



1
00:00:00,000 --> 00:00:01,000
Music.

2
00:00:11,910 --> 00:00:15,639
Tiffany Nail/NASA's Launch Services Program: Hello, I'm Tiffany Nail. We're going to take you on a journey of

3
00:00:15,640 --> 00:00:23,706
NASA's Wide-field Infrared Survey Explorer, also known as the WISE space telescope. First, here's more about

4
00:00:25,190 --> 00:00:28,689
Peter Eisenhardt/WISE Project Scientist:
There's this basic need that people have to
know what is out there,

5
00:00:28,690 --> 00:00:31,756
to understand what the universe is made up
of.

6
00:00:33,270 --> 00:00:36,556
George Diller/NASA Public Affairs: Have you ever wondered how scientists and astronomers find massive stars

7
00:00:38,050 --> 00:00:43,716
millions of light years away, in the darkest
and most isolated areas of the universe?

8
00:00:43,960 --> 00:00:44,226
The WISE space telescope will be poised to explore the entire sky through infrared eyes,

9
00:00:49,560 --> 00:00:49,613
searching for dimmer heavenly bodies that populate the space between the brighter planets and the stars.

10
00:00:56,440 --> 00:00:59,606
Ned Wright/WISE Principal Investigator: So, we're taking pictures in the infrared. And by taking multiple pictures

11
00:01:00,940 --> 00:01:01,450
we're going to cover the whole sky. So, we'll get images of the whole sky in the infrared.

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00:01:06,430 --> 00:01:14,230

We'll be able to see stars near the sun that haven't been seen yet because they're too cool to radiate optical light.

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00:01:14,830 --> 00:01:16,699

George Diller/NASA Public Affairs: The telescope will take an image every

14

00:01:16,700 --> 00:01:22,500

11 seconds and will photograph nearly 1,500,000 pictures in the first six months alone.

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00:01:23,820 --> 00:01:26,079

Ned Wright/WISE Principal Investigator: With all these images we'll stitch them together to

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00:01:26,080 --> 00:01:29,613

make an image atlas of the entire sky and figure out,

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00:01:30,200 --> 00:01:37,066

you know, what objects are on there and make a catalog. And we expect to see about 300 million objects.

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00:01:37,710 --> 00:01:40,809

George Diller/NASA Public Affairs: Although there are other telescopes with infrared capabilities,

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00:01:40,810 --> 00:01:43,543

WISE is hundreds of times more sensitive.

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00:01:44,300 --> 00:01:46,553

Bill Irace/WISE Project Manager: The last time this was done, it was 1983.

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00:01:46,980 --> 00:01:51,113

It was a project called IRAS, Infrared Astronomical Satellite.

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00:01:51,340 --> 00:01:51,993

It was the first time we actually had barely enough technology to do something like this.

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00:01:56,620 --> 00:01:59,860

Ned Wright/WISE Principal Investigator: To go back to the previous mission that did an all-sky survey,

24
00:02:00,180 --> 00:02:03,446
they only had 62 pixels total in their camera and

25
00:02:04,780 --> 00:02:09,580
WISE we have 4 megapixel arrays. So, that's a total of 4 million pixels.

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00:02:11,820 --> 00:02:14,660
Bill Irace/WISE Project Manager: Most of us
when we go to buy a digital camera these
days,

27
00:02:14,980 --> 00:02:19,113
we look for megapixels -- 8, 10, 20 -- and IRAS had 62 pixels.

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00:02:23,970 --> 00:02:26,269
George Diller/NASA Public Affairs:
Compared to the massive Hubble Space
Telescope,

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00:02:26,270 --> 00:02:31,336
WISE is smaller and sees a different kind of light from what Hubble can see.

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00:02:31,740 --> 00:02:34,036
Peter Eisenhardt/WISE Project Scientist: We have only fairly crude maps of the universe at other wavelengths,

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00:02:38,710 --> 00:02:45,310
And so there could be big objects, very
interesting objects, that are out there, maybe not very far

32
00:02:46,550 --> 00:02:46,990
away -- that if we could just look in the right place in the infrared, we would find them.

33
00:02:52,110 --> 00:02:55,050
George Diller/NASA Public Affairs: With the millions of images WISE will send back to Earth,

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00:02:55,370 --> 00:02:56,650
scientists will be able to study the mysterious dark energy that is responsible for the acceleration of the univers

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00:03:01,890 --> 00:03:02,020

WISE will also generate the most complete record of dark objects in the cosmos, like vast dust clouds,

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00:03:08,560 --> 00:03:14,160

brown dwarf stars and even large, nearby asteroids that could pose a threat to Earth

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00:03:14,270 --> 00:03:15,579

Peter Eisenhardt/WISE Project Scientist:

Some of them could be very close.

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00:03:15,580 --> 00:03:17,450

Some of them might even be closer than any star we know about now.

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00:03:18,110 --> 00:03:19,043

And to me, it seems like we ought to know what is out there, what our next door neighbor is.

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00:03:23,310 --> 00:03:25,303

And maybe even a star that has planets around it -- so that would be the nearest planetary system beyond the

41

00:03:29,450 --> 00:03:30,463

That would be something worth knowing about.

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00:03:31,370 --> 00:03:33,609

Ned Wright/WISE Principal Investigator:

Where WISE is really going to pay off is in

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00:03:33,610 --> 00:03:33,690

measuring the infrared radiation from asteroids,

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00:03:36,730 --> 00:03:45,463

whereas previous studies of asteroids have primarily been only in reflected light. And some asteroids are really

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00:03:47,220 --> 00:03:51,686

blackier than coal -- and so, they do not reflect much light at all.

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00:03:51,700 --> 00:03:51,916

And so what WISE will be able to do is provide the infrared radiation.

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00:03:56,150 --> 00:03:56,156

With the infrared radiation we can determine how big the asteroid is. And with that we can know how big these

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00:04:04,410 --> 00:04:04,753

some of which are potentially hazardous to the Earth.

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00:04:07,600 --> 00:04:14,066

So, the ones that are in orbits close to the Earth's orbit, you know, could in the future hit us.

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00:04:14,190 --> 00:04:17,236

George Diller/NASA Public Affairs: WISE
might even find the most luminous galaxies in the universe,

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00:04:17,810 --> 00:04:23,010

some so far away that their light has taken 11.5 billion years to reach Earth.

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00:04:24,470 --> 00:04:28,870

The WISE telescope is targeted to launch in
December 2009 aboard a

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00:04:29,050 --> 00:04:34,650

United Launch Alliance Delta II rocket from Vandenberg Air Force Base in California.

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00:04:34,910 --> 00:04:41,043

The Delta II will place the spacecraft into a polar orbit several hundred miles above Earth.

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00:04:41,100 --> 00:04:41,993

The launch is being directed by NASA's
Launch Services Program based at Kennedy Space Center in Florida.

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00:04:47,140 --> 00:04:51,140

The LSP team routinely launches from Kennedy and Vandenberg.

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00:04:52,750 --> 00:04:56,169

Tiffany Nail/NASA Launch Services
Program: Here now with more about the
WISE mission is Armando Piloto,

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00:04:56,170 --> 00:04:56,340

NASA KSC mission manager. Armando, thanks for joining us.

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00:04:59,800 --> 00:05:01,729

Armando Piloto/LSP & WISE Mission Manager: It's great to be here, Tiffany.

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00:05:01,730 --> 00:05:04,800

Tiffany Nail/NASA Launch Services Program: Armando, what do you do as a KSC mission manager for WISE

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00:05:05,460 --> 00:05:07,799

Armando Piloto/LSP & WISE Mission
Manager: Well, Tiffany, as a mission
manager for WISE,

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00:05:07,800 --> 00:05:12,800

I've been responsible for managing the process of integrating a very unique

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00:05:13,710 --> 00:05:22,443

spacecraft -- WISE -- to the Delta II rocket. So, in essence, my job is to ensure that the rocket and the spacecraft

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00:05:22,790 --> 00:05:30,590

and when they do that they're compatible with each other and that they will both function successfully during flight

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00:05:30,630 --> 00:05:32,899

Tiffany Nail/NASA Launch Services Program: Were there any challenges for this mission?

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00:05:32,900 --> 00:05:34,939

Armando Piloto/LSP & WISE Mission
Manager: Definitely. There were significant
challenges,

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00:05:34,940 --> 00:05:35,170

like in many other NASA missions that we fly.

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00:05:37,710 --> 00:05:45,510

This particular mission, the spacecraft uses a cryostat to keep the telescope at extremely low temperatures in space

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00:05:46,910 --> 00:05:54,643

From a ground operation perspective, this cryostat before it launches it has to be maintained cool 24/7 at the

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00:05:55,900 --> 00:05:57,176

So, the combination of keeping this cryostat cool in conjunction with all of the different rocket activities that are

71

00:06:03,090 --> 00:06:10,756

created numerous logistic and operational challenges for our mission. We found out about this early on in the flow,

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00:06:11,120 --> 00:06:14,253

so we dedicated a team to go work this problem.

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00:06:14,300 --> 00:06:15,443

And the team did a great job, and they have come up with solutions. So we have processes,

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00:06:19,090 --> 00:06:19,130

procedures and resources in place to make sure that we can process the cryostat successfully.

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00:06:25,250 --> 00:06:28,430

Tiffany Nail/NASA Launch Services Program: How long did it take to get this mission from concept to launch?

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00:06:29,270 --> 00:06:30,340

Armando Piloto/LSP & WISE Mission Manager: We started working on WISE back in the 2003-2004 timeframe

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00:06:35,000 --> 00:06:35,596

Early on we did a lot of different trace studies to find a good launch vehicle solution for WISE.

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00:06:40,870 --> 00:06:44,870

We looked at a Deep Impact mission, which is a dual mission.

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00:06:45,000 --> 00:06:45,890

We looked at different vehicles and we found out that the Delta II was the appropriate match.

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00:06:50,310 --> 00:06:51,220

So, it's been about six years, and I know the team has done a lot of work to get to this flow

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00:06:55,600 --> 00:06:56,543

and we're definitely very excited about the upcoming launch of the WISE mission.

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00:06:59,990 --> 00:07:01,729

Tiffany Nail/NASA Launch Services

Program: How will WISE be launched and why

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00:07:01,730 --> 00:07:02,293

are we launching from Vandenberg Air Force Base in California?

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00:07:05,300 --> 00:07:08,666

Armando Piloto/LSP & WISE Mission Manager: WISE will be launched aboard a Delta II vehicle out of Vandenberg

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00:07:09,200 --> 00:07:17,466

The reason is because the spacecraft has a requirement to be placed in a polar orbit so that they can conduct

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00:07:17,810 --> 00:07:18,103

So from a launch vehicle perspective, we can get spacecraft to the polar orbit more efficiently by launching out

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00:07:26,250 --> 00:07:28,316

We could do this mission out of the east coast, but it would take significant more performance from the Delta II

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00:07:32,250 --> 00:07:36,383

So, that's why we have selected Vandenberg as the launch site.

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00:07:36,730 --> 00:07:38,449

Tiffany Nail/NASA Launch Services Program: Armando, thanks for joining us.

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00:07:38,450 --> 00:07:39,859

Armando Piloto/LSP & WISE Mission Manager: Thank you.

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00:07:39,860 --> 00:07:41,579

Tiffany Nail/NASA Launch Services

Program: For more information about the Wide-field

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00:07:41,580 --> 00:07:44,846

Infrared Survey Explorer go to www.nasa.gov/WISE.

93

00:07:48,100 --> 00:07:54,766

Or, you can see the launch as it happens on NASA TV or nasa.gov. For NASA's Launch Services Program,

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00:07:55,150 --> 00:07:55,256

I'm Tiffany Nail. Thanks for joining us.