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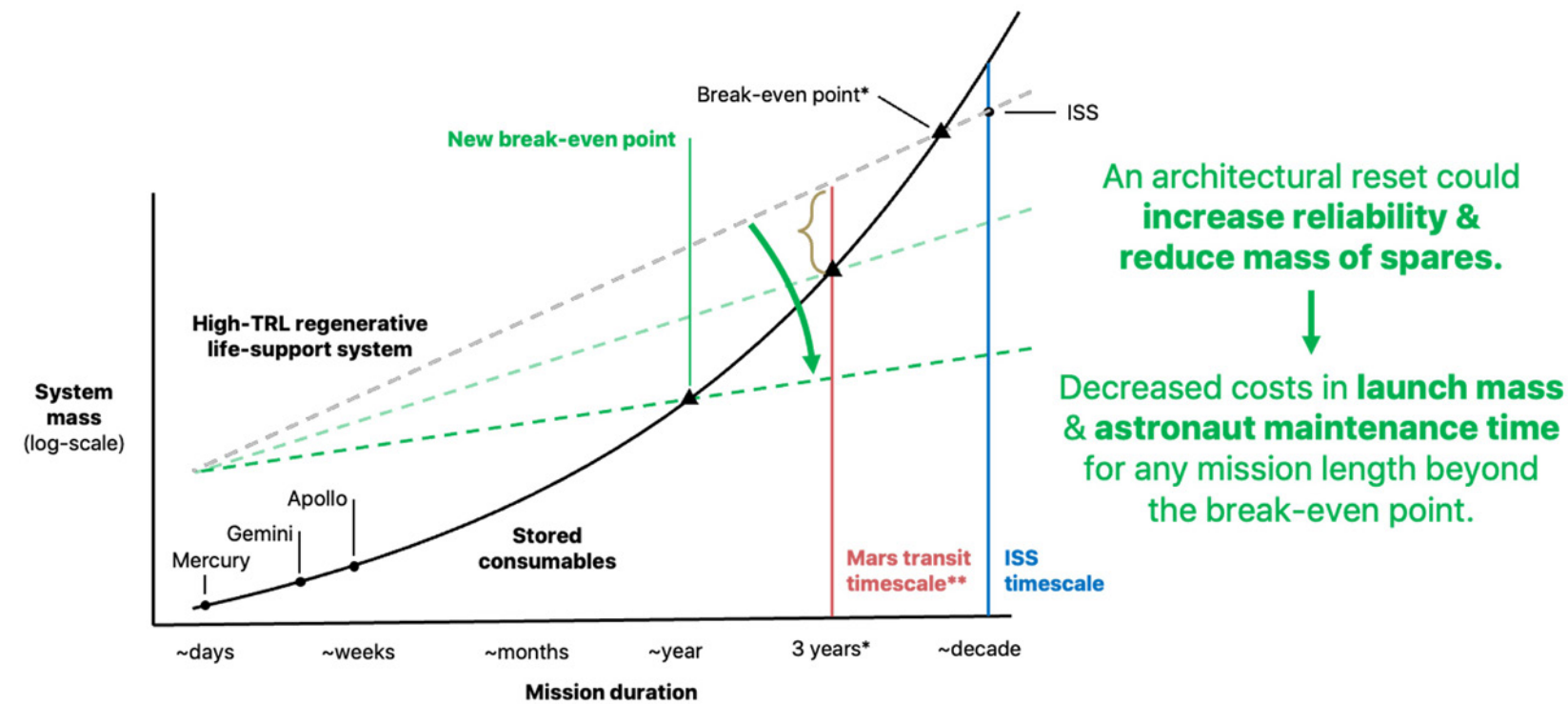
**Georgia Tech**



# A Novel Magnetohydrodynamic Drive for Oxygen Production on a Crewed Mars Mission

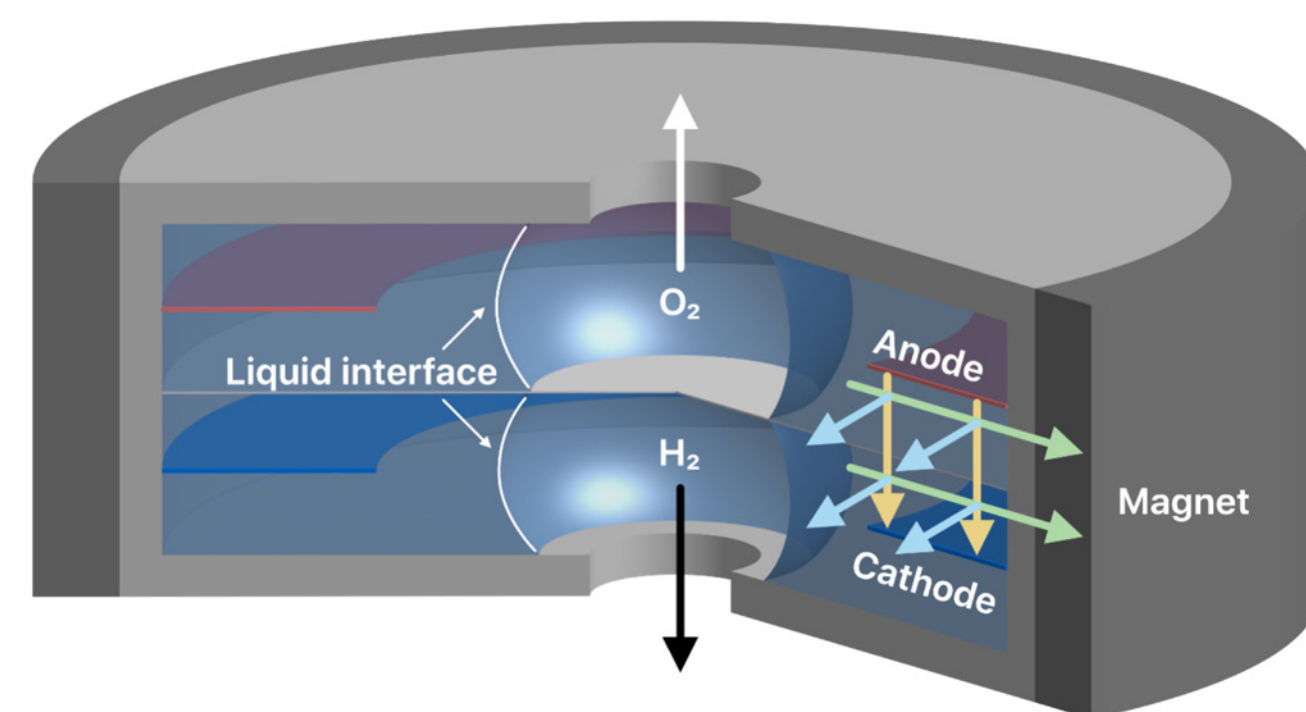
The Magnetohydrodynamic Oxygen Generation Assembly (MOGA) employs permanent magnets in an electrolytic cell to produce and separate oxygen and hydrogen efficiently without moving parts and in the weightless space environment.

## Why do we need a new oxygen system architecture?

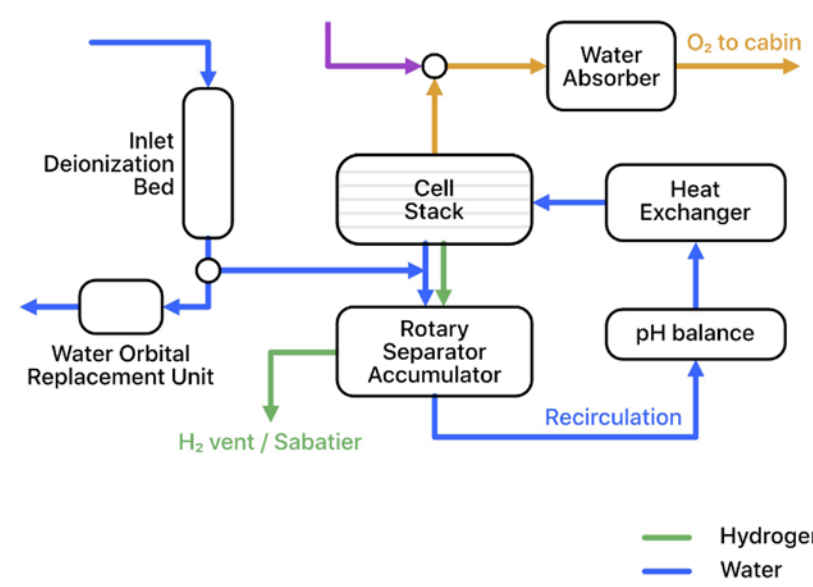


A new architecture is required for a regenerative system to be more mass-efficient than consumables for Mars transit mission duration.

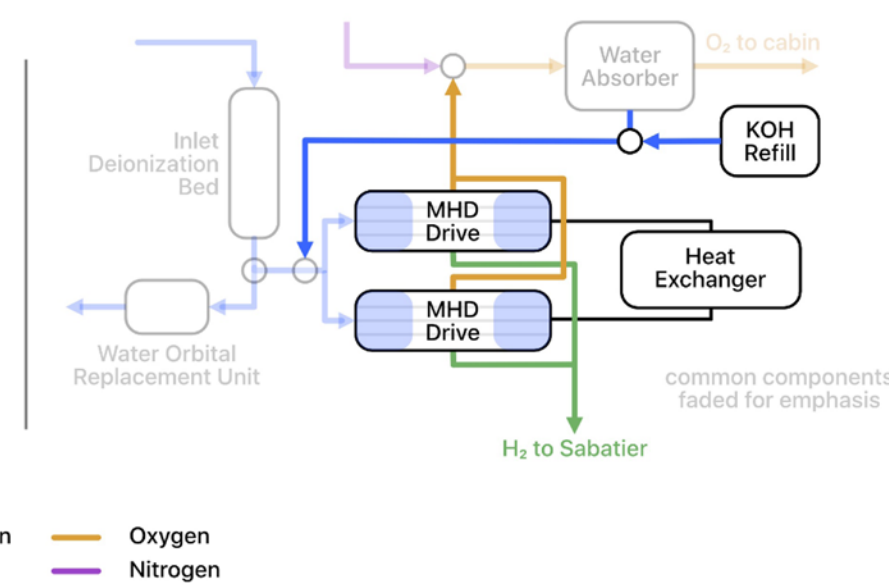
## The Magnetohydrodynamic Drive Schematic



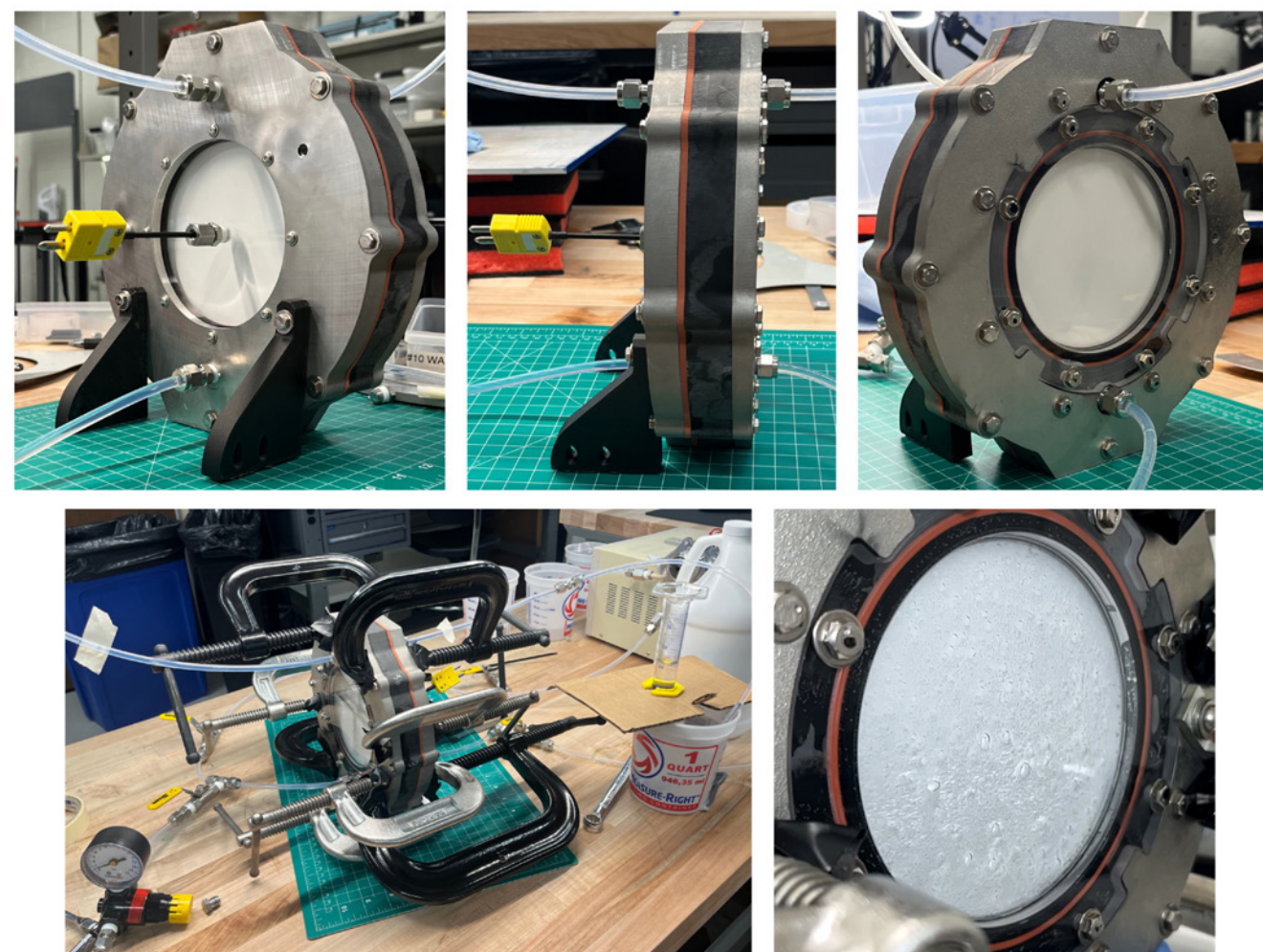
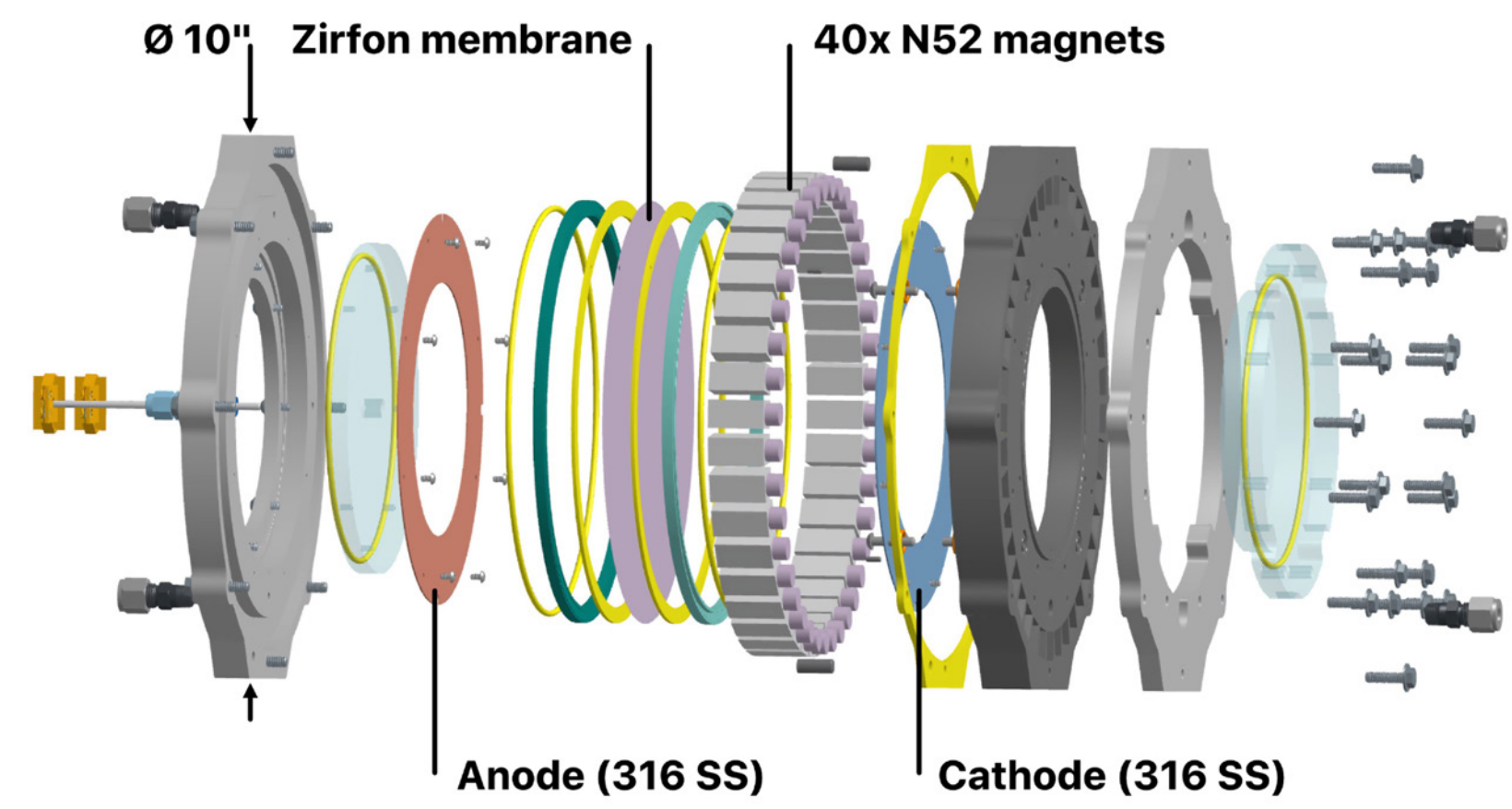
## Oxygen Generation Assembly (OGA)



## Magnetohydrodynamic Oxygen Generation Assembly (MOGA)



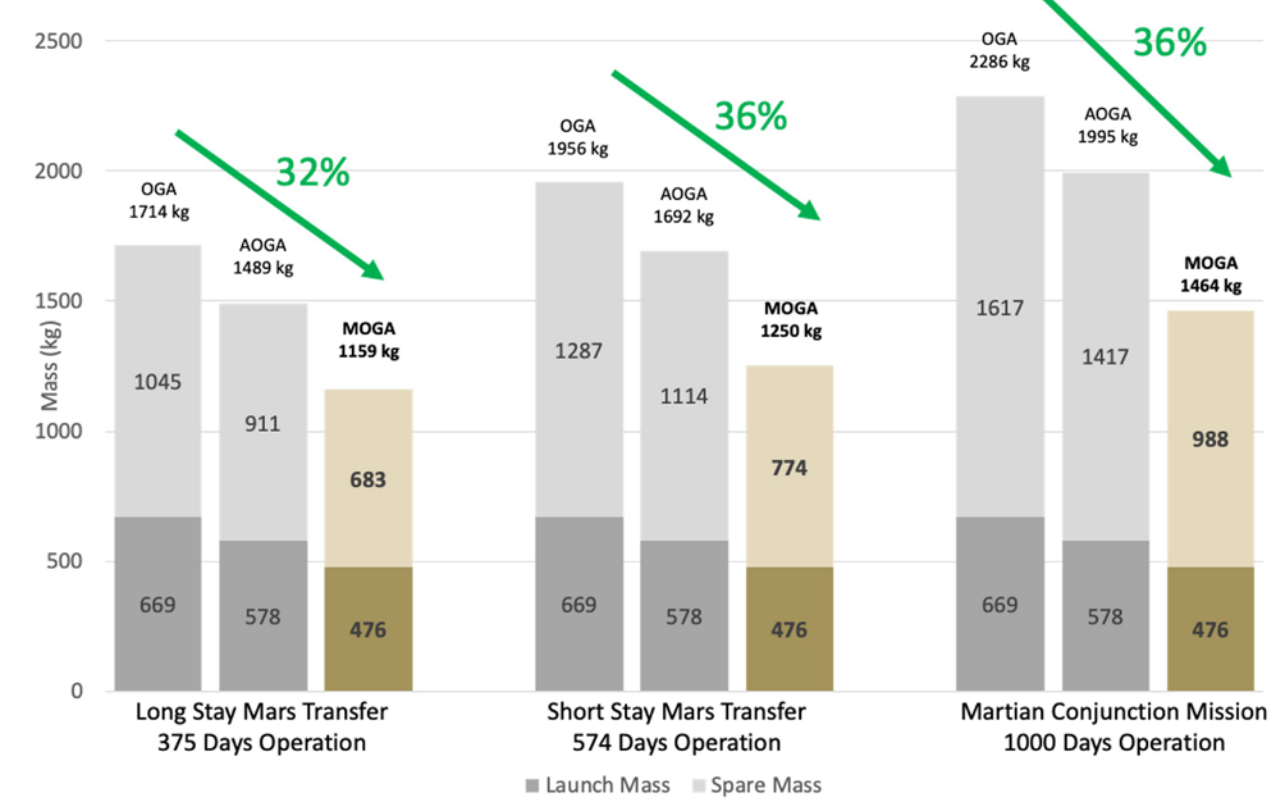
## MHD3: Magnetohydrodynamic Drive Demonstrator



MHD3 first assembled

Leak checks and powered-on at 500 mA/cm<sup>2</sup>

## Reliability and System Masses for Mars Missions



Total system mass including spares for various mission durations for 99% probability of success

