Claire Burke on using thermal drone tech to protect orangutans

Astro-ecologist Claire Burke uses her astrophysics knowledge to protect endangered species and stop poaching, and she loves to watch orangutans in Borneo.

First up, do you have a telescope?

I am more about turning the telescopes upside down these days: using our knowledge and techniques from astrophysics to help monitor life down here on Earth by attaching infrared sensors to drones.

Explain what you do in one easy paragraph.

I am an astro-ecologist. I use drones, thermal infrared cameras, astrophysical understanding and machine learning to help preserve Earth's biodiversity. In thermal infrared images, animals glow as a result of their body heat, and this glow is the same as that given off by stars and galaxies. Every species has a unique thermal fingerprint, so, once I detect them, I can use machine learning to tell them apart.

What does a typical day involve?

One thing I really love about my job is how varied it is. Some days, I am out in the field flying drones and looking for animals. Other days, I am examining data and writing programs to optimise the thermal camera, or meeting with environmental groups to help figure out how best to monitor endangered animals. Quite often, I am thinking about how we can apply our understanding from physics to solve a new problem.

"It is pretty hard to see through the jungle by eye, but our thermal drone tech lets us see orangutans up close"

Were you good at science at school?

Yes, I loved science at school. I also really enjoyed art, computing, geography and maths. I did a degree in physics and a PhD in astrophysics because that was what I enjoyed most. Then I worked as a climate scientist for a few years before coming to astro-ecology. I also guest-lecture on a sci-art course, so even the GCSE in art came in handy.

What's the best piece of advice anyone ever gave you?

One piece of advice I would give to young people is to follow the things you are passionate about, and to be interested in lots of different things, because they will take you to amazing places.

Sum up your work in a one-sentence elevator pitch...

I use astronomical techniques to monitor endangered animals and catch poachers.

Tell us about something you've worked on recently...

A colleague asked if we could use thermal drones to see underground peat fires. After a week of reading papers and physical modelling, I figured out the answer was probably "yes". We tested my predictions in the field and are now helping to fight forest fires in South-East Asia.

How useful will your skills be after the apocalypse?

I can do a half-decent weather forecast from looking at the sky, thanks to my time as a climate scientist. And I know a little bit about which fruits not to eat from the biologists I work with. So I might be able to survive in the jungle...

What's the best thing you've read or seen in the past 12 months?

It is hard to choose between the Milky Way in a clear and light pollution-free sky in Madagascar, and orangutans in Borneo. In Borneo, our team was trying to figure out if we could use our thermal drone tech to monitor orangutans. It is pretty hard to see through the dense jungle by eye, but it turns out that our drones can spot the orangutans pretty well. Seeing our primate cousins up close was absolutely fascinating. They really are marvellous creatures.

OK, one last thing: tell us something that will blow our minds…

There are as many atoms in a grain of sand as there are grains of sand on all the beaches in the world, and there are as many grains of sand on all the beaches in the world as there are stars in in the observable universe.