

The X Prize - Race to the Moon

Kelly Blasberg, Steven Blasberg, Jesse Hall, James Linnell, Alexander Nabavi-Noori, Parker Robinson - Palm Desert Middle

Leslie Barba, Mekai Ely, Rosaleen Escareno, Sonia Gonzalez, Stephanie Olivas, Giselle Quintana-Reyna - Abraham Lincoln School

THE X PRIZE- RACE TO THE MOON



"THE BEST WAY TO PREDICT THE FUTURE IS CREATE IT YOURSELF."

PETER H. DIAMANDIS [2]

"A small group of people with passion for a cause can achieve that which has never been attained."

The Board, X Prize Foundation [1]



The future as imagined in 1958.[3]

X PRIZE FOUNDATION MISSION

**BRING ABOUT RADICAL
BREAKTHROUGHS FOR
THE BENEFIT OF
HUMANITY**

**DRIVE INNOVATORS TO
SOLVE THE GREAT
CHALLENGES FACING
MANKIND TODAY**

**DEVELOP PUBLIC
INTEREST AND
ENTREPRENEURIAL
SPIRIT IN ISSUES THAT
REALLY MATTER**

**CREATE MONUMENTAL
CHANGE IN PUBLIC
PERCEPTION OF THE
DEVELOPMENT OF
FUTURE TECHNOLOGY [1]**

THE STORY SO FAR...

The X Prize Foundation, a non-profit educational organization, offers incentives for innovative solutions to specific challenges. On Oct. 4, 2004 the \$10 million Ansari X Prize was awarded for suborbital space flight to Mojave Aerospace Venture led by Burt Rutan, aircraft designer, and Paul Allen, cofounder of Microsoft. Twenty-six teams from 7 countries competed for this largest prize in history. Today there are several X Prize competitions in progress in different areas like genomics, automotive, and space exploration.

The idea for X Prize came from the mind of Dr. Peter Diamandis. His innovative idea to develop a competition with stringent rules and practical application has captured the public imagination. By the time a team has a winning solution, real breakthroughs have been developed that can potentially benefit all of us. [1]

LUNAR ADVENTURE - OVERVIEW



THE 'BOTGUY' [4] ROVER MAKES IT TO THE MOON
AND WINS THE GOOGLE X PRIZE [7]!!!



GOOGLE X-PRIZE

\$30 MILLION TO BE AWARDED FOR ROBOT LUNAR ADVENTURE

Why a New Moon Race?

There's already been a moon race. The U.S. won. We went to the moon on five Apollo missions from 1969 to '72. We brought back rocks, we did science experiments, and we rode our moon buggy all around. That was over 30 years ago. So, why go back? Why go to the moon now? Why put up \$30 million to start a new moon race?

The Google X Prize will encourage man to go back to the moon. The governments haven't used the new technology developed since the 1960's to make it possible to travel to the moon, so private enterprise needs to do it now. The \$30 million will get people excited about a new moon race. [1]

Why go to the Moon and not Mars?

Scientists think that space exploration is important to our survival as a species. The moon is important to space exploration. It is 22 times easier to launch a spaceship from the moon than the earth. The moon is close enough to radio control lunar robots from the earth. Lunar robots could prepare for people to go to the moon. We could learn how to protect people from cosmic and solar radiation, how to 'live off the land' by mining for materials to produce oxygen, power and building supplies, and how long periods of time away from earth gravity effect humans. There are a lot of questions that could be answered on the moon. We could learn a lot about exploring space by sending people to live and work on the moon. Lunar colonies would be close enough to earth to return quickly or be able to rescue if something goes wrong. Mars on the other hand is very far away. We need to practice living in space before we attempt to send a man to Mars.

The lack of atmosphere means you can use electric motors to launch instead of expensive rockets. The lunar soil of regolith is made of silicon, aluminum, iron and other metals. Silicon could be used to make solar panels that could be used in a lunar solar power satellite. Clean energy could then be sent back to earth even during the night. Helium 3 could be mined on the moon and provide low-radiation fusion fuel. There are many volatiles on the moon that could be mined for use there or for export to the earth. [5]

GOOGLE X PRIZE RULES

OFFICIAL GUIDELINES

1. DESIGN, BUILD AND LAND A PRIVATELY FUNDED CRAFT ON THE MOON.
2. TRAVERSE THE LUNAR SURFACE FOR A DISTANCE OF AT LEAST 500 METERS.
3. COMPLETE SPECIFIC MISSION GOALS
4. TRANSMIT TWO 'MOONCASTS' BACK TO EARTH.

\$20 MILLION GRAND PRIZE

SOFT LAND A CRAFT ON THE MOON THAT TRAVELS 500 METERS AND SENDS A MOONCAST TRANSMISSION BACK TO EARTH.

TIMELINE:

\$20 MILLION BEFORE DEC. 31, 2014; \$15 MILLION AFTER UNTIL DEC. 31ST, 2014

\$5 MILLION SECOND PRIZE

COMPLETE THE MISSION IN 2ND PLACE

TIMELINE:

AVAILABLE UNTIL DEC. 31ST, 2014

BONUS PRIZES FOR ADDITIONAL TASKS - \$5 MILLION

ROVE 5,000 METERS

TAKE PICTURES OF HUMAN ARTIFACTS FROM PREVIOUS LUNAR MISSIONS

DISCOVER WATER/ICE

SURVIVE THE LUNAR NIGHT (14.5 EARTH DAYS)

MOONCAST REQUIREMENTS

DIGITAL DATA COLLECTED AND TRANSMITTED TO EARTH

HIGH RESOLUTION 360 DEGREES PANORAMIC PHOTOGRAPHS FROM THE SURFACE OF THE MOON

SELF PORTRAITS OF THE ROVER ON THE SURFACE

NEAR REAL TIME VIDEOS OF THE LUNAR ROVER

HIGH DEFINITION VIDEO

FIRST MOONCAST

CACHED DATA (EMAIL) ALONG WITH FOOTAGE OF THE ARRIVAL ON THE MOON

SECOND MOONCAST

PICTURES AND VIDEO OF THE ROBOT'S JOURNEY ROAMING THE SURFACE [6]

MISSILE TO THE MOON

**NOW YOU CAN
BUY A RIDE
TO THE MOON**

OUR ROBOT IS HITTING A RIDE WITH SOME SATELLITE FRIENDS

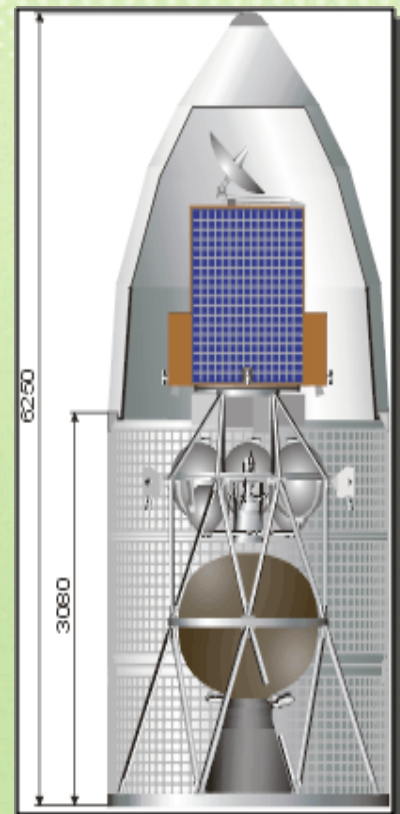
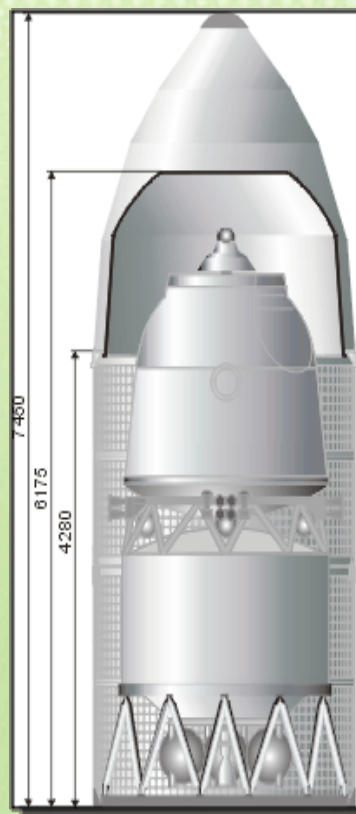
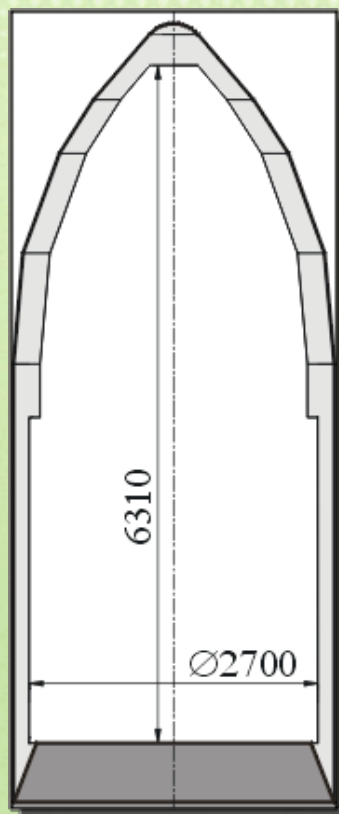
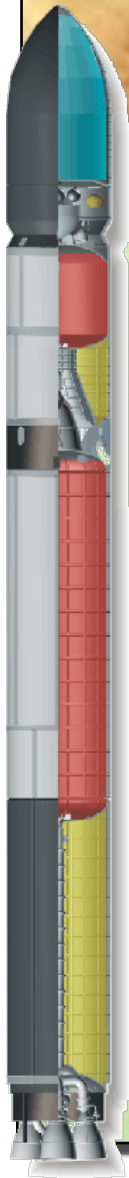
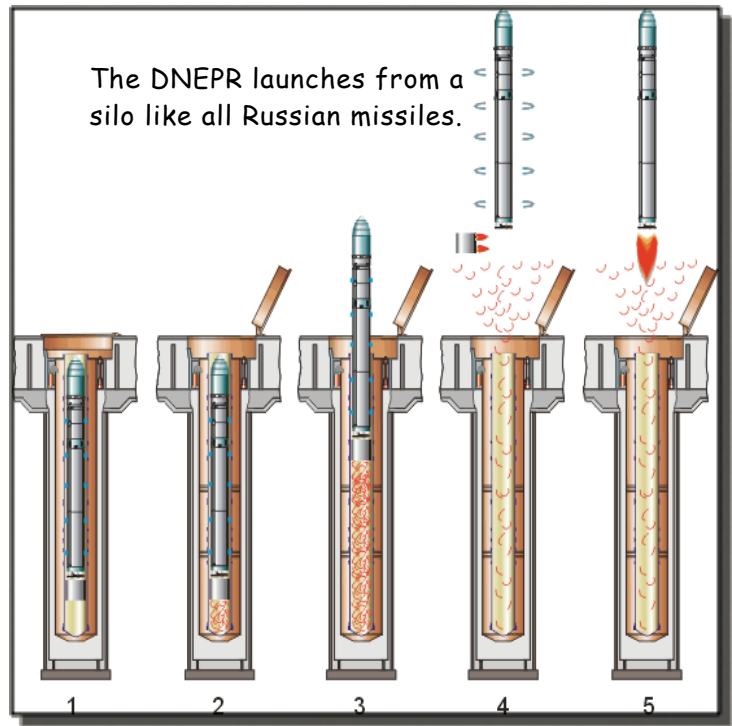
A change in the original X Prize rules now permits competing teams to buy a ride on existing rockets. The reason for the change is the expertise and high cost involved in designing and building a rocket capable of flying the robot to the moon. Buying a ride could cost as little as \$5 million; building a rocket, a \$100 million or more. [7]

SECOND LIFE FOR ICBMS

Since 1999, the Russian company called International Space Company, ISC Kosmotras, has been launching satellites into earth orbit on top of their rocket, the DNEPR. The DNEPR rocket wasn't developed for the job it has now though. It is an modified ICBM, Soviet intercontinental ballistic missile known as the SS-18 Satan. Instead of carrying satellites to space these missiles sat in Soviet silos with multiple nuclear warheads aimed at the United States. They were the biggest and most destructive missiles in the Soviet arsenal. This was in the 1970-80's during the 'Cold War' and of course, the U.S. also had its share of silos with missiles aimed at Russia. Now that the Cold War is over, both the U.S. and Russia have retired many of these types of missiles. By converting them into space boosters the Russians can make money in the commercial business of launching satellites into orbit. It's also cheaper to convert the missiles for commercial use than destroy them. The ISC plans to convert around 150 ICBMs for use as space launchers and market them to other nations. They have already made 10 launches.

Our Rover Project will buy a ride on the DNEPR and share the payload bay with other companies sending their satellites into orbit. This will greatly reduce the price for our robotic mission to the moon. The ISC Kosmotras sells cargo space on its rocket for as little as \$10,000 per kilogram for a full payload. Quite a bargain! The rocket can achieve LEO, low earth orbit, and place the satellites into orbit and then continue on to lunar trajectory ejection point and send us on our way to the moon. [8]





SIZE OF THE PAYLOAD BAY AND SAMPLE
PAYLOAD CONFIGURATIONS [8]

BIBLIOGRAPHY

- [1] <<http://www.googlelunarxprize.org/about>>
- [2] <<http://www.diamandis.com/>>
- [3] -Evans/Three Lions/Getty Images; A circa 1958 artist's impression of space travel: a Lunar Liner designed to transport people to and from the moon.
- [4] KISS Institute for Practical Robotics <www.botball.org>
- [5] <<http://www.googlelunarxprize.org/lunar/education/>>
- [6] <www.googlelunarxprize.org/lunar/about-the-prize/rules-and-guidelines>
- [7] <<http://www.xprize.org/>>
- [8] Kosmotras - International Space Company; <<http://www.kosmotras.ru/>>