SPACE FOUNDATION

March 17, 2014

Dear Students of STEM Launch,

I am writing this letter to you in hopes that you will assist in the research and development of the problems that will face us as we venture out into the solar system.

The current plan is to put humans on Mars in the 2030's. We have the technology to do that, but what overwhelming obstacle faces us is keeping the astronauts alive during the two and a half year mission to Mars. The six month trip to Mars and back presents its own set of problems, but so does the 18 month stay on the surface.

For the trip to Mars and back the primary concern is that of solar radiation. Even protected by Earth's magnetosphere astronauts on the International Space Station {ISS) must go into a lead-lined room when a coronal mass ejection (CME) is expected to hit Earth. On a mission to Mars solar radiation is a real threat on the round-trip journey as well as on the surface. It could kill our astronauts instantaneously. The second biggest concern is bone loss or osteoporosis. An astronaut on ISS that stays for 8 months has close to the same bone loss as a person from age 50-60. On a trip to Mars an astronaut could lose as much as 30% bone mass. Another huge concern is muscle loss and atrophy after not being able to exercise strenuously enough. When arriving on the surface after a calm six months the astronauts will be expected to start rigorously exploring the surface with brittle bones and atrophied muscles-not to mention the psychological issues as well.

It will be the scientists and engineers of your generation that will eventually solve these issues for our astronauts. Let's get started, NOW!

Sincerely,

Bryan DeBates
Director-Education