but good afternoon welcome to NASA

headquarters in Washington my name is

Dwayne brown with the Office of

Communications today's briefing will

preview the Dawn spacecraft upcoming

year long visit to the large asteroid

Vesta will have presentations then we'll

open it up for questions and just a

quick reminder that all of the images

and information you will see today on

the web at WWF.gov/dawn but we can

start it let me introduce you to today's

speakers first up will be Jim Adams

deputy director Planetary Science
Division NASA headquarters Bob Mays Don

project manager Jet Propulsion

Laboratory Pasadena California Chris

Russell Don principal investigator UCLA

and Carol Raymond the dawn deputy principal investigator also from JPL so

with that I'll turn it over to Jim

thanks Duane spend an incredible year

for planetary science we started the

year off with two commentary encounters

and then inserted the messenger probe around the planet mercury and today were

happy to tell everybody about the

opportunity to insert in the dawn
mission into orbit around the asteroid

Vesta one of the largest objects in our

asteroid belt the dawn science campaign

of Vesta will in vail a mysterious world

an object that can tell us much about

the earliest formation of the planets

and the solar system indeed the science

community is very excited about that

opportunity and to study this particular

asteroid up close and personal is a very

unique opportunity Dawn's journey to

Vesta started back in 2007 and since

then it's been steadily thrusting it's

way past Mars and out into the asteroid

Dawn's journey to

Vesta started back in 2007 and since
belt where it's slowly catching up with

44 00:02:09,899 --> 00:02:18,598
the dawn or with the asteroid

45 00:02:13,590 --> 00:02:22,170
the system has enabled this system has

46 00:02:18,598 --> 00:02:24,318
enabled us to not only visit Vesta but

47 00:02:22,169 --> 00:02:27,988
when we're done there will move on to

48 00:02:24,318 --> 00:02:30,179
the dwarf planet ceres the way we can do

49 00:02:27,989 --> 00:02:31,620
that is through an ion propulsion system

50 00:02:30,180 --> 00:02:35,939
that Bob is going to tell us more about

51 00:02:31,620 --> 00:02:38,730
in a few minutes just as unique as the

52 00:02:35,939 --> 00:02:41,128
Dawn spacecraft is its team the dawn

53 00:02:38,729 --> 00:02:43,259
team is going to over the next year

54 00:02:41,128 --> 00:02:46,679
enable us to get a bird's-eye view of

55 00:02:43,259 --> 00:02:49,289
this new world until now it's only been

56 00:02:46,680 --> 00:02:52,620
a fuzzy blob but Chris and Carol have

57 00:02:49,289 --> 00:02:54,539
more to show us about the science of the
asteroid Vesta and why it's important

and plus I believe they're going to have

a sneak peek at some of the earliest

images some of us recall with amazement

seeing those first images from the

Mariner series of Mars and I'd like to

think that this week next week and over

the coming year that that's the kind of

excitement that we're going to see is we

unveil this new world I think that it's

a fantastic opportunity for a young and

old alike to get a sense of just how

vast and unique our solar system is over

the next year the dawn team will paint a
face on that fuzzy blob the pictures

will just get better and better and we'll begin to understand that's an awesome new world and with that I'll give you Bob all right well thank you Jim after traveling for nearly four years 1.7 billion miles and two laps around the Sun Don is finally on our final approach to Vesta today we're only about 96,000 miles away that's about a third of the distance from the earth to the moon our destination is within sight and this team is very excited that we're finally closing in on Vesta and I'm very
pleased to be here today to tell you a little bit about the dawn mission and about the background on how we got here if we could roll the first video you'll see some spectacular footage of the Delta to launch vehicle that started dawn off on this amazing journey back in September of 2007 as you watch that I'll tell you that the dawn mission is unique and that we're going to be the first mission to run with not just one body but two solar system bodies many spacecraft have flown by multiple bodies but Don will be the
first to make an extended port of call

at our two destinations Vesta and Ceres

two of the last unexplored worlds in our inner solar system and

these are large bodies that reside in the asteroid belt between Mars and Jupiter so if we go ahead and roll the second video I'll describe how do we get there Vesta and Ceres like the planets are in orbit around the Sun so to get to

vesta Don is placed into orbit around the Sun and over a period of months and years we shape its orbit to match vesta's orbit we do this with the ion propulsion system which is represented by the blue
glow that you can see in the video after

launch we flew by Mars for a gravity assist in 2009 and we completed almost two full orbits around the Sun well

rendezvous on July the 16th and be captured into orbit around Vesta well orbit Vesta for a year before starting our climb out to series and then we'll arrive in series in early 2015 now to get to these two small bodies as these two bodies is no small feat they're relatively far away from the Sun two to three times farther than the earth and solar energy which powers the spacecraft
is pretty scarce at those distances as

well four to nine times less than here

Thawne has two very large solar arrays

each is 27 feet in length that's about

the width of a singles tennis court and

tip to tip the total wingspan is about

65 feet that's the distance from the

pitcher's mound to home plate on a

professional baseball field this makes

dawn the largest interplanetary

spacecraft that NASA has ever launched

and our journey is made possible by ion

propulsion this advanced sounding
technology has actually been around in

concept for decades you may have even

heard it on this original Star Trek TV

series or in the Star Wars movies you'll

recognize the TIE fighters the twin ion

engines they are impressive ships but we

do them one better on done we actually

have three ion engines on the spacecraft

now these ion engines are very efficient

in the sense that they require very

little propellant

as compared to conventional chemical

systems xenon gas is used as the

propellant and it's ionized by large
electric fields and these ions are accelerated at very high velocities out of the thrusters now this requires a tremendous amount of energy up to 2,500 watts of power which is another reason that the ion solar rays are so large our conventional chemical systems can generate tremendous amounts of thrust and acceleration to use a terrestrial analogy they go from zero to 60 in just a few seconds ion engines on the other hand produced very low thrust about as much as a single piece of paper would push down on your hand so this means we go from zero to 60 in about four days
but the ion engine can continue to
thrust and accelerate day after day
month after month eventually achieving
tremendous velocities over time so with
less than a thousand pounds of xenon on
board over the course of our eight-year mission the ion propulsion system will
provide more than 24,000 miles per hour
of velocity change to put that in context that's about the same we got from the Delta to launch vehicle that
lifted dawn off of the earth so this is truly an innovative technology that enables us to do things and go places
that would otherwise be either very expensive or downright impossible to do.

so now after nearly four years of travel, we've matched Vesta's orbit around the Sun and like two cars traveling together at high speed down the freeway relative to each other they appear to be moving very slowly and as Don and the rest of the team are traveling at tens of thousands of miles per hour around the Sun, Don is closing in on Vesta at a modest 260 miles per hour. So as you watch the last video showing the approach to Vesta, I'll tell you a little bit about the team that
makes this all happen our principal investigator dr. Russell at UCLA leads our mission project management and the flight operations are performed at NASA's Jet Propulsion Laboratory the spacecraft was designed and built by the orbital sciences corporation are capable partners just down the road in Dulles Virginia we have three scientific instruments on Don and I'd like to take this opportunity to recognize and thank the german aerospace agency and the Max Planck Institute for solar system research for
providing and operating the framing

00:09:03,450 --> 00:09:05,850
camera which is going to show you some

00:09:04,799 --> 00:09:08,279
of the images you're going to see in

00:09:05,850 --> 00:09:10,259
just a few minutes also the Italian

00:09:08,279 --> 00:09:12,809
space agency and the Italian national

00:09:10,259 --> 00:09:14,549
institute for astrophysics for providing

00:09:12,809 --> 00:09:17,279
and operating the visible and infrared

00:09:14,549 --> 00:09:19,019
mapping spectrometer and our third

00:09:17,279 --> 00:09:21,029
instrument the gamma-ray and neutron

00:09:19,019 --> 00:09:23,159
detector was built by the los alamos

00:09:21,029 --> 00:09:26,730
national labs and is now operated by the

00:09:23,159 --> 00:09:28,559
planetary sciences institute so in

00:09:26,730 --> 00:09:30,240
addition to our instrument partners RPI

00:09:28,559 --> 00:09:31,979
is assembled a first-rate team of

00:09:30,240 --> 00:09:34,769
scientists and investigators from around
the country and around the globe in this regard Don is truly a shining example of a successful international collaboration and of course no flight operations would be possible without the tireless and dedicated support of the Deep Space Network so today Don is halfway through our three-month best approach phase will capture into orbit in mid-july and spend the next several weeks slowly spiraling into our first science orbit then we will begin the science campaign in the second week of August we've already begun to image our destination and
team is very excited that our destination is finally within sight the image of Vesta is slowly coming into view and I'll now hand you over to dr. Russell to explain the significance of this unknown world that we're about to explore thank you very much Bob as Don principal investigators my job to make sure that the mission achieves its scientific objectives and I will start doing that in earnest very shortly but right now we're all we're doing is taking navigation images and so they're not the scientific product that we will
get but they're very interesting and I'm

the when we do get these images the

pointing at Vesta so it has to turn off

Vesta take the data and then return it

to earth so we only do this about once a

week at least at the start we're picking

up the the speed now and taking them

every twice a week

these images when we're staring at Vesta

we take the order of say 30 once a

minute that order and then you'll since
that's the spins at a degree a minute

we're seeing about 30 degrees in these first few frames and then later we'll see about an hour's worth of images and see it rotate about 60 degrees could we have the first video please so the first image was taken in May and made the third and at that time we were about four times the distance of the earth to the moon now we've got much closer and we are now about half the distance between the Earth and the moon as we take a look at these images we can see features rotating we don't know exactly what they are many of them look like
craters but we're waiting till we get higher resolution to make you know interpretations of what we see whatever is on that surface it's a lot more varied and then we would have thought from the earlier Hubble pictures um now Vesta is no stranger to people on the earth uh because Vesta has been visiting the earth through a set of meteorites that have fallen to earth over the Earth's history and at the present time about one meteorite out of every 20 that falls the earth comes from Vesta and here is an example this one fell in
Australia and we've sliced it to show

the interior of the meteorite you can go
to a store and buy this material is that
common it's not like the lunar samples

we have more Vesta samples than we have

of the moon or Moon and Mars one of the
reasons we're going to Vesta is not only
because it's so

big but it's also one of the earliest
bodies to form in the solar system so

the surface of Vesta will hold a record

of the earliest history of the solar
system and another important thing is

that our understanding of the history of
the solar system tells us that these bodies were on their way to becoming a larger bodies we think of Vesta as a protoplanet it would have grown into a planet had it been allowed to continue but the formation of Jupiter started stirring up that region of the asteroid belt and preventing materials from coming together any longer in fact things started bumping into one another and breaking up so uh that we think that the Vesta is a good example of those early formation the earthly bodies that were forming early in the solar system
however the it's just an example of what

329 00:14:28,610 --> 00:14:34,909 was around and there were other bodies

330 00:14:31,940 --> 00:14:37,010 that came together in the inner part of

331 00:14:34,909 --> 00:14:40,669 the solar system they grew larger they

332 00:14:37,009 --> 00:14:44,328 formed Mars they thrown the earth and so

333 00:14:40,669 --> 00:14:46,429 bodies like Vesta are building blocks we

334 00:14:44,328 --> 00:14:48,139 believe that these were examples of the

335 00:14:46,429 --> 00:14:50,809 building blocks so we're going back and

336 00:14:48,139 --> 00:14:53,208 doing some sort of you know

337 00:14:50,809 --> 00:14:55,879 investigation in our roots of the roots

338 00:14:53,208 --> 00:15:02,208 of the solar system could I have the

339 00:15:04,519 --> 00:15:04,519 next video please this shows basically

340 00:15:02,208 --> 00:15:08,359 an artist conception and animation of

341 00:15:04,519 --> 00:15:11,240 dawn flying over the surface of Vesta

342 00:15:08,360 --> 00:15:13,730 and what you see there are craters and
craters are very important to us on this mission because they excavate beneath the surface our instruments only a sense what's on the surface they're not sensing very deeply only about one meter into the surface at most so these craters are very useful for probing deeper down into the body I'd like to hand over the mic to dr. Carol Raymond dr. Carol is Raymond is the dawn deputy principal investigator and in that role she's been doing most of the scientific planning and she'll tell us more about what dawn is going to do
thank you Chris um so I mean as Chris said I'm going to talk to you about how we're going to explore Vesta over the next year this is an unprecedented opportunity to spend a year at a body that we really know nothing about we're going to do a very comprehensive job of mapping it will be mapping the mineral composition of the surface and in particular investigating the link between Vesta and this class of meteorites which we have in hand on the earth we're particularly interested in a large feature at the South Pole of Vesta
a large crater because we expect it resulted from an impact which was large enough to have blown away the crust and exposed the deep interior of Vesta so we're going to be able to peer into it Vesta by observing within this crater will be imaging to define the surface features of Vesta at both large and small scales and using them to define geologic units based on their colors and textures and we'll be looking at individual lava flows and craters on the surface down to scales of tens of meters so we're really going to get to know the
surface of Vesta and and decipher its

geologic history at a much coarser scale

we're going to be looking at the

abundances of the elements on the

surface and this together with the

mineral composition data is going to

enable us to understand more about the

formation of Vesta the process by which

it just resolved into different layers

and what the impact of initial

conditions was on vesta's evolution then

finally we'll be mapping the gravity

field of Vesta to understand the

internal layering and confirm the

presence of a
core so I'll explain a little bit more than about what the instruments are on
dawn and how we're using them we have
two identical framing cameras from the Max Planck Institute in Germany we use
them one at a time and map the surface in seven color filters whereas most of
the images are in the clear or panchromatic filter we image looking
directly down at Vesta as well as taking data from multiple angles so that we can use the shadows to develop the heights
of the surface using stereo processing
these image mosaics reveal the
information about the craters and

together with the mineral

composition data produce geologic maps

we carry a visible and infrared

spectrometer which measures the spectrum

of reflected light from the surface in

doing the UV to IR range and this gives us

diagnostic information about the

minerals so that we can together with

the camera develop these geologic

mosaics and then decipher the

processes which have been occurring on

the surface to produce the what we're

seeing today on in the next slide coming
up we see two views of Vesta and
reflected light in single bands of visible light and infrared light and
these images were taken from the D visible infrared spectrometer provided by the intern italian national institute of astrophysics and they were taken mainly for calibration purposes so they're very not very well resolved and much lower resolution than the framing camera images you just saw but even at this resolution at 200,000 miles from vest oh we can see some differences in the reflectance of Vesta
between these two wavelengths

00:19:57,089 --> 00:20:06,308
in the next animation we'll be looking

00:20:01,359 --> 00:20:11,139
at a simulation of John being captured

00:20:06,308 --> 00:20:13,839
by Vesta and as we spiral in on approach

00:20:11,140 --> 00:20:16,690
using the ion propulsion system we

00:20:13,839 --> 00:20:18,548
capture and then continue to thrust to

00:20:16,690 --> 00:20:21,100
achieve our first dedicated science

00:20:18,548 --> 00:20:23,529
orbit which is the survey orbit at about

00:20:21,099 --> 00:20:26,769
twenty seven hundred kilometers there we

00:20:23,529 --> 00:20:29,589
turn to Vesta we spend about 20 days in

00:20:26,769 --> 00:20:31,599
seven orbits making low resolution maps

00:20:29,589 --> 00:20:37,119
with the visible infrared spectrometer

00:20:31,599 --> 00:20:40,659
and taking limb mosaic and direct images

00:20:37,119 --> 00:20:43,479
of the surface with the cameras we then

00:20:40,660 --> 00:20:45,820
spend about 28 days thrusting into our
high altitude mapping orbit where we are
spending 30 days making six complete
global mosaics of the surface in the
clear filter and in color filters and in multiple angles to do the height mapping
on we also take a high resolution spectrometer data mainly of the southern hemisphere which is well lit at the time
of this orbit we subsequently spend another 39 days spiralling with the ion propulsion system down to the lowest altitude orbit which is only about 200 kilometers above the surface and there we have enough sensitivity to measure
gamma-ray signatures of the individual

elements and also to map the to be

sensitive to the perturbations of the

gravity field and map the the gravity of

the body after spending our 70 days in

the low altitude orbit we spiral back

out and stop again at the high altitude

orbit to map the terrain which has

become newly illuminated as the the Sun

has moved north relative to Vesta so we

complete our height mapping in that

orbit and then we will continue to

spiral out until we've escaped from

Vesta and on we go to series so while we
take data all types of data in each orbit each orbit is optimized for a particular objective and as I mentioned in survey the field of view of the spectrometer is large enough that we can make a global mapping of the surface so that's our primary objective in that orbit and we do this with the Sun almost directly behind us which is optimum for measuring the reflected light from the surface as we go lower and lower in orbit the Sun angle increases which is better for taking the framing camera data because we'd like to see shadows to
be able to look at the the topography so

500
00:22:43,809 --> 00:22:48,339
as we go lower we still obtain higher

501
00:22:46,569 --> 00:22:52,179
and higher resolution spectrometer data

502
00:22:48,339 --> 00:22:57,519
but it's it's not as complete or as

503
00:22:52,180 --> 00:22:59,680
high sensitivity as above when we we

504
00:22:57,519 --> 00:23:03,009
designed our low altitude orbit mapping

505
00:22:59,680 --> 00:23:05,019
mapping orbit to be able to resolve the

506
00:23:03,009 --> 00:23:07,480
individual elements and the ratios of

507
00:23:05,019 --> 00:23:09,670
those elements which tell us about the

508
00:23:07,480 --> 00:23:12,250
chemical evolution of the surface of

509
00:23:09,670 --> 00:23:14,560
Vesta and enough resolution in the

510
00:23:12,250 --> 00:23:18,970
gravity field to be able to understand

511
00:23:14,559 --> 00:23:23,500
the internal structure and then the next

512
00:23:18,970 --> 00:23:26,769
animation we see in a notional sense the

513
00:23:23,500 --> 00:23:29,680
spacecraft in its high altitude mapping
orbit Vesta is rotating at about five

point three hours and this is a 12-hour orbit so we see coming down the lit side

of Vesta taking the framing camera

images which are the blue squares and we also see that co-located with the framing camera inches is the the green slit which is the vir spectrometer when the spacecraft's on the dark side of Vesta is turning to earth and it's sending those data back before it comes around and starts again we do take these images constantly in in swathes as the body rotates under us and in that manner
we build up complete coverage of the

surface over ten orbits and then we do

this six times

so I'd like to return then to the last

rotation movie we took a vest on June

twentieth and talk a little bit about

why anybody should care about the dawn

mission in this animation we compare the

data from Hubble Space Telescope to the

latest data from dawn they're rotating

in the same manner and what we see is

the intriguing patterns of bright and

dark and the ellipsoidal shape of Vesta

resolved by the Hubble Space Telescope
has now resolved into a very complex pattern of brightness variations on the surface of Vesta and intriguing suggestions of topography making it obvious why it was really worth getting to this body once we fully mapped the chemical nature of the Vesta surface and understand its relationship to the meteorites right it's geologic history understand its topography and it's gravity field we're going to begin to understand the role of Vesta size the timing of its formation in its bombardment history in the history and
creating the protoplanet that we see

today and this protoplanet is Chris that

is literally a building block of the

terrestrial planets this will give us

better tools to understands the

thousands of fragments that are out

there in the asteroid belt that and

understand better than how they

contributed to shaping our planetary

neighborhood so in the course of

preparing all the science observation

plans for done it's become clear that

this tiny world has huge importance vest

is a window into the early origins of

our solar system and the terrestrial
planets and as we explore Vesta we take

a virtual journey back in time to the

beginning of the solar system we're all

extremely excited or literally on the

edge of our seats

waiting for the status come in and we

would like you all to come on the

journey with us thank you thank you

Karen okay so we're going to now

transition into questions and before we

go to the phone bridge i would like to

remind our audience out there that all

of the information is on the web at wwc

gov / dawn
let's go to the LA Times Tom ah when you
say one in 20 of the meteorite to reach
Earth come from Vesta I mean can you explain that are these the rubble that surrounded in orbit are they coming
being knocked off fester or what do you mean precisely that if you take a look
at the pictures we just showed you'll see that the surface is heavily cratered
er appears to be and it's very irregular
so over the years much material has been knocked off the body and is floating
between us and the earth or the earth and Vesta and it gets into gravitational
resonances with Jupiter and get scattered towards the Earth and so there's this constant stream almost like a highway of material from the neighborhood of Vesta the stuff that was knocked off perhaps originally four billion years ago but maybe some only one billion my thumb maybe just a million years ago and that makes its way to the earth and falls through the atmosphere and we pick it up on the surface of the earth now having said that these are from Vesta all I can say is that this material has the same reflectivity as
Vesta the same sort of inferred

00:28:17,720 --> 00:28:23,600
composition as we'd expect from Vesta it

00:28:20,779 --> 00:28:28,029
looks like it was formed on the surface

00:28:23,599 --> 00:28:30,740
of a body about the size of Vesta and it

00:28:28,029 --> 00:28:34,839
the material that comes down to earth

00:28:30,740 --> 00:28:38,779
shows the evidence of heavy bombardment

00:28:34,839 --> 00:28:41,659
so we put all that information together

00:28:38,779 --> 00:28:44,149
and we believe that the original source

00:28:41,660 --> 00:28:49,910
the ultimate source of this material was

00:28:44,150 --> 00:28:51,440
Vesta itself ok our next caller is Pete

00:28:49,910 --> 00:28:57,710
spots on the Christian Science Monitor

00:28:51,440 --> 00:29:01,460
Peter you there yeah can you hear me go

00:28:57,710 --> 00:29:02,450
ahead hello we can eat you yeah but the

00:29:01,460 --> 00:29:05,840
question I have

00:29:02,450 --> 00:29:08,630
oh good good okay thanks yeah I was
wondering uh were sort of getting to it

when you were showing the Hubble images

but I wonder with the the support you

may have been getting over the last

couple of years from Hubble and from

ground-based observatories I wonder if

there are any examples of sort of

specific observations that have tended

to to wet your folks appetite for this

understanding the excitement level

already is pretty high well we have in

the audience here with us is john young

lee who was one of those who took the

hubble their most recent hubble pictures
and so if to as a typical excited observer let's ask John Young what has
whetted his appetite well um previously Hubble has give us a lot of support to
observe Vesta and in the mission and um they are they were totally for HST
hubble space telescope observations of Vesta and we use those images to map
vestas northern hemisphere southern hemisphere and also team for the shape
of Vesta and most recently are we use Hubble images to to improve the poor
entation of Vesta and that has kept on a lot of help in the chocolatey trajectory
design and long-term planning but you know the limit of hobo is that it is near the earth and it's very far from Vesta so the spatial resolution is very low and that's why we still need on to go there and get a get us a lot more information about Vesta okay well actually I have a question has come in we have a lot of media watching this and also some museums and the question is form of the comm comms that talk about careers and scientists and engineers when I get together exciting things happen so they would like a question on
for each of you what inspired you all to

00:31:05,569 --> 00:31:11,750
go on your respective careers Jimmy

00:31:08,329 --> 00:31:16,250
wants nothing that's too long a story

00:31:11,750 --> 00:31:19,490
Duane actually my father

00:31:16,250 --> 00:31:22,700
I was in the aerospace industry and

00:31:19,490 --> 00:31:27,200
worked on the Apollo LEM and encouraged

00:31:22,700 --> 00:31:29,420
me to pursue my talents in science and

00:31:27,200 --> 00:31:31,190
math and so I went to college and I got

00:31:29,420 --> 00:31:34,250
a degree in physics and found that i

00:31:31,190 --> 00:31:36,080
liked it and over time ended up back in

00:31:34,250 --> 00:31:40,490
the aerospace industry just like my dad

00:31:36,079 --> 00:31:42,349
oh okay well I grew up in Florida which

00:31:40,490 --> 00:31:45,140
was not too far from the kennedy space

00:31:42,349 --> 00:31:48,279
center so i could actually watch the

00:31:45,140 --> 00:31:51,350
space shuttle as it was launched and so
that in addition to an interest in science and engineering led me to a degree in aerospace engineering at Purdue University and of course that led me to the Jet Propulsion Laboratory.

Chris well when I was in high school I took an aptitude test and the guidance counselor came up to me and said you should be an engineer uh and I said engineer maybe you know I rather do science okay so I started you know taking courses that prepared me for doing scientific research and when I got my bachelor's degree I really didn't
know exactly I mean there's a you know a lot of boring things you can do in physics and I had got to prepare myself well in physics but look choosing between these various things was a little bit difficult but I took a summer job in which I worked on satellite data we were taking observations basically of the Sun using measurements in the Earth's ionosphere and I like that of course then the summer was over and that's the problem with summer vacations you know you have to then hit back into the real world and so I went into a
physics department and started to do

some of these things that you know large
teams of two hundred physicists do ah

and I said you know maybe maybe there's

some space physics around here that so I

went around the University and talked to

people and I found a group that was

working in space I said do you have room

for another person and they said yes and

that started me off

and I just have been lucky ever since of

being able to get into exciting projects

and go to one stage of exploration to

another and I've been very very lucky in
my career oh yeah I always loved science

00:33:44,849 --> 00:33:52,139
in school and I studied geology and

00:33:48,929 --> 00:33:54,750
physics got a degree in both and then

00:33:52,140 --> 00:33:56,370
went on to grad school and while I was

00:33:54,750 --> 00:33:58,529
getting my degree at Columbia University

00:33:56,369 --> 00:34:01,529
I was studying the floor of the ocean

00:33:58,529 --> 00:34:04,589
and how the interior of the earth

00:34:01,529 --> 00:34:06,509
corresponded and you know various

00:34:04,589 --> 00:34:09,840
things about the dynamics on the

00:34:06,509 --> 00:34:13,108
interior of the earth but during that

00:34:09,840 --> 00:34:15,059
time was a time when earth observation

00:34:13,108 --> 00:34:18,418
from space was becoming more and more

00:34:15,059 --> 00:34:20,878
common and I started to pull in

00:34:18,418 --> 00:34:23,730
satellite data sets to to get a

00:34:20,878 --> 00:34:24,989
different view of things and before I
knew I was working at the Jet Propulsion lab trying to help with getting gravity and magnetic field satellites launched around the earth but you know a geophysicist on the earth is no different than a planetary scientist at Mars pretty much interested in the same things and the data from the Mars Global Surveyor began to come in and opened a whole new view into Mars's history which then just became incredibly interesting so at that point I really started to invest most of my time into planetary scientist and the
evolution of terrestrial bodies of which

Vesta is one we call it the smallest
dressed real planet and it's it's very
you know as a lot of the things are
going on there are not that much
different than what happens on the earth

but I'll also say that I think what
really drove me and a lot in my career

was the desire to explore to always go
to new places to see new things I've
done a lot of research in Antarctica

I've sailed on ships surveying the ocean

and taking this virtual journey is very

similar in terms of the excitement level
and just a wonderful feeling of achievement you get when you've done something really really really interesting so thank you all let's go take at least another call from our phone line now let's go to mike wall from space com Mike are you there oh um yeah sure can you guys hear me go ahead Mike yes alright yeah I was just hoping that you guys can actually talk a little bit about what it's going to be like to have to be captured by by this objects gravity are you concerned at all I mean is this going to be a very complicated
maneuver or a tricky one because it's

00:36:28.710 --> 00:36:32.699
it's relatively a small body it

00:36:31.230 --> 00:36:34.860
doesn't have all that much gravity I

00:36:32.699 --> 00:36:36.359
mean is this like a like a very

00:36:34.860 --> 00:36:39.030
complicated maneuver that you're going

00:36:36.360 --> 00:36:42.300
to be doing to actually to go into orbit

00:36:39.030 --> 00:36:45.570
around dusta okay I'll go ahead and take

00:36:42.300 --> 00:36:47.460
that one it turns out that this is a

00:36:45.570 --> 00:36:49.440
different type of encounter than we're

00:36:47.460 --> 00:36:51.389
used to with most of either the

00:36:49.440 --> 00:36:52.980
planetary types of encounters that

00:36:51.389 --> 00:36:55.170
you've seen that have the critical orbit

00:36:52.980 --> 00:36:57.210
insertion burns and it's also different

00:36:55.170 --> 00:36:59.280
than the small body flybys that we've

00:36:57.210 --> 00:37:03.780
seen on some of the recent missions as
well Vesta is not a tiny small body like a temple or Hartley or any of those which were only just a few kilometers very small traveling at very high speeds vestas large as 500 kilometers across it has a small but a significant amount of gravity and so being captured by vestas gravity is is not a problem it's not challenging we're all so different because we're using our ion propulsion system to capture into orbit around Vesta as opposed to more conventional missions that use a chemical system where they have a specific burn that has
to happen at a very specific time with the ion propulsion system again we're just shaping our orbit to gently pace vestas orbit around the Sun and so at that point we really just slowly rendezvous with Vesta and slowly captured by into orbit around it and it's a so very slow smooth gradual process that happens very gently on this mission as opposed to some of the more conventional missions that we've seen in the past okay we're going to go ahead and wrap it up I want to thank you all for joining
us congratulations to the dawn team and

again visit w wa gov / dawn finds never

sleeps

you