



Editorial

Overview of Volume 65 (2026): Advances in Metallurgy, Materials Science and Sustainable Manufacturing

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Dear readers, authors, reviewers and colleagues,

Volume 65 of *Metalurgija* represents another successful year in the journal's development, reaffirming its role as an international platform for the dissemination of scientific and technological advances in metallurgy, materials science, and manufacturing engineering. The papers published throughout 2026 demonstrate the continuing transformation of modern metallurgy, where traditional metallurgical knowledge is increasingly integrated with sustainable technologies, digitalization, advanced modelling approaches, and the development of innovative materials.

The articles published in Volume 65 cover a broad range of contemporary topics, including advanced steels and alloys, heat treatment processes, microstructural characterization, casting and welding technologies, metal forming, corrosion protection, composite materials, functional materials, and environmentally sustainable production methods. Together, these contributions provide valuable scientific insights while simultaneously addressing practical challenges faced by modern industry.

A dominant research direction throughout the year concerned the relationships between processing parameters, microstructural evolution, and the resulting mechanical and functional properties of metallic materials. Particular attention was devoted to advanced high-strength steels, martensitic and bainitic microstructures, aluminium alloys for automotive and aerospace applications, and materials operating under demanding service conditions. Advanced characterization techniques, including scanning electron microscopy (SEM), energy-dispersive spectroscopy (EDS), and X-ray diffraction (XRD), together with thermodynamic and numerical modelling, enabled deeper understanding of material behaviour and performance.

Sustainability remained one of the central themes of the published research. Numerous studies addressed greenhouse-gas emission reduction, energy efficiency improvement, recycling technologies, and the utilization of secondary raw materials. Research on hydrogen- and ammonia-based metallurgical processes, metallurgical slag valorization, and circular-economy approaches reflects the growing commitment of the metallurgy community to sustainable industrial development and climate-neutral production strategies.

Another important trend observed throughout the volume is the increasing implementation of digital technologies in metallurgical research and production. Numerical simulations, optimization algorithms, machine-learning methods, and artificial intelligence are becoming indispensable tools for improving manufacturing efficiency, process control, and product quality. These developments clearly illustrate the continuing transition toward Industry 4.0 and intelligent manufacturing systems.

The first issue of Volume 65 focused primarily on the development and characterization of metallic materials, thermo-mechanical processing, continuous casting, and heat-treatment optimization. The second issue expanded the journal's thematic scope through contributions dedicated to advanced metallic and composite materials, process optimization, and sustainable engineering solutions. The third issue highlighted research on microstructure, thermal processes, sensors, robotics, and intelligent systems, while the fourth issue further demonstrated the interdisciplinary nature of contemporary metallurgy through studies involving corrosion, composites, modelling, artificial intelligence, and advanced industrial applications.

The scientific topics represented in Volume 65 closely reflect current international research priorities in metallurgy and materials science. Particular emphasis has been placed on advanced high-strength steels, lightweight alloys, sustainable production technologies, digital manufacturing, functional materials, and advanced composites. The diversity of published research demonstrates the increasingly strong connections between metallurgy, materials science, energy technologies, electronics, and emerging industrial sectors.

An important strength of the journal remains its international character. During 2026, Metalurgija continued to attract contributions from researchers representing numerous European and Asian institutions, strengthening the journal's international visibility and scientific impact. The diversity of research topics and collaboration among authors from different scientific and engineering disciplines further confirm the journal's role as a platform for international knowledge exchange and cooperation.

The papers collected in this volume clearly demonstrate that contemporary metallurgy is undergoing profound transformation. Sustainability, digitalization, advanced materials design, artificial intelligence, and intelligent manufacturing technologies are increasingly shaping the future of the discipline. At the same time, traditional metallurgical expertise remains essential for addressing complex engineering challenges and supporting industrial innovation.

As Metalurgija continues its mission of promoting high-quality scientific research and technological development, we remain committed to fostering international collaboration, interdisciplinary approaches, and the dissemination of knowledge that advances both science and industry.

Finally, we express our sincere gratitude to all authors, reviewers, Editorial Board members, and readers whose expertise, commitment, and support continue to contribute to the quality and international reputation of the journal. We are confident that the contributions published in Volume 65 will inspire further scientific achievements, strengthen international cooperation, and support the development of sustainable metallurgical technologies, advanced materials, and innovative manufacturing solutions for the future.

Editors:

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