however the serial gravity of orbit costs its physiological changes and weakening of the bones as well as creating practical problems with live lives etc one would therefore want any long-term base for human beings to be on a planet or moon by digging into the surface one would get thermal insulation and protection from meteors and cosmic rays the planet or moon could also serve as a source of the raw materials that would be needed if the extraterrestrial community was to be self-sustaining independently of
Earth what are the possible sites of a human colony in the solar system?

The most obvious is the moon that is close by and relatively easy to reach. We have already landed on it and driven across it in a buggy. On the other hand, the moon is small and without atmosphere or a magnetic field to deflect the solar radiation particles like on earth.

There is no liquid water but there are craters at the North and South Poles, a colony on the moon.

Renewed this as a source of oxygen with power provided by nuclear energy for
solar panels the moon could be a base for travel to the rest of the solar system Mars is the obvious next target that is half as far again as the Earth from the Sun and so receives half the warmth that once had a magnetic field but a decade for a billion years ago living Murs without protection from solar radiation the script mersa most of its atmosphere living it with only 1% of the pressure of the Earth's atmosphere however the pressure must have been higher in the past because we see what appear to be runoff candles and dried up
leaves live with water cannot exist on Mars now that would be Paris in the near vacuum this suggests that Mars had a warm wet period during which life might have appeared ether spontaneously Burt Rutan spermy oh there is no sign of life on Mars now but if we found evidence that life had once existed that would indicate that the probability of life developing on a suitable planet was early hi nASA has sent a large number of spacecraft to Mars starting with marina for in 1964 that has surveyed the planet with the number of orbiters the latest being the Mars Reconnaissance Orbiter
these orbiters have revealed deep

blowies and the highest mountains in the

solar system NASA has also landed a

number of probes on the surface of Mars

most recently but who Mars rovers each

have sent back pictures of a dry desert

landscape however there is a large

quantity of water in the form of ice in

the polar regions a colony on Mars could

use this as a source of oxygen

there has been low ionic activity on

Mars this would have brought minerals

and metals to the surface which our

colony produce the Moon and Mars are the
most suitable sites for space colonies

in the solar system Mercury and Venus are too hot while Jupiter and Saturn are gas giants with no solid surface

the moons submerge are very small and have no advantages over MERS itself

some of the moons of Jupiter and Saturn might be possible in particular Titan a moon of Saturn that's larger and more massive than our Moon and has a dense atmosphere

the cassini-huygens mission of NASA ESA has landed a probe on Titan which has sent back pictures of the surface
however it is very cold being so far

from the Sun and I will be fancy living

next to a lake of liquid methane what

about beyond the solar system our

observations indicate that a significant

fraction of dearths have planets around

them so far we can detect only giant

planets like Jupiter and Saturn but it

is reasonable to assume that they will

be accompanied by smaller earth-like

planets some of these low lie in the

Goldilocks zone where the distance from

the stars in the right range were lived

with water to exist on their surface
they're around a thousand stars within
30 light years of Earth if one percent
of these Huebner science planets in the
Goldilocks zone we have 10 candidate new
worlds we can visit visiting them with
current technology but we should make
interstellar travel a long-term aim by
long-term I mean over the next 200 to
500 years the human race has existed as
a separate species for about 2 million
years civilization began about 10,000
years ago and the rate of development
has been steadily increasing if the
human race has to continue for another
million years we will have to boldly go
where no one has gone before

thank you for listening

Thank You professor Hawking for that

series of insights and a challenge to us

all I believe now for those of you that

wanted to do flash photography it would

be okay for a few moments and I invite

you all to head upstairs for a very nice

reception courtesy of our sponsor

Lockheed Martin thank you all