

# Aerospace Europe Conference 2023

## Joint 10<sup>th</sup> EUCASS – 9<sup>th</sup> CEAS Conference

Abstract #XXX (to be filled by the organizers)

Preferred Topics: SUSTSP / SYSINT / REUSSA (3 maximum from the list of topics)

Corresponding author: BONNAL Christophe

e-mail of corresponding author: christophe.bonnal@cnes.fr

Type: Oral / Poster (*select*)

Status or corresponding author: Regular / Student (*select*)

For student corresponding author: student member of one of the following:

3AF / AAAR / AIAE / AIDAA / CzAeS / DGLR / FTF / NVvL / PSAA / RAeS / SVFW / EUROAVIA

### Title

## **BFS an atmospheric reentry kit to bring NANOSAT Payloads « Back From Space »,**

### Authors

Arthur HUMBERT<sup>1</sup>, Isaac MULLEND<sup>1</sup>, Xavier MARTIN<sup>1</sup>, Karine HEINRICH<sup>1</sup>, Stephane HEINRICH<sup>1</sup>

\* Corresponding author

<sup>1</sup> e.NOVA Aerospace, 11 avenue Maurice Chevalier, Pépinières d'Entreprise, F-06150 Cannes la Bocca

[stephane.heinrich@enova-aerospace.com](mailto:stephane.heinrich@enova-aerospace.com) & [comm@enova-aerospace.com](mailto:comm@enova-aerospace.com)

### Abstract

The atmospheric reentry technologies have not evolved significantly since the early days of space exploration. Mostly they were designed for manned spaceflight applications allowing humans to return safely to Earth in a capsule or shuttle-like vehicle. Those applications have all the drawbacks that return vehicles whose shapes were constrained by launch phase restrictions (cross-section of the capsule or of the heat shield under fairing, aerodynamic shape of the shuttle). The next generation of reentry systems intends to disrupt this constraint with the deployment of a larger heatshield via an inflatable or deployable heatshield composed of flexible or textile thermal protection systems. If those concepts are not completely new and have already been intended in the past more than 2 decades ago, their implementation on operational applications seems to be finally underway. (H2020 EFESTO, NASA ADREPT, ...).

The trends for NEWSPACE and for GREENSPACE for a more industrial and sustainable use of space have reactivated the interest in reusable systems and recovery of elements from space in a more innovative manner (in-orbit manufacturing and production, short-time recovery of experiments out of ISS resupply cargo 6-month routine.).

Due to its past experience in reentry topics coming from past activities in Design for Demise in a research entity of the ALTRAN Company, the e.NOVA start-up was created by his founder to promote this legacy and top-listed this project BFS "Back from Space" as a main initial objective and initiated a consortium with industrial textile and composite developers, shape memory alloy provider, thermo-mechanical and computational fluid dynamics analysts.

This paper intends to present the state of the art on this thematic and the initial progress status of this internal project and the legacy reused in this initiative.

### References

[1] Poipoipo...