good afternoon and welcome to NASA's wide-field Infrared Survey Explorer also known as wise pre-launch news conference from Vandenberg Air Force Base joining us today are John Morse director of NASA's astrophysics division chuck de val NASA launch director burnhamthorpe United Launch Alliance NASA program manager bill iris wise project manager and captain andrew frye launch weather officer 30th Space Wing will begin with some opening statements and then take your questions John thanks Tracy what I'd like to do is run over the broader
context of the wise mission and also
talk about at a top level its science
objectives and to remind you that there
is a science briefing coming up after
this briefing let's get right to it and
go to the first graphic and show that
NASA's astrophysics mission portfolio as
it stands right now we have Hubble
Chandra and Spitzer along the bottom
there those are great observatories we
also have Kepler in the lower left which
launched in march of this year and Fermi
in the upper right which launched last
year both returning their science
results there are five internationally

led missions on which NASA is a partner

and we also have four Explorer missions

xte GALEX swift and w map and the

Explorer program is one of our most

important aspects of our flight program

and it does entail the smaller missions

along with the larger missions like

Hubble Spitzer and Chandra now these

missions cover the entire

electromagnetic spectrum now if we go to

the next graphic we see that we're

adding wise and why

as shown here not because it's very
large but in order to emphasize its

00:02:17,300 --> 00:02:23,030 newness wise joins the largest fleet of

00:02:20,900 --> 00:02:25,789 astrophysics missions that has ever been

00:02:23,030 --> 00:02:28,669 flown and that astronomers were use to

00:02:25,789 --> 00:02:31,068 make new discoveries now wise as a 40

00:02:28,669 --> 00:02:34,068 centimeter telescope it's cryogenically

00:02:31,068 --> 00:02:36,889 cooled to minus 430 degrees Fahrenheit

00:02:34,068 --> 00:02:39,139 it has four state-of-the-art infrared

00:02:36,889 --> 00:02:41,568 detectors it'll take over a million

00:02:39,139 --> 00:02:45,649 images during the course of its 10 month

00:02:41,568 --> 00:02:47,298 mission and so now why don't we contrast

00:02:45,650 --> 00:02:49,939 a little bit between the visible in the

00:02:47,299 --> 00:02:52,159 infrared and and begin to delve into why

00:02:49,939 --> 00:02:55,969 we're doing wise on the next graphic

00:02:52,159 --> 00:02:58,129 what we see is how the Milky Way and the
the sky which is centered on the Milky Way appears to the visible the Milky Way is the band across the middle it's diffuse you could see the galactic center in the middle and there's other galaxies like the Magellanic Clouds those smudges on the lower part this map is dominated essentially by starlight and you see how patchy the Milky Way appears due to the obscuring dust that permeates the galaxy however in the infrared on the next graphic we see how infrared on the next graphic we see how much different the sky appears in the infrared and this is a new tool for
astronomers to use in order to examine the cosmos now this infrared map shows how the Milky Way is a very flat disk where material concentrates and then you can see the tenuous clouds some nearby some far away which are the sites where new stars are forming so in summary this new sky map that wise will generate is hundreds of times more sensitive than the previous maps it will represent the infrared mother lode that astronomers will mine for the years to come and then identify interesting targets for
follow-up observations with observatories such as Spitzer Hubble and eventually Sofia which is in the air right now I might point out also the James Webb Space Telescope which will be launched in the middle of the next decade and so with that let me turn it over to chuck thanks John a good afternoon I'm proud and privileged to be here today representing the men and women of the launch services program I can tell you that the launch team is ready we have been through all of the
NASA's reviews we do have one review
remaining tomorrow morning we're going
to meet with the Air Force and get a go
hopefully from the Wing Commander but we
have a busy next 40 hours and I'll touch
on that a little bit but what I wanted
to describe today is how we got to this
point I have a video depicting some of
the processing milestones that we've
achieved so far if we can roll into that
it shows the booster being hoisted into
the mobile service tower there's a shot
of the RS 27 main engine that provides
about 200,000 pounds of thrust at
lift off this is a shot of the interstage
which rests atop the booster it helps

span the first and second stage the

second stage will be hoisted and set in

between that where you the engine valve

will reside in that interstage here's

one of three solid rocket motors being

hoisted up this this configuration is a

70-300 where we have three ground 'let

solid motors built by alliant

techsystems that's the second stage

coming in this was on october 23rd it's

got an arrow jet engine for this mission

that engine will burn twice in order to

get wise and into its proper orbit there
it is setting down into that interstage

if you can visualize that here's the

spacecraft canned up rolling out on

November 20th spacecraft weighs about

fourteen hundred and sixty pounds that's

a direct made adapter that allows the

team to rest that atop the second stage

work it down some of the B platforms

allowed to move to bring the fairing the

two halves of the fairing in this was

just before Thanksgiving there's a shot

of the spacecraft on top of the second

stage with one half of the fairing on

obviously in a clean room environment
with wises telescope and instrument it's vital to keep that area in a clean room.

environment and there's the launch decal.

so going into the next 40 hours starting tomorrow morning we do have the range.

review as i mentioned following that.

because we are going to here we've got some challenging weather ahead of us.

we're going to have one last tag up and see what the forecast for friday would bring this will allow the wise spacecraft to disconnect their prior Jenica operations and commit to launch.

so if we are successful with that we do.
have another weather weather brief at

three thirty tomorrow afternoon which

will allow the mobile service tower to

retract back we plan to do an early fuel load into the first stage that plan is

for 7 p.m. tomorrow evening versus doing it during the countdown on Friday that aids in wins if we if we were to have

high winds having that stability and the booster helps us handle a higher wind

condition given all that the tower would be rolled back at eight-thirty between a

30 and 1030 tomorrow evening so if we

get past those we start on console

Friday morning the management will come
on at two in the morning we are in a 60-minute built-in hold at that point we then transition into our terminal count for the final three hours we have one more weather brief that says we are able and willing to load liquid oxygen into the first stage that's at t minus 75 minutes we get past that we do at engine Slough check with 30 minutes to go we have planned built-in holds if we get behind in the out we can use those to make sure we hit the t0 two zeros 60 933 pacific time we've got a 14-minute 18 second window
00:09:01,149 --> 00:09:07,490
we have on the range the 11th and the

00:09:04,610 --> 00:09:09,379
12th if we need it and you'll probably

00:09:07,490 --> 00:09:13,399
hear from Belarus how complex this

00:09:09,379 --> 00:09:16,279
mission is so we have a two days on two

00:09:13,399 --> 00:09:18,230
is it two days off kind of posture so if

00:09:16,279 --> 00:09:20,059
we were to count down and not make the

00:09:18,230 --> 00:09:21,470
eleventh and twelfth we would have to

00:09:20,059 --> 00:09:24,769
stand down for the thirteenth and

00:09:21,470 --> 00:09:27,470
eighteenth let them go do some cryogenic

00:09:24,769 --> 00:09:32,899
operations and we'd be back after that

00:09:27,470 --> 00:09:35,600
so it's it's quite complicated but we we

00:09:32,899 --> 00:09:38,000
are poised to to make an attempt and get

00:09:35,600 --> 00:09:39,560
through our next forty hours and looking

00:09:38,000 --> 00:09:41,990
very much forward to it I'll turn it

00:09:41,990 --> 00:09:48,380
back over to Tracy and now we'll go to

Vernon Thorpe afternoon United Launch

Alliance is proud to be supporting

mission for supporting NASA for the

launch of the wise mission this will be

our seventh NASA launch of the year

coming on the heels of some other

well-known missions like nella and Prime

Kepler el rol cross and we've also

supported NASA on some missile defense

agency missions this year as well and

this is a great time to be part of you

away just last week we launched a delta

for from the Cape we launched the wgs 3
mission for the Air Force and that

00:10:16,879 --> 00:10:22,639
marked our 36 launch in thirty six

00:10:19,159 --> 00:10:25,309
months since you will a was formed the

00:10:22,639 --> 00:10:26,480
wise mission we hope if we are launched

00:10:25,309 --> 00:10:29,389
in the next few days will actually be

00:10:26,480 --> 00:10:31,340
the 37th mission in 36 months we have

00:10:29,389 --> 00:10:33,919
until December 14th to achieve that

00:10:31,340 --> 00:10:35,840
milestone because December 14th of 2006

00:10:33,919 --> 00:10:39,169
was our first launch as United Launch

00:10:35,840 --> 00:10:41,629
Alliance the credit for all that goes to

00:10:39,169 --> 00:10:43,429
all of the incredible people at ula as

00:10:41,629 --> 00:10:45,110
well as our government partners like

00:10:43,429 --> 00:10:48,109
NASA who support us on all these

00:10:45,110 --> 00:10:49,940
challenging missions we've been using

00:10:48,110 --> 00:10:51,289
our entire launch vehicle family all
three of our families over the last three years we've been launching Delta fours and Delta tues and Atlas 5s and that we've been launching off of both coasts as you know and I'm happy to say that more than a of those missions have been performed on behalf of NASA counting wise 14 out of 37 missions more than a third of them have been done on behalf of NASA in just 2009 alone we've launched eight Delta tues for from the cape and four from Vandenberg and I would now like to tell you briefly what tomorrow's flight
profile or what Friday's flight profile
is going to look like we're using a
da delta 273 20 configuration as a delta 2
core with three SRBs on the back end we
have a 10 meter or a 10-foot composite
payload fairing protecting the
spacecraft and after liftoff the three
solid motors will burn for about ninety
nine seconds then will jettison those
the central engine the core engine on
the first stage will continue to burn
until about four minutes in the flight
after we run on a propellant on that
stage will separate from the second
stage and will ignite the upper stage

engine for the first of two burns about five minutes into flight during that first stage burn that will jettison the payload fairing because we'll be clear the atmosphere about five minutes later ten minutes in the flight we will complete our first stage burn there are our first of the upper stage burns rather excuse me and then we have a 40-minute Coast period following the end of the 40-minute Coast we light the upper stage engines one more time very short burn only about eight and a half
seconds and then we will use that burn

00:12:28,970 --> 00:12:33,620 to inject the wide spacecraft into the

00:12:30,889 --> 00:12:35,360 orbit it needs to get to and will

00:12:33,620 --> 00:12:37,639 separate the spacecraft from the launch

00:12:35,360 --> 00:12:40,639 vehicle just a little bit less than an

00:12:37,639 --> 00:12:43,789 hour into flight and that's all I have

00:12:40,639 --> 00:12:48,769 back to you Tracy thank you now bill

00:12:43,789 --> 00:12:51,349 iris Thank You Tracy and Vernon pleasure

00:12:48,769 --> 00:12:54,379 for me to represent the wise project

00:12:51,350 --> 00:12:57,290 team Jet Propulsion Laboratory Ball

00:12:54,379 --> 00:13:01,549 Aerospace Corporation and the space

00:13:01,549 --> 00:13:06,919 dynamics lab have have gotten together

00:13:04,938 --> 00:13:09,889 to produce this beautiful instrument I

00:13:01,549 --> 00:13:06,919 can report that the instrument and the

00:13:04,938 --> 00:13:12,679 satellite is is ready to go that the
flight team is ready to go and that

the operations team is ready
to launch and operate wise it's going to

be a very busy time when that 55 minute

point after launch occurs for wise we

will turn the satellite on at about six

o'clock tomorrow morning do some

software loads and some checkouts but

we'll be sitting quietly waiting for the

separation signal from the spacecraft computer when that happens we

have lots to do the first thing we'll do

is phone home will be in our circular

orbit and the wise satellite has a low
300
00:13:49,500 --> 00:13:55,649
gain antenna that's shown up on top here

301
00:13:52,409 --> 00:13:58,860
that low gain antenna will communicate

302
00:13:55,649 --> 00:14:02,610
with the relay satellites above us and

303
00:13:58,860 --> 00:14:05,250
and they should acquire a signal fairly

304
00:14:02,610 --> 00:14:07,220
rapidly we expect anywhere from a couple

305
00:14:05,250 --> 00:14:10,259
of minutes to maybe five or ten minutes

306
00:14:07,220 --> 00:14:12,060
depending on how the Y spacecraft is

307
00:14:10,259 --> 00:14:14,389
tumbling when it separates from the

308
00:14:12,059 --> 00:14:17,659
launch vehicle we expect it will tumble

309
00:14:14,389 --> 00:14:20,549
the satellite is going to be in a

310
00:14:17,659 --> 00:14:23,370
tumbling mode due to the fact that the

311
00:14:20,549 --> 00:14:25,379
separation system is not perfectly

312
00:14:23,370 --> 00:14:27,899
symmetrical we expect that and the

313
00:14:25,379 --> 00:14:29,549
software in the satellite is designed to
cope with that its objective is

eventually to take the solar panel and
point it at the Sun directly so that the
batteries that have been discharged
during the flight can be recharged about
20 minutes after launch another very
important event occurs as as chuck
indicated this is complicated it's not
complicated for us because we're used to
it but we have two solid hydrogen
cryostats that contain about 40 pounds
of solid hydrogen they've been warming
up for about a day and we need to vent
those tanks so that the telescope and
the detectors that WISE will use cool to

their operational temperatures that will

occur automatically at about 20 minutes

after launch and then we have one last

important task to perform which is to

get our bearings with respect to the the

the visible sky in this case we have two

star trackers on the back side of WISE

shown here see here and over here one

there and one there those star trackers

will image the visible sky and they will

determine where WISE is pointed

inertially and with our knowledge inside

the computer we're going to be able to

orient WISE so that it faces directly
out from the center of the earth and is

in its final survey orientation in its

orbit and I have an animation coming

here which which illustrates that orbit

there it is it also illustrates our

model so you can see the various

features of wise you see a lot of

plumbing on the upper part of the of the

instrument on top there that is part of

our complication so here we are wise in

orbit pointing outward scanning the sky

in great circles repeatedly about 5,700

pictures a day and this orbit was chosen

and optimized specifically to do an
all-sky survey in six months so that as

you see as the Earth rotates around the

Sun the orbit plane rotates with it and

and so that after six months the entire

sky can be seen in this orbit and we

will have completed an all-sky survey at

that point in time so here we are we're

oriented in orbit we've got our initial

bearings but we still have lots to do

this occurs after about a day there's

another month of work to do before we

can start our all-sky survey we'll start

with a cover on the telescope to protect

it from any possible deviations from the
normal plan that we have will calibrate our attitude control system and we'll get comfortable with the sequences that we would use to eventually survey this guy after 16 days we'll remove the cover and expose the telescope of lies to the infrared sky that will require further calibrations this will be the first time the wise's eyes the eyes of wives will see the infrared sky and it'll take about two weeks to get those calibrations completed after which time we will begin the the survey that wise will perform so I'm
looking forward to this and we have a couple videos to step back to the kind of our life here at Vandenberg Air Force Base for the last few months this video that you see now shows the flight payload adapter fitting being installed this is the actual hardware the little red hammers you see ur is the separation plane between the spacecraft and the in the launch vehicle here you see wise when it arrived being lowered on to the separation springs that I refer to these are what's one of the three Springs that separates the satellite from the launch vehicle and so there we have the flight
spacecraft and it's solar panels being mounted on the spacecraft the our last step here at Vandenberg Air Force Base was to package wise into its flight conspiration container and move it out to the launch pad and that was a pretty exciting event that i think is shown here in this video you see the container being lowered on top of the double bagged spacecraft very carefully there's not a lot of room on the edge sarah so we've got lots of care being taken there and there we are rolling out of the high bay here at Vandenberg on our way to the
launch pad so we're really excited about

due to you know it's a matter of just

the weather now and captain fry is going
to tell us how good the weather is on

Friday morning or not thank you i am the

launch weather officer for delta 2 y's

the launch weather officers job connolly

commonly called the elbow is to leave

the long to other team to make the final

make the go/no-go call for whether we

have constraints on both sides with the

air force and the range side as well as

ay ula or customer side both are

designed to protect the satellite and
get it into orbit and to protect the public in general that the rocket is successful let me go to the satellite loop that we have currently right now you can see the weather on satellite rolling towards the central coast you can see a lot of the energy going up towards the north but the entire band extends down well to the south and west that's slowly making its approach towards Vandenberg over the next day or so it will continue its march and rain should start falling here at Vandenberg tomorrow around noon or
thereabouts and then we'll continue with

light rain all through the count towards

to the launch forecast for tomorrow

calls for thick clouds in the area and

thick clouds is a one of our constraints

we're not allowed to launch a rocket

that's through a cloud layer that's

greater than or equal to 4500 feet thick

with temperatures between 0 and minus 20

degrees Celsius you can kill the loop

now with those clouds moving our way

even if the rain showers a decrease or

diminish those thick clouds will remain

and that's our main area of concern we

issue what's called a probability of
violation or POV and a POV that tells us how likely we are to break our constraints how likely the weather is to negatively impact the mission our POV right now is eighty percent for those thick clouds some other associated constraints that we're worried about is called are called disturbed weather which has to do with any kind of instability in the area we are worried about that with some moderate rain showers moderate rain showers are also constraint any rain they'll be above the 10,000 foot level is also a
constraint luckily though Delta tues in

December are traditionally hampered by

winds out here on the Central Coast at

this time though the winds are looking

to stay below the 20 not level which is

well below our constraint of 26 to 30

knots for t0 so we're not looking for

that problem however with this system

it'll move through once it gets here to

move through during the day on Friday

another system is quickly approaching

behind that and that will cause problems

for a possible 24 hours scrub if that

were to occur if that 24-hour scrub
occurs the same type of weather happens

however you get the cold front type of weather that comes along with it a few cumulus clouds heavier rain showers and wind so you tie all those together and you have another eighty percent probability a violation for Saturday much the same continues on Sunday the weather finally starts to clear and break up for Monday as ridging and high-pressure move back into the Central Coast giving us fair skies and a light offshore breeze for Monday and into Tuesday that's what
we're worried about right now for delta

00:22:12,929 --> 00:22:16,769
2 y's the launch weather team will be on

00:22:15,359 --> 00:22:18,329
console throughout the throughout the

00:22:16,769 --> 00:22:20,369
count evaluating all the weather data

00:22:18,329 --> 00:22:22,288
that's coming in and giving you the

00:22:20,369 --> 00:22:26,189
final go or the final no go call for

00:22:22,288 --> 00:22:27,808
weather back to you Tracy thank you we

00:22:26,190 --> 00:22:30,120
will now take questions please state

00:22:27,808 --> 00:22:36,808
your name and affiliation and to whom

00:22:30,119 --> 00:22:38,609
your question is directed Scully santa

00:22:36,808 --> 00:22:40,648
maria times in lompoc record can you

00:22:38,609 --> 00:22:43,798
further explain when the clock starts on

00:22:40,648 --> 00:22:48,949
the 48 hours with the wise constraint

00:22:43,798 --> 00:22:48,950
and when exactly that goes into effect

00:22:49,009 --> 00:22:55,740
yeah I'll take that you're talking about
the cryogenic servicing constraint it's
it starts when we disconnect the
cryostat at about launch minus the 19
hours at that point we disconnect
cooling helium cooling firm from the
cryostat and and the hydrogen and starts
to warm and and we can allow it to warm
for two days before we have to reconnect
and cool it that cooling takes about two
days so we have a two day on two day off
two day on cycle which is not common for
for a launch like this and so we're
working with the NASA people too and ula
people to get those cooling days on
rainy days and the punch attempts on

clear days Nora Wallace Santa Barbara

news-press mr. Morse the the wow factor

of the science and this seems pretty

obvious when you start reading about it

but can you explain and perhaps more

layman's terms why this mission is so

important for people on the ground we'll

start with the importance of the

infrared band to begin with and in fact

I would encourage you to make sure if

you're around to ask

scientists later they love to tell you

about Wow and the the infrared is
important to us in astronomy because it shows us where a lot of the cool things are in the universe things much cooler than stars like the Sun and as you saw in the sky maps the the universe looks much different when we're at infrared wavelengths and the wow factor wise is that we're going to go much much deeper 100 times deeper and in some wavelengths and even a thousand times deeper and other wavelengths than we've ever gone before we're going to see in the solar system a hundred thousand new asteroids or more we'll see new structures and
targets in the Milky Way and we're going
to see hundreds of millions of objects

around the sky and open up the extra
galactic full Sky Survey and this is
going to support our other missions that
we have up there flying now and will be
flying in the future and so not only is
why is going to be a fantastic science
mission in itself but the support it
will give to other missions in the
future following a long legacy of
previous sky surveys at other
wavelengths is going to be fantastic for
astronomers to use so why is his legacy
could could literally last decades are
there any further questions with no

further questions this will conclude our

pre-launch news conference our next

event will be the wise mission science

briefing scheduled at 145 for more

information on NASA's wise mission go to

ww na sa gov / wise thank you for

joining us