatulla, Carlo Sansour, Michael Kaliske, Maxime Nutte*

Dynamic Response of Materials During High Velocity Impact, *Marisol Koslowski, Simon Gonzalez Zapata*

Thermal-Mechanical-Chemical Coupled Model and Three-Dimensional Damage Evaluation for Laser-Ablated CFRP, *Zeang Zhao, Daining Fang*

AI Methods in Solid and Fluid Mechanics | Venue B

Numerical Simulation of Lower Limb Surrogates for Injury Prediction in Under-Vehicle Blast Events
Thanyani Pandelani

From NN-Based Material Modelling Towards Inverse Materials Design, *Markus Kästner*

Interpretable, Uncertainty-Aware Soft Tissue Modelling
Kevin Linka, Ellen Kuhl

Application of Physics-Informed Operator Learning in Computational Solid Mechancis, *Shahed Rezaei*

Contrasting Variance– and Interpretability-Driven Latent Variable Models with Latent Post-Processing for Guide Wave Ultrasound for Feature Detection, *Isaac I. Setshedi, Daniel N. Wilke, Philip W. Loveday, Jesse Stevens*

Tea Break (15:00 – 15:30)

Session 12 (15:30 – 17:30)

Structural Mechanics, Stability and Dynamics | A

On the Use of Supervised and Unsupervised Machine Learning Methods for Structural Analysis of Mooring Lines for Offshore Wind Turbines, *Thi-Hoa Nguyen, Bruno Roccia, Marcelo Ruiz, Cristian Gebhardt*

Passive Vibration Damping of Prestressed Thin-Walled Structures Using Shunted Piezoelectric Elements
S. V. Lekomtsev, Valerii P. Matveenko, Alexander N. Senin

Impact of New Joining Processes of New Materials of the Structure of an Automobile on Its Vehicle Handling Dynamics, *Pedro Millan, Jorge Ambrosio, Lucas da Silva*

A Geometrically-Exact Triangular Shell Element Based on Rodrigues Rotation Parameters, *Maximilian Vorwerk, Cinthia A. G. Sousa, Paulo M. Pimenta, Jörg Schröder*

Misalignment Detection in Large Segmented Telescope Primary Mirrors Using Structural Health Monitoring and Modal Analysis, *Sam Ndumo, Isaac Setshedi*

Explicit Multi-Time Step Solver Using Mortar Coupling for the Simulation of Non-Linear Dynamic Buckling of Thin-Shell Structures, *M. Brun, A-K Chau, P. Ventura, H. Zahrouni, M. Potier-Ferry*

Investigation of the Impact of Form Deviations in a Bidirectional Piezoelectric Motor, *D. Juhre, P. Marter*

Review of Digital Image Correlation–Enabled Validation of Dynamic Finite Element Models for WIND Turbine Blades Within Structural Mechanics and Dynamics
Wilfried Barros, Harry Ngwangwa, Thanyani Pandelani

Various Topics related to Computational Mechanics | B

Enhanced Concept-Based Exploration of Manipulators' Design Spaces with Kinematics, Dynamics, Control Co-Design, and AI Integration
Dithoto Modungwa, Amiram Moshaiov, Alon Snir

A Kinodynamic Extension of the Dynamic Window Approach for Off-Road Autonomous Ground Vehicle
N Mhlongo, D Modungwa

Computational Models of Overhead Contact Lines for Pantograph-Catenary Contact Dynamics
Jorge Ambrosio, Pedro Antunes

Chance Constraint Optimization in Gas Transport
Jens Lang

Uncertainty Quantification in Patient-Specific Cardiovascular CFD: A Global Sensitivity Study on the Lengau Cluster
Vincent M M Punabantu, Amit Kumar Mishra, Malebogo Ngoepe

Quasi-Optimal Mesh Generation Using the Virtual Element Method: A Fully Adaptive Remeshing Procedure
Daniel van Huyssteen, Felipe Lopez Rivarola, Guillermo Etse, Paul Steinman

The Gradient Engine: From Scaling Laws to Cross-Fidelity Learning in Surrogate Construction, *Daniel N. Wilke*

Closing Function 17:30 - 18:00