

# Risks with Manned Space Exploration – Pressure Differential

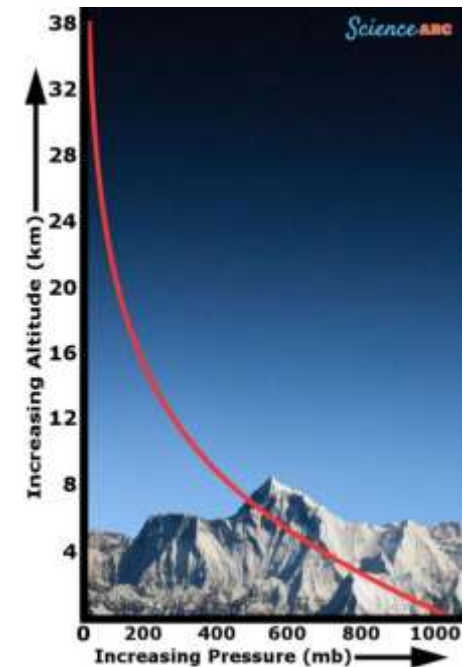


THE PRESSURE IN OUTER SPACE IS SO LOW THAT MANY CONSIDER IT AS NON-EXISTENT. IT HAS A PRESSURE OF  $1.322 \times 10^{-11}$  PA. PRESSURE MAY BE DETECTED FROM THE MOLECULE OF AIR OR WATER HITTING YOU. SINCE THERE IS VERY LITTLE AIR AND HARDLY EVER WATER HITTING YOU IN SPACE, PRESSURE IS ALMOST ZERO.

WHEN IN SPACE THE FLUIDS IN YOUR BODY WILL SHIFT UPWARDS TO YOUR HEAD, WHICH COULD PUT PRESSURE ON YOUR EYES CAUSING VISION PROBLEMS.

SPACE TRAVEL PLAYS HAVOC WITH OUR BLOOD CIRCULATION. HUMAN CARDIOVASCULAR SYSTEMS ARE DESIGNED TO PUMP BLOOD STEADILY AROUND THE BODY AGAINST THE FORCE OF GRAVITY, WHICH NORMALLY PULLS BLOOD TOWARDS OUR FEET. BUT IN THE MICROGRAVITY OF SPACE, BLOOD MOVES UP TO THE CHEST AND HEAD, GIVING ASTRONAUTS PUFFY FACES AND RAISED BLOOD PRESSURE.

HUMANS AND OTHER ANIMALS EXPOSED TO VACUUM LOSE CONSCIOUSNESS AFTER A FEW SECONDS AND DIE OF HYPOXIA WITHIN MINUTES. BLOOD AND OTHER BODY FLUIDS DO BOIL WHEN THEIR PRESSURE DROPS BELOW 6.3 kPA.



BECAUSE WEIGHTLESSNESS INCREASES THE AMOUNT OF FLUID IN THE UPPER PART OF THE BODY, ASTRONAUTS EXPERIENCE INCREASED PRESSURE INSIDE THEIR SKULL. THIS APPEARS TO INCREASE PRESSURE ON THE BACKS OF THE EYEBALLS, AFFECTING THEIR SHAPE AND SLIGHTLY CRUSHING THE OPTIC NERVE.