Guest Editors of
Structural Integrity and Life no.2/2026 - Special Issue B

Dr MANOJ SAHNI and Dr CHANDRA SHEKHAR NISHAD

The Special Issue (B) in 2026 of *Structural Integrity and Life* once again invites **Prof. Dr. Manoj Sahni** from the Department of Mathematics, School of Technology, Pandit Deendayal Energy University, Gandhinagar, Gujarat, India, and **Dr Chandra Shekhar Nishad** from the Department of Science and Mathematics at the International Institute of Information Technology Naya Raipur (IIIT-NR), India.

Brief about the Guest Editors:

Dr Manoj Sahni is a highly distinguished educator and researcher, renowned for his dedication and expertise in applied and theoretical mathematics, with over 21 years of invaluable contributions to teaching and scholarly inquiry. He holds the esteemed position of Professor within the Department of Mathematics at the prestigious School of Technology, Pandit Deendayal Energy University, in Gandhinagar, Gujarat, India. Besides his academic responsibilities, he is serving as the Deputy Controller of Examinations at Pandit Deendayal Energy University.

His career trajectory includes a notable tenure as Head of Department from 2020 to 2022. Dr Sahni's scholarly endeavours extend far beyond the confines of academia, evidenced by his prolific publication record comprising over 120 research papers in peer-reviewed journals such as the SCI, SCIE, ESCI, and Scopus-indexed Journals and Conference Proceedings, along with authored chapters in esteemed publications by renowned publishers as Springer, Taylor & Francis, Wiley and Elsevier.

Furthermore, his commitment to academic excellence is reflected in his multifaceted role as an esteemed Advisory Board member, Technical Committee member, and diligent reviewer for numerous international journals and highly reputed conferences.

Dr Sahni's leadership extends to the orchestration of esteemed international conferences, notably serving as the organiser of the 1st, 2nd, 3rd, 4th and 5th International Conferences on Mathematical Modelling, Computational Intelligence Techniques, and Renewable Energy (MMCITRE).

Dr Sahni's global footprint is further underscored by his active involvement in scientific committees of international conferences and associations, coupled with his notable engagements as a sought-after speaker, delivering expert talks at both national and international platforms.

In addition to his scholarly pursuits, Dr Sahni is an esteemed member of several esteemed international professional societies, including the American Mathematical Society (AMS), Society for Industrial and Applied Mathematics (SIAM), IEEE, Mathematical Association of America (MAA), Forum for Interdisciplinary Mathematics (FIM), Indian Mathematical Society (IMS), IAENG, and others.

His exemplary contributions to research have garnered widespread acclaim, earning him two prestigious awards in recognition of his outstanding research endeavours benefiting society at large.

Dr Chandra Shekhar Nishad is an accomplished academician, researcher, and educator in the fields of applied mathematics, scientific computing, and fluid mechanics. He serves as a faculty member in the Department of Science and Mathematics at the International Institute of Information Technology Naya Raipur (IIIT-NR), India. His research interests primarily focus on numerical simulation of fluid flow problems, computational mathematics, boundary element methods, and mathematical modelling of complex physical systems. Dr. Nishad has made significant contributions to the advancement of computational techniques for solving engineering and scientific problems. His work integrates mathematical theory with modern computational approaches, addressing challenges in fluid dynamics, numerical analysis, and scientific computing. Through his research publications and academic activities, he has contributed to the growing body of knowledge in applied and interdisciplinary mathematics.

Introduction to the Special Issue B 2026:

The field of structural integrity and life assessment continues to evolve through advances in materials engineering, computational mechanics, fluid dynamics, optimisation, and data-driven modelling. The papers included in this Special Issue present contemporary research that addresses the performance, reliability, durability, and service-life prediction of engineering systems operating under complex loading and environmental conditions. Together, these contributions provide valuable insights into the analysis, design, monitoring, and optimization of structures and materials across diverse engineering applications.

The issue begins with a study on the influence of oxygenated nanoparticles on the performance, combustion characteristics, and emissions of internal combustion engines, highlighting the potential of nanotechnology in enhancing energy efficiency and reducing environmental impacts. This is followed by an investigation into the dynamics of SH-wave propagation in fibre-reinforced media modelled using a power-law framework, offering new understanding of wave behaviour in anisotropic materials. Complementing this work, a case-wise analysis of torsional wave propagation in two-layered heterogeneous media provides further insights into dynamic responses relevant to geophysical and structural applications.

Several contributions focus on fluid mechanics and transport phenomena. A study on suspended sediment modelling incorporating exponential mixing length and hindered settling advances the understanding of sediment transport processes in natural water bodies. Thermal-fluid applications are represented by research investigating the effective thermal characteristics of nanofluid flow over a shrinking sheet using response surface methodology, demonstrating the potential of statistical optimisation techniques in heat-transfer enhancement. Another paper applies an overlapping multi-domain paired quasilinearisation technique to mixed convective Jeffrey nanofluid flow involving microorganisms and activation energy effects, thereby extending the scope of bio-convective and non-Newtonian fluid analyses.

The Special Issue further explores microscale and computational fluid dynamics through a detailed investigation of Stokes flow around staggered circular cylinders in a rectangular microchannel. Numerical studies on symmetry breaking and stable solutions in lid-driven cavity flows at high Reynolds numbers provide valuable insights into complex flow structures and stability phenomena. In a related contribution, machine learning techniques are employed to analyse the Hall and Soret-Dufour effects in Williamson fluid flow over a stretching cylinder, demonstrating the increasing role of artificial intelligence in predicting and optimising transport processes.

Coastal and marine engineering challenges are addressed through a numerical investigation of a partially submerged H-type porous barrier positioned in front of a seawall, contributing to the understanding of wave attenuation and coastal protection mechanisms. Structural dynamics and vibration analyses are represented by a study on porous functionally graded plates using Carrera Unified Formulation, which provides an efficient framework for evaluating the free vibration characteristics of advanced structural elements. Another contribution examines Williamson fluid flow over an exponentially stretching sheet with thermal radiation effects, further enriching the issue's coverage of coupled heat and fluid flow phenomena.

A significant emphasis of this Special Issue is placed on structural health monitoring, durability assessment, and life prediction. A noteworthy contribution presents a structural integrity and service-life assessment framework for flexible pavements using multi-temporal InSAR-derived deformation indicators, demonstrating the growing importance of remote sensing technologies in infrastructure monitoring. The optimisation of mechanical performance is explored through a multi-criteria decision-making approach applied to Al-SiC-MoS_2 hybrid composites, enabling the identification of optimal material configurations for enhanced engineering performance.

The final papers address critical challenges in aerospace and power-sector applications. A comprehensive fracture analysis of spacecraft cylindrical pressure vessels under combined pressure and thermal loading provides important insights into the safety and reliability of aerospace structures operating under extreme conditions. Concluding the issue, a detailed assessment of the microstructure of the heat-affected zone and its influence on the mechanical properties of cladded components used in the power sector highlights the crucial relationship between manufacturing processes, microstructural evolution, and long-term structural integrity.

Collectively, the sixteen papers presented in this Special Issue demonstrate the interdisciplinary nature of structural integrity and life assessment. Through advancements in wave mechanics, fluid dynamics, materials engineering, optimisation, machine learning, infrastructure monitoring, and fracture analysis, the contributions offer valuable knowledge and practical methodologies for improving the reliability, durability, and sustainability of modern engineering systems. The Guest Editors hope that this collection will serve as a useful reference for researchers and practitioners engaged in the development of next-generation materials, structures, and life-assessment technologies.