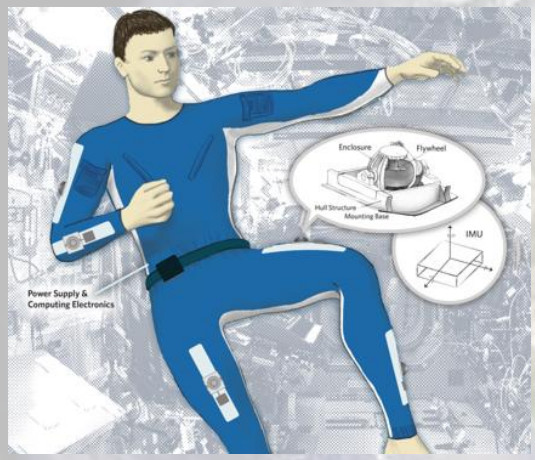
Variable Vector Countermeasure Suit (V2Suit) for Space Habitation and Exploration

THE V2SUIT CONCEPT

The V2Suit is a spaceflight physiological adaptation countermeasure platform using gyroscopic motion to provide "viscous resistance" during movements



KEY ENABLING TECHNOLOGIES

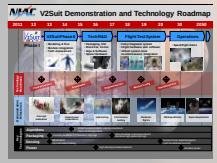
Key Technologies		
	Algorithms	•Inertial tracking of position, velocity, orientation •Control moment gyroscope control
	Packaging	•Ultra-miniature high torque motors •Miniaturized components, dense packaging
	Sensing	•MEMS inertial measurement units •Robust vision-aided navigation
	Power	•High-density miniaturized batteries •Wireless power

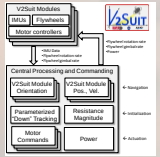
Technologies for a robust, operational system

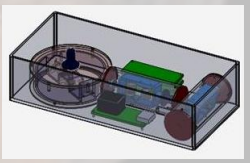
APPROACH

Four integrated aims to further the V2Suit concept development – a goal of operational demonstration

Aim 1: V2Suit mission assessment
Aim 2: Technology assessment and roadmap
Aim 3: System-level closed-loop simulation
Aim 4: V2Suit module design and integration







AEROSPACE IMPACT

SPACE TECHNOLOGY WITH EARTH APPLICATIONS

Start TRL: 2 **End TRL: 4 (early)**

An integrated and comprehensive counter-measure system has a measurable impact :

- Save 2.5 hours per day in allocated exercise time
- Exercise equipment mass and volume
- Enable optimal performance during mission-specific gravitational transitions (landing, egress)

The V2Suit is an enabler for space exploration mission technologies, including human adaptation and countermeasures, health monitoring, robotic interfaces, and adaptation and operations during artificial gravity.

A VISIONARY SYSTEM CONCEPT THAT WILL REVOLUTIONIZE SPACE MISSIONS AND BENEFIT LIFE ON EARTH