



It has been over a year since the First Call for Proposals closed their applications, and the results have exceeded our expectations.

GALACTICA's 1st Call for proposals had two different types of funding instruments, in the form of lump-sum vouchers, addressed to SMEs and start-ups with innovative solutions that could be part of cross-sectoral and cross border value chains in the relevant sectors.

Pioneer Acceleration voucher supported the exploration of new cross-sectoral value chains focusing on developing a Minimum Viable Product (MVP).

Orbital Projects voucher aimed to support the demonstration of new cross-sectoral value chains connecting the different sectors of GALACTICA with initial market tests of the products and services developed.

The GALACTICA consortium received 83 applications (43 in Orbital Projects and 40 in Pioneer Acceleration) and selected 25 for funding. Those 25 projects comprise 40 SMEs from the textile, aerospace, and advanced manufacturing sectors across 14 European Countries.



In the following pages, we share with you examples of selected projects under Orbital and Pioneer, followed by the other beneficiaries explaining the impacts of GALACTICA on their business



ADDTITUDE ORBITAL PROJECT



OBJECTIVE: Horizon sensor using additive manufacturing, which could have the potential to pave the way to significantly increase its production rate. This device is used for Earth detection and Nadir vector determination in satellites. This unit, called HSNS (Horizon Sensor for Nano and Micro Satellites) was developed by Solar MEMS for the small satellite market, and is based on a Quad Thermopile detector to measure the infrared radiation from Space and from Earth with 4 infrared sensors, providing accurate and reliable detection and attitude determination

RESULTS: After defining the technical and functional requirements and specifications of the Horizon sensor and analysing the current state of additive manufacturing techniques for space components, the teams conducted an iterative optimisation process of the design of the HSNS to achieve optimised and viable mechanical parts for additive manufacturing. With the manufacturing sequence and processes detailed, SMT proceeded with the final assembly, and the electronic components of the rigid-flex PCB were soldered and assembled.

To conclude the project, a control process of additive manufacturing was performed to validate the mechanical properties of prototype parts and the nominal performance of HSNS before the qualification thermal cycling test. Finally, final functional tests were executed to validate the nominal performance of the HSNS prototype.

These results have increased the competitiveness of the HSNS in the space market, with an economic impact in terms of sales that will also include other products from the company portfolio, like sun sensors and star trackers. This impact in terms of beneficiary revenue is estimated to be close to 200K€ in the period 2022-2024



"ADDtitude project has presented higher challenges than initially expected, showing that bringing new manufacturing techniques to complex space parts is not an easy matter, especially when you do not accept failing to comply with requirements"



AMPERE ORBITAL PROJECT

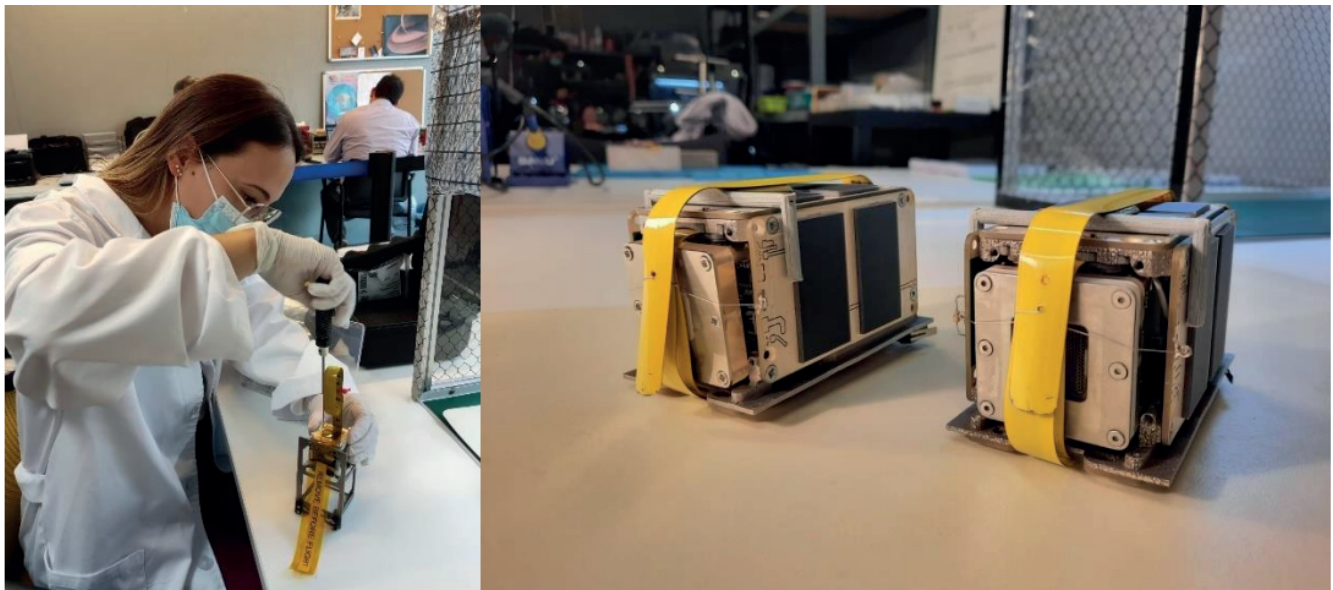


OBJECTIVE: manufacture, test, and certify ATHENA reservoirs, which fully comply with the technical requirements, and to demonstrate the scalability and versatility of the manufacturing processes. ATHENA is an innovative electric propulsion thruster developed by ienai SPACE; it is based on ionic liquid emission and aims to be the world's first fully customizable electric propulsion system.

RESULTS: 3D printed porous metallic reservoirs were identified as a promising solution since the advanced manufacturing processes could comply with all the technical requirements while maintaining a high level of customization and a low cost.

During the AMPERE project, the pre-flight certification tests with a fully operative ATHENA engineering model have been carried out, which advanced the TRL of ATHENA propulsion systems to TRL 8. As for the additive manufacturing part, due to the demanding characteristics of the propellant management system, the printing capabilities have been challenged and tested.

Moreover, an opportunity to demonstrate in orbit the project's outputs appeared during the project development. All the actions carried out during the project were vital to the success of the delivery of the flight model, which will fly in mid-2022.



"GALACTICA project has helped us to advance faster the TRL of our Electric Propulsion System ATHENA by increasing our knowledge in the additive manufacturing state-of-the-art technologies."



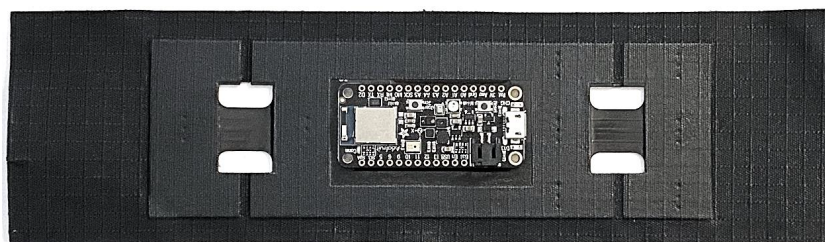
FRET PIONEER ACCELERATION



OBJECTIVE: FRET, now known as Astradyne, has received GALACTICA's support after submitting its Pioneer Acceleration proposal. The idea behind their project was to combine two well-known and well-established technologies in the aerospace industry, namely rigid-flex PCB and flight-grade Nomex Textile material, enabling the integration of electronics into dynamic structures thanks to the unique mechanical properties offered by textile materials.

RESULTS: They have successfully designed a prototype in the form of a Minimum Viable Product using rigid-flex PCB with FRET technology and a textile pattern integrated with a COTS electronics board, even though they found some issues during the textile and rigid-flex PCB bonding.

The technological MVP Astradyne developed thanks to GALACTICA ("FRET") will be the fundamental enabler of novel applications, including origami-inspired solar panels and space and innovative space suits. In addition, the know-how developed throughout the prototyping process is now being secured through a patent.



"The GALACTICA project has been invaluable in helping us understand how our technology could be applied to real world scenarios, solving pressing client needs"



NOOBIS
PIONEER ACCELERATION



fureho

OBJECTIVE: For the GALACTICA project, Fureho AB aimed to develop and validate an MVP of a Noobed 3D fabric reinforced composite material solution for an identified problem in the space industry.

RESULTS: The project has been completed despite some delays, achieving the expected outcomes initially proposed:

1. a low-fidelity MVP of Noobed 3D Carbon Fabric reinforced composite material for inserts,
2. initiated validation of the business/market case, and
3. developed a plan of action for next steps to advance development towards commercialisation.

The results of this GALACTICA's Pioneer Project directly contributed in the short term to increasing Fureho's competitiveness concerning the capability of designing customised 3D fabric reinforcement solutions to create lightweight and high performing composite material alternatives to metallic components in weight-sensitive and performance-critical applications. In the long-term, this will translate to increasing Fureho's competitiveness and increasing the portfolio of ready-to-implement products (not just materials) that they can offer to the market.

Through this project, the TRL has advanced from 3.5 to 4.5.



"Through this project, Fureho has re-affirmed the value of its 'advanced manufacturing enabled 3D textiles' to meet the aerospace industry's need for highly customised high-performance material solutions. A central challenge has been to adjust and adapt to aerospace timelines."



IDD - INFLATABLE DE-ORBIT DEVICE PIONEER ACCELERATION



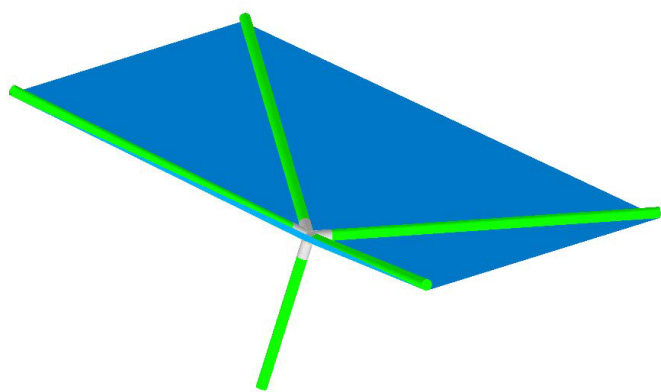
OBJECTIVE: Its objective was to build a scale prototype of an inflatable passive de-orbiting device for satellites based on advanced technical textiles.

RESULTS: The concept of the designed solution takes as base the knowledge developed by Eptune in a previous conceptual study. Considering this, a satellite of 200 Kg at a circular orbit of 800 km was selected as a case study example for this prototype design.

During the design process, aspects like flight stability, drag coefficient, and mass were considered. After several iterations, the selected concept was a triangular pyramid with an angle of 15 deg and a base length of 3 meters.

After completing the characterisation of the operational environment of the de-orbiting drag device, it was identified what materials and components fit into the requirements to proceed with the prototype manufacturing and assembly.

One of the goals of the project was to identify potential clients and collaborators, and this objective was met after a market assessment that allowed scheduling meetings and discussions.



"The interaction with different working sectors allowed the identification of possible partnerships and establishment of development paths with the aim of improving product performance and pushing for new materials from textiles industry."



HOW DID GALACTICA SUPPORT THE DEVELOPMENT OF THE PROJECTS?

- ORBITAL PROJECTS -

FLOWCO®

almadesign

ECO-FRIENDLY. The solution advocated in this project will have a clear impact on the market, as there are currently very few solutions on the market that respond to the sustainability challenges in the aeronautical industry.

iNDUO®

scamex

FIBREMIX. Teams from both companies learnt a lot from the collaboration, both technically and personally. Both teams will collaborate again on other technical development, bringing new technical possibilities to both businesses.

proionic

RBX
CREATIONS

IROONY. This project combines proionic deep expertise on innovative eco-friendly solvents, recycling and advanced manufacturing, with RBX knowledge of agriculture, ligno-cellulose and textile. It opens to new opportunities for low-impact materials development. The dynamic between the teams should lead to a sustainable cooperation for a sustainable industry.

iBreve

vecmedical
Innovative solutions
for a healthier life

ITRAINUP. The project increased their competitiveness, also in terms of the potential to secure follow-up funding. Further, they see a promising impact on the future growth of the business due to GALACTICA.

e.cima

GESELLSCHAFT
FÜR INTELLIGENTE
TEXTILE PRODUKTE
ITP

TEXCOOL. They demonstrated their technology in an environment closer to the market with this project. They now have the opportunity to expand their product portfolios of products toward active cooling systems and smart textiles in general.

TIWARI
SCIENTIFIC INSTRUMENTS

SPARTAN
SPACE

TXTHAB-3D. The GALACTICA project has enabled the development of a closed-loop process to produce parts for the future moon village, thereby making the participants one of the first companies to be proposing such technology for the application



HOW DID GALACTICA SUPPORT THE DEVELOPMENT OF THE PROJECTS?

- PIONEER ACCELERATION -



ATLASAERO. They were able to showcase that their actuators work and find partners to cooperate on composite manufacturing will undoubtedly help them in the high-growth but also highly competitive eVTOL market



BATWATEX. The GALACTICA support helped improve their competitiveness, as they managed to develop the material and test it in real life in a short period of time



BIOMX. The GALACTICA support has enabled the team to specify their product and marketing and discover new potential applications for the product. It allowed them to work on the go-to-market strategy and find new potential partners.



CINPASA. They were able to start working with the aeronautical sector and generate new income sources, focusing on applications for monitoring the stability of structures and communication.



CIRPLATEX. There is no similar circular solution in the textile market, based on the full circularity of products and covering their entire life cycle - from production, distribution, sales, take-back, recycling and new production. Therefore, this project is highly competitive.



DRONE-3D. The support of GALACTICA will help the company grow to provide additional services in a vastly different sector. This will be critical for the company to scale and generate additional revenue



EASYNANO. GALACTICA has highly contributed and enabled the technical validation under a real environment of developed products by potential customers. A high impact is expected for the polymers sector due to the properties obtained when incorporating EasyNano.





ETISILK. Before the GALACTICA project, the aircraft industry was uncharted territory for ETISILK. They developed lightweight fabrics tailored to this sector with promising results with the project, creating breakthrough products and diversifying into novel end-uses with higher added value.



GRAFREN AB

G-COMP. For them, it was imperative to make samples to demonstrate the technology's maturity and scale, as they are currently developing the most efficient strategy to enter the most promising, fast, and significant market segment.



MICROGRAVITY-KNIT. The GALACTICA support has enabled their consortium to develop an MVP. This technology is novel, and more accurate estimations can be made after the market test. However, this technology is estimated to lead to high competitiveness and growth.



PHAST-DEPOSIT. The project's outcomes have confirmed the interest in continuing the development of the technology, and new partnerships have emerged or been reinforced.



SG2 SMART GARMENTS FOR SPACE. The GALACTICA project will open a massive opportunity for the competitiveness and growth of the FNDMT business scopes, including not only in the space sector but also for people with reduced hand mobility or repetitive-stress job injuries, which account for around 60% of doctor-diagnosed musculoskeletal disorders proving that the need for this solution goes beyond the aerospace industry).



SIFA. The SIFA project, in the short term, will lead to participation in new markets and the export of a new product that can be used for space missions (European Commission directive on silkworm is needed so that humans can consume it) and in the food industry.

ParaStruct

TEXTIL-REINFORCED PARAMETRIC FREE-FORM FACADE. Through the support of GALACTICA, they were able to finance and physically produce their first MVP. That was the basis for further funding and will lead to a first fully developed final product



TRIBO BLEND. They were able to invest in the project, improving its capacity, power, and automation level, and ensuring the technical competitive advantage. Furthermore, with the hiring of a new team member and the opportunity to take part in several networking events and learning expeditions, they could expand their contact network and open the door to future possibilities.



MEET THE PARTNERS



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