the moon our nearest celestial neighbor

has intrigued and inspired us since the

dawn of humanity during the Apollo

program 12 astronauts landed on its cold

and cratered surface but they couldn't

stay now NASA's constellation program

begins a new journey to live and work on

the moon setting the stage for future

long-duration human exploration today

two spacecraft Scouts are poised to lift

off together aboard a powerful Atlas 5

rocket on the first launch at this new

era

they are the lunar reconnaissance
orbiter and the lunar crater observation
and sensing satellite or LRO and LCROSS
one rocket one destination two critical
missions together they're helping us
pave the way back to the moon
welcome to the show I'm your host George
Diller I'm here at NASA's Kennedy Space Center in Florida
inside the Apollo Saturn v Center behind
me is an actual massive 363 foot long
Saturn 5 rocket just like those but
boosted the Apollo astronauts on
America's first human missions to the moon
today NASA is preparing to return
to the moon

beginning with the Lunar Reconnaissance Orbiter and a lunar crater observation and sensing satellite this upcoming launch aboard an Atlas 5 rocket is the critical first step in the new constellation program on today's show.

we're going to take you inside both of these exciting missions and find out what it takes to launch two spacecraft at once our first guest is Kathy petty deputy project manager for the Lunar Reconnaissance Orbiter she stopped by the NASA direct studio to give us the
inside story on this moon mapping

mission the lunar reconnaissance orbiter

project or LRO's main goal is we're

really the first mission the first step

that NASA's taking back to exploring our

universe and so what we really need to

do is have a reconnaissance mission you

know get more data one of the things

that we want to do is go back to the

moon you know we've been there before we

we have really awesome datasets from our

previous missions from the Apollo era to

to the other spacecraft that have gone

so we want to build upon those datasets

that we already have and and most of
those datasets really focused on the equatorial region of the Moon so now we want to go back and say hey let's map the entire moon so so have more of a global perspective or a comprehensive atlas of the moon and help whoever wants to join us in exploring our universe or or taking that next step back they need to have a more comprehensive atlas of the moon so that they know where to go what to do what to expect that they help them out we're like a scout mission for the for the exploration well well roughly a couple of days after
we've launched we will begin what we call the lunar orbit insertion burn

and that burn will help us or help the moon and us get captured by the moon

and so what happens during that burn is LRO starts to get closer to the moon and the moon will capture LRO and once once

once we have that confirmation that the moon is captured as we call that lunar acquisition and then after we have lunar acquisition for we're sure that we have a stable orbit then we will begin a series of burns that are roughly a day apart from each other series of four or
five burns that begin to lower LRO into
her final orbit which is roughly 50
kilometers above the moon or 31 miles
and that's LRO's polar orbiting orbit
we're where we lower the spacecraft low
enough so that so that the instruments
can focus on the surface of the moon and
begin the data collection that that is
what our mission is all about to create
that comprehensive atlas of the moon now
an interesting offshoot of our data is
that our data will also be made
available to Google moon so that anyone
that has access to the web or Google
will be able to punch in I don't know

one like Shackleton crater and be able
to see all the cool data from LRO pop up

radon they're their own personal
computers at home NASA we're all about
exploring and pushing our our knowledge
across the boundaries and and LRO even
though taking us back to the moon where
we've been before that there's a lot
about our moon that we don't know and a
lot about our moon that we want to use

as we begin to look out into the
universe and decide you know where we
want to go next so having a
reconnaissance or a scout mission that
that that begins to take us out is

perfect fit into what NASA is all about

and what people like me who've dreamed about working for NASA they've always wanted to do you know explore

look out beyond who and what we are

today and LRO is the perfect fit for that type of vision for all now that we know what to expect from the Lunar Reconnaissance Orbiter we turn our attention to its sister payload the lunar crater observation and sensing satellite its goal is to hunt for evidence of water ice using a hard
hitting method dr. Kimberly Enic oh well

cross payload specialist explains Lcross mission has to impact events the

first is the upper stage of the launch

vehicle that we take with us on our four-month mission into space and we separate from it and it's traveling to hit the moon at 5,600 miles per hour

it's going to impact one of these lunar permanently shadowed basins of a crater on the lunar poles and it's going to hit a particular place it's going to hit a place on the moon that we think there's water scientists who believe that there
is water on the moon don't know whether it's smooth or chunky peanut butter type so where you hit is important the secondary impact is the L cross payload which will impact somewhere between three to five kilometers away from the first impact so we're gonna hit another part of that crater we've targeted this crater because it's got a strong hydrogen concentration we're gonna sample two parts of this crater and so the two impact events will tell us something about the distribution of this hydrogen concentration or perhaps a
distribution of water if the hydrogen is

00:07:13,439 --> 00:07:15,589
in

00:07:16,100 --> 00:07:23,400
the live images of our what we're taking

00:07:20,850 --> 00:07:24,900
with our science payload as we're going

00:07:23,399 --> 00:07:27,629
into the surface for the last four

00:07:24,899 --> 00:07:29,819
minutes of the mission which is 600

00:07:27,629 --> 00:07:36,990
kilometers down to the surface will be

00:07:29,819 --> 00:07:39,300
stream live on a public channel L course

00:07:36,990 --> 00:07:41,639
is important because that it provides us

00:07:39,300 --> 00:07:45,509
a way to confirm the presence or absence

00:07:41,639 --> 00:07:48,120
of water ice at a particular location on

00:07:45,509 --> 00:07:53,579
the lunar pole there's water ice there

00:07:48,120 --> 00:07:57,449
or water in some form it means that for

00:07:53,579 --> 00:07:59,639
future missions to the moon and perhaps

00:07:57,449 --> 00:08:01,740
beyond there's there an institute a
resource that's there a resource that's
on the surface of that planet you
don't need to bring it with you so for
the human species in terms of exploring
the rest of the solar system so getting
out of low Earth orbit and we need
water with us if we can find a resource
of water on the moon that will be an
amazing step forward and a great
resource to take advantage of in a very
resource limited place
you