National Aeronautics and
Space Administration

RASSOR

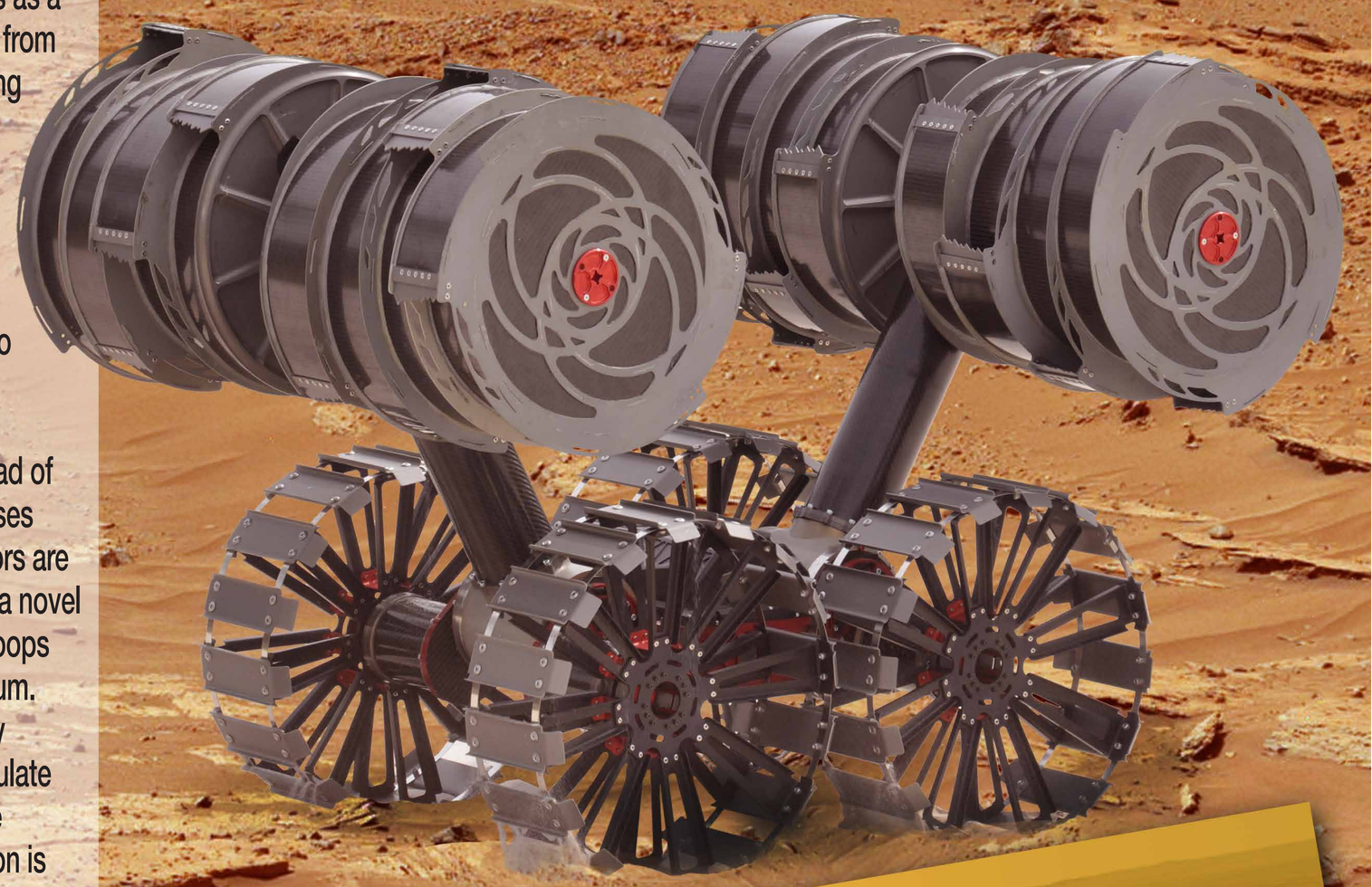
Regolith Advanced Surface Systems Operations Robot
NASA's Low Gravity Excavator

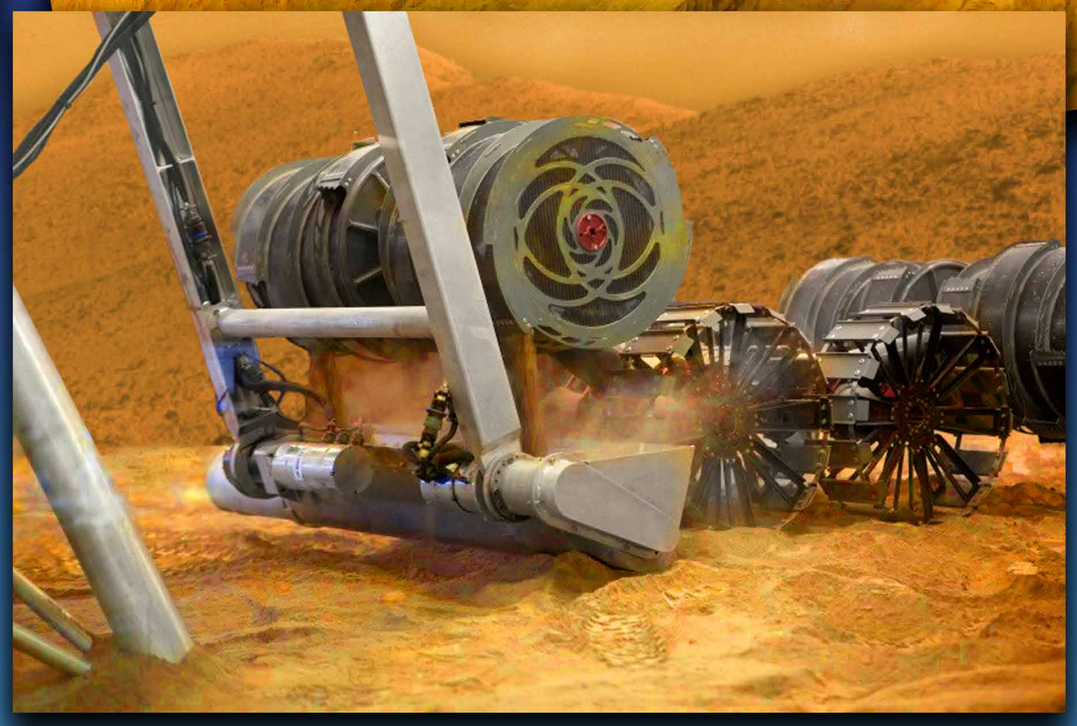
PROBLEM:

NASA wants to use the regolith (dirt) on the surface of the Moon and Mars as a resource for future missions. Regolith can be used for a number of things from building habitats to creating rocket fuel. But the first challenge before using the regolith is mining it in a low gravity environment. On Earth, we simply use very large and heavy machines to dig. But these machines are so massive that putting them on-board a rocket would be too costly. Additionally, if we tried putting one of these machines on the surface of the Moon or Mars, the gravity is so low that when we go to scoop up the regolith the wheels of the excavator would simply spin because there is so little traction.

SOLUTION:

RASSOR solves this problem by re-inventing the way we excavate. Instead of relying on mass to give us the reaction forces we need to dig, RASSOR uses counter-acting excavators that react off one-another. RASSOR's excavators are known as bucket drums. This is a novel digging tool that uses small scoops staggered around a hollow drum. Inside the drum are specially designed baffles that recirculate the dirt while rotating in one direction, and when the rotation is reversed, the dirt slides back out through the scoops.





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