

IAF SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Future Space Transportation Systems (4)

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THE NEW EUROPEAN FRONTIER OF IN-SPACE EXPERIMENTATION, DEMONSTRATION AND
VALIDATION: SPACE RIDER SYSTEM**Abstract**

The development of new space technologies and the new expanding horizon in the human exploration are pushing forward the space frontier while bringing new needs to increase human knowledge of nature processes in space and to enable the development and validation of new technologies for space applications. Space Rider System will provide Europe with an affordable, independent, reusable end-to-end integrated space transportation system for routine access and return from space. It is conceived to provide a space laboratory for payloads to operate in orbit for a variety of applications in missions lasting minimum two months. It will make available an undoubtedly new concept of in-space facility to support extensive experimentation: from microgravity to radiation exposure for chemical, biological, medical and pharmaceutical experiments. It will be a reliable infrastructure for other envisioned programmes in support of space science and human and robotic exploration, enabling in-orbit validation and demonstration of new instruments, technologies and processes. It will represent a strategic facility for in-space manufacturing and assembling: every in-space manufacturing experiment will contribute to establishing on-demand manufacturing on long space missions and improving 3D printing methods on the ground. The paper presents the Space Rider System from the flight segment to the ground segment, giving an insight of the newest European approach to the in-space Experimentation, Demonstration and Validation, from Earth to space and back to Earth.