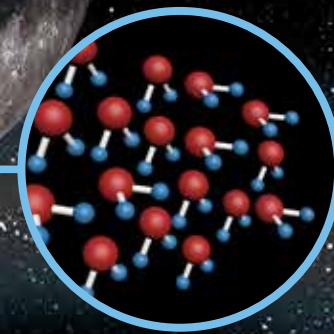
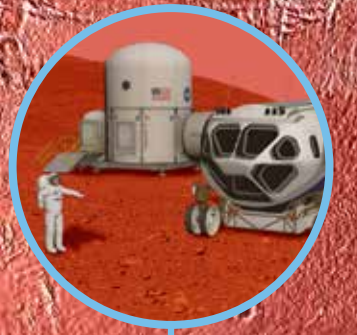
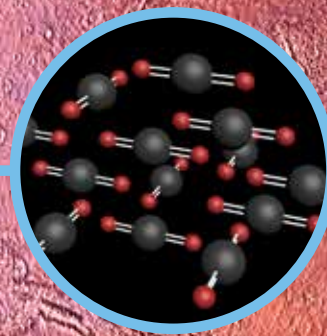


How does the ability to replenish and store cryogenic fluid help with exploration?



Refueling Spacecraft at the Moon

Hydrogen and oxygen could be separated from water found on the Moon then used as fuel. The ability to transfer and replenish these elements, both cryogenes, in space will be critical to this operation.



Refueling Spacecraft at Mars

RRM3's cryogen replenishment techniques could be used to refuel a spacecraft at Mars via in-situ resource utilization. Using this method, carbon dioxide in Mars' atmosphere could be converted into liquid methane, a cryogenic propellant, and used to refuel a departure rocket.

Maintaining Astronaut Life Support Systems

Liquid oxygen maintains astronaut life support systems in space. The ability to replenish and store this crucial cryogen with zero boil off, which RRM3 will also demonstrate, leads to its more efficient use. This is valuable for long-duration crewed missions as well as future planetary habitats.