

And here is an example of something that was picked up not long after we started to think about using radio telescopes. Big ones like the Lovell Telescope there at Jodrell was built in 1957. So, in the 1960s we started to use these telescopes to look out for messages, maybe 'Morse code' type messages buried in that noise.

And just a few years after that in 1967 one of these signals was picked up and here again is a recording made with our telescope pointed at a particular direction in the sky.

[1967 - An unusual signal from space]

So, this is a bit of a surprise. We had been used to hearing the noise, the hiss... to hear, to see the regular radio flashing of an object in the invisible sky would be quite a surprise and actually, that first object was discovered by Jocelyn Bell at Cambridge University in 1967.

That first thing was called little green man 1: LGM1. They called it because they thought, this is possible for an alien signal. We actually now know that they're remnants of exploded stars. The things called pulsars, very exotic objects that we use to test our understanding of physics and Einstein's theories of gravity.

So, not aliens, perhaps sadly but exciting for physics all the same. What do we do with other telescopes? Well, we use telescopes like this one; this is the Arecibo telescope. This is a massive radio telescope, the world's biggest radio telescope. It's in a valley in Puerto Rico. It's 300 meters in diameter. That makes it four times the size in diameter of the Lovell telescope at Jodrell Bank, a huge telescope. That's used for lots of different things.

But one of the things it does is a project called SERENDIP which some of you might know as SETI at home. You can download a screensaver for

your computer and it'll basically process data looking for these sort of extraterrestrial signals being picked up with a radio telescope like that one.

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Another radio telescope around the world has been doing this sort of work is the Green Bank telescope. This is in West Virginia. This telescope is about 100 meters in diameter. These large telescopes collect lots of radio waves. They see, or if you like, they hear very faint things coming from the distant universe.

So, these are the sort of things we might be interested in using to pick up extraterrestrial signals. And this one's been used to search out those... look in the direction of those planets that we know of.

The Parkes telescope here is in Australia. Again, this telescope and the Green Bank telescope were involved in a new project looking for these extraterrestrial signals called the Breakthrough Listen Project. Our own telescopes, here in the UK, we started a project with these telescopes a network of telescopes spread across the country between Jodrell Bank and all the way out to Cambridge.

Seven radio telescopes all connected by optical fibres linked together to act as one giant telescope. And again amongst all the other things we do we're starting to look through those signals; looking for potential extraterrestrial signals.

What's coming in the future is an amazing telescope we're designing at the moment called The Square Kilometre Array. It's going to be built in Southern Africa and Australia. It's going to be made up of hundreds of dishes connected together, and other types of aerials connected together,

that would make a giant telescope whose size is equivalent to 220 times the size of the Lovell telescope at Jodrell Bank. It'd be able to see incredibly faint things in the universe, pick up incredibly weak signals.

And in terms of looking for aliens, in just one minute, that telescope will be able to look at every star in the direction. It's pointing out to about 300 light years away from us. So, the nearest another star was four light-years. It'll be able to get 300 light-years away searching every star in just a minute for the sorts of strong signals that come from the radar systems that we use in our big telescopes.

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So, if there are aliens out there with this sort of technology and if there are signals coming our way this telescope is going to be an amazing facility for us to be able to detect those signals.

What I can't do is give you the answer to my question at the beginning, which is where are all the aliens? We don't know. We haven't detected aliens anywhere. We do know there're potentially habitable planets. That's a fact that wasn't — we didn't know that twenty years ago. We know that now.

We have got the technology. We will have the technology that is allowing us to search ever greater bits of our galaxy. Searching for the sorts of signals from the technology we produce, the radar systems that we use in airports and so on.

Looking out for these signals that might be coming from aliens and I do hope that at some point, in the not-too-distant future we will be able to answer this question, 'Are we alone in the Universe?'



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