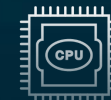




# Examples of academic involvement in pilot projects for space – terrestrial TT



These applications have been developed as a result of support for technology transfer between the space and terrestrial sectors. The support was implemented by the ESA Technology Broker network.

In the Czech Republic, the network is managed by Technology Centre Prague.



CONTENT



Health



Aviation



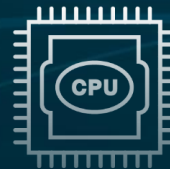
Materials



Smart Cities



Transport



ICT



Environment

# Aviation

## Successful application



Technology Transfer supported by ESA Technology Broker Czechia through the ESA Spark Funding programme.

## Space know-how to drone security



**dronetag**

Czech Technical University's (CTU) know-how in securing satellite communication data was used by Dronetag to develop a system for safe identification of drones

### Introduction

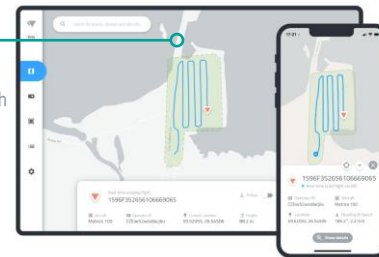
Dronetag, s.r.o. has developed the Dronetag RIDER, a breakthrough Remote Identification Device (RID) aimed at enhancing airspace safety for drones. This project, supported by ESA Spark Funding, addresses critical issues in the drone industry, specifically the lack of RID data reception on mobile devices and vulnerabilities to spoofing. Dronetag, in collaboration with CTU, aimed to create a reliable and secure solution for drone pilots and airspace control authorities.

detect and prevent RID data spoofing. This know-how was provided by CTU, which validated it during satellite communications security projects. The integration of this innovative firmware into robust HW and its incorporation into Dronetag's HW ecosystem has created a product that has attracted interest from more than 30 partner organizations. Dronetag has thus become the market leader in RID technology.

### Solution

The Dronetag RIDER is a compact wireless device designed to receive 99% of all RID broadcast messages and provide airspace users with reliable situational awareness. The device uses GNSS for accurate time stamping and incorporates multilateration algorithms to

**SUCCESS CASES**  
Space-tested algorithm help safely identify drones



ESA Technology Broker is a project implemented by the Technology Centre Prague



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CZECHIA

ICT

Technology Transfer

# Space-grade fibre-optic temperature sensor



FBG-based sensing for precise temperature monitoring in harsh space environments

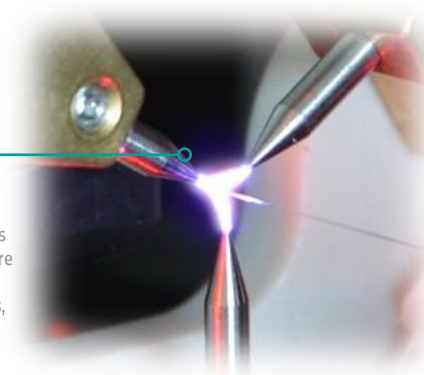
## Introduction

NETWORK GROUP, s.r.o., in cooperation with the HiLASE Centre, is developing the MANTIS project – a modular next-generation temperature sensor based on Fibre Bragg Grating (FBG) technology. The aim is to adapt proven industrial fibre-optic temperature sensing for space-ready applications where precise monitoring, low weight, radiation resistance, and electromagnetic immunity are required. The solution is intended for use in satellites, solar panels, structural parts, and thermal monitoring systems.

## Solution

The sensor is designed to provide accurate temperature measurement from approximately -100 °C to +300 °C in gas, liquid, and solid environments. The FBG-based solution is lightweight, compact, resistant to ionising radiation, immune to electromagnetic interference, and suitable for integration into

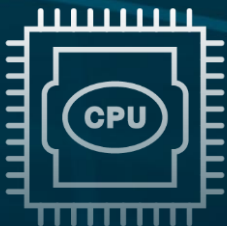
composite and lightweight structures. The project includes sensor preparation, assembly, calibration, temperature and outgassing tests, and space-readiness testing. Letters of interest included in the application show potential relevance for future use by Spacemanic CZ and TOPTEC.



### SUCCESS CASES

A lightweight fibre-optic sensor enables accurate temperature monitoring in harsh space environments, combining radiation resistance, electromagnetic immunity, and compact design.

Successful application



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## Successful application



Technology Cooperation

## Digital twin for eVTOL development

Advanced simulation supports Airwolf aerodynamic optimisation before physical prototyping.



### Introduction

UDX.aero is developing Airwolf, a compact single-seat eVTOL personal carrier for urban mobility. The vehicle resembles a lightweight flying motorcycle and is intended to offer efficient, safe and flexible aerial transport in urban environments. Before investing in physical prototypes, the startup needed a reliable verification method for aerodynamics, safety and efficiency.

### Solution

ESA Technology Broker Czechia introduced UDX.aero to VÚTS, a Czech R&D institute specialising in digital twins, automation and mechanical engineering. VÚTS created a virtual model of the Airwolf eVTOL, enabling UDX.aero to simulate real-world performance in a controlled digital environment.

The digital twin makes it possible to evaluate aerodynamic behaviour, test different design configurations, improve safety features and identify performance limitations before building full physical prototypes. This approach helps UDX.aero reduce development costs, accelerate design iterations and shorten the route to market, while supporting the development of a safer and more efficient personal eVTOL vehicle.

#### SUCCESS CASES

A digital twin accelerates eVTOL design validation, helping reduce prototyping costs and shorten the path to market.



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## Successful application



Technology Cooperation

## Metal 3D prototyping for jet engines

Space-grade additive manufacturing helps PBS accelerate turbine component prototyping



### Introduction

PBS Velká Bíteš needed a faster and more flexible way to prototype jet engine inlet ducts, diffusers and other critical components. Growing demand for unmanned vehicles and specialised propulsion applications increasingly requires turbine optimisation for individual projects, making rapid prototyping and fast aerodynamic design changes an important part of development.

### Solution

ESA Technology Broker Czechia connected PBS Velká Bíteš with the Institute of Physics of the Czech Republic (FZU) and One3D to identify a partner combination capable of supporting advanced metal additive manufacturing for aerospace applications. One3D contributed practical experience in metal 3D printing developed through work on

aerospace and space-related projects, including demanding applications with strict quality and reliability requirements. FZU added strong expertise in materials, additive manufacturing processes and support for advanced industrial development. By combining PBS's knowledge of small jet engine design with One3D's manufacturing capabilities and FZU's materials and process expertise, the partners created a strong foundation for faster prototyping of complex engine parts.

#### SUCCESS CASES

Space-grade additive processes enable lighter, more robust jet engine prototypes and faster design iteration.



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Successful application



Technology Transfer supported by ESA Technology Broker Czechia through the ESA Spark Funding programme.

## ICARUS ARMOR

Commercial application for a device measuring astronauts' physical parameters



### Introduction

Company is working on project called ICARUS ARMOR – a wearable vest which enables to map individual users' physiological limits (with special focus to thermal stresses).

The output of this project shall be an The technology, originally developed as ESA BIC project for monitoring the thermal overheating problems faced by astronauts, will be boosted by Uptimai's own technology which solves uncertainty propagation in engineering problems.

### Solution

The human body is extremely complex and lots of factors is interconnected each other. Using the Uptimai's know-how the existing models will be simplified, and digital twin will be developed, so that the ICARUS ARMOR can be easily integrated e.g., as apps into today's

devices like smartphones, smart watches and web-based apps. This will allow the technology to be used to ensure the safety of workers who are in demanding environments – firefighters, miners, metallurgical work, etc.

The project was scouted by Technology Centre Prague and supported by €60,000 from the ESA Spark Funding programme within the project ESA Technology Broker.

#### SUCCESS CASES

Wearable vest which enables to map individual users - physiological limits (with special focus to thermal stresses)



ESA Technology Broker is a project implemented by the Technology Centre Prague



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Successful application



Technology Transfer supported by ESA Technology Broker Czechia through the ESA Spark Funding programme.

## Hyperspectral imaging in the thermal infrared for material analyses



ESA-derived infrared imaging adapted for compact, high-resolution material analysis

### Introduction

BBT – Materials Processing, s.r.o. was developing TWINS-T, a spin-off project transferring technology originally developed for Earth Observation and hyperspectral remote sensing in an ESA project into a compact terrestrial imaging solution. The technology provider is the National Research Council of Italy (CNR), represented by Dr. Cristian Manzoni. The final MVP is intended to be an innovative imaging system based on Fourier transform principles, capable of measuring incoherent broadband spectra and generating hyperspectral images in the thermal infrared (TIR) for commercial applications.

### Solution

TWINS-T is based on an ultracompact Fourier-transform interferometer using birefringent materials, enabling continuous hyperspectral imaging from the visible to the far infrared, with

an operating range of approximately 0.38 to 18 microns and spectral resolution of  $4.2 \text{ cm}^{-1}$  or better. Compared with conventional systems, the solution offers high sensitivity, compactness, broadband transparency, and better measurement throughput. The project aims to transform the existing ESA breadboard into a portable MVP for terrestrial markets such as material analysis, agriculture, environmental monitoring, civil security, and R&D spectroscopy. The product notes strong early interest from research institutions and potential users, including CTU, VSB-TUO, and the Czech Academy of Sciences.

#### SUCCESS CASES

ESA-developed hyperspectral imaging technology transferred into a compact terrestrial device for fast, high-resolution material and substance analysis



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## Successful application

Technology Transfer

## Archaeological satellite map

Upgrade of the aerial archaeological map by using the know-how for clearing satellite data.



### Introduction

Czech software and systems engineering company Space Systems Czech upgraded an archaeology map of the Czech Republic for the Institute of Archaeology of the Czech Academy of Sciences, Prague.

Space Systems Czech is a company incubated within the BusinessRunway programme of the Technology Centre Prague. As part of the incubation, it uses the services of the ESA Technology Broker project to find new partners.

### Solution

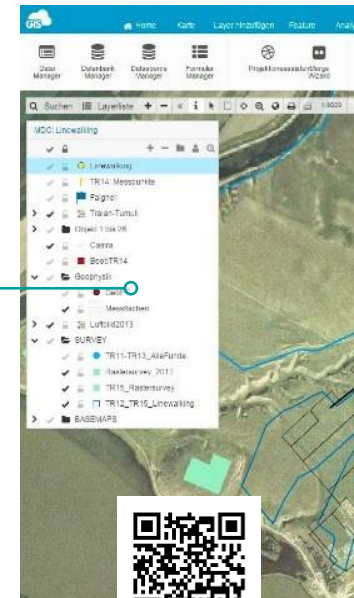
ESA Technology Broker has linked the company up with the Institute of Archaeology and applied its know-how in software development for critical infrastructure into a mapping system. During this process, errors and failures were removed due to knowledge

of Big Data and GIS, additional functions were added.

Technology transfer commercial value reached the €40.000.

#### SUCCESS CASES

The refined archaeological photomap will bring new research opportunities for archaeologists



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Successful application



Technology Transfer supported by ESA Technology Broker Czechia through the ESA Spark Funding programme.

## Plasma shock peening for space applications



Shockwave surface treatment improving fatigue resistance of metallic parts for space use

### Introduction

The Czech company PSP Technologies Ltd. is developing PSP SPACE, a project focused on transferring plasma shock peening technology from terrestrial industry into the space sector. The solution is based on licensed know-how from the Institute of Thermomechanics of the Czech Academy of Sciences and is intended to improve the surface properties of metallic components exposed to wear, fatigue, and cracking in demanding operating conditions. The project targets applications such as drilling cutting segments and other exposed metal parts for space use.

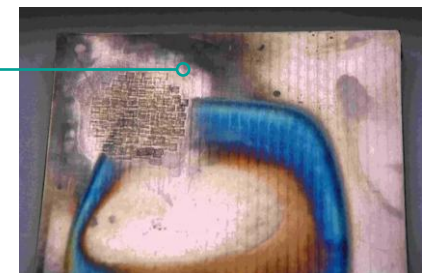
### Solution

PSP SPACE applies a shockwave that introduces compressive residual stresses into the surface layer of metallic materials. This increases resistance to fatigue, stress corrosion cracking, wear, cavitation, and other surface-related

failures, while also creating potential for weight reduction and longer service life. The project includes development of a mobile prototype covering mechanical design, electronics, material testing, EMC compliance, and preparation for certification for space applications.

#### SUCCESS CASES

Plasma shock peening improves the durability of metal components for space applications, increasing resistance to surface failure and enabling longer lifetime and potential weight reduction.



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# COMMERCIALIZATION REACTOR IGNITION EVENT



**An opportunity to transfer academic know-how into industry and business. Since 2026, TC Prague has been the national partner of the programme for the Czech Republic.**

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## WHAT IS NEW IN THE SCHEME

The scientist does not take on the CEO role. The programme complements the technology with an entrepreneur, market validation, mentoring and an investment pathway. The scientist gains equity while remaining in academia; the institution benefits from licensing.

The Ignition Event is the entry point where the technology meets business leadership and investment logic.



**Outcome: more investable spin-offs, licensing revenues for the institution and stability of scientific teams.**

Partner countries: United Kingdom, Germany, Poland, Slovakia, Austria, Hungary, Switzerland, Italy, Czech Republic, Latvia, Estonia, Slovenia, Croatia, Ukraine, Bulgaria, North Macedonia, Türkiye, Cyprus and Morocco.



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