1
00:00:12,780 --> 00:00:16,530
Mary Estacion/Reporter: The Mid Infrared Instrument
or MIRI on the James Webb Space Telescope

2
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 --> 00:00:24,619
instruments do.

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00:00:24,619 --> 00:00:26,680
It looks at mid infrared frequencies.

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00:00:26,680 --> 00:00:30,360
Second of all, it takes both pictures and
spectra.

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00:00:30,360 --> 00:00:35,410
To find out more about the MIRI, we have with
us the European principal investigator, Gillian

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00:00:35,410 --> 00:00:36,410
Wright.

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00:00:36,410 --> 00:00:41,030
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 --> 00:00:50,559
compared to what the other instruments do,
which is described as near infrared.

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00:00:50,559 --> 00:00:53,239
It's better at seeing through dust.

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00:00:53,239 --> 00:01:01,329
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 --> 00:01:06,720
Those molecules make spectra in the mid infrared.

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00:01:06,720 --> 00:01:09,659
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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00:01:18,550 --> 00:01:24,020
on JWST, but there wasn't space so we built
it into just one instrument that does both

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00:01:24,020 --> 00:01:25,020
things.

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00:01:25,020 --> 00:01:29,570
Mary: And I understand we have a real, honest
to goodness, MIRI, right here at Rutherford

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00:01:29,570 --> 00:01:30,770
Appleton Laboratory, right?

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00:01:30,770 --> 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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00:01:48,969 --> 00:01:56,320
So that each module, for example, this box
here can be built and tested by itself before

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00:01:56,320 --> 00:01:58,100
we build it into the rest of the instrument.

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00:01:58,100 --> 00:02:00,039
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 --> 00:02:05,580
We had different modules built in different
parts of Europe so that way we could use the

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00:02:05,580 --> 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 --> 00:02:15,540
certain areas of how to do instruments and
we could bring it all together to create the

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00:02:15,540 --> 00:02:16,540
MIRI.

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00:02:16,540 --> 00:02:18,660
Mary: But the MIRI is both a spectrometer
and an imager.

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00:02:18,660 --> 00:02:19,660
Gillian: Yes, that's right.

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00:02:19,660 --> 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 --> 00:02:34,320
The light would come in here from the telescope
and it hits the mirror which turns it and

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00:02:34,320 --> 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 --> 00:02:52,379
Mary: Gillian, thank you so much for showing
us your MIRI.

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00:02:52,379 --> 00:02:54,260
Gillian: You're very welcome.

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00:02:54,260 --> 00:02:59,940
Mary: As you can see the MIRI is basically
two instruments in one and it will be able

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00:02:59,940 --> 00:03:04,680
to do its job because of the help of international
partners.