

AEROFAST

Aerocapture for Future Space Transportation

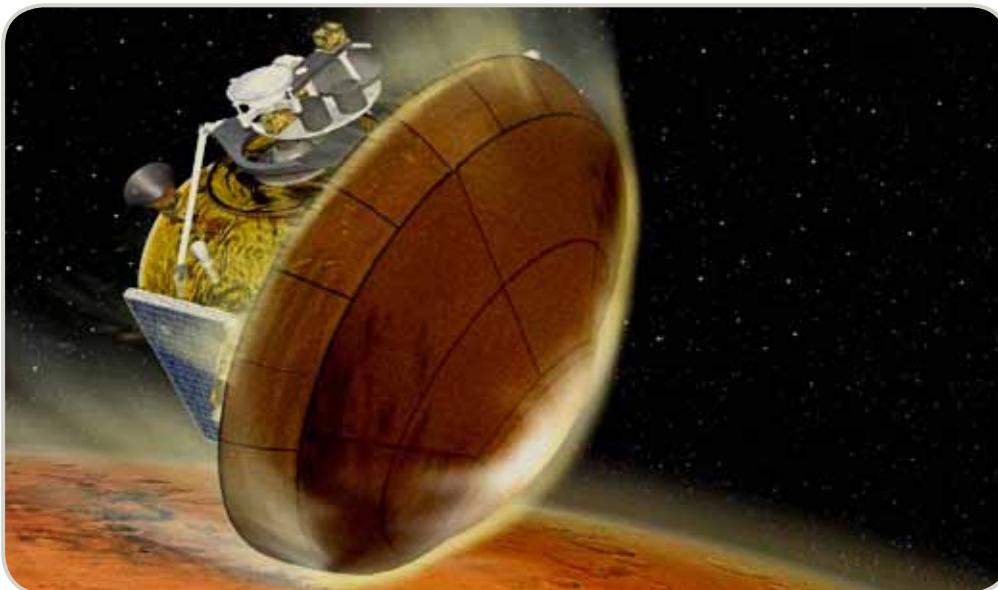
FLY ME TO THE MOON

*The discoveries of pioneers such as Columbus, da Gama, and Cook led to transportation across oceans and this paved the way for large scale human settlements on new continents. Similar to the trans-Atlantic boats of the past, **advanced space transportation systems** will take today's pioneer missions into space further and allow for enhanced mobility of humans and cargo between Earth and space. The project AEROFAST supports these developments, refining aerocapture technology.*

"But Man is not a tree – he has no roots; he has feet, he walks", states Spanish author Juan Goytisolo, writing about today's globalised world where **enhanced mobility reshapes reality at high speed**. In the future such mobility is taken into a much vaster sphere, as advanced space transportation systems herald enhanced mobility between Earth and space.

In the decades ahead, **aerocapture technology** is predicted to become one of the core capabilities needed for **inter-planetary transportation**. The technology allows for the production of vehicles that are mass effective, using atmospheric drag to slow them. Such technology holds the potential to make lunar and Martian missions more affordable and more feasible, assuming high launch rates.

Aerocapture allows for up to 30 percent of mass to be saved when a spacecraft is launched. The technology is fully adapted to large weight missions carrying both cargo and humans.



Future space transportation takes new forms.
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With current propulsion technology, a spacecraft which would enter into a Mars orbit would only arrive with 41% of its initial mass. With refined aerocapture technology, this number would be doubled.

AEROFAST's main goal is to improve aerocapture transportation technology. Today the technology readiness level (TRL) of an aerocapture mission is roughly 2 to 3 in Europe. AEROFAST's goal is to prepare for a flight demonstration on a planet with atmosphere - the Earth or Mars - and to reach a TRL level of 3 to 4. The project is an important step towards the development of advanced transportation systems that will allow for **human expansion into the solar system**, moving humans and cargo more easily between Earth and space, and also returning humans from the Moon or from Mars. Indeed, looking ahead, today's globalised world might seem small, when future generations live in a time of high speed inter-planetary mobility.



FRANCINE BONNEFOND
IS PROJECT COORDINATOR

QUESTIONS & ANSWERS

What do you want to achieve with this project?

AEROFAST's main goal is to invest and improve the AEROCAPTURE transportation mean. AEROFAST's goal is to prepare for a flight demonstration and to reach TRL 3 - 4 in the frame of this FP7 first call.

Why is this project important for Europe?

An important step for human expansion into the solar system is to develop advanced transportation systems to move humans and cargo between geostationary and Low Earth orbits or return from Moon or Mars. Improving this technology allows Europe to be a valuable partner within the international cooperation.

How does your work benefit European citizens?

Human expansion in the solar system is part of our dreams: using the aerocapture technology to slow space vehicles is regarded as one of the largest contributors to making both lunar and Martian missions affordable.

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LIST OF PARTNERS

- Astrium SAS (AST-F), France
- Astrium GmbH (AST-D), Germany
- DEIMOS Engenharia S.A., Portugal
- Amorim Cork Composites S.A., Portugal
- Samtech S.A., Belgium
- Università degli Studi di Roma "La Sapienza", Italy
- Instituto Nacional de Engenharia, Tecnologia e Inovação (INETI), Portugal
- Solar-Terrestrial Influences Laboratory at the Bulgarian Academy of Sciences (STIL-BAS), Bulgaria
- Instytut Lotnictwa (IoA), Poland
- Centrum Badań Kosmicznych Polskiej Akademii Nauk (SRC-PAS), Poland
- Office National d'Etudes et Recherches Aérospatiales (ONERA), France
- Kybertec s.r.o., Czech Republic

COORDINATOR

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PROJECT INFORMATION

Aerocapture for Future Space Transportation (AEROFAST)

Contract no: 218797

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Duration: 30 months

EU Contribution: € 1.924.374

Estimated total cost: € 2.961.592

