



BSGN

Business in Space Growth Network

Advanced Materials Accelerator

Call for Proposals

Submission instructions and evaluation overview

Satellite Applications Catapult

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Note: For any questions about the proposal process or potential submissions please email bsqmaterials@sa.catapult.org.uk

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1. Background

Emerging Space Economy

We are entering a new era of unprecedented infrastructure and economic development in space, which promises to open new markets, and with it, new opportunities for cross-enabling innovations, differentiation, and growth in diverse industries. The emerging-market value chains of this new economy are diverse and dynamic. From commercial in-orbit terminals that enable cutting-edge microgravity R&D and manufacturing to the development of space-based solar power platforms that will support our net-zero future on Earth.

Accelerating the development and utilisation of these emerging space market value chains, by necessity, will require transferring know-how, advanced capabilities and cross-enabling technologies from other industries into the space sector, such as advanced materials, robotics and manufacturing, which Europe has world-class capabilities in. The deepening cross-sector engagements and integration of supply chains will undoubtedly drive innovations and business models, and spur new economic and scientific spillovers and technology spin-offs that will have major benefits to earth.

BSGN Advanced Materials Accelerator

[The BSGN Advanced Materials Accelerator](#) has [been established](#) to promote and support innovators and enterprises that are keen to develop breakthrough products, technologies, and services at the intersection of advanced materials, microgravity engineering or in-space manufacturing. The accelerator operates under the Business in Space Growth Network ([BSGN programme](#)) and is funded by the European Space Agency.

[With space and microgravity gaining momentum as a unique R&D and manufacturing platform](#) for driving innovations in several high-value sectors, the accelerator is developing a portfolio of attractive projects along with a fund to support their development, maturation, and commercialisation.

The accelerator through its tailored services and partnerships across Europe will support innovators and enterprises to navigate opportunities and dimensions of accessibility while building the required capabilities for maximising the value of their ventures.

The accelerator is currently under development with the objective to develop a fund of up to EUR 2 million (which will be match funded by ESA), resulting in EUR 4 million funds. This will be used to support innovations and project portfolios that fall under the focus and interest area of the accelerator. During the fund development phase, the project portfolio development will be implemented through a Call for Proposals (light touch proposals) from innovators and enterprises.

The accelerator is positioned to play a crucial role in facilitating new cross-sector engagements and partnerships to maximise the utilisation of space-enabled opportunities across diverse materials value chains. To do so effectively, the accelerator is made of a consortium of six European partners with deep technical and market expertise across the Advanced Materials and Space sector.

The consortium is led by Satellite Applications Catapult and supported by the National Composites Centre (NCC), the DLR Institute of Material Research, the Centre for Process Innovation (CPI), the Technological Institute of Plastics (AIMPLAS), and Innovate UK KTN. The consortium and extended cross-sector partnerships provide an inclusive environment for enabling new collaboration and co-creations between innovators, industry, and research networks.

The consortium is made of six European Space and Materials technology and market specialists with deep reach across the value chains of both industries

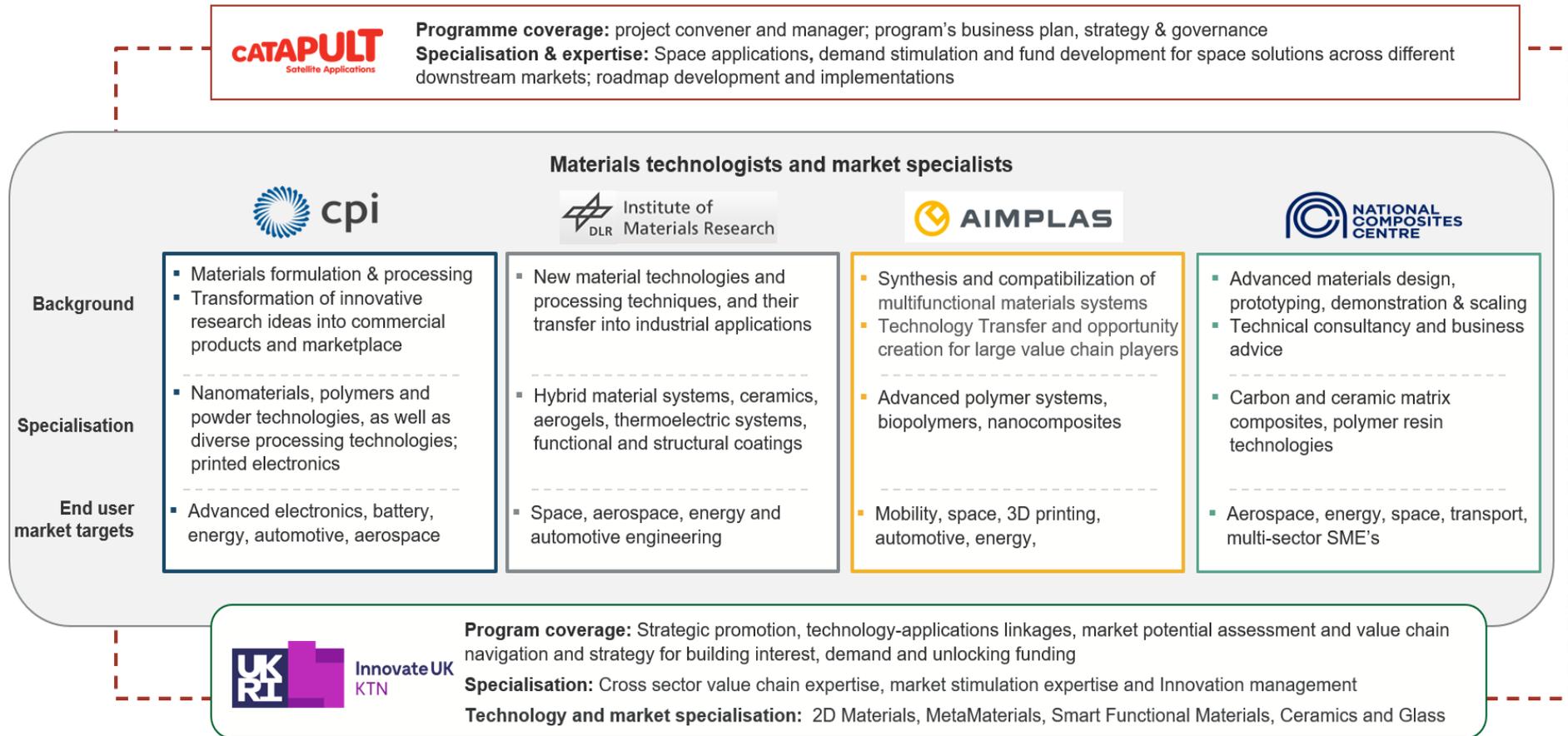


Figure 1: The consortium expertise and structure

Why Space and microgravity?

What would you do if you could take gravity out of the materials development equation? How would you utilise an environment where convection, sedimentation and hydrostatic pressure are significantly altered?

Space is providing the industry with the opportunity to manipulate materials in unique ways, thereby, enabling the manufacturing of novel materials systems with tailored properties and sophisticated functionalities

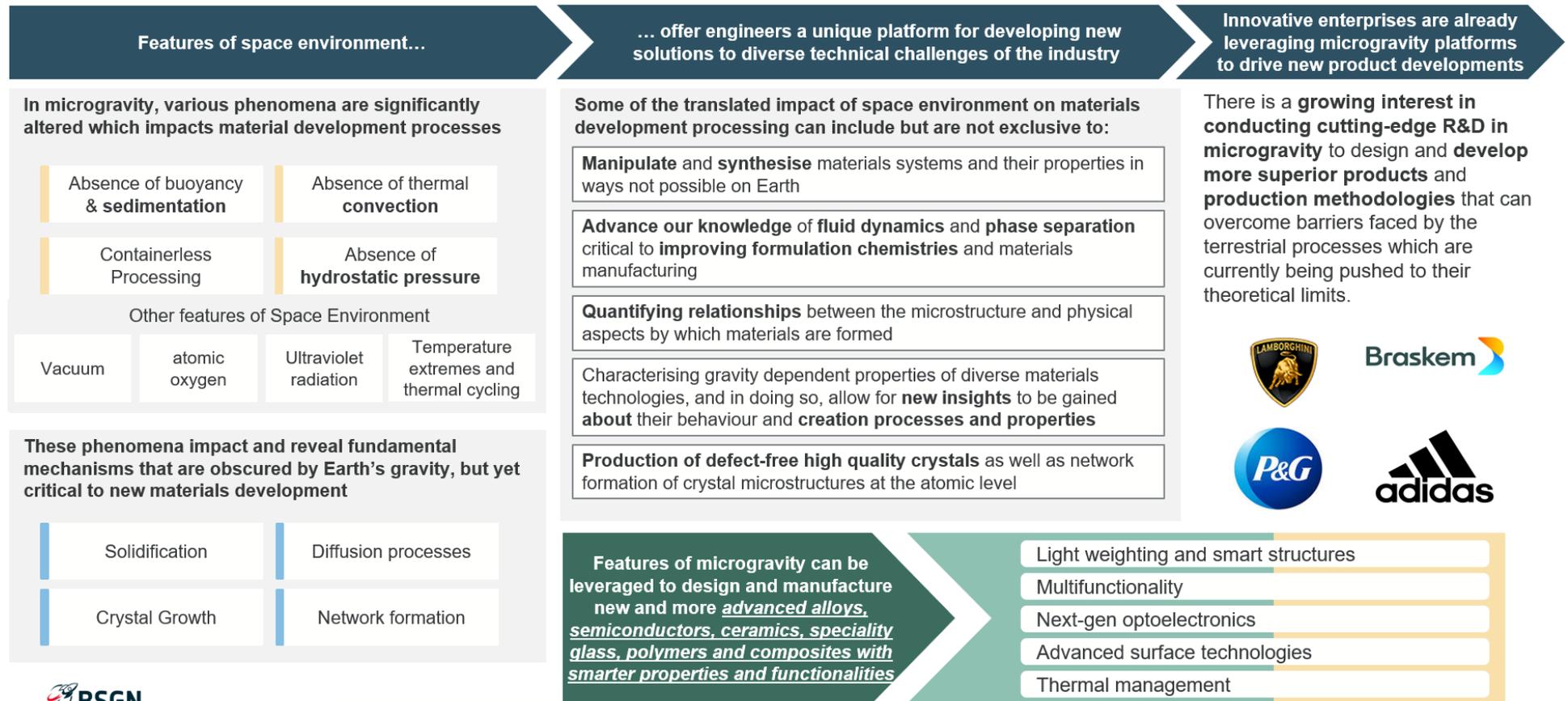


Figure 2: Features of microgravity environment and its translational potentials for materials development and innovation

Dozens of companies, including large multinationals, such as [Lamborghini](#), [Adidas](#) and [Procter & Gamble](#), are conducting cutting-edge R&D in microgravity to develop new superior products and production methodologies that can overcome barriers faced by the terrestrial production processes which are being pushed to their theoretical limits.

The commercially available microgravity platforms, such as those hosted on the International Space Station and others orbiting earth, are offering enterprises a unique R&D laboratory to study, manipulate and develop new material solutions to both known and novel engineering challenges. Critical knowledge gained from experimentations and research in space can be transitioned back to Earth to drive new innovations in products or improve and optimise manufacturing and industrial processes on Earth.

2. The Call for Proposals

This Call is inviting project proposals from innovators and enterprises in the UK and [ESA member states](#) that seek to demonstrate space-based advanced materials research, manufacturing and/or associated technologies in microgravity. The aim of this call is to develop and support a portfolio of commercially attractive projects involving innovations and technological breakthroughs in advanced materials and manufacturing (for both Earth and Space applications) that will benefit from being developed in microgravity or the extreme conditions of Lower Earth Orbit.

From the pool of submitted proposals, the accelerator will select up to 15 attractive proposals that will become part of the accelerator's portfolio for development and implementation in 2023. The selection will be subject to the quality of the proposals and interest from our financial sponsors. Once the funding has been secured, the selected candidates will be requested to complete full proposals.

Scope

The accelerator prioritises project proposals that are aligned with at least one of the following areas of interest.

- Uniquely leverage space environment such as microgravity platforms with the objective of driving innovations in advanced materials solutions and processing. Innovation aims can be broad and target diverse materials systems.
- Require space-based testing to mature technical solutions to known or new engineering challenges and lead to the creation of new products and opportunities across either space or industrial applications, such as energy, electronics, aerospace and beyond
- Require the use of microgravity platforms to advance the TRL of products and processes that have already demonstrated potential to produce near-term commercialisation, such as space-grade optical fibres (ZBLAN) and semiconductor materials.
- Involve the development of enabling hardware (smart research or production facilities) for deployment in microgravity platforms to accelerate in-space research and manufacturing of advanced materials solutions. These can be as diverse as 3D printers, production and testing facilities for alloys, composites processing or other advanced fabrication and manufacturing hardware.
- Involve the re-design and adaptation of the latest innovations in materials or manufacturing processes to the space environment to accelerate or enable the development of large

infrastructure and emerging applications in space – such as Space-Based Solar Power (Composites or 3D printers)

Eligibility

The proposed technology and R&D projects must:

- Come from researchers, innovators or businesses registered in one of the European Space Agency member states
- Demonstrate the sound rationale for the need to use microgravity platforms to advance the proposed innovations (technology or product development)
- Proposals must address a specific space or terrestrial industrial application technical challenge that supports a business case for product development
- Demonstrate that the final product development or scientific and technology R&D aims will benefit from being executed in space

We strongly encourage collaborative proposals, and if you would like assistance in finding a partner please contact bsqnmaterials@sa.catapult.org.uk.

It is desirable that the proposed projects will translate to at least one of the following:

- Delivering a key result that will lead to a product or production with improved performance that can be produced in space – a proof of concept for the manufacture and/or optimizing an existing product or processes in microgravity
- Has a clear pathway plan and target for raising the technology to TRL 9 - flight proven

3. Submission

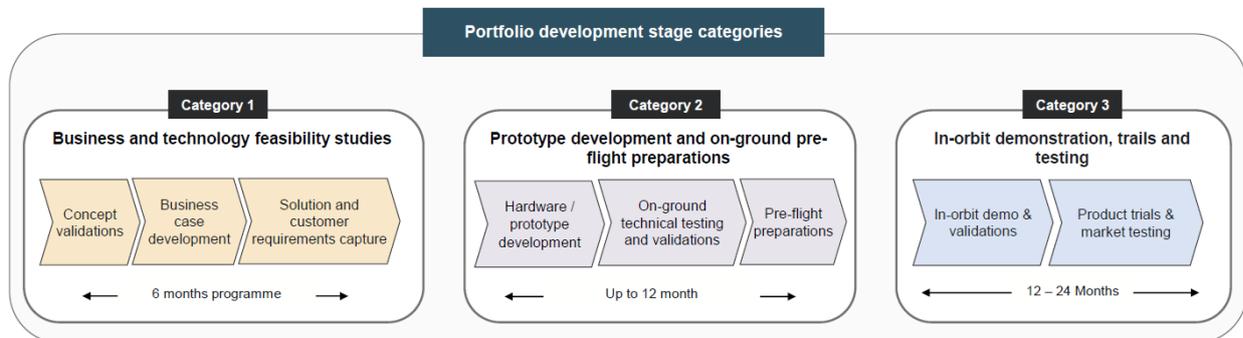
The forms will be made available on Innovate UK KTN website for candidates to fill out. The form is designed as a pitch questionnaire to give flexibility to the proposer pitching their innovations while also allowing for conciseness.

Before being invited to complete a full proposal, all interested proposers must first complete and submit for review the call forms. The purpose of this is to evaluate the applicants' innovations with technical and operational feasibility, as well as alignment with the announcement scope and the interest of the financial sponsors. Applicants must use the template provided on the Innovate UK KTN website. The submitted forms will be

- Handled and treated with strict confidentiality by the accelerator and the reviewers.
- Approved and shortlisted proposal, upon the interest of our financial sponsors and ESA, will proceed to the final stage of completing full proposals.

4. Awards

The accelerator intends to select up to 15 attractive project proposals that will be spread across three categories based on their different TRLs and development needs as illustrated below.



The final number will also be subject to the final funding value that the accelerator will secure from the financial sponsors. Based on their categorization and depending on their development and maturations needs, the selected projects will be awarded in services packages or funding to cover various fees for their external services, including procurement of hardware and prototype development.

Funding packages available for selected projects

Category 1	Business and technical concept maturation and feasibility studies	Up to €30k
Category 2	Prototype development and on-ground pre-flight feasibilities	Up to €200k
Category 3	In-orbit demonstration, trails and testing	Up to €750k

*Subject to funding being secured as well as approvals by stakeholder
 The amount of funding awarded will vary by project depending on their development needs and service requirement costs
Note: There is no guarantee to be selected, and there is no guarantee that selected entities will be funded as we remain in the fund development phase and in negotiations with financial sponsors. However, the risk of funding not being secured is low.

Available development services for maturing and advancing the TRL of projects

Technical & commercial feasibility assessments	Business case development; user and solution requirements capture
Hardware and prototype dev; on-ground testing	Pre-flight readiness (technical & programmatic feasibility) services
In-orbit flights and demonstrations	Expert-led mentoring sessions
Legal & IP advisory	Market launch planning, strategizing and project management
Investment readiness lab	Enabling partnerships & signposting

The funding body is the BSGN Advanced Materials Accelerator Fund which allocates awards and funds, with matching funding from ESA.

The intellectual property rights of the onboarded project will be protected as defined by Article 12 ESA Incubation Contract rules, which bounds the accelerator to exercise and protect.

5. The Evaluation Criteria

Proposals will be evaluated by the Review and Evaluation board of the Advanced Materials Accelerator, made up of representatives from science, business, operations, and financial sponsors. The submitted proposals will be assessed based on various evaluation factors taking into consideration the technical merit, business and economic merit as well as implementation feasibility in microgravity platforms. From the reviewed proposal, the top 15 highest-scoring projects will be selected.

	Evaluation points	Evaluates:
1	Technical merit	The compelling nature of the project and whether it is designed so that its outcomes relate directly to addressing high-priority technology maturation goals, customer needs, technical/ engineering challenges in the proposed target applications and markets
2	Innovation merit	The degree of novelty or innovation of the project, and how unique is considered for maturation or how novel is the line of investigation; or how innovative is the proposed technology? High score for proposals that clearly build on past projects while offering differentiated approaches
3	Significance and impact potential	The potential of the final project aims to deliver economic impact by addressing a technical solution or product development or other solutions with market disruption potential. High score for candidates that link and relate the two together
4	Business viability	Whether the intended innovation has clear product development aims, and subsequently has a clear target application and customer segment, and accordingly takes into consideration their challenges and needs
5	In-orbit utilization	Whether the proposed investigation or technology maturation can only be achieved by using space-based testing /validation or has well-substantiated requirements for microgravity, persistent exposure to the low Earth orbit environment, or the unique ISS vantage point
6	Project Approach	Robustness of the project approach taking into consideration appropriate development requirements and methodologies to guide the execution of the project and increase the likelihood of success
7	Implementation merit	Whether the proposed research/innovation development has a probability of technical success, taking into consideration the adequacy of the plan and the ability of a team to effectively utilize (or has a clear plan for utilization) relevant facilities, instruments/hardware, and software necessary for the development of the project.
8	Implementation timeline & budget	whether the proposed estimated project costs are appropriate for the implementation of the proposed approach
9	Team and team aspiration	The team experience, expertise, motivation, and history of the project team. High score for projects that are set or interwoven in longer-term goals of the innovator/business/research team goals
10	Implementation risk	Whether or not the proposal identifies credible and complete risks and opportunities to implement the investigation, product development/ technology maturation