

NOT JUST ANOTHER CONSTELLATION

ICEYE'S RADAR SATELLITE CONSTELLATION COULD SOON BE TRANSFORMING THE EARTH OBSERVATION INDUSTRY, SAYS **ALISTAIR MACLENAN**

In today's earth observation industry, keeping up with the Joneses doesn't mean having this year's BMW on the driveway or a kitchen the size of a football field.

To be in with the in-crowd, you need to have your own constellation.

If you don't have or aren't planning to ring our home planet with an inordinate number of small, micro, nano or – presumably soon to be announced – pico satellites that are capable of imaging every inch of the planet, every day, then you really can't hold your head up in the polite, albeit competitive society that is 'New Space'.

So many swarms are planned that low Earth orbit is on its way to becoming a literal information superhighway and one that may soon require traffic-calming measures.

But if there is space left up there for another network then I, like many others, will be extremely interested to see what use the Finnish company, ICEYE, will make of it.

Espoo, a town just outside Helsinki, acquired a certain level fame for being the location of the head office of mobile phone maker Nokia. But it may be that this latest space start-up will grow to be the next big thing in town. With a huge amount of support from Aalto University

and millions of Euro from investors, students Antti Kestilä, Rafal Modrzewski and Pekka Laurila created a new radar satellite. From the beginning, their ambition was for it to be cheap to build (that is, nearer US\$1m than the traditional US\$100m), small and yet powerful enough to produce an active signal.

The home-town mobile phone connection may have prompted the solution to the price challenge. ICEYE satellites are built using off-the-shelf components, many of which were developed for phones. They're not built or tested for use in space, but they work and they are cheap!

Following the successful launch of ICEYE-X1 in September 2018, the company now has four operating satellites in orbit. The plan is for 14 more to join them before the end of 2021.

I enjoyed a presentation by CEO Rafal Modrzewski at this summer's Living Planet Symposium, organised by the European Space Agency, but I hold my hand up that I filed the company away in my mind under 'another constellation'.

Hurricane Dorian has changed my mind. At the time of writing, more than 600 people are still missing in the Bahamas, whilst 56 have been confirmed to have

been killed by the category five storm that recently tore through the archipelago.

The pictures of flattened houses and the video interviews with those who used to live in them are heart-breaking.

But I didn't realise the scale of the impact this hurricane has had on the island until I saw an ICEYE image that was released the day after Dorian made landfall. It showed a dark area of the land around the Grand Bahama International Airport, surrounded by the light blue-grey of the floodwater from the Atlantic Ocean.

What makes it such a breath-taking image is that the outline of the island's coastline has been overlaid on top of it, revealing that only a third of the island's land mass remains above the floodwaters.

Radar satellites have always had the advantages over their optical cousins of being able to take images at night and to also 'see' through clouds. But soon, there won't be just one or two hulking great units up there – the sky will be full of agile, active sensors, mapping every inch of the world, whatever the weather or time of day. Nothing will be hidden from view.

So, when the full ICEYE constellation is up and running, the rest of the industry might just be peering over the hedge and thinking they need to keep up.

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