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00:00:12,779 --> 00:00:16,530
Mary Estacion/Reporter: The Mid Infrared Instrument
or MIRI on the James Webb Space Telescope

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00:00:16,530 --> 00:00:18,920
is unique in a number of ways.

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00:00:18,920 --> 00:00:23,250
First of all, it looks at a different part
of the electromagnetic spectrum than the other

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00:00:23,250 --> 00:00:24,618
instruments do.

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00:00:24,618 --> 00:00:26,679
It looks at mid infrared frequencies.

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00:00:26,679 --> 00:00:30,359
Second of all, it takes both pictures and
spectra.

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00:00:30,359 --> 00:00:35,409
To find out more about the MIRI, we have with
us the European principal investigator, Gillian

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00:00:35,409 --> 00:00:36,409
Wright.

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00:00:36,409 --> 00:00:41,029
Gillian, it looks at the mid infrared range
of frequencies.

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00:00:41,030 --> 00:00:42,030
What is mid infrared?

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00:00:42,030 --> 00:00:45,539
Gillian Wright/MIRI, European Principal Investigator:
Mid infrared means we look at longer wavelengths

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00:00:45,539 --> 00:00:50,558
compared to what the other instruments do,
which is described as near infrared.

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00:00:50,558 --> 00:00:53,238
It's better at seeing through dust.

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00:00:53,238 --> 00:01:01,328
It's also better at looking at different colors
of objects, lots of molecules that might indicate

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00:01:01,329 --> 00:01:03,359
life on other planets...

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00:01:03,359 --> 00:01:06,719
Those molecules make spectra in the mid infrared.

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00:01:06,719 --> 00:01:09,658
Mary: It takes both pictures and spectra,
why the two?

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00:01:09,659 --> 00:01:13,620
Gillian, Yes, because to do our science, we
want to be able to take both pictures and

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00:01:13,620 --> 00:01:18,550
spectra so I suppose in an ideal world, we
would've had two mid infrared instruments

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00:01:18,549 --> 00:01:24,019
on JWST, but there wasn't space so we built
it into just one instrument that does both

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00:01:24,019 --> 00:01:25,019
things.

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00:01:25,019 --> 00:01:29,569
Mary: And I understand we have a real, honest
to goodness, MIRI, right here at Rutherford

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00:01:29,569 --> 00:01:30,769
Appleton Laboratory, right?

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00:01:30,769 --> 00:01:35,009
Gillian: Yes, we're all really excited because
we've just finished putting the flight model

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00:01:35,009 --> 00:01:37,810
of the instrument together and we're about

to start testing.

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00:01:37,810 --> 00:01:39,980

Mary: so Gillian, this is the MIRI, huh?

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00:01:39,980 --> 00:01:44,430

Gillian: Yes, this is the MIRI, the flight instrument, so we need to be very careful.

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00:01:44,430 --> 00:01:48,969

MIRI deliberately has a very modular design.

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00:01:48,968 --> 00:01:56,319

So that each module, for example, this box here can be built and tested by itself before

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00:01:56,319 --> 00:01:58,099

we build it into the rest of the instrument.

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00:01:58,099 --> 00:02:00,038

Mary: Did you build these modules all here?

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00:02:00,039 --> 00:02:01,039

Gillian: No.

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00:02:01,039 --> 00:02:05,579

We had different modules built in different parts of Europe so that way we could use the

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00:02:05,579 --> 00:02:10,399

skills of a lot of different institutes, all of which have very specialist knowledge about

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00:02:10,399 --> 00:02:15,539

certain areas of how to do instruments and we could bring it all together to create the

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00:02:15,539 --> 00:02:16,539

MIRI.

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00:02:16,539 --> 00:02:18,659

Mary: But the MIRI is both a spectrometer and an imager.

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00:02:18,659 --> 00:02:19,659

Gillian: Yes, that's right.

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00:02:19,659 --> 00:02:23,709

When the spectrometer, when it's this way round, the spectrometer sits

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00:02:23,709 --> 00:02:28,650

on top, but we can turn the instrument over so we can take a look at the imager....

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00:02:28,650 --> 00:02:34,319

The light would come in here from the telescope and it hits the mirror which turns it and

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00:02:34,319 --> 00:02:36,959

sends it to the middle of the instrument.

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00:02:36,959 --> 00:02:42,959

Most of the light is then sent to the imager so that we can take pictures with the imager

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00:02:42,959 --> 00:02:49,180

and a very small fraction of the light is sent to the spectrometer for us to do spectroscopy.

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00:02:49,180 --> 00:02:54,260

Mary: Gillian, thank you so much for showing us your MIRI. Gillian: You're very welcome.

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00:02:54,259 --> 00:02:59,939

Mary: As you can see the MIRI is basically two instruments in one and it will be able

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00:02:59,939 --> 00:03:04,680

to do its job because of the help of international partners.

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00:03:04,680 --> 00:03:07,709

Thanks for joining us for another edition of Behind the Webb.