

GRAVITY

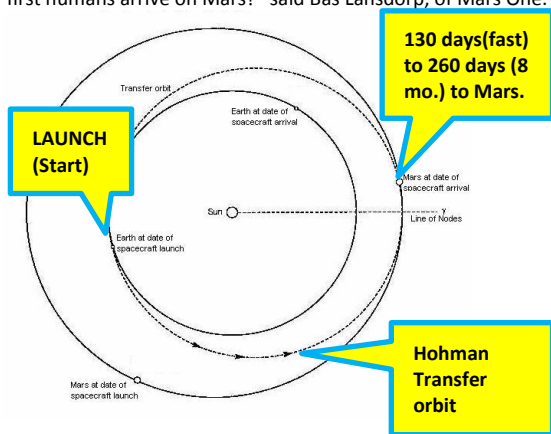
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Reality TV for the Red Planet



“How many people do you think would want to watch the first humans arrive on Mars?” said Bas Lansdorp, of Mars One.



INTRODUCTION: First click on GRAPHIC(BELOW)..”Aiming for the Red Planet” for information on various planned trips to Mars in the next ten years(from 2013). The Hohman Transfer Orbit(minimum cost trajectory) is the mainstay of interplanetary space travel.The typical transfer time(Earth to Mars)during Mar’s closest approach to the Earth (every 1.6 years) is about 260 +/- 10 days(~8 mo.) Some high-speed Transfer orbits could make the trip in as little as 130 days(~4 months). When the humans arrive on Mars they will experience 38% the force of gravity they experienced on the earth.

QUESTIONS: (a) Find g_{Mars} (metric gravitational acceleration on Mars) Knowing these facts about Mars: $M_{\text{Mars}} = 6.4 \times 10^{23} \text{ kg}$, $R_{\text{Mars}} \text{ radius} = 3.397 \times 10^6 \text{ meters}$? (b) Find mass(in slugs) of 160 lb person on earth? (c)Find mass in Kg. of 160 lb person on earth? (d)What is mass in Kg. of this 160 lb earth weighted person on Mars?(e) Find the Mar’s weight(in Newtons and pounds) of a 160 lb. earth weight person?

HINTS: weight on Mars = $mg_{\text{Mars}} = G(mM_{\text{Mars}}/R_{\text{Mars}}^2)$, $G(\text{gravitational constant}) = 6.67 \times 10^{-11} \text{ Nm}^2/\text{kg}^2$, Weight on a Planet = $m g_{\text{on that planet}}$, 2.204 kg = 1 lb. , 4.448 N = 1 lb

ANSWERS: (a) $g_{\text{mars}} = 3.7 \text{ m/s}^2$, (b) 5 slugs , (c)72.60 kg (d) 72.6 kg. (e) 268.6 N or ~60.4 lb.

An illustration of a proposed settlement on Mars from Mars One, a \$6 billion plan to **send four people by 2023.**

PARIS — As [Wernher von Braun](#), the rocket scientist, used to say, the most overwhelming obstacle to exploring the cosmos isn’t gravity. It’s the paperwork.

- **GRAPHIC: Aiming for the Red Planet** ← Click GRAPIC AT LEFT Not to mention the money.

So when Bas Lansdorp began dreaming more than a decade ago about establishing the first permanent human colony on [Mars](#), his primary focus was not on overcoming the technological challenges. It was the business model.

“All the technology we need exists already — or nearly exists,” he said. “I just couldn’t figure out how to finance it.”

Mr. Lansdorp, a 36-year-old Dutch engineer and entrepreneur, does not have the name recognition of Dennis Tito, the American financier and space tourist, who announced a plan last month to send two people on a round-trip Mars flyby in 2018. Nor can Mr. Lansdorp hope to match the deep pockets of Elon Musk, the billionaire founder of SpaceX and Tesla Motors, who has proposed sending as many as 80,000 people to the Red Planet and charging them \$500,000 each.

Richard Branson, the Virgin entrepreneur, has space aspirations, too.

But Mr. Lansorp is convinced that he has found the perfect plan to raise the \$6 billion he says he needs **to land an initial crew of four people on the Martian surface by 2023.** The entire mission — from the astronauts’ selection and training to their arrival and construction of a permanent settlement — would be broadcast as a worldwide, multiyear reality television show.