several billion years ago Mars was vastly different than it is today evidence taken so far it was a very wet environment rivers lakes perhaps even oceans on the surface of Mars a thicker atmosphere Mars as we know it is a barren planet of extreme temperatures and the thinnest of atmospheres an environment too hostile to sustain even microbial life but has this always been the case a variety of spacecraft launched in recent years have examined the red planet's landscape up close and surveyed it from above and discovered
intriguing signs of an ancient watery world now scientists seek to understand what could have caused such a dramatic change on a planet so near our own a new nasa mission called maiden is heading to Mars to investigate maven is the first mission that we've sent to Mars that has the primary goal of understanding the upper atmosphere and what we're trying to do with maven is to learn how the atmosphere changed over time and why we think that the atmosphere had a lot more water a lot more carbon dioxide early in history when a lot of the water related
features we see on the surface were carved what we're trying to do is to determine where did the water go where did the co2 go from that early environment the nearly three ton maven spacecraft is designed to look at the red planet in a whole new way instead of focusing on the Martian surface maven will keep its eyes trained on the upper atmosphere maven which stands for Mars atmosphere and volatile evolution is fundamentally different from the Mars missions that have gone before Rovers such as curiosity opportunity and spirit
and orbiters like Mars Odyssey and the Mars Reconnaissance Orbiter when you look at the other spacecraft that have gone to Mars each one of them has explored a different piece of the mars system and with maven were exploring the single biggest unexplored piece of Mars so far after a ten-month journey from Cape Canaveral Florida to Mars navin will arrive at the red planet on tember 22nd 2014 the spacecraft then we'll slip into Martian orbit and after another five and a half weeks of checkout it will be ready to spend the next earth year carrying out its
assignment the laboratory for atmospheric and space physics at the University of Colorado Boulder leads the scientific portion of the mission while NASA's Goddard Space Flight Center in Maryland is responsible for the overall mission management. MAVEN is an 8-foot Q weighing about 5,400 pounds at launch as much as a fully loaded sport utility vehicle with its twin pairs of goal wing-shaped solar panels fully extended. It stretches 37 feet from wingtip to wingtip and maybe brings with it eight instruments designed to take a variety
of measurements throughout Martian orbit

in every region near Mars space built by

Lockheed Martin Space Systems the

spacecraft makes the most of every

available spot for these scientific

sensors after a series of tests to prove

the spacecraft can handle the rigors of

launch and the extremes of deep space it

was flown to NASA's Kennedy Space Center

in Florida aboard an Air Force c-17

cargo aircraft with maven on-site at the

spaceport the final preparations for

liftoff intensified and excitement

continued to build as the milestones
were checked off it makes it all so real

to see all this right behind you so

there's a tremendous amount of excitement not only from the team but our friends and family coming down to watch this launch its kind of the culmination of a lot of years of hard work by the team getting maven safely off the ground and honest path to Mars is the job of NASA's launch services program based at Kennedy LSP has been preparing for maven for about five years and and maybe a little bit longer if you look at the announcement of
opportunities that came up before that

so it's been quite a while

it's coming to maturity now the Maven

mission only has 20 days to launch

before it's window of opportunity closes

for about two years that's because of

the periodic alignment of the Earth and

Mars orbits the Sun about half as

fast as the earth does so that means

that every 26 months the Earth and Mars

are sort of aligned again so that it

takes the least amount of energy for a

rocket to deliver a spacecraft to Mars

mavens ride to space is the Atlas 5

rocket a reliable workhorse with a
history of success for NASA missions

including the Mars Science Laboratory

mission featuring the Curiosity rover

while the Atlas 5 was ready for flight

and a hangar at the Atlas spaceflight

Operations Center or a sock on Cape Canaveral Air Force Station maven was

sent to Kennedy's payload hazardous

servicing facility for one last round or

checkouts tests and closeouts the

processing team did face one significant

challenge with less than two months and

to lift off a 17-day government shutdown

that briefly halted pre-launch
activities it's kind of like a hurricane

we have hurricane plans but we don't

have a government shutdown plan so

that's a hurdle we overcame it we're

moving forward and we're ready to hit

the beginning of the window luckily our

launch vehicle contractor was not

affected as much by the shutdown and the

work continued there so we're able to

press forward we were able to get a

limited crew in here to be able to work

things today maven is still aiming for

the same launch period the team targeted

from the start and we lift off right
around the corner everyone is looking forward to seeing this spacecraft begin its mission of discovery way back in 2008 we proposed for a launch date of November 18 2013 and we're running right to it. it's quite an accomplishment by the team we're really exciting we're so close now we were headed to Mars this is all-consuming I don't know how to do anything except talk about maven anymore at least that's what my wife tells me and to see it come together now to see it today just about ready to go I'm
beside myself launch day arrives

managers and controllers from NASA's

launch services program United Launch

Alliance and the US Air Force along with

the spacecraft team report to their

consoles in launch control for the start

of the countdown by this time a maven

spacecraft is sealed in its protective

payload fairing atop the Atlas 5 rocket

on the launch pad at cape canaveral

everybody has butterflies

going into launch date no matter how

much you plan and how much you practice

there's always things that come up at

the last second that make you nervous e
we have a very good team to overcome

those but you never know what's going to come up and and grab your attention and

so you will have to be ready and able to do that the launch team the launch vehicle people the spacecraft people

these are the ultimate professionals who are doing their best to make sure everything works properly not only on launch day before the whole mission and I've got absolute faith in their ability to deliver a spectacular liftoff might be the most visible ones don't launch day but a successful climbed
space is only the beginning after the Atlas booster and centaur upper stage have carried me even out of the grasp of Earth's gravity another critical element remains the spacecraft must deploy a solar arrays and lettuce caretakers on earth know that it's healthy on the right path when you get a positive confirmation that the spacecraft has successfully separated from the second stage and it's on its trajectory and on its way to Mars that's always very exciting all that work that you've done over the past meal five to seven years
pays off what will may even discover

what we learn about our neighboring planets past and what might this new information teach us about our own planet I'm just hoping that we'll get there and get the data to answer these questions about where did the water and the co2 go I don't really have a prediction or an expectation of what the answer is going to be I'm just hoping we can get that answer

the thing about exploration is sometimes you don't know what you're going to find until you get there so we're going to be
exploring this this planet there's going to be discoveries that I believe that the scientists had quite thought of that are there going to be very compelling to unlocking the secrets of Mars