

23rd IAA SYMPOSIUM ON BUILDING BLOCKS FOR FUTURE SPACE EXPLORATION AND
DEVELOPMENT (D3)

Interactive Presentations - 23rd IAA SYMPOSIUM ON BUILDING BLOCKS FOR FUTURE SPACE
EXPLORATION AND DEVELOPMENT (IP)

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REVOLUTIONIZING THE SPACE FRONTIER WITH INDUSTRY 5.0

Abstract

The advent of Industry 5.0 introduces a transformation in the space industry, emphasizing the amalgamation of human creativity and advanced technological systems. This study explores the integration of human-centric automation, artificial intelligence, and robotics to revolutionize space exploration, mission operations, and extraterrestrial resource management. This research paper also includes the effect of Industry 5.0 on the space economy. By leveraging human-machine collaboration, Industry 5.0 fosters sustainable and efficient space missions, enabling autonomous spacecraft operations, predictive maintenance of satellites, and enhanced astronaut support systems. Furthermore, it briefly addresses challenges in sustainable resource utilization on extraterrestrial bodies through smart automation and ethical frameworks. This shift prioritizes human well-being and sustainability, ensuring ethical practices in humanity's cosmic endeavors. Industry 5.0 not only augments technological capabilities but also promotes innovation and resilience in the face of the complexities of space exploration, paving the way for a balanced, futuristic approach to conquering the final frontier.