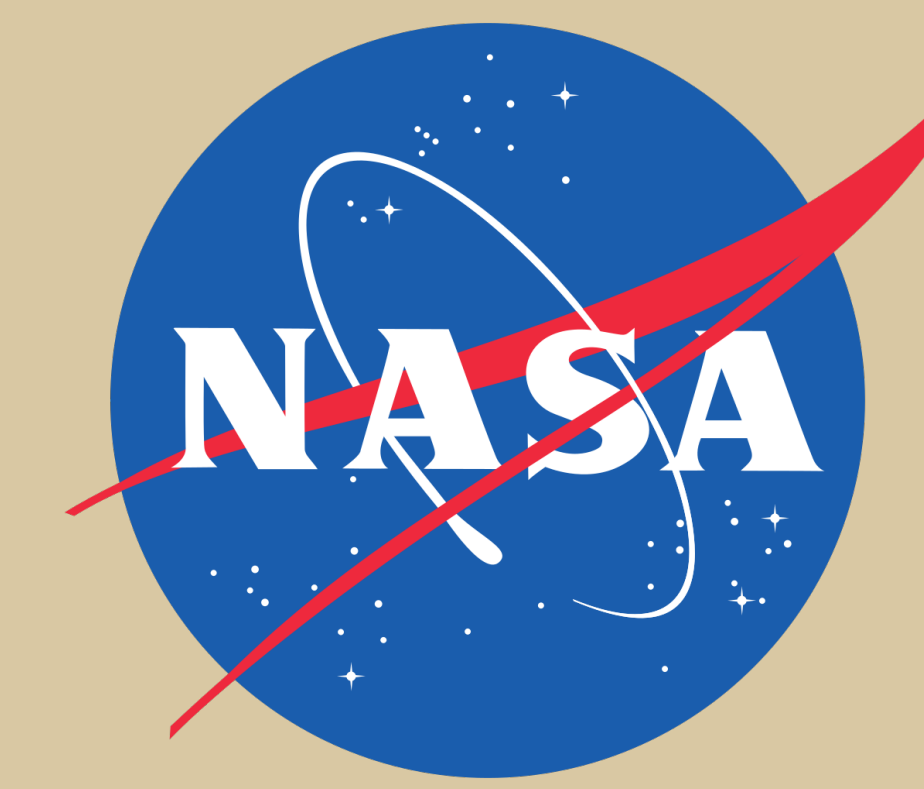




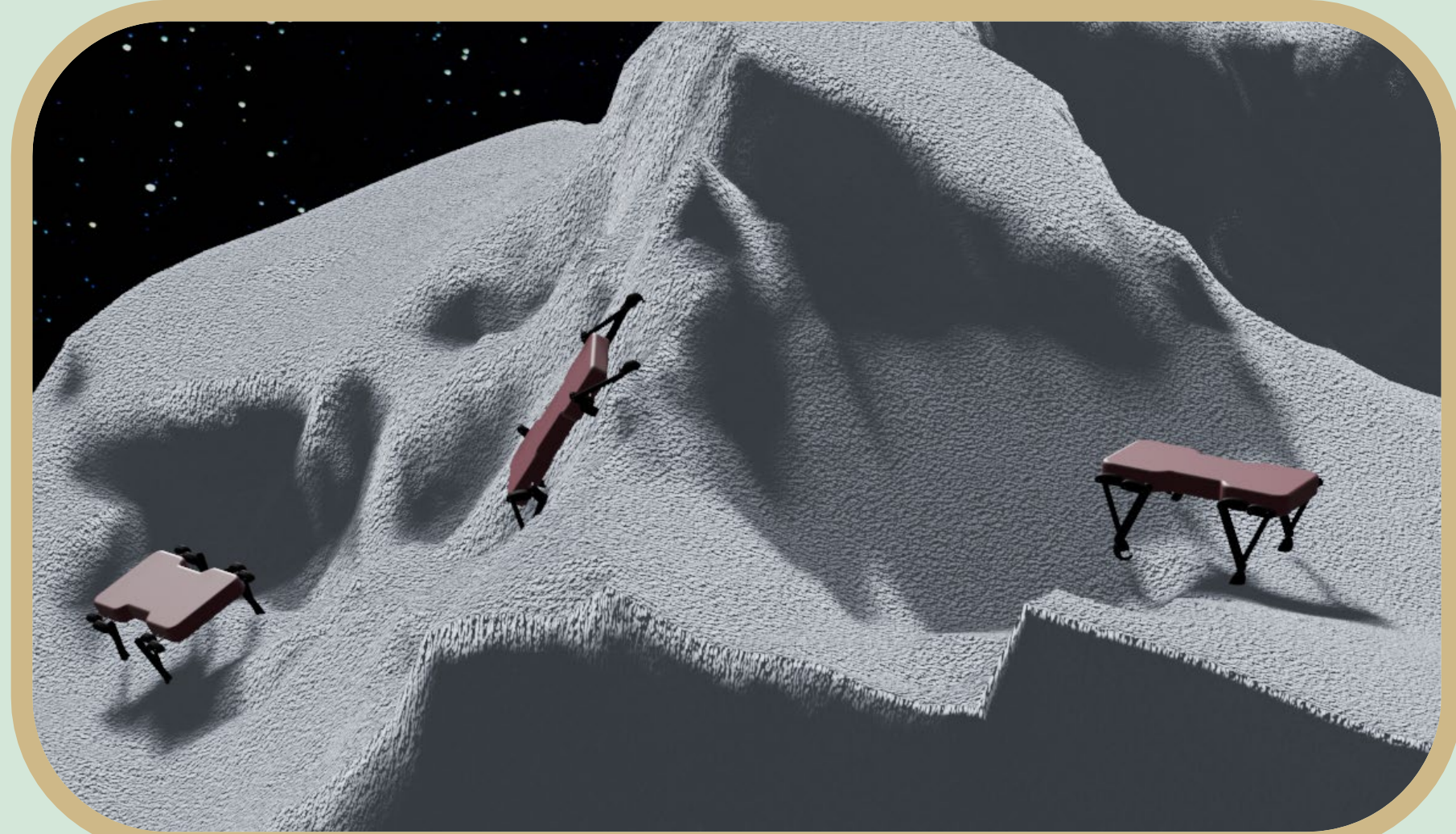
Extreme Terrain Quadruped (ET-Quad) For Traversing Rocks, Regolith, and Rough Terrain



Concept Synopsis

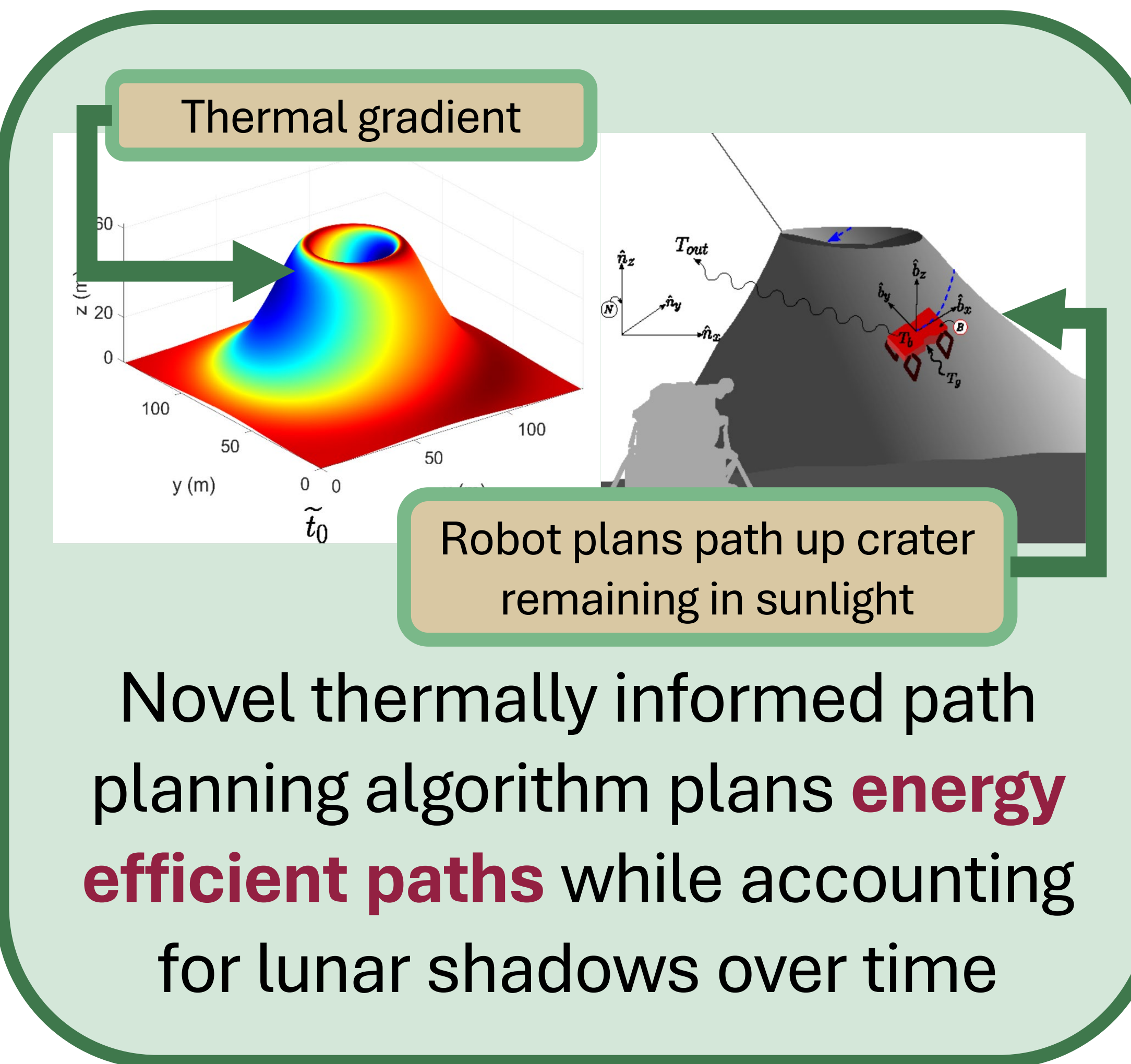
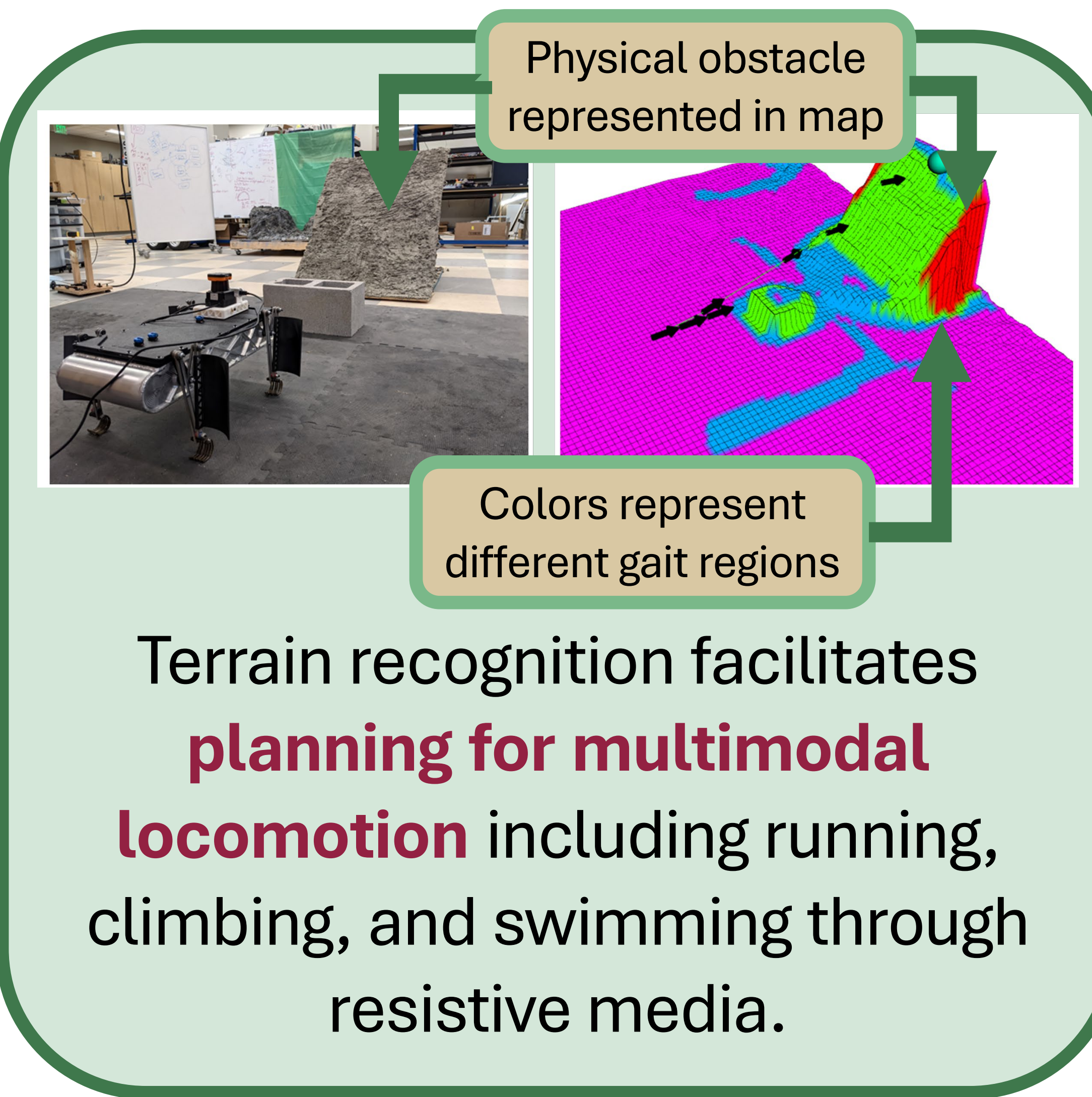
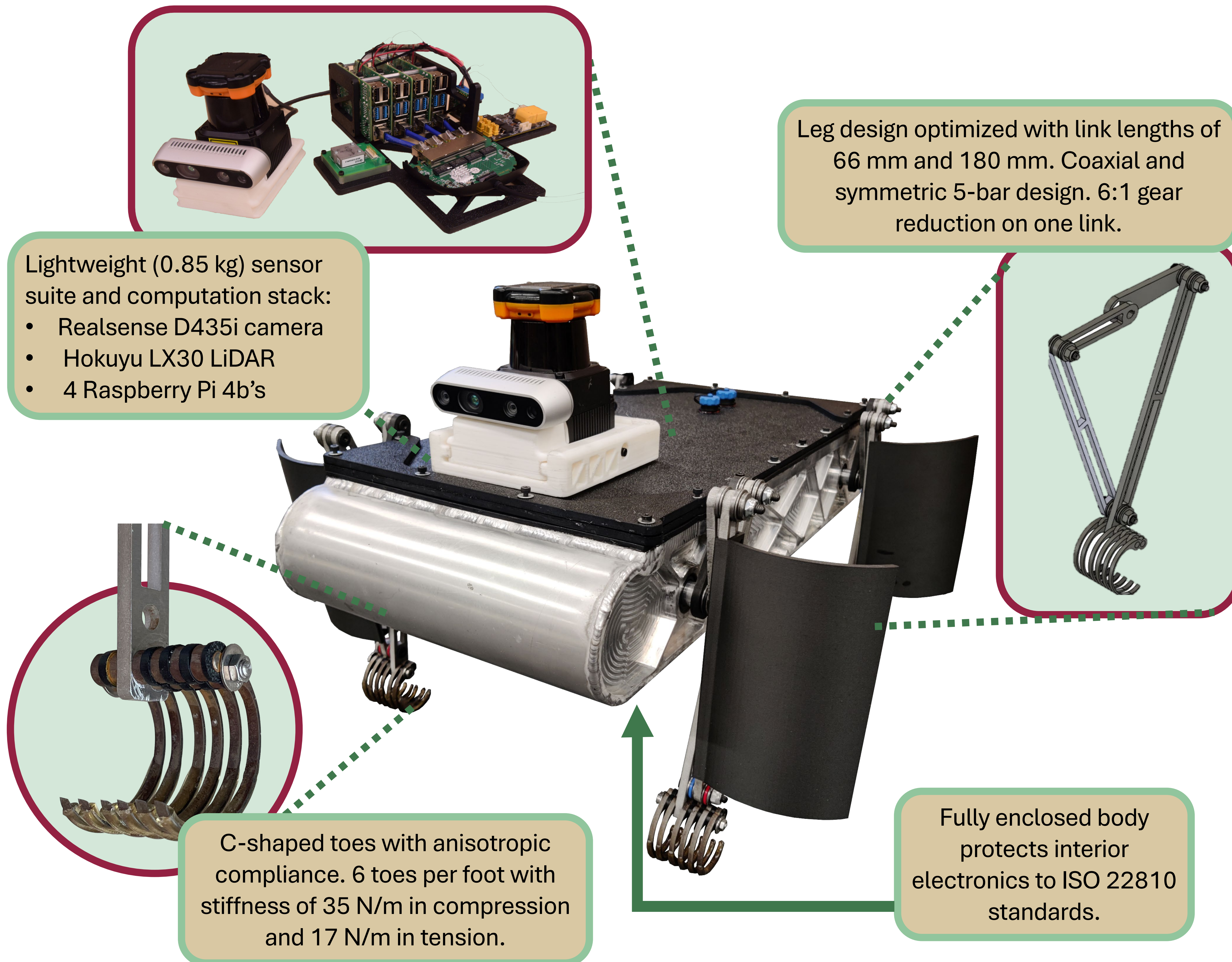
A quadruped robot capable of

- **Walking** over rough terrain
- **Climbing** steep (>60 deg) rocky slopes
- Traversing through **resistive media** (regolith, water, etc.)



Innovations

- **First** legged robot capable of walking, climbing, and swimming
- **Multimodal legs** and feet allow trimodal locomotion without hardware changes
- **Thermally informed planning** allows energy efficient locomotion over lunar orbital cycle
- **3D mapping** for multimodal locomotion planning



Results

Swimming in water (resistive media) at 8 cm/s

Walking on various terrains up to 25 cm/s

Climbing up to 15 cm/s and up to 90 deg

