

Company Expertise  
Aerospace & Defense



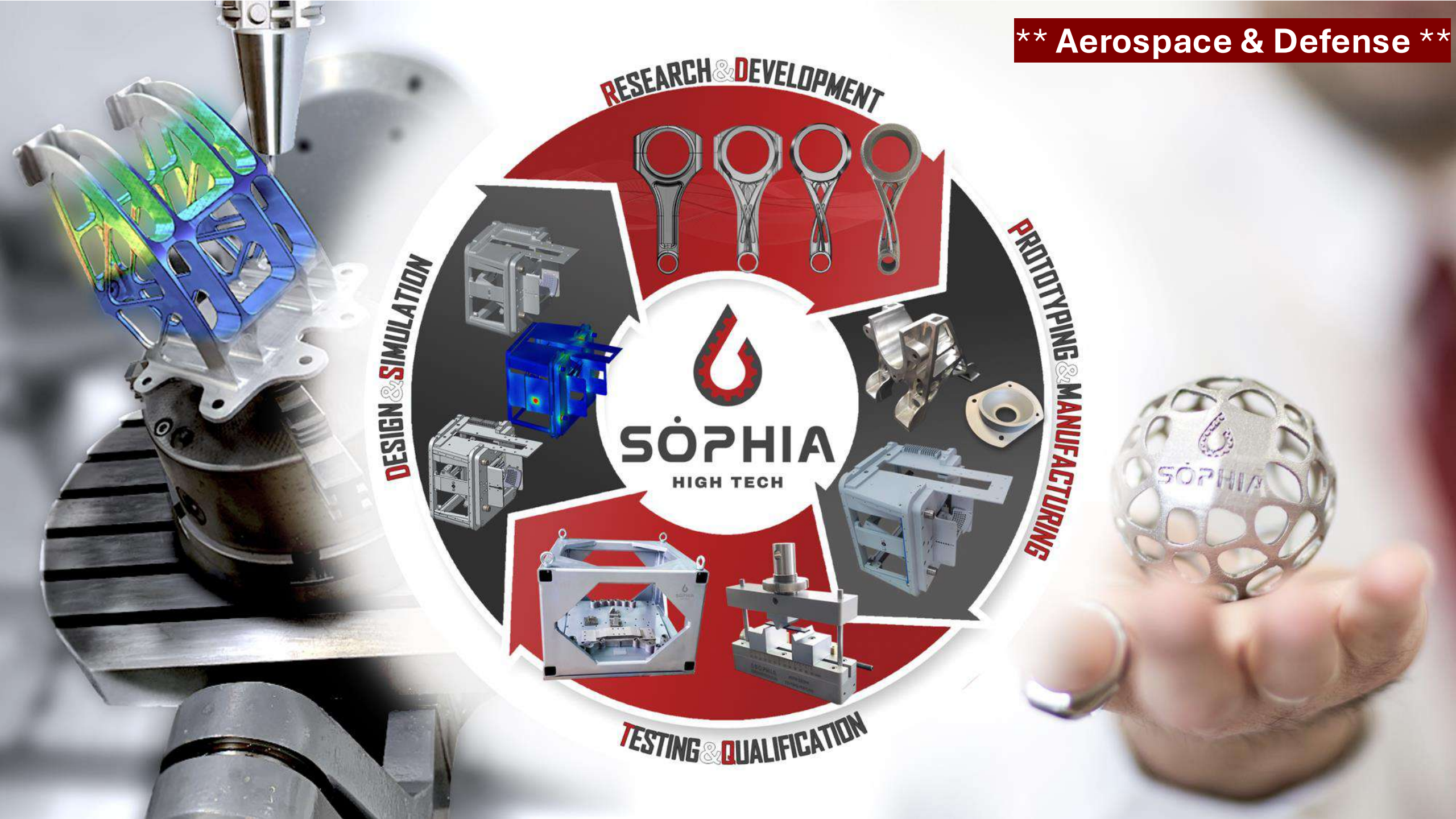
**EXPERTS IN MECHANICS**



**SOPHIAHIGHTECH.COM**

Monday, February 10, 2025

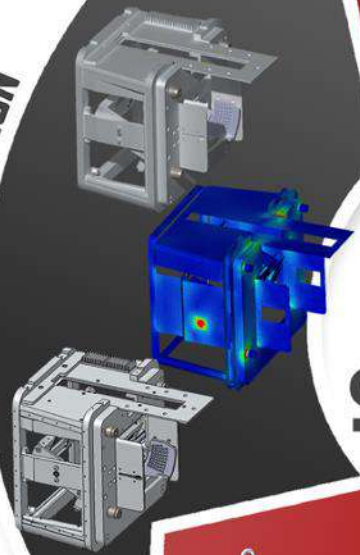
**\*\* Aerospace & Defense \*\***



**RESEARCH & DEVELOPMENT**



**DESIGN & SIMULATION**



**PROTOTYPING & MANUFACTURING**

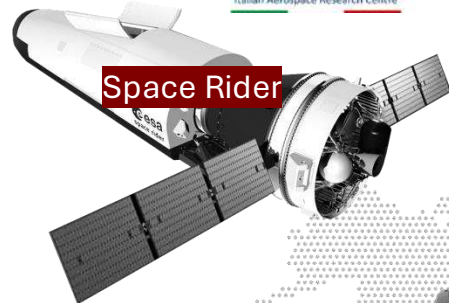
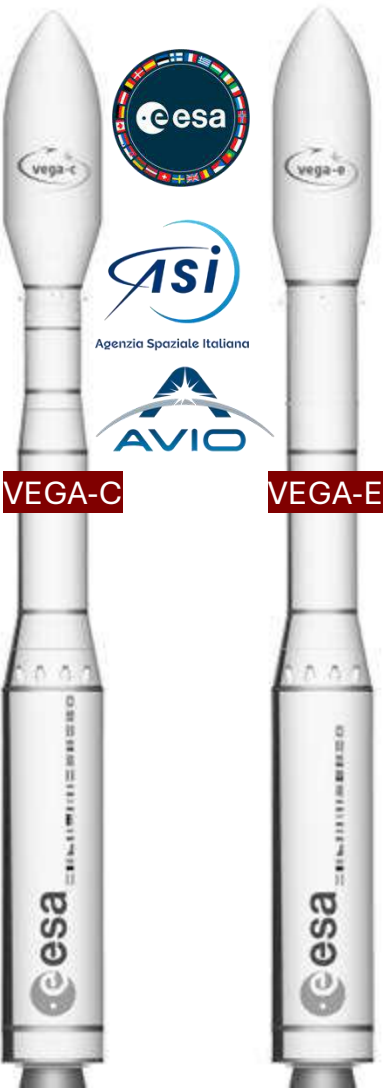


**TESTING & QUALIFICATION**





# Customers & Programs



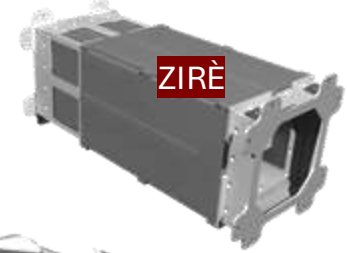
Space Rider



MILANI



Wink



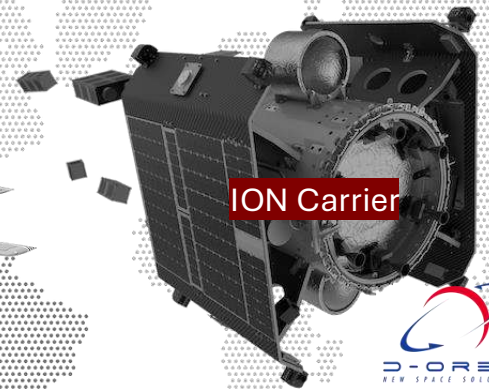
ZIRÈ



Crystal Eye



C130J



ION Carrier



Air Launch



Gaganyaan Capsule



Aster



GCAP



C27J



AW169



Hyperion





# Facility List



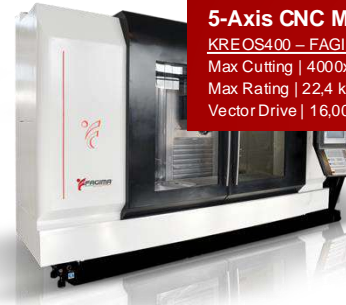
**Multitasking Machine,  
Lathe/ 5-Axis**  
MULTUS B250II OKUMA  
Max Cutting | D600 mm x 750 mm  
Max Rating | 22,4 kW  
Vector Drive | 20,000 rpm



**5-Axis CNC MILLING**  
UMC-750SS HAAS  
Max Cutting | 768x508x508 mm<sup>3</sup>  
Max Rating | 22,4 kW  
Vector Drive | 15,000 rpm



**5-Axis CNC MILLING**  
UMC-500SS HAAS  
Max Cutting | 508x508x508 mm<sup>3</sup>  
Max Rating | 22,4 kW  
Vector Drive | 15,000 rpm



**5-Axis CNC MILLING**  
KREOS400 – FAGIMA  
Max Cutting | 4000x800x1000 mm<sup>3</sup>  
Max Rating | 22,4 kW  
Vector Drive | 16,000 rpm



**4-Axis CNC MILLING**  
VF-4SS HAAS  
Max Cutting | 1270x508x635 mm<sup>3</sup>  
Max Rating | 22,4 kW  
Vector Drive | 12,000 rpm



**CNC TURNING**  
ST-30 HAAS  
Max Cutting: 533 x 660 (d,z)  
Max Rating: 22,4 kW  
Vector Drive | 12,000 rpm



**Wire EDM**  
FANUC Robocut alpha-1B  
Max Cutting: 300 x 300 x 540  
Moving: CNC



**QUALITY CONTROL &  
REVERSE ENGINEERING**  
7520 Laser Romer Arm HEXAGON  
In air conditioned room  
Max Dimension | 1800 mm (x,y,z)  
Resolution | 752.000 points/sec



**QUALITY CONTROL &  
REVERSE ENGINEERING**  
CMM GLOBAL S HEXAGON  
In air conditioned room  
Max Dimension | 900x1500x800 mm<sup>3</sup>  
Max 3D speed | 510 mm/s  
Max 3D acceleration | 1700 mm/s<sup>2</sup>



**Single-stage spray  
washer**  
Elegele MACHINERY SRL  
Max washing: D900 x L500  
Moving: automatic with rotating



**UPS System**  
GALAXY VL200KVA  
Autonomy until 100 kW



**SELECTIVE LASER MELTING**  
TruPrint 3000 – TRUMPF  
Working Material | Metal alloys  
Working volume | D300mm x H400mm  
Cusing laser | Fibre laser 500 W



**SELECTIVE LASER MELTING**  
TruPrint 2000 – TRUMPF  
Working Material | Metal alloys  
Working volume | LxW 200mm x H200mm  
Cusing laser | Fibre laser 500 W [DOUBLE LASER]



**SELECTIVE LASER MELTING**  
M2 Concept Laser  
Working Material | Metal alloys  
Working volume | 250x250x350 mm<sup>3</sup>  
Cusing laser | Fibre laser 400 W



**SELECTIVE LASER MELTING**  
M2 Concept Laser  
Working Material | Metal alloys  
Working volume | 250x250x350 mm<sup>3</sup>  
Cusing laser | Fibre laser 400 W



**Depowdering**  
SEM-AT350  
Working Material | Metal alloys  
Working volume | 500 x 280 x 400 mm<sup>3</sup>  
Inert gas infusion for Reactive Materials (ATEX)



**HEAT TREATMENT**  
NABERTHERM FURNACE  
Max Volume | 450xe | 1280°C  
+ tem450x350 mm<sup>3</sup>  
Max. Temperaturperature uniformity  
+ Motorized exhaust air flaps  
+ Nitrogen environment

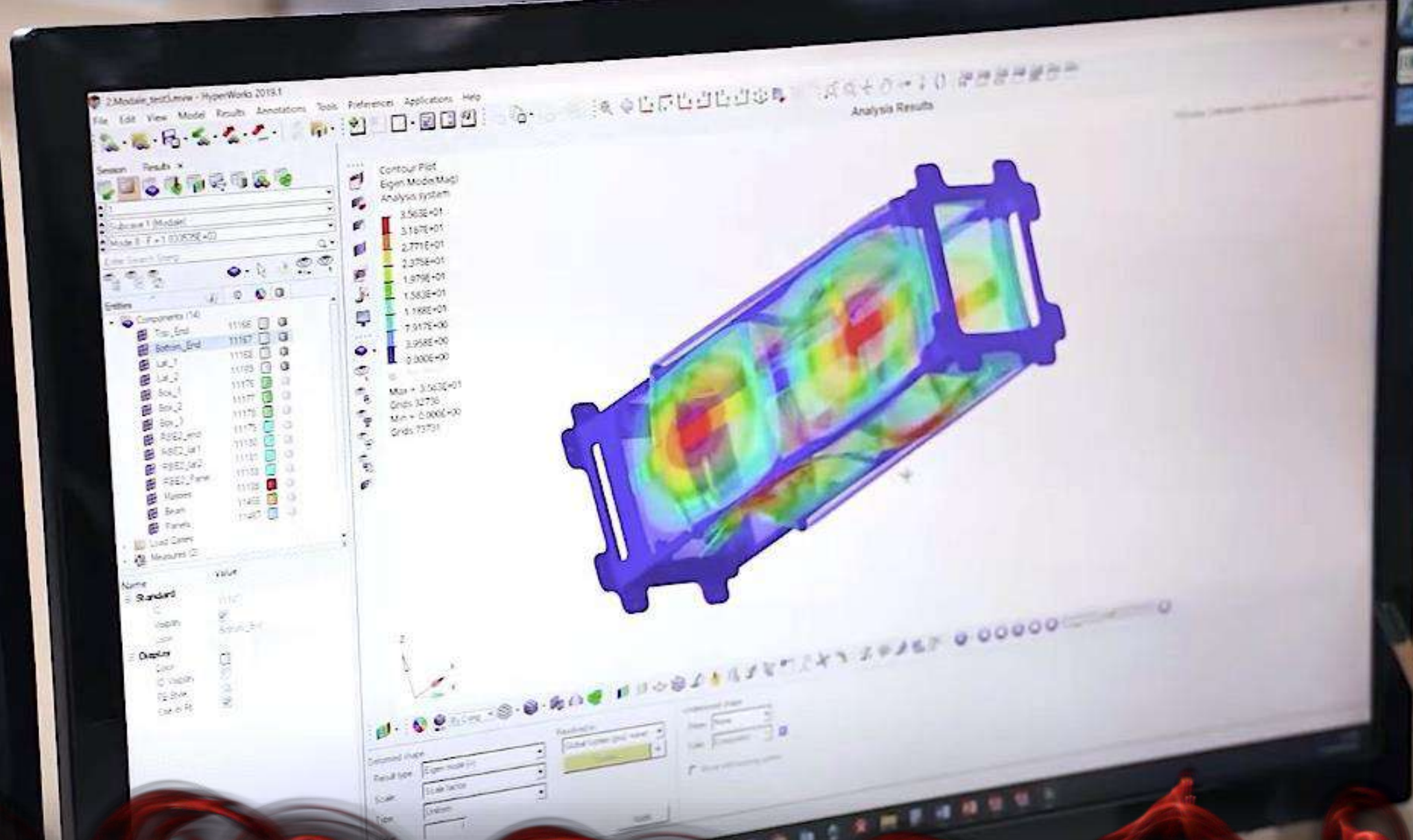


## Celebrating 10 years | SOPHIA

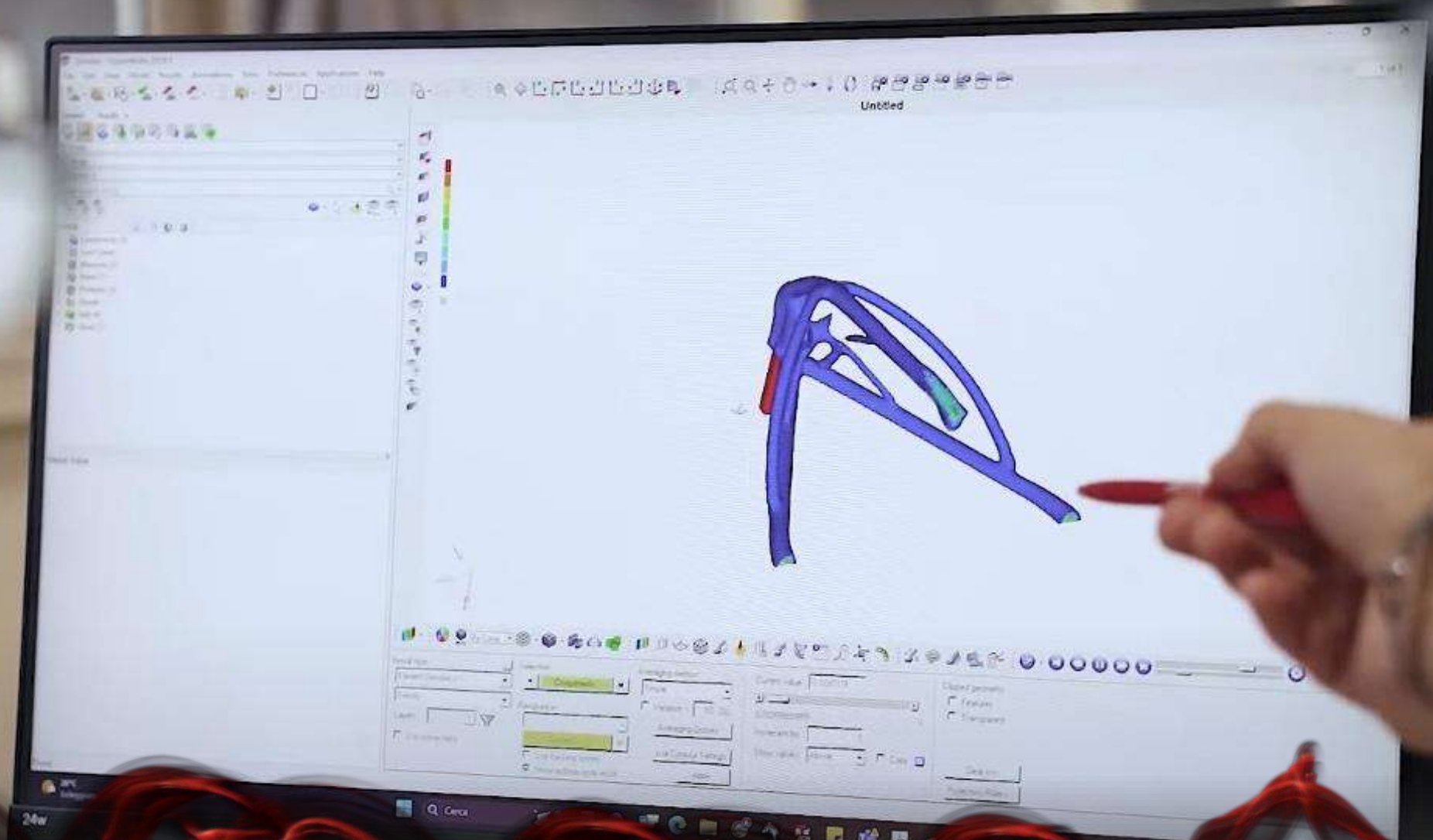


[https://youtu.be/5d3aZgFoE6M?si=UczyyEcsDB\\_Tg1tB](https://youtu.be/5d3aZgFoE6M?si=UczyyEcsDB_Tg1tB)





**AEROSPACE DESIGN**

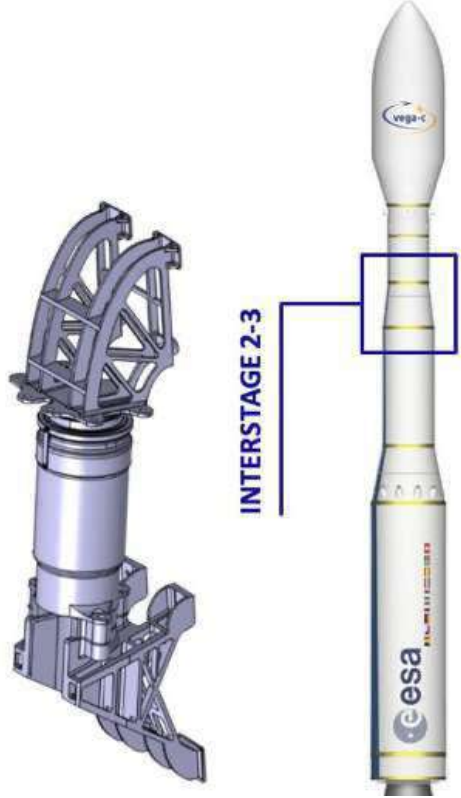


# STRUCTURAL OPTIMIZATION



# CNC MACHINING

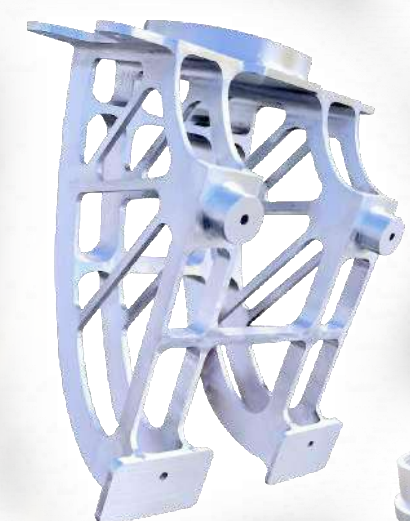
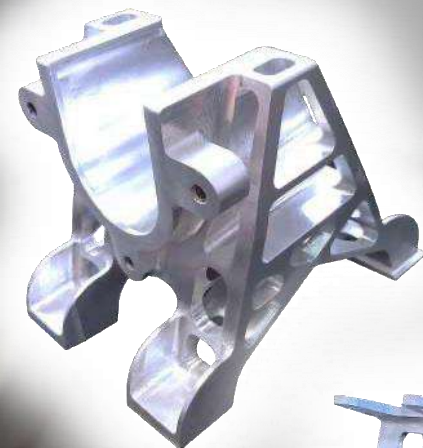




INTERSTAGE 2-3

# VEGA-C

**\*\* Spring Assy \*\***



<https://www.youtube.com/watch?v=VooFSDEtKUs>



# SPACE RIDER

**\*\* NOSE & WINDWARD Assy \*\***



<https://www.youtube.com/watch?v=uzAwE9TtlSU>





# ION SATELLITE CARRIER

**\*\* All Mechanical P/Ns \*\***



[https://www.youtube.com/watch?v=st\\_8KziRiNo](https://www.youtube.com/watch?v=st_8KziRiNo)



# STRUCTURAL MODEL



# ZIRÈ SATELLITE







**POLITO  
ROCKET  
TEAM**

MU...  
BETA  
EXPLORER

**SOPHIA  
HIGH TECH**

**EUROC**  
EUROPEAN ROCKETRY CHALLENGE

**POLITO  
ROCKET  
TEAM**

MU...  
BETA  
EXPLORER

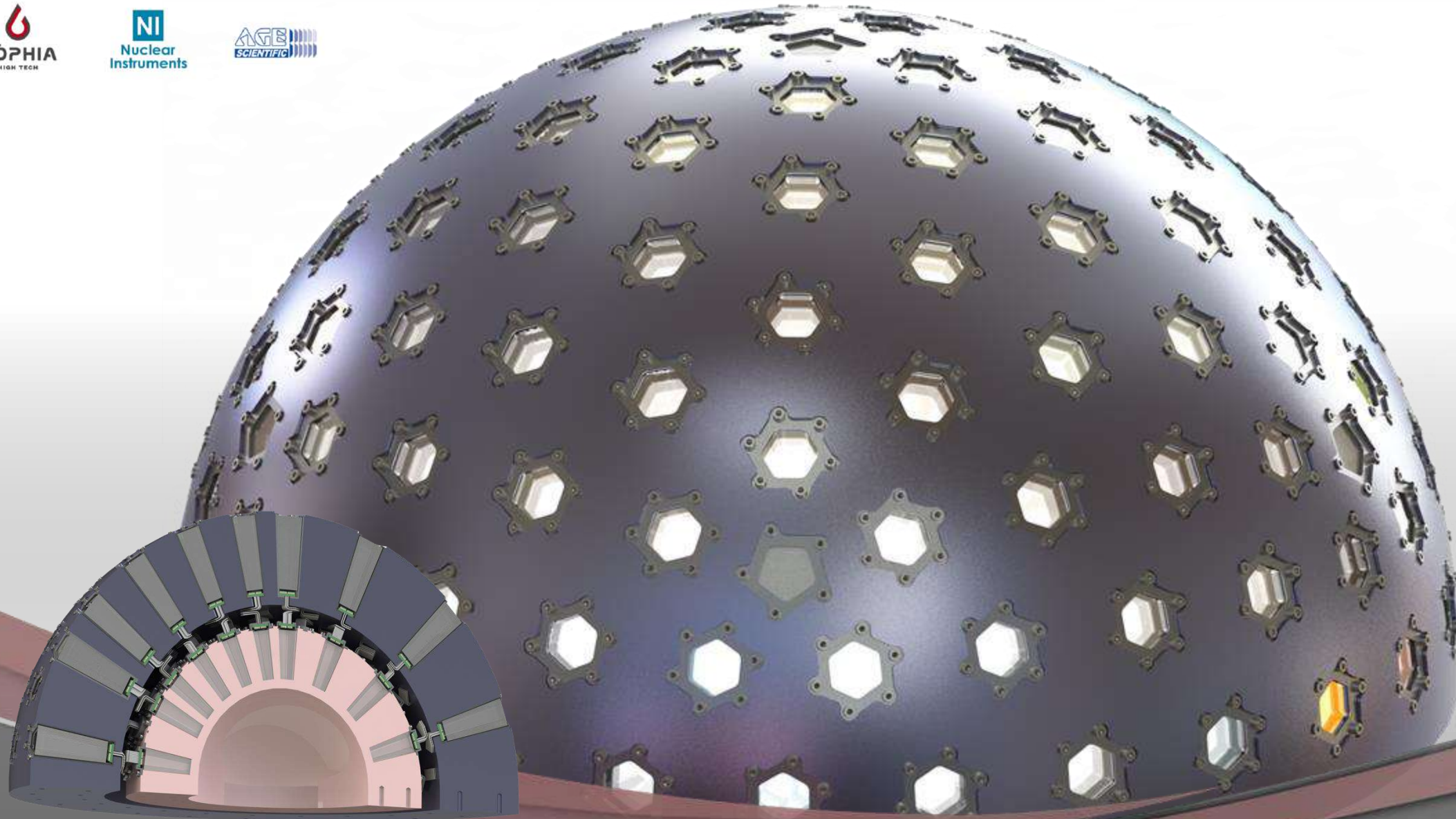
**SOPHIA  
HIGH TECH**

**EUROC**  
EUROPEAN ROCKETRY CHALLENGE



**OFFICIAL PARTNER**





CRYSTAL EYE

SATELLITE

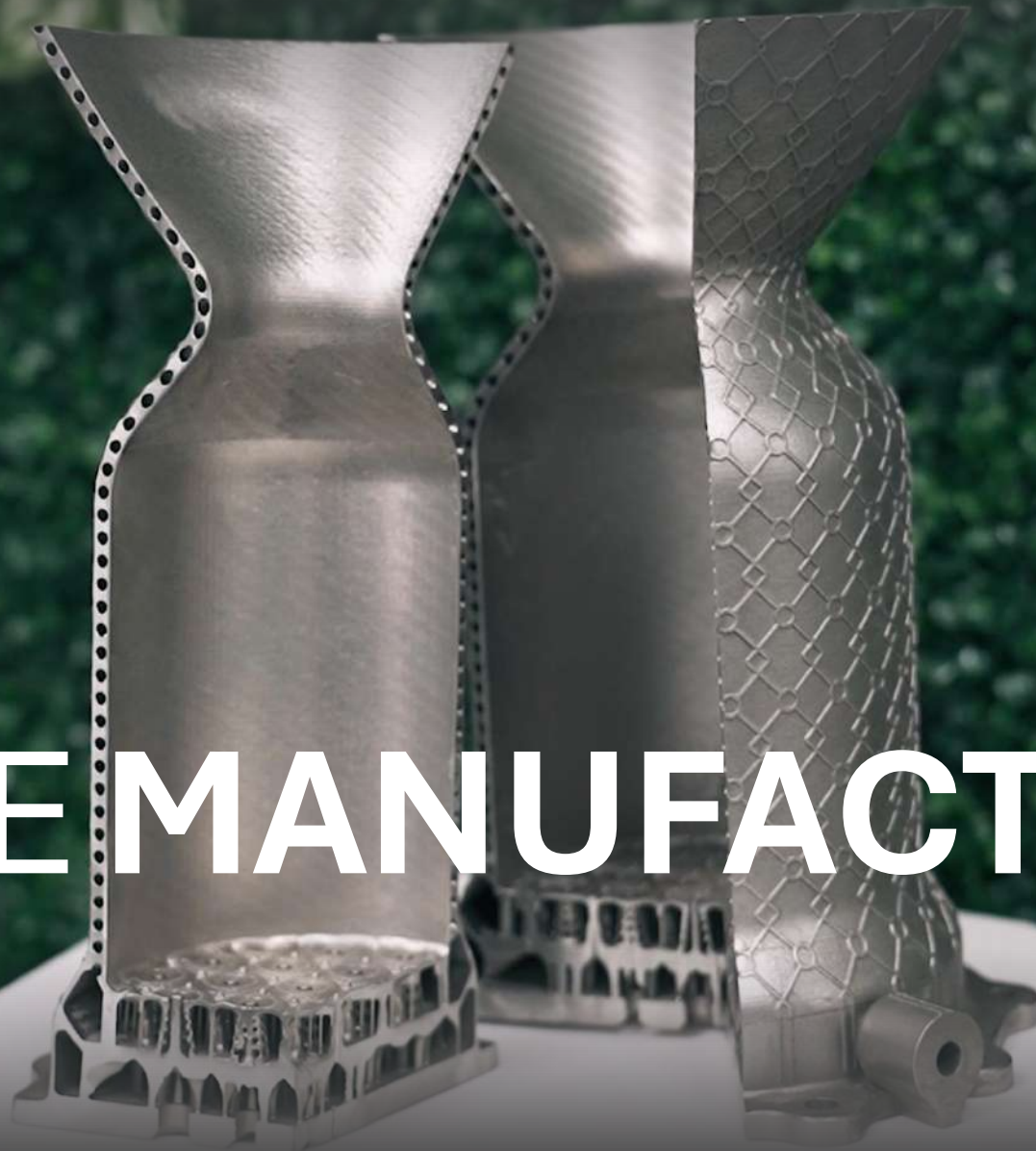


# ADDITIVE MANUFACTURING





# ADDITIVE MANUFACTURING





# ECSS-Q-ST-70-80C: ECSS AREA LAYOUT





# ECSS-Q-ST-70-80C: SPACE COMPONENTS

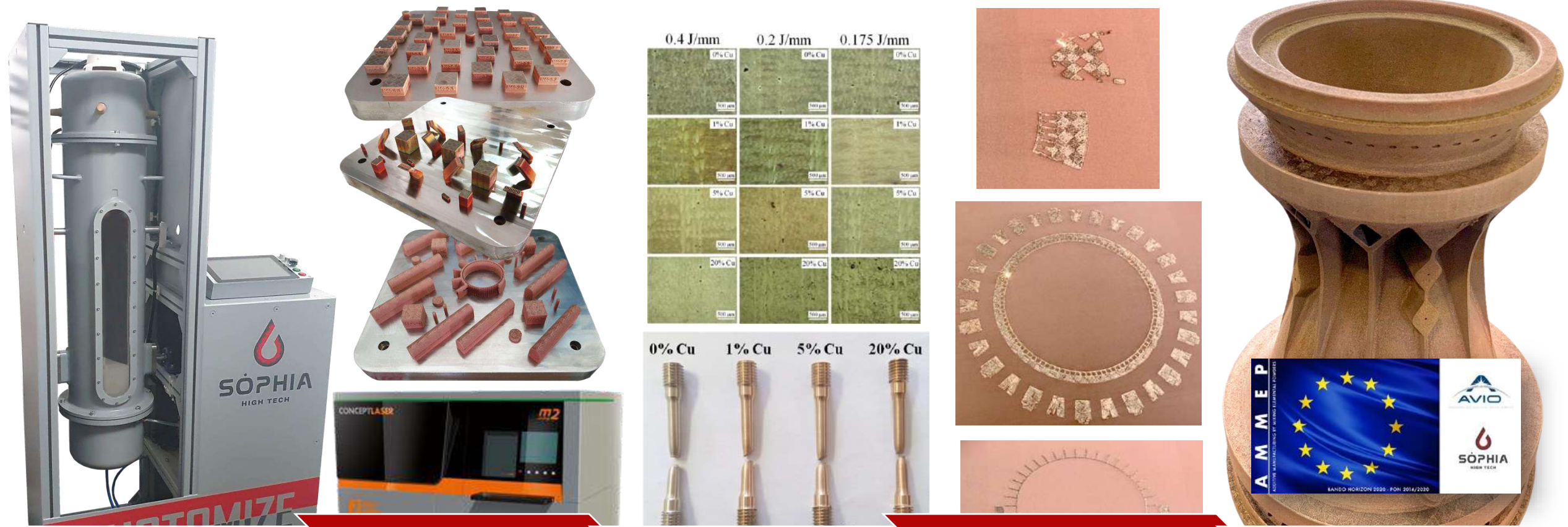




# ECSS-Q-ST-70-80C: SPACE COMPONENTS



# POWMIX R&D Project [Powder Mixing + SLM + Machining]



**Powder Mixing**  
*new material*

**SLM**  
*samples*

**Testing**  
*material validation*

**Optimization**  
*industrial scale*

**SLM + CNC**  
*Aerospace Part*



# \*\* Space Parts in Additive Manufacturing



VEGA-E COMBUSTION CHAMBER



SOUNDING ROCKET COMB. CHAMBER



VEGA-E FUEL NOZZLE



VEGA-C LINER



PNRR: **AVIO** assegna a **SOPHIA** le attività di supporto per lo Sviluppo, la Realizzazione ed integrazione dell'Innovativo Motore MPGE.



CONTESTO

**In-Orbit Economy | In Orbit services. Linea M1C2.I4 del PNRR-FC**  
Attività di ricerca, sviluppo tecnologico e produzione concernente il design, lo sviluppo e la qualifica di un motore green multi-purpose per applicazioni orbitali e sub-orbitali [IOS, VEGA-C, VEGA-E e Space Rider].

Nel Contratto dell'**AGENZIA SPAZIALE ITALIANA [ASI]** n. 2023-8-I.o, cui la **AVIO SpA** è affidataria, **SÒPHIA HIGH TECH** è stata scelta dalla AVIO SpA per l'attività di supporto alla progettazione, produzione, assemblaggio, integrazione e Testing di ITEM del Motore MPGE. Il progetto concluderà lo sviluppo entro il primo semestre del 2026, in accordo con gli obiettivi del PNRR. Una prima versione del motore verrà predisposta entro la fine del 2024 per le applicazioni specifiche nell'ambito del trasporto spaziale.

OBIETTIVI

**SÒPHIA** è responsabile della Produzione e del Controllo dei seguenti ITEM:

*Thermal Control System* | *Combustion Chamber* | *Nozzle Extension* | *Injection Section* | *Piping*



A 3D printed model of a space thruster is shown on a workbench. The thruster has a conical nozzle with a diamond-patterned mesh texture. A red play button icon is overlaid on the model. The background is a blue pegboard with various tools and components.

<https://www.youtube.com/watch?v=fjfdfaeN1ZU>

# SPACE THRUSTER



CURIOUS TEAM



AS/EN 9100 QMS



TULPS License



ECSS-Q-ST-70-80C

ADDITIVE  
MANUFACTURING

# SOPHIA



# SPACE TEAM

# Thank You!



## **SÒPHIA HIGH TECH S.R.L.**

HQ: Via Malatesta 30A, 80049 – Somma Vesuviana (NA) – Italy

LO: Viale Manzoni 113, int.2 80040 - Poggiomarino (NA) – Italy

P.IVA/VAT: 07547751219

[www.sophiahightech.com](http://www.sophiahightech.com) - [info@sophiahightech.com](mailto:info@sophiahightech.com)

T: +39 08231504748 - F: +39 0818651210