The 13th International Conference on Fracture Fatigue and Wear (FFW 2025)

&

The 8th International Conference on Numerical Modelling in Engineering (NME 2025)

July 29-31, 2025

Conferences Programme

Venue: physically (NH Gent Belfort) and online (MS Teams)

NH Gent Belfort Hotel Address: Hoogpoort 63, 9000 Ghent - Belgium

For online: to join the conference sessions, please click on the following link:

Click here to join the meeting

All presentations are scheduled in Central European Summer Time (CEST)

The 13th International Conference on Fracture Fatigue and Wear (FFW 2025)
July 29-31, 2025

Chairman

Prof. Magd Abdel Wahab
Ghent University, Belgium

International Scientific Committee

Prof. S Abdullah, Universiti Kebangsaan Malaysia, Malaysia
Dr. J Abenojar, Universidad Carlos III de Madrid, Spain
Prof. J Toribio, University of Salamanca, Spain
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Prof. K Oda, Oita University, Japan
Dr. Dagang Wang, China University of Mining and Technology, China
Prof. Hung Nguyen-Xuan, HUTECH, Vietnam
Prof. Timon Rabczuk, Bauhaus University Weimar, Germany
Prof. X. Zhuang, Leibniz Unversität Hannover, Germany
Dr. Y.L. Zhou to Xi'an Jiaotong University, China
Dr. Qi Zhao, Hubei University of Automotive Technology, China
Prof. Lihau Wang, Tongji University, Shanghai, China
Prof. Mojtaba Ayatollahi, University of Zanjan, Iran
Dr. Anagnostis Toulfatzis, ELKEME Hellenic Research Centre for Metals S.A., Greece
Prof. Magdalena Niemczewska-Wójcik, Cracow University of Technology, Poland
Dr. Raul Campilho, Instituto Superior de Engenharia do Porto, Portugal
Prof. Yusuf Şahin, OSTIM Technical University, Turkey
Prof. N. B. Dhokey, COEP Technological University, India

The 8th International Conference on Numerical Modelling in Engineering (NME 2025)

July 29-31, 2025

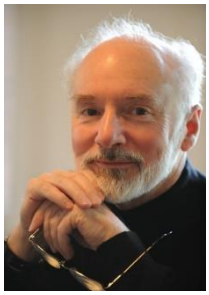
Chairman

Prof. Magd Abdel Wahab
Ghent University, Belgium

International Scientific Committee

Prof. L. Vanegas Useche, Universidad Tecnológica de Pereira, Colombia
Prof. Hung Nguyen-Xuan, HUTECH, Vietnam
Prof. Timon Rabczuk, Bauhaus University Weimar, Germany
Prof. Xiaoying Zhuang, Leibniz Unversität Hannover, Germany
Dr. Y.L. Zhou to Xi'an Jiaotong University, China
Prof. Lihau Wang, Tongji University, Shanghai, China
Dr. Qi Zhao, Hubei University of Automotive Technology, China
Dr. Yong Ling, Ghent University, Belgium
Prof. Mojtaba Ayatollahi, University of Zanjan, Iran
Dr. Ho Viet Long, University of Transport and Communications, Vietnam
Dr Feiyang Wang, University of Shanghai for Science and technology
Dr. Francesco Petrini, Sapienza University of Rome, Italy
Dr. Ilaria Fiore, University of Catania, Italy
Dr. Christine Detournay, Itasca Consulting Group, USA
Dr. Desmond Adair, Nazarbayev University, Republic of Kazakhstan
Dr. Cristhian Mendoza, National University Of Colombia
Dr. Carlos Frajuca, Rio Grande Federal University, Brazil
Professor Raul Duarte Salgueiral Gomes Campilho, Instituto Superior de Engenharia do Porto, Portugal
Assoc. Prof. Ángel A. San-Blas, Miguel Hernandez University of Elche, Spain

KEYNOTE LECTURE 1



Wednesday 30 July 2025
Time: 10:10 am to 11:00 am
Keynote speaker: Professor John Campbell
Affiliation: School of Metallurgy and Materials, Faculty of Engineering, The University of Birmingham UK
Title: The Origin of Fracture

Abstract: Over recent decades it has become clear that the pouring of liquid metals is damaging to the liquid. The surface oxide is folded in, making a double oxide film, which acts as a crack. Most of our cast metals (but with interesting exceptions) are full of bifilm cracks originating from the casting process. The bifilm population, as a pre-existing population of cracks, is not easily detected because they are generally closed cracks with nano scale thickness. They are shown to initiate simple tensile failure, and fatigue. The bifilms become open cracks by the mechanism of precipitation cleavage, in which precipitates grown during certain sensitizing heat treatments form on the bifilms to reduce their strain energy of formation, and thereby prize the bifilms open. In this way metals become vulnerable to invasive corrosion, leading to stress corrosion cracking and/or hydrogen embrittlement. The reduction or elimination of bifilm populations by improved casting technology appears to lead to an order of magnitude increase in toughness of Al alloys and stainless steels, and appears to be a low cost technique to eliminate invasive corrosion, stress corrosion cracking and hydrogen embrittlement.

Biographical Sketch: Educated in England at the universities of Cambridge, Sheffield and Birmingham he first trained as a physicist, then became a metallurgical engineer, but finally has spent much of his life in industry.

In the 1980s he built the casting operation for Cosworth Engineering, developing the Cosworth Casting Process, then a novel process making Al alloy cylinder heads and blocks for the Formula One racing engines, using counter-gravity filling of moulds by electromagnetic pump. The process has been taken up by Ford, Nemak and General Motors for the production of automotive cylinder blocks in North America and Mexico. This process still has the world record for production rates of sound and strong V6 and V8 blocks.

His industrial experience and his academic background including two masters degrees and two doctorates fitted him for his 15 years as Professor of Casting Technology in the University of Birmingham, UK. Here, he was able for the first time to define the nature of turbulence and the mechanism for the generation of casting defects, introducing the concepts of entrainment and the concept of the bifilm and the crack population of liquid metals. He has subsequently devoted much effort to the development of casting techniques to control defect formation. His mantra is the phrase “Making metals we can trust.”

He is currently working on the building of an integrated melting and casting machine which takes in tonnage quantities of recycled aluminium at one end, which is treated, producing aerospace quality aluminium castings and other high purity products with high properties at the other end. The process is low cost, high productivity, low labour content, low energy, low floor space, with few moving parts for maximum reliability. His other current interest is his quest to warn the world of the dangers of using vacuum arc remelted metals. It is not widely known that this expensive material contains bifilm cracks which bring down aircraft, but could be improved by abandoning the vacuum induction melted and cast electrode, and substituting a carefully cast low-cost air-melted electrode using the newly established casting technology.

His book “Complete Casting Handbook” published in 2011 and revised in 2015 is not light bed-time reading, but is all there: a bargain for the determined and fearless reader with an open mind. The “Mini Casting Handbook” 2017 and expanded in 2018 and 2023 is a basic, slimmed text specifically written for casting personnel.

His latest book “The Mechanisms of Metallurgical Failure - The Origin of Fracture.” 2020 is regrettably revolutionary and will be burned in the streets. It describes the potential elimination of failure mechanisms such as cracking, creep, fatigue, stress corrosion cracking etc in most metals, especially steels and high temperature alloys, by eliminating bifilms – the failure initiation sites introduced by turbulent pouring of the liquid.

In 1991 he was invited to become a Fellow of the Royal Academy of Engineering, and in 1993, Her Majesty, Queen Elizabeth, awarded him the Civil Honour, the Order of the British Empire, for services to casting technology.

KEYNOTE LECTURE 2

Wednesday 30 July 2025
Time: 2:00 pm to 2:50 pm
Keynote speaker: Professor Vladimir Kobelev
Affiliation: University of Siegen; Faculty IV: School of Science and Technology, Germany
Title: Game-theoretical Approach to Optimal Design

Abstract: The primary objective of this study is to enhance the game-theoretical approach for the optimization of structural design in contexts characterized by uncertainty regarding external loads. The game formulation finds application in game structural optimization with distributed control functions. A game on a unit square necessitates a minimum of two levels due to the fundamental requirement of the optimization process. These levels are designated as the substratum and superstratum levels of the stratified game. At the substratum level, the optimization criterion functions as the payoff function, with "ordinal players" striving to minimize or maximize the respective payoff functions. The strategies employed by these "ordinal players" are constrained by limited resources, and the value of the substratum game on the unit square is reflected in these strategies. At the upper substratum level, the value of the game is contingent upon the design parameters. The "designer," or cardinal player, exerts control over these design parameters. In the event of multiple cardinal players with conflicting objectives, the game task resolves their interests. Conversely, in the event of a sole cardinal player, the search for the extremum of the value of the superstratum game reduces to conventional optimization. The lecture presents some representative solutions for game optimization formulations in matrix convention.

Biographical Sketch: Vladimir Kobelev, Dr. rer. nat. habil, received the title of Dipl.-Physicist in 1982 and his PhD in 1984 at the Faculty of Aerophysics and Space Research, Moscow Institute of Physics and Technology, Dolgoprudny, Russia.
Since 2000 he has been a private lecturer and APL professor at the Department of Mechanical Engineering at the University of Siegen, Germany.
Author of the works: “Fundamentals of Spring Mechanics” (Springer, 2024), “Fundamentals of structural optimization. Stability and contact mechanics” (Springer, 2023), “Fundamentals of Structural Optimization (II). Shape, Anisotropy, Topology” (Springer, 2024) and “Design and Analysis of Composite Structures for Automotive Applications” (Wiley, 2019). https://orcid.org/0000-0002-2653-6853
https://www.researchgate.net/profile/Vladimir-Kobelev

KEYNOTE LECTURE 3

Thursday 31 July 2025
Time: 9:00 pm am to 9:50 pm
Keynote speaker: Professor Lihua Wang
Affiliation: School of Aerospace Engineering and Applied Mechanics, Tongji University, Shanghai, 200092, P.R. China
Title: Prediction and detection of crack problems based on Data-Assisted Physics-Informed Neural Networks

Abstract: Numerical methods have been extensively applied to the fracture mechanics, while they cannot simulate the problems without the mechanical models or constitutive equations. Artificial neural networks (ANNs) can be utilized to predict the complex fracture problems, but these approaches require large amounts of data for the training. Therefore, in this paper, to combine the advantages of the numerical methods and the ANNs, an improved back propagation neural network (BPNN) is proposed through introducing the enrichment used in the numerical methods into the activation function utilized in the neural networks. The enrichment is able to represent the crack tip field which can accelerate the convergence. At the field near the crack tip, the improved BP solution can converge to the analytical solutions which validate the high accuracy of the proposed method. Without sufficient data, especially the data are missing in the near field of the crack tip, the improved BP method can also achieve high accuracy and convergence, while the conventional BP method may not converge to the predetermined error bound. Numerical simulations of the quasi-static and fatigue crack problems demonstrate that the improved BP method can accurately predict the crack propagation and its growth rate with relatively little data.
Subsea carbon sequestration technology plays a crucial role in addressing global climate change, but CO2 leakage can harm the subsea ecosystem. Therefore, long-term monitoring and prediction of subsea carbon storage are essential. In this paper, forward and inverse Data-Assisted Physics-Informed Neural Networks (DA-PINNs) are established for subsea CO2 leakage prediction and detection. Firstly, the forward DA-PINN model integrates numerical simulation data and physical constraints including initial conditions, boundary conditions, and governing equations. This model is utilized to predict the CO2 velocity and pressure fields under different leakage widths and initial velocities. The results show that the proposed algorithm outperforms conventional Artificial Neural Networks (ANNs) in accuracy and exceeds the efficiency of conventional numerical simulations. Subsequently, the inverse model incorporates known initial and boundary conditions of leakage as training data, while the governing equations and pressure boundary conditions serve as physical inputs. The inverse DA-PINN model is then used to detect leakage widths and initial velocities under different velocity and pressure fields, achieving a prediction accuracy of over 97%. Compared to conventional ANNs and numerical simulations, the proposed DA-PINNs not only predict CO2 leakage with high accuracy and efficiency but also solve inverse problem with the same high precision and effectiveness.

Biographical Record: Dr. Lihua Wang is a professor at School of Aerospace Engineering and Applied Mechanics in Tongji University, Shanghai, China. She is currently a General Council Member of the International Association for Computational Mechanics (IACM) and the International Chinese Association for Computational Mechanics (ICACM). She is the recipient of several awards, including the APACM Award for Young Investigators in Computational Mechanics, the Qian Linxi Computational Mechanics Award (Young Investigators), the ICACM Young Investigator Award, and the Du Qing-Hua Medal & Young Researcher Award of Computational Methods in Engineering. She has authored more than 120 peer-reviewed journal articles, including CMAME, IJNME, JCP etc., and has been invited to deliver more than 10 plenary and invited lectures at international conferences. She served as associate editor of Chinese Quarterly of Mechanics and as an editorial board member for four international/Chinese journals. Her research interests include development of meshfree methods and machine learning, fluid-structure interactions, high-speed impact, fracture mechanics.

KEYNOTE LECTURE 4

Thursday 31 July 2025
Time: 2:00 pm am to 2:50 pm
Keynote speaker: Professor Nguyen Xuan Hung
Affiliation: Institute for Interdisciplinary Research and Technology (CIRTech), HUTECH University, Ho Chi Minh City, 700000, Vietnam
Title: TPMS-Based Bioinspired Structures: From Modeling to 3D Printing

Abstract: The Schoen Gyroid (G), Schoen IWP, and Schwarz Primitive (P) porous structures, which fall under the category of complex triply periodic minimal surface (TPMS) architectures, exhibit various applications connecting physical and mechanical domains. These intricately designed structures, inspired by nature, are increasingly gaining attention due to their ability to meet both biological and mechanical requirements. This study also assesses the mechanical properties of G, IWP, and P printed from biodegradable Polyamide (PLA) material with or without fiber reinforcements. The processing parameters and manufacturability of fiber-reinforced PLA composite TPMS structures using the stereolithography (SLA) printing technique are considered. The present study aims to develop bioinspired lattice structures with minimal surface area and evaluate their load-bearing properties through axial compression simulations and experimental analyses. Their stiffnesses and damage behaviors with or without short fiber reinforcement are thoroughly examined. All the TPMS samples are designed using an in-house MATLAB code and analyzed through multiscale homogenization based on the finite element method. Utilizing a preconditioner to solve this homogenization method produces significant computational time savings, especially when analyzing these intricate geometries. Furthermore, using this research framework, TPMS-based bioinspired structures can be designed and fabricated more efficiently, broadening their application to engineering as well as bio-applications. In summary, we also present insights into future considerations and recommendations for further advancements in this field.

Biographical Sketch: Prof. Hung Nguyen Xuan (H. Nguyen-Xuan) is the Director of CIRTech Institute, HUTECH University, Vietnam. He is an adjunct professor at China Medical University (Taiwan) and a visiting professor at Sejong University (South Korea). He is the President of Ho Chi Minh City Association for Mechanics. He serves as an editorial board member of Composite Structures, Journal of Micromechanics and Molecular Physics, Underground Space, Computers & Structures, Engineering Fracture Mechanics and CMC: Computers, Materials & Continua, and Editor of CMES: Computer Modeling in Engineering & Sciences, Associate Editor: Vietnam Journal of Mechanics, International Journal of Hydromechatronics, and Editor-in-Chief of Materials and Emerging Technologies for Sustainability. Dr. Nguyen-Xuan received his Ph.D. in Computational Engineering from The University of Liège (Belgium) in 2008. His research focuses on advanced computational methods in engineering, data-driven machine learning modeling, sustainable materials design, and 3D printing. He has led as PI and Co-PI of 4 international projects (01 Vlirous-Belgium, 01 Horizon2020-EU, 02 Humboldt foundation-Germany) together with several national and industrial projects. Dr Nguyen-Xuan authored 01 patents and 01 certificate of trademark registration and published more than 290 peer-reviewed papers indexed in WoS. He is the founder and director of the deep additive manufacturing lab https://cloud.ht3dprint.com. His remarkable work has earned him recognition for nine consecutive years in the top 1% of highly cited influential scientists of Thomson Reuters and Clarivate: from 2014 to 2021 in the category of Computer Science and 2022 in the Cross-field category. Dr. Nguyen-Xuan earned several prestigious awards: Alexander von Humboldt Foundation Digital Cooperation Fellowship (2021), outstanding Humboldtian (2019), Georg Forster Research – Alexander von Humboldt (2015), Vietnam National University HCMC (2008 – 2013), and Nguyen Van Dao (2011).

KEYNOTE LECTURE 5

Thursday 31 July 2025
Time: 2:50 pm am to 3:30 pm
Keynote speaker: Dr Muhammad Khan
Affiliation: Centre of Life-Cycle Engineering and Management, Cranfield University, Cranfield, MK43 0AL, United Kingdom
Title: Damage in 3D printed polymeric structures: The trade off in printing parameters and damage resistance

Abstract: Structures and machine components are nowadays manufactured by additive manufacturing processes. This process dominates the resultant microstructural properties of the manufactured part and hence influences its damage behaviour. An effort is required to incorporate this influence into the existing concept of theoretical and applied mechanics models. At Cranfield, the damage mechanics research group is currently working to explore the mentioned influence with a special focus on structures made by fused deposition-based additive printing. So far extensive empirical testing schemes and computations have been used to analyse the trade-off in the values of printing parameters and the damage resistance of printed structures. Both simple and composite structures are tested under pure dynamic, pure thermal and coupled thermo-mechanical loads. The trade-off is evaluated on simple geometries such as plates and beams and also on composite geometries such as battery pack enclosures and metal-polymer riveted panels. This keynote lecture will provide the highlights of the key results, the complexities in data visualisation and modelling and future work.

Biographical Record: Muhammad Khan is the Head of the Centre for Life-cycle Engineering and Management and Reader in Damage Mechanics at Cranfield University. With over 23 years of experience, he specializes in damage mechanics, modelling for life extension of engineering assets, and non-invasive techniques for asset health diagnostics. Khan has led and worked on projects sponsored by reputed organizations, including General Dynamics, MoD, QinetiQ, Cummins, UTC Aerospace, ESPRC, Atkins, and PTDF. He has authored a book on machine health diagnostics and published over 150 research articles in international journals and conferences. Dr Khan received his doctorate in machine health diagnostics from the University of Manchester in 2008 and he completed his post-doctoral research in damage diagnosis in aero-transmissions in 2011. He is a Chartered Engineer, a Fellow of the Institute of Mechanical Engineers UK, and a Fellow of Higher Education Academy UK, He is an active member of Condition Monitoring and Structural Health Monitoring Committees of British Institute of Non- Destructive Testing.

CONFERENCE PROGRAM SUMMARY

Tuesday 29 July 2025

Time	Session
5:00 pm to 7:00 pm	Early registration

Wednesday 30 July 2025

Time	Session
10:00 am to 10:10 am	Opening address
10:10 am to 11:00 am	Keynote lecture 1
11:00 am to 1:00 pm	Session FFW 1
1:00 pm to 2:00 pm	Lunch Break
2:00 pm to 2:50 pm	Keynote lecture 2
2:50 pm to 6:30 pm	Session NME 1
6:30 pm to 6:40 pm	Conference Group Photograph
6:40 pm to 8:30 pm	Conference reception

Thursday 31 July 2025

Time	Session
09:00 am to 9:50 pm	Keynote lecture 3
09:50 am to 12:30 pm	Session FFW 2
12:30 pm to 1:10 pm	Posters session
1:10 pm to 2:00 pm	Lunch Break
2:00 pm to 2:50 pm	Keynote lecture 4
2:50 pm to 3:30 pm	Keynote lecture 5
3:30 pm to 6:30 pm	Online presentations
6:30 pm to 6:40 pm	Conference closing address
7:00 pm to 9:00 pm	Conference Dinner

Tuesday 29 July 2025	
5:00 pm to 7:00 pm	**Early registration**

Wednesday 30 July 2025	
10:00 am to 10:10 am	**Opening address**: **Professor Magd Abdel Wahab**, Ghent University, Belgium
10:10 am to 11:00 am	**Keynote lecture 1**: The Origin of Fracture, **Professor John Campbell**, School of Metallurgy and Materials, Faculty of Engineering, The University of Birmingham UK
	Session FFW 1 **Chair: Professor John Campbell**
11:00 pm to 11:20 pm	FFW1479: An Optical Method for Heat Flux Measurements in Stagnation Point Laminar Methane/Air Flames using Thermographic Phosphors thin films and the effect of hydrogen addition, **Prof Muhammed Elmnefi**
11:20 am to 11:40 am	FFW1439: Optimization of Cutting Parameters in Surface Roughness for Machining Stainless Steel, **Prof Yusuf Şahin**
11:40 am to 12:00 am	**Coffee Break**
12:00 pm to 12:20 pm	FFW1427: Transient behavior of imperfectly bonded dissimilar piezoelectric layers containing multiple embedded cracks under anti-plane electro-mechanical impact, **Mr Seyed Mohammad Moein Hashemi**
12:20 pm to 12:40 pm	FFW1491: Research on Fracture Mechanics of Non-reciprocal Adhesive in Composite Single-lap Structure Based on UEL, **Mr Xinqi Zhang**
12:40 pm to 1:00 pm	FFW1493: Comparison of Two Typical Adhesive Fracture Mechanics Considering Hygrothermal Aging, **Prof Dong Chen**
1:00 pm to 2:00 pm	**Lunch Break**
	Keynote lecture 2 **Chair: Professor Magd Abdel Wahab**
2:00 pm to 2:50 pm	Game-theoretical Approach to Optimal Design, **Professor Vladimir Kobelev**, University of Siegen; Faculty IV: School of Science and Technology, Germany
	Session NME 1 **Chair: Professor Vladimir Kobelev**
2:50 pm to 3:10 pm	NME1549: Compact and Mobile Educational Aquaponics for Food Security and Sustainability, **Dr Hassan Abdulmouti**
3:10 pm to 3:30 pm	NME1581: Numerical computation of eigenvalues in spectral gaps of Schrödinger operators, **Dr Salma Aljawi**
3:30 pm to 3:50 pm	NME1580: A Localized Multi-Level Method of Fundamental Solutions Applied to Steady Heat Transfer Problems, **Dr Csaba Gáspár**
3:50 pm to 4:10 pm	**Coffee Break**
4:10 pm to 4:30 pm	NME1579: Internal Failure Detection in Laminated Rubber Bearing Using Deep Learning Techniques, **Dr Chai Ai Bao**
4:30 pm to 4:50 pm	NME1578: Develop a tool for democratising knowledge within small and medium enterprises in simulations, **Mr Callum Scott-Russell**
4:50 pm to 5:10 pm	NME1571: Application of multiple linear regression analysis for compressive strength prediction of compressed stabilized earth blocks, **Dr Aghiles Hammas**
5:10 pm to 5:30 pm	NME1554: The localized radial basis polynomials method for solving Laplace equation, **Prof Weichung Yeih**
5:30 pm to 5:50 pm	NME1584: Partial Discharge Signal Extraction in Dominating VHF Range from High Noise in Power Transformer, **Dr Djordje Radmilo Dukanac**
5:50 pm to 6:10 pm	NME1589: Two-dimensional Janus material design for photovoltaic and photocatalytic applications: a machine learning combined with density functional study, **Dr Y Mao**
6:10 pm to 6:30 pm	NME1575: X-ray diffraction (XRD) characterization and photocatalytic performance testing of the PDMS/TiO_2 nanocomposites, **Dr. Belgroune Nadir**
6:30 pm to 6:40 pm	**Conference Group Photograph**
6:40 pm to 8:30 pm	**Conference reception**

Thursday 31 July 2025	
	Keynote lecture 3 **Chair: Professor Magd Abdel Wahab**
09:00 am to 09:50 am	Prediction and detection of crack problems based on Data-Assisted Physics-Informed Neural Networks, **Professor Lihua Wang**, Tongji University, Shanghai, 200092, P.R. China
	Session FFW 2 **Chair: Professor Lihua Wang**
09:50 am to 10:10 am	FFW1437: Fracture Analysis in Pressure Vessels: The Role of Nozzle Offset, **Dr Murat Bozkurt**
10:10 am to 10:30 am	FFW1446: Anisotropic behavior on fatigue properties of api 5l x42 pipeline steel, **Dr Manuel Beltran**
10:30 am to 10:50 am	FFW1492: Enhancement of CFRP Single-Lap Bonded Joint Strength Based on Local Pre-Curing Effects, **Dr Jiazheng Wang**
10:50 am to 11:10 am	FFW1442: Identifying bearing steels plastic properties using multiscale modelling and nanoindentation testing: application to the Rolling Contact Fatigue modeling, **Dr Y Kadin**
11:10 am to 11:30 am	FFW1494: Fracture Risk Modeling in Pyrolyzed Phenolic Resin: Microstructure Prediction and Stress Concentration Factor Evolution via CNN-CVAE and FEM, **Dr Jianwei Shi**
11:30 am to 11:50 am	FFW1475: Fracture study of a metal for X80 steel pipes based on phase field method, **Dr Pan Fang**
11:50 am to 12:10 pm	FFW1435: Fretting Fatigue and Crack Initiation Analysis of 42CrMo4+QT and 34CrNiMo6+QT Steels, **Dr Martin Nesládek**
12:10 pm to 12:30 pm	FFW1495: A Method to Simultaneously Improve Anti-loosening and Fatigue Resistance of Threaded Fasteners, **Dr Xi Liu**
12:30 pm to 1:10 pm	**Posters session**
	FFW1434: Rotary Fatigue Tests on Adhesive Joints, **Dr Miguel-Angel Martinez**
	NME1574: Elastic wave propagation characteristics of periodic track structure in urban rail transit, **Mr Peicheng Li**
	FFW1433: Tire Rubber versus Silicone: A Comparative Study of Wear Resistance, **Dr Juana Abenojar**
	NME1573: Finite Element Study on Strength Optimization of Joints with Functionally Graded Adhesives, **Ms Yanan Zhang**
	NME1558: A Transfer Learning method for deep drawing force, **Mr. Yingjian Guo**
	NME1552: Finite element analysis of two-roller vertical flow forming process for EN36B Steel, **Mr Acar Can Kocabicak**
	FFW1463: The Symbolic Regression for Predicting Fretting Fatigue Lifetime, **Yuxuan Wu**
	FFW1460: A multi-objective optimization of wing spar based on ANN and Blood-Sucking Leech Optimizer, **Mr Jianfu Bai**
	FFW1459: Influence of Contact Behavior on Fatigue Lifetime in Fretting Fatigue of Dovetail Joints, **Mrs Qiqi Xiao**
	FFW1454: Damage Assessment of Functionally Graded Circular Plates under Low Velocity Impact, **Dr Ilyas Bozkurt**
	FFW1452: Fretting Fatigue Crack Growth Life Based on Long Short - Term Memory Networks, **Dr Can Wang**
	FFW1451: Prediction of fatigue life of steel wires under fretting wear condition using Linear Elastic Fracture Mechanics, **Mr Muhammad Imran**
	FFW1436: Modification of Frictional Behavior of the Al0.7CoCrFeNi High-Entropy Alloy through Titanium or Vanadium Additions, **Prof Malgorzata Gradzka-Dahlke**
	FFW1449: A viscoplastic finite element model for irradiation hardening of EUROFER97, **Mr Jianxin Liu**
	FFW1447: Prediction of cyclic softening curves of irradiated and nonirradiated RAFM steels using physics informed neural network combined with transfer learning, **Hussein Zahran**
	FFW1483: Fatigue Damage Detection of Welded I-section Steel Beam with optical fiber sensor, **Dr Ying Xu**
1:10 pm to 2:00 pm	**Lunch Break**

Thursday 31 July 2025	
	Chair: Professor Magd Abdel Wahab **Keynote lecture 4**
2:00 pm to 2:50 pm	KingdomTPMS-Based Bioinspired Structures: From Modeling to 3D Printing, **Professor Nguyen Xuan Hung**, Institute for Interdisciplinary Research and Technology (CIRTech), HUTECH University, Ho Chi Minh City, 700000, Vietnam
	Keynote lecture 5
2:50 pm to 3:30 pm	Damage in 3D printed polymeric structures: The trade off in printing parameters and damage resistance, **Dr Muhammad Khan**, Centre of Life-Cycle Engineering and Management, Cranfield University, Cranfield, MK43 0AL, United
	Online presentation **Chair: Dr Muhammad Khan**
3:30 pm to 3:50 pm	NME1572: Performance Aspects and Error Analysis of the Finite Difference Method Applied to Functional Electric Stimulation, **Dr Andrijana Kuhar**
3:50 pm to 4:10 pm	FFW1444: Input parameter analysis for low-cycle multiaxial fatigue models using artificial neural network, **Mr Yevhenii Savchuk**
4:10 pm to 4:30 pm	**Coffee break**
4:30 pm to 4:50 pm	FFW1489: Exploring Low-Cost Fused-Deposition-Printed PZT/Polymer Smart Mats for Footstep Energy Harvesting in Masjid Al-Haram, **Ms Fatimah Alotibi**
4:50 pm to 5:10 pm	FFW1423: Transforming Fatigue Life Prediction in Additive Manufacturing: Synergies of Surrogate Modeling, Transfer Learning, and Bayesian Inference, **Dr Mustafa Mamduh Mustafa Awd**
5:10 pm to 5:30 pm	FFW1486: Influence of Lubricant Properties on Elastohydrodynamic Oil Film Thickness in Angular Contact Ball Bearings: A Numerical Investigation, **Dr Hikmet Bal**
5:30 pm to 5:50 pm	FFW1488: Comparison of the time vary mesh stiffness of gears with single and multi-mode damage, **Ms Aselimhe Gabrielle Oreavbiere**
5:50 pm to 6:10 pm	NME1548: On the question of applying one creep model with a real structural parameter in the mechanics of deformable solids, **Dr Rafael Shaikhutdinov**
6:10 pm to 6:30 pm	FFW1496: A Novel Approach for Modelling Crack Paths in Plate Structures for Dynamic Response Analysis, **Dr Yousef Lafi A Alshammari**
6:30 pm to 6:40 pm	**Conference closing address – Prof. M Abdel Wahab**
7:00 pm to 9:00 pm	**Conference Dinner**

	Online Posters
	FFW1481: Fatigue Life Evaluation of a Medium Dump Truck Frame Under the Random Road Profile Excitation, **Dr Tuan Dat Vu**
	FFW1455: Hybrid Blood-Sucking Leech Optimizer and Artificial Neural Network for Structural Damage Identification: A Case Study of a Suspension Footbridge, **Dr Ngoc Lan Nguyen**
	NME1546: On statistical graph and pointwise convergence of sequences of set-valued functions defined on intuitionistic fuzzy normed spaces, **Dr SK Ashadul Rahaman**
	FFW1461: Effects of dwell time on the creep-fatigue damage mechanisms in nickel-based superalloys, **Mr Kaifa Fan**
	FFW1426: Introduction of Crystallographic Factor into the Von Mises Equivalent Stress Calculations, **Dr Oleg Karuskevych**
	FFW1453: Artificial neural network-based prediction of fretting fatigue crack path, **Mr Bilal Ahmed**
	FFW1464: Influence of corrosion environment in coal mine on corrosion damage and bending fatigue life of steel wire rope, **Mrs Gaofang Wang**
	NME1562: Effect of reentrant auxetic core on the ballistic response of hemispherical sandwich shell structure, **Mr Usama Hamid**
	NME1557: A meshfree method for nonlinear deformation problems, **Mr Zhiyuan Xue**
	FFW1490: The influence of Zr addition on surface texture and tribological characteristics of AlSi5Cu2Mg alloy, **Prof Niemczewska-Wójcik Magdalena**
	FFW1473: Beyond S-N Curves: A Residual Stress-Driven Approach to Fatigue, **Dr Alejandro Morales Ortiz**
	FFW1472: Fatigue Regime Transition in Pelton Turbines: From Low-Stress/High-Cycle to High-Stress/Low-Cycle and Its Impact on Structural Integrity, **Dr Alejandro Morales Ortiz**
	FFW1474: Effects of UV Radiation-Induced Aging on the Tensile Mechanical Behavior of Polyamide: Implications for Telecommunications and Energy Applications, **Dr Alejandro Morales Ortiz**
	FFW1476: Residual Stress Analysis: An Essential Tool for Pelton Runner Lifespan Evaluation, **C. Seifert**
	FFW1477: Advanced XRD Profiling of Residual Stresses in Penstock Pipelines for Enhanced Structural Integrity, **S. Acuña**
	FFW1443: Crystal Plasticity-based Intergranular facture of AA 5083 aluminum alloy for tri-junction grain boundary model, **Dr Qi Zhao**
	NME1569: Enhanced ANN predictive model based on Blood-Sucking Leech Optimizer for fatigue life of dovetail joints, **Mr Jianfu Bai**
	NME1561: Investigation of the effect of Axial and Normal Stress Ratios on Fretting Fatigue Crack Initiation and Propagation, **Dr Can Wang**
	NME1568: Prediction of fretting fatigue lifetime of dovetail joints using a Modified Theory of Critical Distances, **Mrs Qiqi Xiao**
	NME 1567: Analysis of factors affecting contact stresses in two-bolt connections using finite element analysis, **Dr Mingpo Zheng**
	NME1559: A study on Irradiation and Non-Isothermal Creep-Fatigue Behavior of Eurofer97 Steel Based on a Multi-Mechanism Coupling Model, **Mr Jianxin Liu**
	FFW1450: Prediction of rupture instability during deep drawing using Gated Recurrent Units based on conditional sequence generation, **Mr Yingjian Guo**
	FFW1441: Deep Learning and Numerical Simulation Application for Dimensional Accuracy Prediction in Backward Flow Forming, Mr **Acar Can Kocabıçak**

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INSTRUCTIONS TO SPEAKERS

- Your oral presentation should not exceed 15 minutes. If your presentation stretches over 15 minutes, you must end your presentation to ensure strict adherence to the programme.
- Your presentation will be followed by a Question and Answer (Q/A) session not exceeding 5 minutes.
- Please submit your presentation file(s) as PDF or Microsoft Powerpoint to the section helper at the end of the preceding session, or at least 5 minutes before the start of your session at the respective venue.
- Please also meet up with the Chairperson of your session to inform him of your presence.
- All presentation will be streamed through the MS link: Click here to join the meeting
- For physical poster presentation, please upload your poster size 120 cm (height) ×80 cm (width) in your submission system or send it to the conference chairman. The conference organizer will print it for you, send it to the conference venue and make it ready for your presentation.

CONFERENCE DINNER

The conference dinner was pre-booked by participants during registration.
If you wish to book a ticket during the conference, please contact the conference reception desk.
The dinner will take place on Thursday, 31 July, at 7:00 PM at Urfa Restaurant. Address: Sleepstraat 90, 9000 Gent.
The restaurant is within walking distance of the conference venue.