SYSTEMS WORKFORCE SUMMIT · DELFT · 27–28 OCTOBER 2026

Secure Systems Engineering

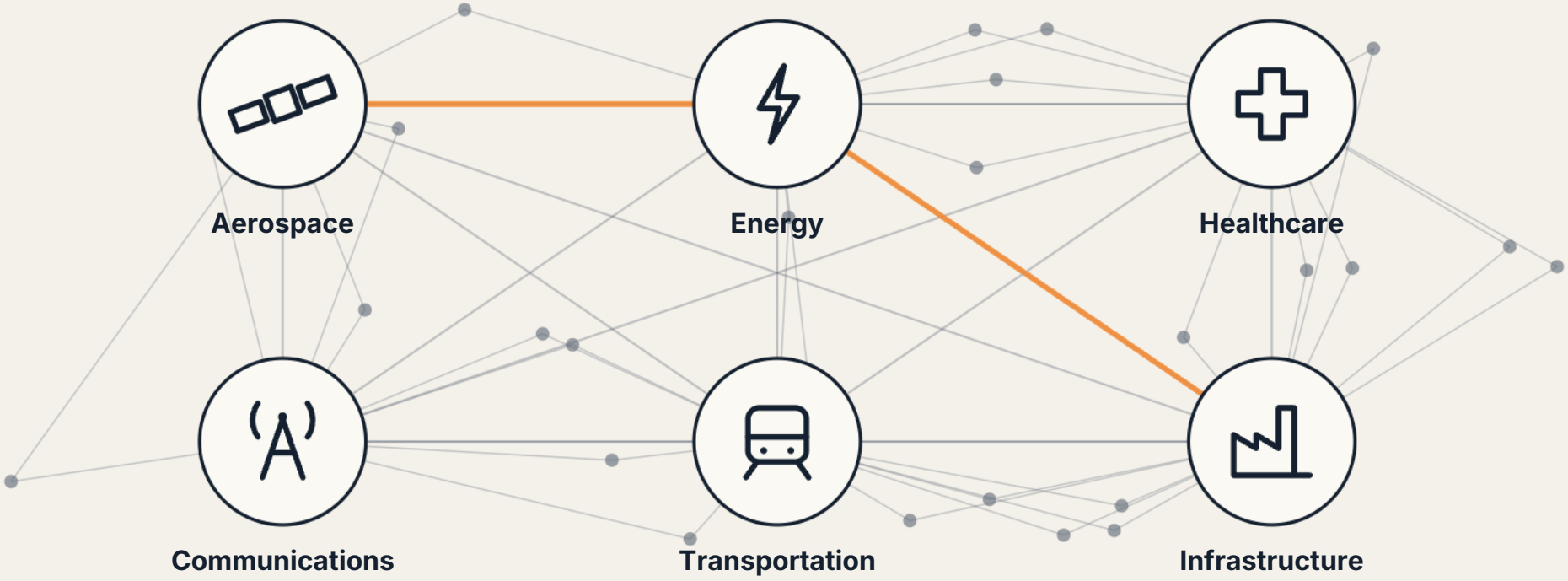
in an Age of Advanced Cyber Attacks and Quantum Computing

Larry James
CEO, KAIperShield, Inc.



01 · THE CHALLENGE

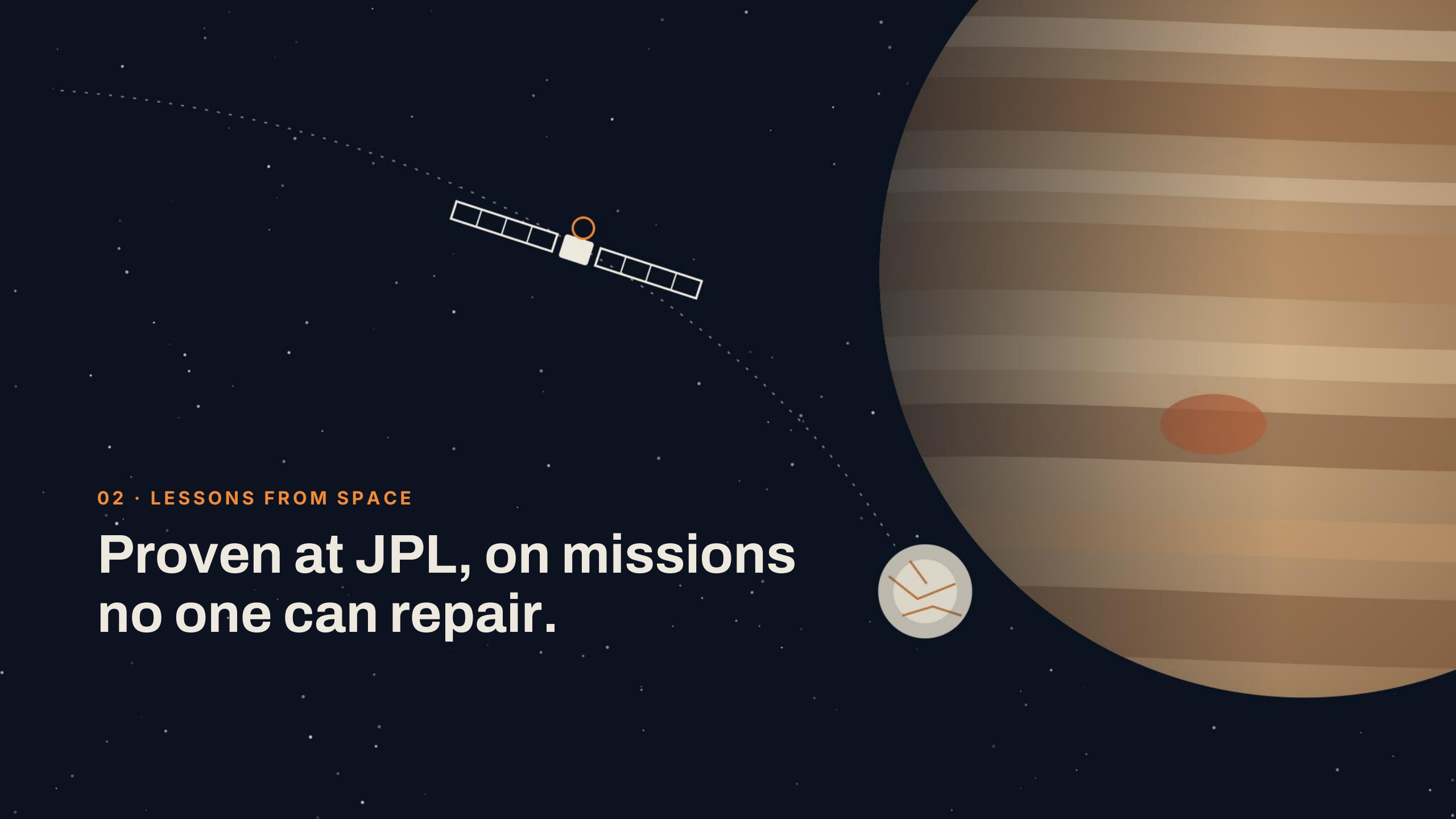
We depend on Systems of Systems



THE FUNDAMENTAL CHALLENGE

Prevention alone is not enough. We must engineer systems that keep delivering essential functions while under attack.



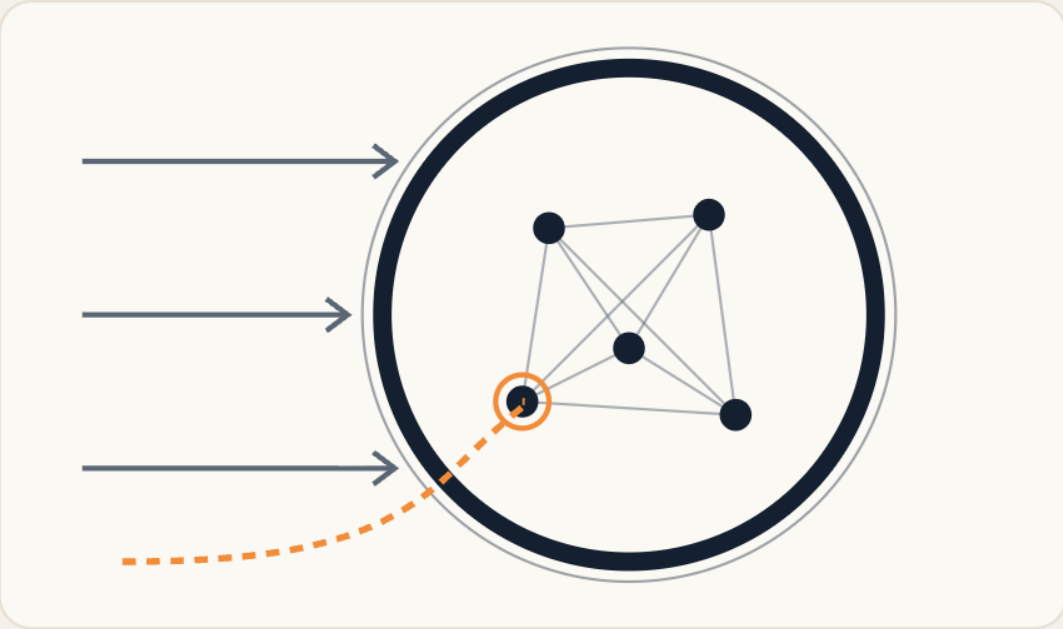


02 · LESSONS FROM SPACE

Proven at JPL, on missions no one can repair.

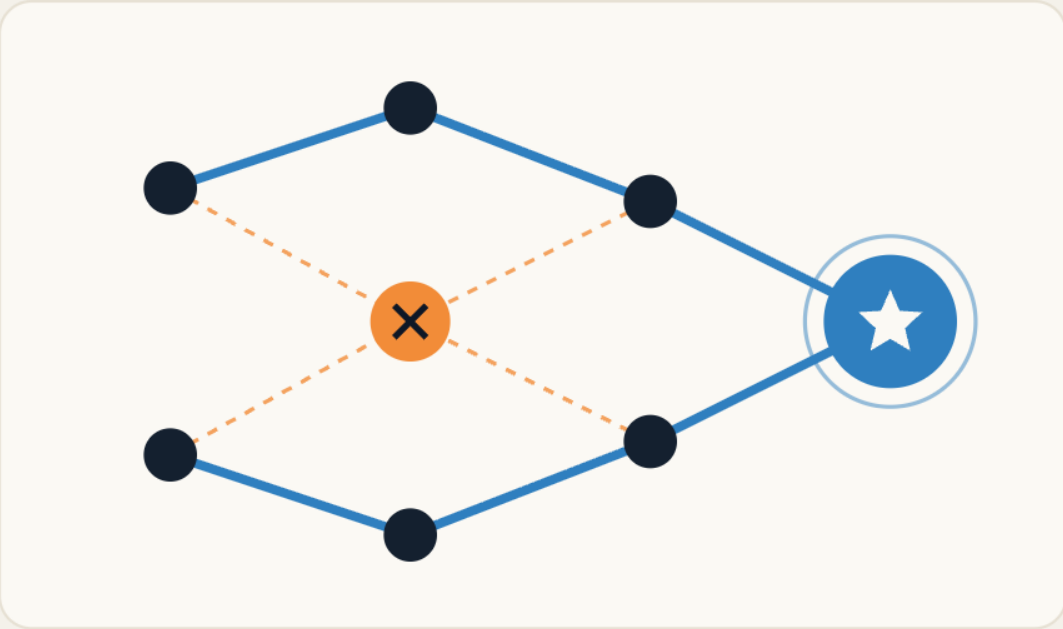
02 · LESSONS FROM SPACE

Two ways to think about security



Traditional IT cybersecurity

Protect the perimeter, detect intrusions, respond to incidents.

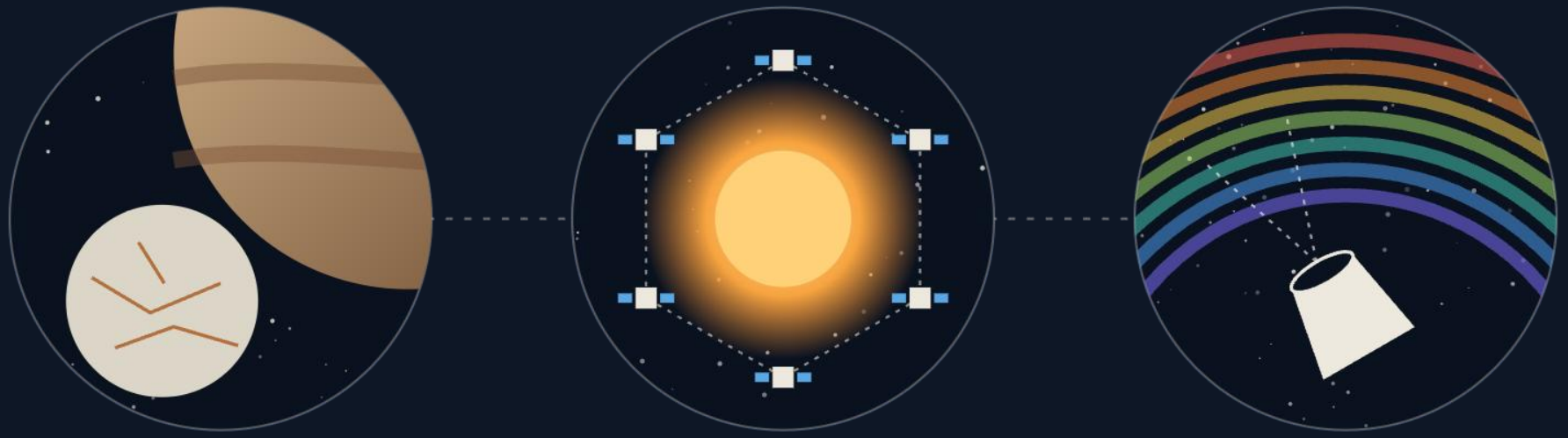


Systems engineering for mission resilience

Keep critical mission functions running even when components are compromised.

02 · LESSONS FROM SPACE

Three missions, one discipline



Europa Clipper

Model-based assessment of mission vulnerabilities and resilience

SunRISE

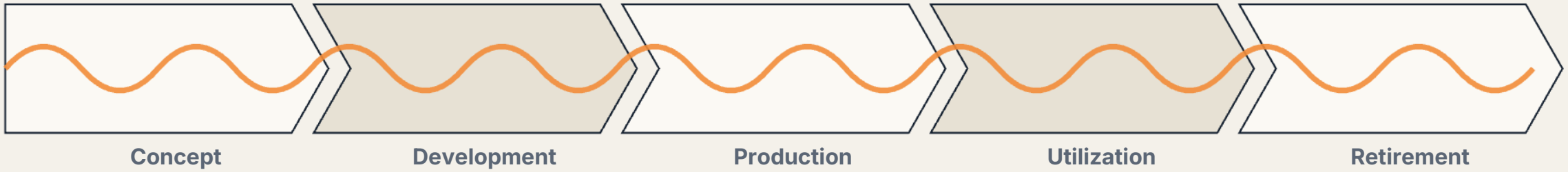
Secure systems engineering demonstrated in a mission environment

SPHEREx

Extending the approach to additional missions

03 · NIST SP 800-160

Security engineered into the whole lifecycle



Mission-critical functions and dependencies

Architectural vulnerabilities and attack consequences

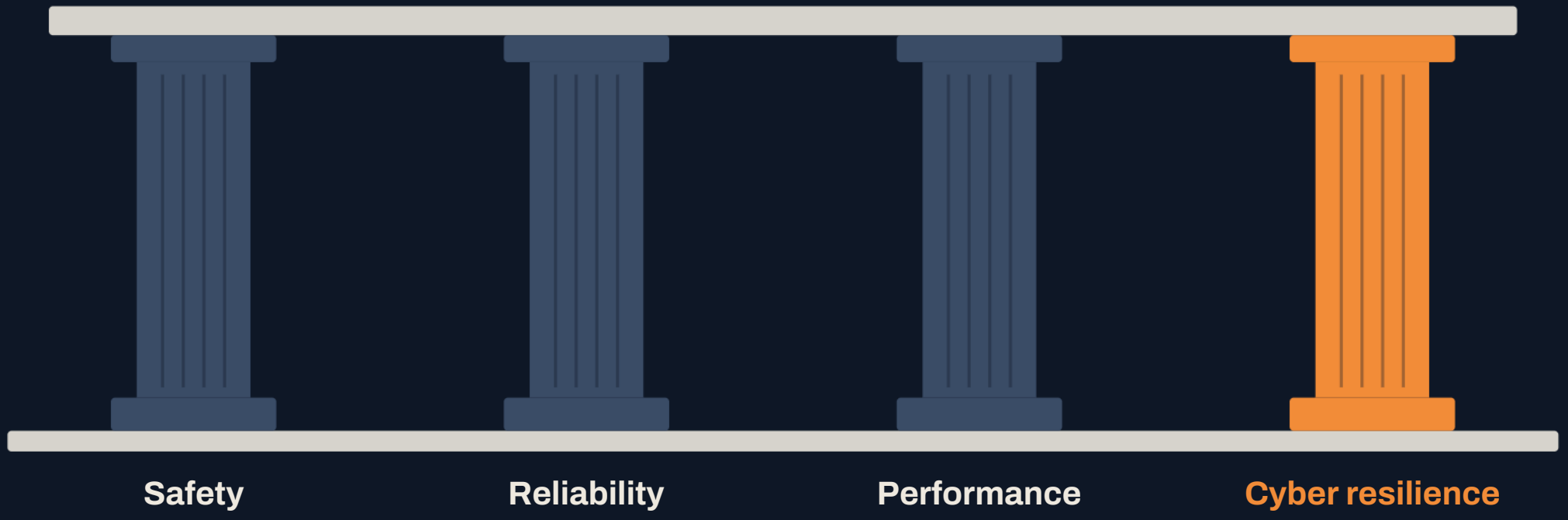
System behavior under adverse conditions

Continuity when trusted elements are compromised

Advanced in collaboration with NIST and Ron Ross

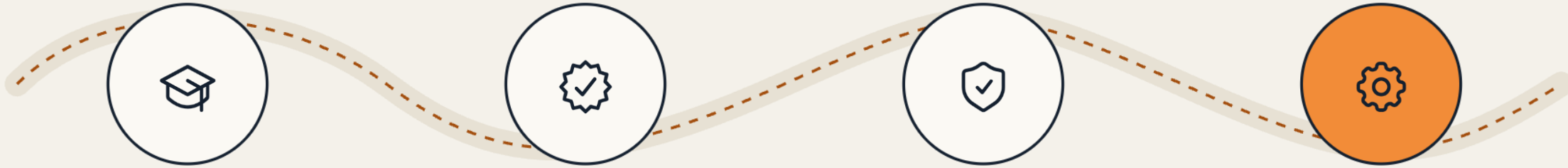
03 · NIST SP 800-160

Cyber resilience belongs beside safety, reliability and performance



04 · FROM RESEARCH TO INDUSTRY

From research to industry



JPL and Caltech
Proven on NASA missions

Patented technology
U.S. Patent 11,425,157, licensed from Caltech

KAIperShield
Founded to commercialize it at scale

AULIS
AI-enabled secure systems engineering platform

Turning proven secure systems engineering principles into an operational capability organizations can adopt at scale.

04 · FROM RESEARCH TO INDUSTRY

AULIS: a living model of the mission

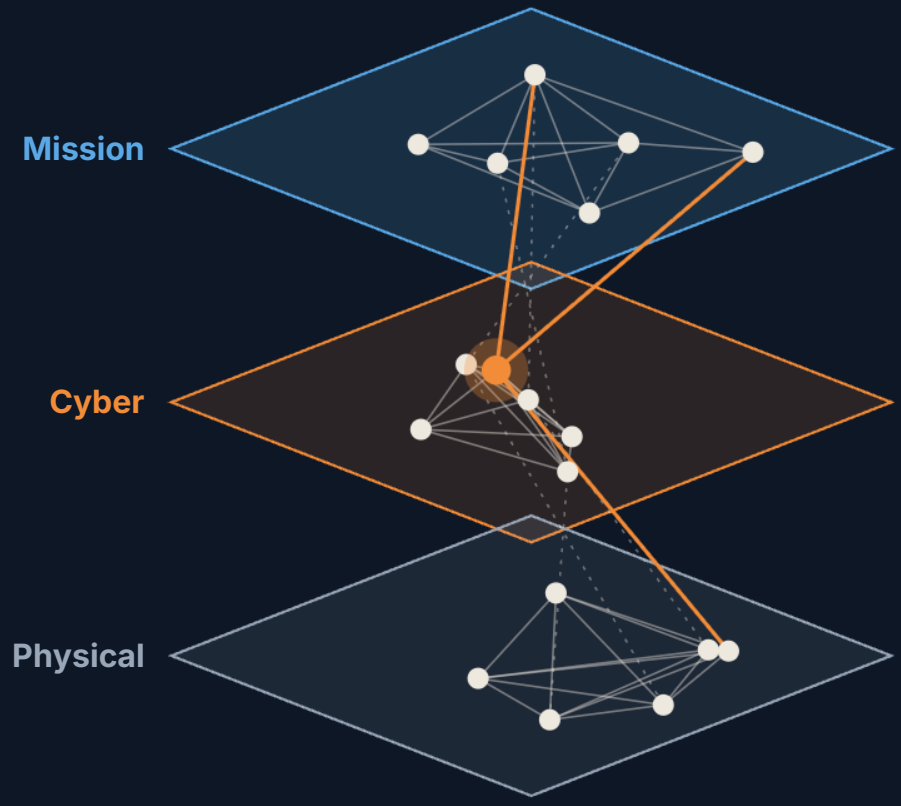
01 Model complex system architectures

02 Map dependencies and critical functions

03 Evaluate the impact of cyber compromise

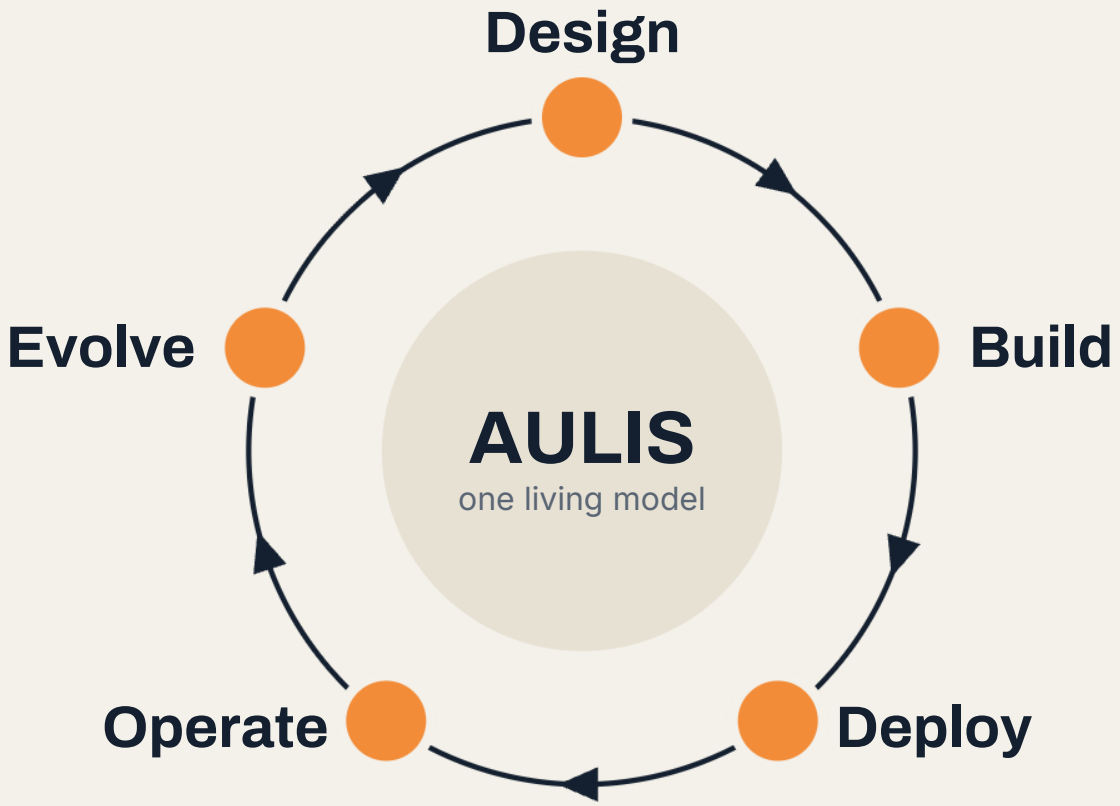
04 Generate evidence for resilience decisions

05 Reassess continuously as threats evolve



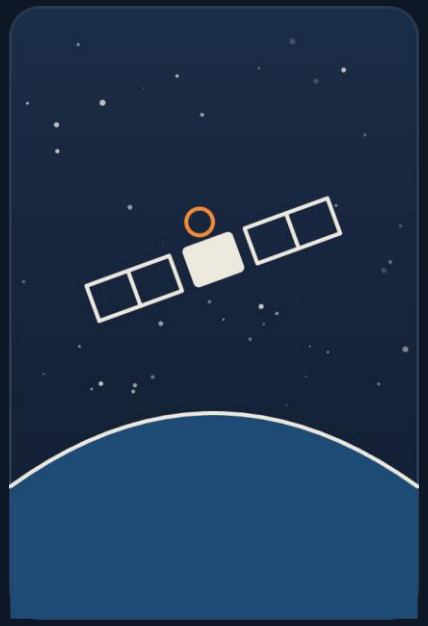
04 · FROM RESEARCH TO INDUSTRY

Continuous secure systems engineering

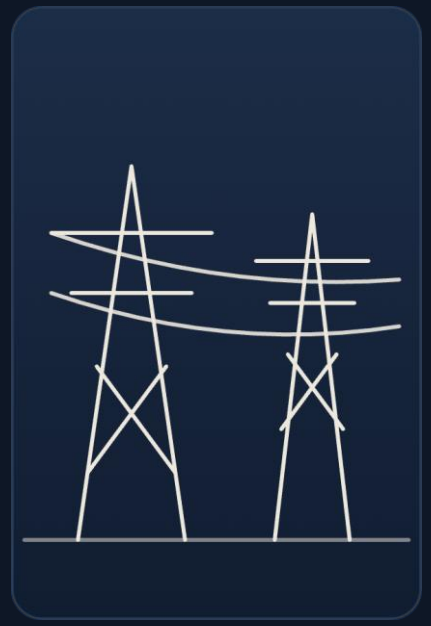


05 · ACROSS CRITICAL INDUSTRIES

The same challenge, across critical industries



Space and aerospace



Electric power grids



Healthcare and hospitals



Oil and gas



Communications

05 · ACROSS CRITICAL INDUSTRIES

Already engaging the market

Nodestream

An early commercial customer

Government pilots

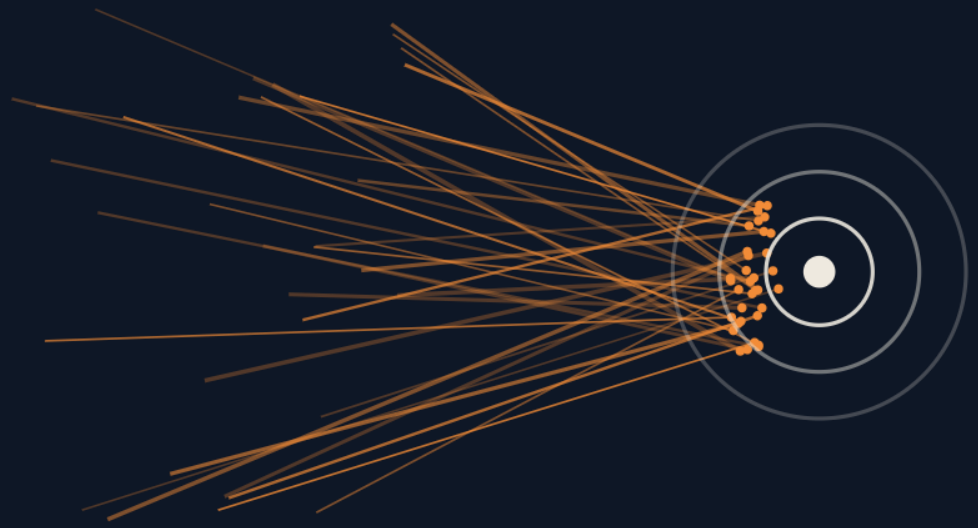
Pilot opportunities identified

Power grid and critical infrastructure

Active discussions on new applications

06 · AI AND QUANTUM COMPUTING

The next generation of threats





AI-enabled attacks

Faster, more sophisticated and more complex than ever.

Quantum computing

A long-term risk to public-key cryptography.

When keys, credentials or trusted components are compromised, what keeps the mission running?

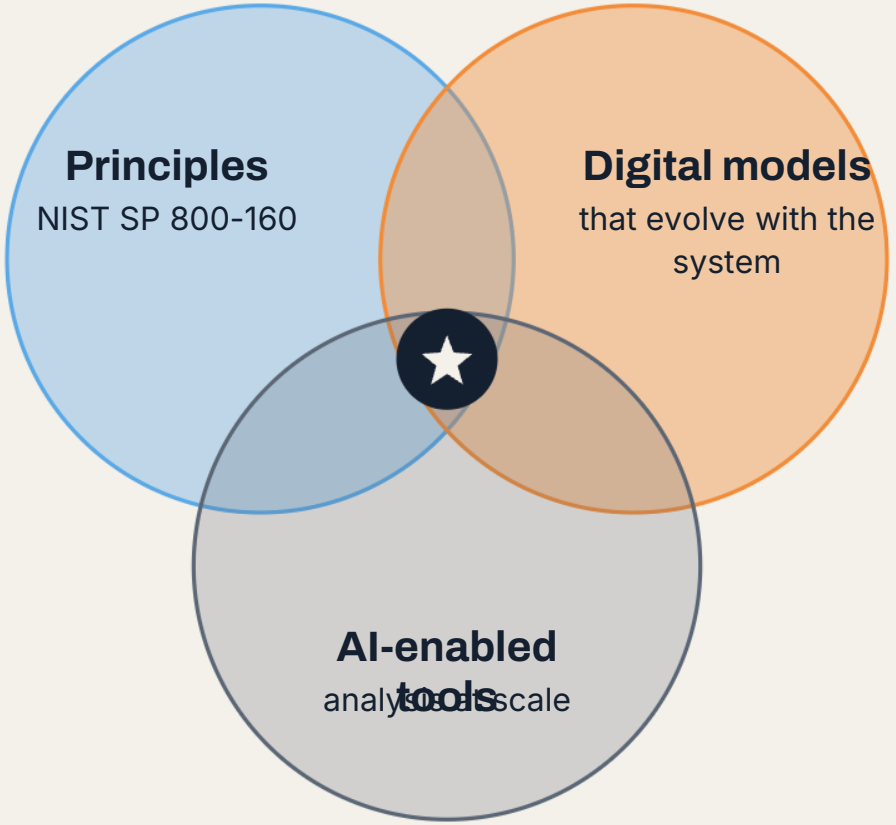
Quantum-resistant cryptography is essential, but on its own it cannot guarantee resilience. Resilience must be engineered into the architecture itself.



Transforming the systems engineering workforce

A workforce equipped to engineer resilience at scale.

Not every systems engineer must become a cybersecurity specialist. Build secure systems engineering into the workflows they already use.



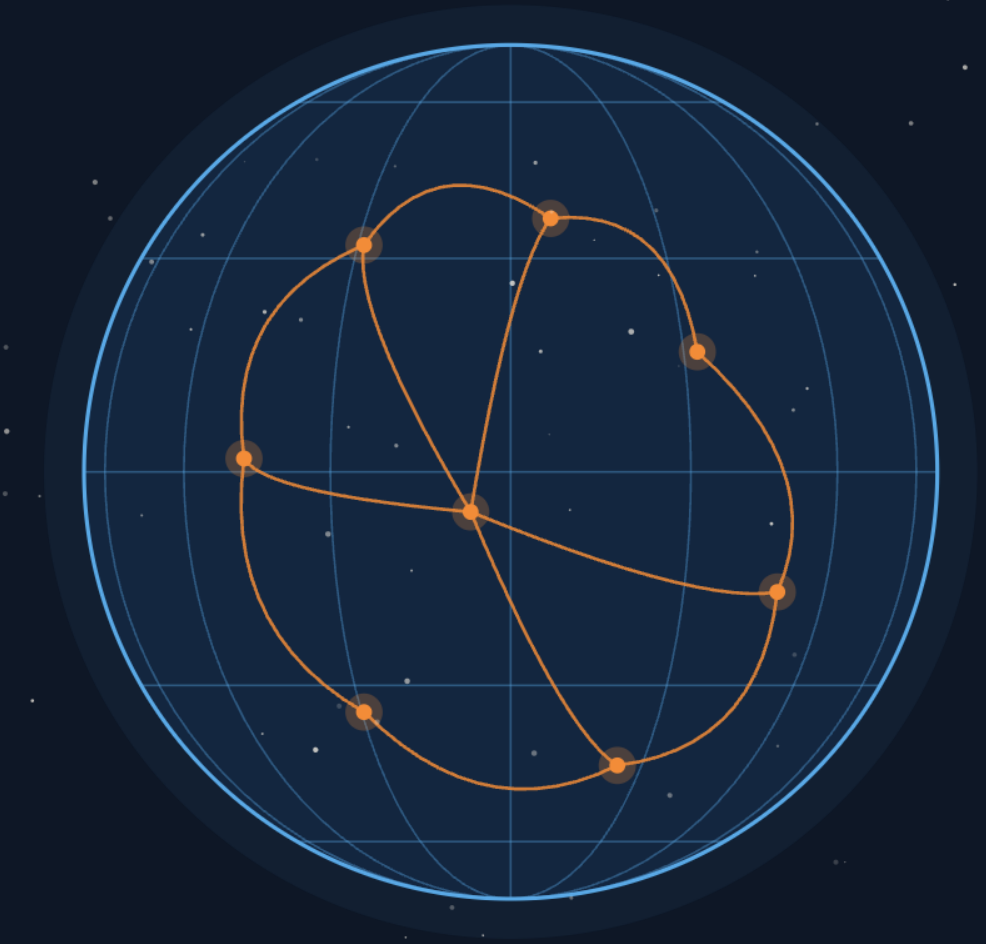
08 · THE INTERNATIONAL IMPERATIVE

Resilience is an international effort

Critical infrastructure crosses industries, supply chains and national borders. Disruptions reach far beyond one organization or one country.

COLLABORATION ACROSS

- Industry
- Government
- Academia
- Professional organizations
- Systems integrators



“The next generation of complex systems will face threats we cannot fully predict or prevent. Our responsibility as systems engineers is to design systems that can continue fulfilling their missions despite those threats.”

Larry James, CEO, KAIperShield

LET'S WORK TOGETHER

Let's make engineered resilience real.

- Architecture assessments
- Pilot projects
- Technology integration
- AULIS deployment

Larry James · CEO, KAIperShield, Inc.
[email] · [website]

