Space telescope to provide 'super sharp' thermal images

Cambridge-based space tech company SuperSharp is developing thermal infrared space telescopes for Earth Observation to tackle some of the world's most pressing challenges.

SuperSharp's unfolding self-alignment technology enables it to fit big telescopes in small satellites. Its innovative technology will provide a variety of organisations – including Earth Observation satellite operators, space agencies and governments – with thermal images of the Earth in unprecedented detail.

CEOI provided approximately £1 million to help SuperSharp develop its Hibiscus telescope which is due to be launched into orbit in early 2027. Hibiscus will be the world's first closed-loop, unfolding thermal telescope and is set to bring down the cost of thermal imaging – opening up the benefits of ultra-high resolution heat mapping to a wide range of sectors. Hibiscus will provide data that will help humanity to combat global warming, improve the energy efficiency of urban areas, enhance agricultural output, detect environmental disasters, manage wildfires, monitor maritime activity and support border surveillance.

Hibiscus' background

Space telescopes tend to be very large because the size of their main mirror determines how well they can collect light. Traditionally, telescopes need a large, perfectly positioned mirror to ensure that when they look at the Earth they do not experience any blurriness or impediment.

Large space telescopes can typically take a decade, or even two in more extreme cases, to build and the associated cost of their missions are huge.

Enter SuperSharp and its self-aligning, unfolding infrared space telescope, Hibiscus.

Equipped with a high-resolution camera, Hibiscus will capture thermal images accurate to +/- half a degree centigrade, and down to the size of a car. Its name is inspired by the five petals of the hibiscus flower because the telescope has five, unfolding mirror 'petals'. Its unfolding design means it has a much smaller footprint than traditional telescopes and as a result it costs less to manufacture. Its smaller size also means it does not require a large rocket to be launched into space like most telescopes – Hibiscus can be deployed into orbit on a small satellite platform. The combination of Hibiscus' lower manufacturing costs and lower mission costs are set to make satellite thermal imagery far more commercially viable for a range of markets.

When Hibiscus is in orbit its mirror petals can be opened out to create a large mirror with an aperture of 1.2 metres.

SuperSharp estimates the resolution of the images that Hibiscus can capture are 10 times sharper than those captured by traditional or static solutions.

Another difference between Hibiscus and alternative static solutions is it

Pictured: COO Miguel Goncalves Co Founder and CTO Ian Parry and Technician Henrique Tome at Space Comm Manchester 2025

"The resolution of the images Hibiscus can capture are 10 times sharper than those from traditional or static solutions. It is like a high precision detective that surpasses the current state-of-the-art in thermal imaging from space using a satellite that is the size of a washing machine."

Marco Gomez-Jenkins
SuperSharp
Co-founder and CEO

has a closed feedback loop. With static telescopes everything has to be perfectly positioned while they are on the ground as when they are in space they cannot be corrected. As a result, if the optics become misaligned on a static solution you are going to get blurry images. In contrast Hibiscus' system is intelligent enough to allow itself to be calibrated. Each one of its five segments constantly reads where it is. It can make very fine movements – to the thickness of a human hair – so all its segments are in focus and form a single large mirror that captures perfect images. If something was to knock into the telescope and move one of its segments it could read that and calibrate so it could continue to capture clear images.

SuperSharp will use Hibiscus to provide organisations – such as Earth Observation service providers, space agencies and governments – with thermal images of the Earth in unprecedented detail.

For example, reducing the amount of heat that escapes from buildings is a key part in the fight against global warming. The most effective way to detect if buildings are bleeding energy is through a heat map generated by satellite imagery. This technology is not currently widely available but Hibiscus will be able to identify energy inefficient buildings and is set to bring down the cost of ultra-high resolution heat mapping.

Hibiscus will also be able to assist with improving agricultural output. It can highlight crops which are under stress because they have a different thermal infrared signature. Farmers will be able to use this information from Hibiscus to see where they should focus their irrigation efforts.

It can also support with wildfire management. A visible spectrum camera can only see the canopies of trees whereas Hibiscus can see through the canopies. This enables it to identify hotspots on the forest floor, which may indicate that vegetation underneath the canopy is catching fire. This information can enable the authorities to identify and respond to incidents more quickly.

Another example of an area where it can help agencies is maritime surveillance. Seas and oceans are a huge mass of almost constant temperature. As a result, when a boat crosses them, they are very clearly visible to Hibiscus' technology.

How the CEOI grant helped

Towards the end of 2020, SuperSharp began developing prototypes for an unfolding thermal telescope with support from the UK Government's Defence and Security Accelerator (DASA) and UK Research and Innovation (UKRI). This prototype had four unfolding mirror 'petals' and used a CubeSat payload. Funding from CEOI enabled SuperSharp to step up from a CubeSat lower resolution prototype to a SmallSat with higher resolution and the five unfolding mirror 'petals' which are key to Hibiscus' ability to capture thermal images.

At the UK Space Conference in Manchester in July 2025 there was a lot of interest in the CEOI prototype of Hibiscus among potential customers, partners and suppliers who were interested in its different applications and were excited to see demonstrations of the technology. CEOI's funding has enabled SuperSharp to develop Hibiscus at a rapid pace. SuperSharp started the CEOI part of the project at the end of 2023 and is preparing to launch Hibiscus in early 2027.

For SuperSharp, the time to market is crucial as there are similar solutions that are starting to be developed, or have been developed, in the US. SuperSharp says the support it received from the CEOI and the UK Space Agency has enabled it to compete with the US and to be where the market needs the company to be, at the right time.

"The funding we received from CEOI allowed us to develop Hibiscus quickly. We started the CEOI part of the project at the end of 2023 and we're launching in early 2027 – even for new space the pace of that development is radical."

Marco Gomez-Jenkins
SuperSharp Co-founder and CEO

Pictured: The SuperSharp team with former European Space Agency Director General Jean-Jacques Dordain

In the words of Marco Gomez-Jenkins, SuperSharp Co-founder and CEO

"It's very rare for a UK start-up to have hardware to demonstrate to potential customers, partners or suppliers. Thanks to CEOI we were able to take a prototype of Hibiscus to the 2025 UK Space Conference in Manchester. This made a huge impact because potential customers could actually see our technology in action. CEOI allowed us to build hardware that convinced people that what we are doing is real – it's not a theoretical idea that will never make it to the light of day.

In the US there are so many space start-ups and there are a lot more people who are willing to invest and provide initial funding to develop space technology – even a very high risk, very high reward technology like ours. In the UK and the EU, you don't have that and that's why CEOI and the UK Space Agency are key. They allow organisations like ours to compete with the US and enable us to be where the market needs us to be at the right time. Without the CEOI and the UK Space Agency it would have taken us a lot longer to develop our technology and by then the market may have moved on."

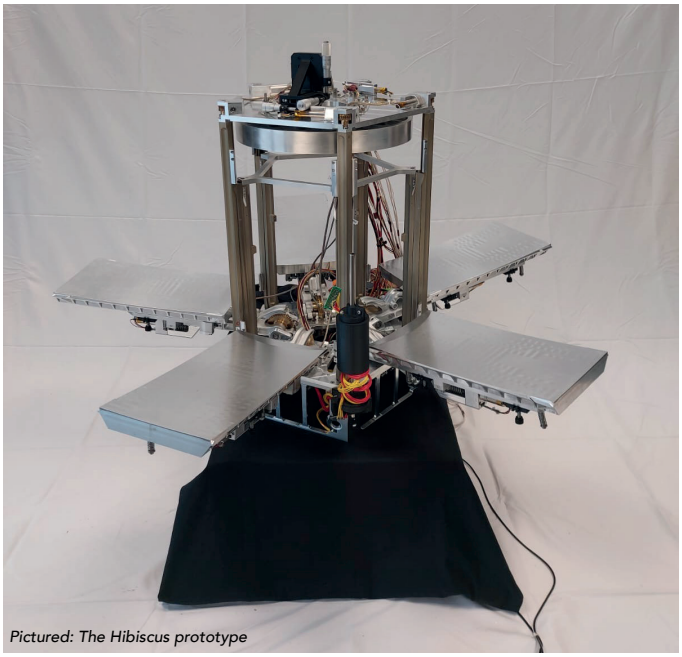
Pictured: Marco Gómez-Jenkins and Prof Ian Parry at Space Comm London 2025

Current status of the project

With CEOI's support, SuperSharp took Hibiscus to Technology Readiness Level 5, which enabled it to successfully apply for around £5 million from the UK Space Agency's National Innovation Space Programme (NSIP). The NSIP funding is enabling SuperSharp to continue the technology's development towards the top Technology Readiness Level of 9.

SuperSharp will carry out an intensive testing campaign of the technology in the second half of 2026 with support from NanoAvionics – a small satellite mission integrator focused on building new-generation satellite buses and providing end-to-end mission services.

SuperSharp has selected NanoAvionic's MP42 microsatellite platform for a first-of-its-kind Thermal InfraRed (TIR) mission called Blue Moon. The mission is expected to take place in early 2027 and will see Hibiscus go into orbit onboard NanoAvionics' flight-proven MP42 satellite bus.



Pictured: The Hibiscus prototype

At a glance

- Approximately **£1m provided by CEOI** for the development of Hibiscus.
- **6.5 years** from phase 1 prototyping to in-orbit demonstration
- **5** aluminium 7000 series diamond turned unfolding mirror 'petals' form Hibiscus' primary mirror – giving the telescope its name
- Hibiscus' images are **10 x sharper** than traditional or static solutions
- Hibiscus will make **15 orbits daily**
- **8** payload image captures daily
- Hibiscus will capture thermal images accurate to **+/- half a degree centrigrade**
- SuperSharp workforce **increased by 25%** thanks to CEOI funding

Pictured: Prof Ian Parry with the Hibiscus prototype at S4 Symposium 2024