MoonBots Robot Design Funding Proposal

Colonizing space will be very important in the future for many reasons, including the growing population, limited natural resources on Earth, global warming and pollution. Space seems a better option than trying to colonize the seas or going underground because none of these have sunlight, and humans need the sun to live. As our nearest neighbor, the Moon seems the best base to explore the human colonization of space.

The reduced gravity on the Moon also reduces the energy needed for moon launches to explore other planets and stars. However, a lunar base can work only if we can generate power and make rocket propellants and oxygen from materials available on the moon. We now know that the moon has plenty of water ice and silica.

However, the moon also poses challenges such as the lack of an atmosphere, long days and nights, daytime temperatures of more than 100°C at the equator, and night-time temperatures of about -200°C. Also, the lunar surface is powdery, and uneven, due to constant bombardment from micro-meteorites. Due to the lack of atmosphere, there is a lot of dangerous ultraviolet radiation on the moon.

To win the Google Lunar X Prize (GLXP), teams have to design two systems. The first is a rocket ship for reaching the moon. The second is the lunar rover that meets the GLXP requirements.

We plan to launch a rocket from a high-altitude aircraft to eliminate the heavy and expensive first stage rocket booster. When this rocket system reaches the moon, it will launch a lander that will make a controlled lunar landing using retro-rockets, air bags and flexible landing pads, soon after the lunar morning begins. Although water-ice may be present all over the moon, it would be less risky to land near a crater close to the lunar south pole that is known to have water. Landing outside a crater permits the lander and rover to charge their batteries, though they would need more solar cells because they are close to the lunar pole.

Our rover, Π (Pi), uses solar panels to convert sunlight to electricity. This electricity is stored in insulated batteries that can work in both the lunar day and night. Π also stores extra power generated during the long solar day to raise lunar rocks high above the lander. The energy in the rocks is then converted back into electricity when needed during the long lunar night. We have designed Π to be like a Segway on a pogo stick to take advantage of the reduced gravity on the moon. Π uses compressed gas and springs to jump over obstacles and wheels for moving shorter distances and for changing directions. Our rover uses large balloon–like tires to avoid sinking into the powdery lunar dust. It uses UV-absorbing plates to reduce the effects of UV radiation.

We are an elite team of creative, hard-working, elementary schoolers who really want to win the Moonbots competition. We have no one leader. Members of different age, race and gender all are equal in rank and free to give ideas. We are inspired by science fiction such as 2001: A Space Odyssey and Star Trek: The Next Generation. In Brian Littrell's famous words, "Shoot for the moon. Even if you miss you'll land among the stars".

We love learning new skills and have a lot of natural curiosity. We are all experts at robotics. We use state of the art system engineering tools to create best in class solutions. Most importantly, we are all interested in science, technology and robotics, which are all important for the future of humanity. Supporting us could bring us all fame and fortune. The future of the world is in your hands! Please fund our team.

A revolution is brewing. A flash mob of young technologists is gathering. Π, anyone?