

# ROV-E

## Lightweight technologies for exploration rovers

### RE-DESIGNING LIGHTWEIGHT EXPLORATION ROVERS

Flexibility is paramount for successful scientific exploration of the surfaces of the Moon and Mars. We need exploration rovers, and in the future, if the ROV-E project proves successful, they might be lighter than ever before.

In 1971, the first Lunar Rover took Apollo 15 astronauts across the surface of the Moon. Whilst on previous missions, man had been constrained to exploring the Moon walking, with the Rover, the range lunar exploration was extended enormously, and some 27 km were covered during the course of a few days.

Similarly, on the surface of Mars, rovers have enabled scientists to examine more territory and perform examinations of interesting features, such as rocks.



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**ROV-E will develop technologies required for lightweight exploration rovers.**

Hence Europe's future ExoMars mission to the red planet is foreseen to take the form of a rover.

Yet, with rising scientific demands, rovers risk being overloaded and become too heavy. Therefore, new and lighter designs are needed.

The ROV-E project responds to this challenge with a proposal for lightweight exploration rovers. Without compromising on the rovers' ability to perform, the project is set to explore how lightweight advanced materials may replace existing rover components to make the rovers both lighter and flexible at once. By developing the technologies required to obtain such lightweight fully integrated equipments for exploration rovers, based on multifunctional structures, ROV-E in a sense puts existing rover concepts on a diet, making them fit for the challenges of future space missions.

Indeed, in space each extra kilo is costly, as it requires more fuel to reach the destination. Re-designing rovers with lightweight materials and multifunctional technologies may therefore also contribute to lowering the cost of future space missions.



**GARBINE ATXAGA**  
IS PROJECT COORDINATOR

### QUESTIONS & ANSWERS

#### What do you want to achieve with this project?

The main objective of ROV-E is the development of technologies required to obtain lightweight—fully integrated equipments based on multifunctional structures (MFS), where additional functions as health monitoring, shielding, power and storage could be integrated in a component.

#### Why is this project important for Europe?

ROV-E will enhance European aerospace industry competitiveness. MFS have proved to be a disrupting technology. However, work is still required to implement this approach in flight components. ROV-E will allow Europe to reach an advanced position as technology provider.

#### How does your work benefit European citizens?

Developments carried out in ROV-E are directly applicable to sectors where mass and volume play a key role. Outputs of this project could be translated to aeronautics reducing aircraft weight, fuel consumption and therefore, providing cheaper and environmentally friendly solutions.

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## LIST OF PARTNERS

- TECNALIA, Spain
- Thales Alenia Space Italia, Italy
- Deutsches Zentrum für Luft- und Raumfahrt (DLR), Germany
- Yuzhnoye SDO, Ukraine
- Advanced Composites Group, United Kingdom
- University of Southampton, United Kingdom

## COORDINATOR

TECNALIA, Spain

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## PROJECT INFORMATION

Lightweight technologies for exploration rovers  
(ROV-E)

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