

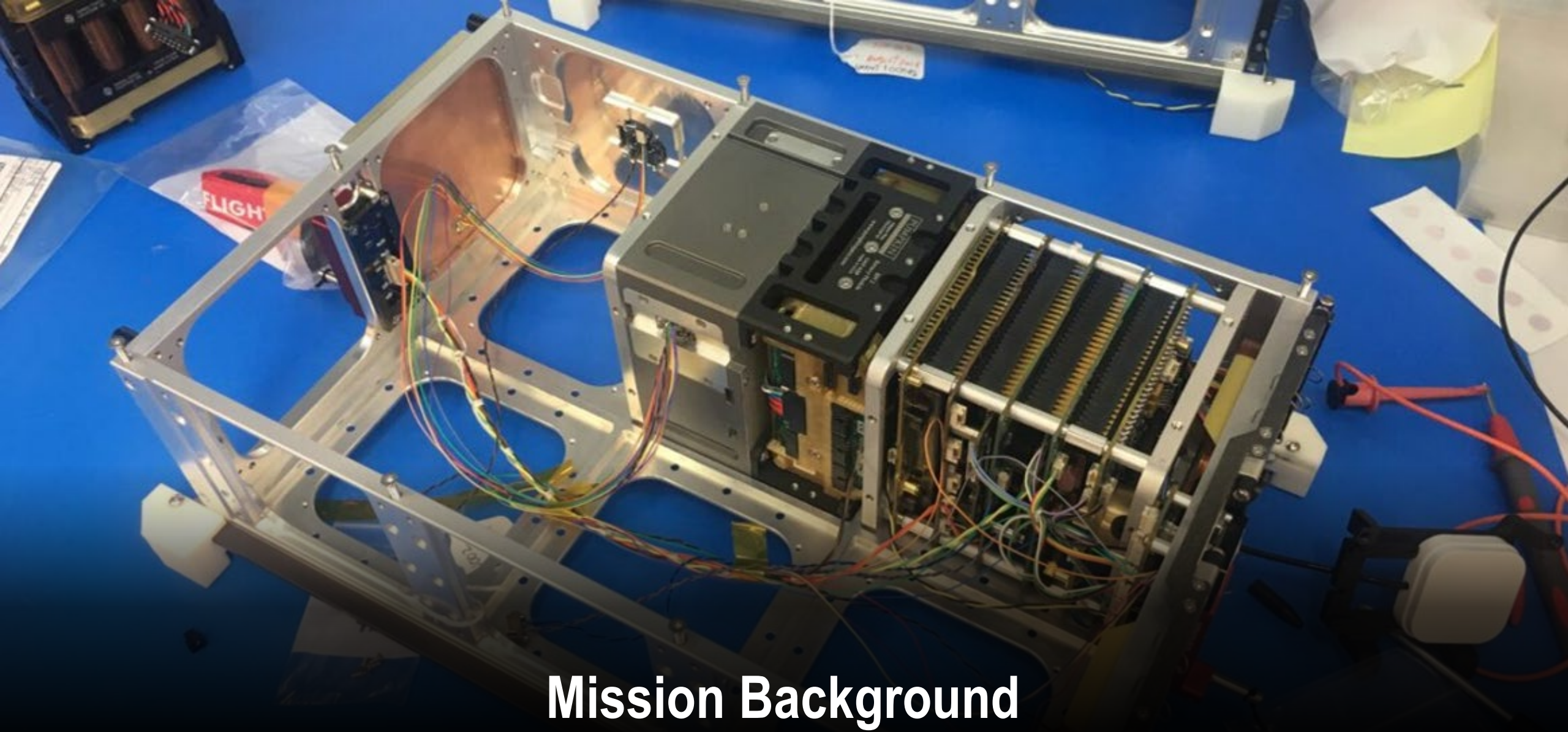
# Naval Information Warfare Center Pacific

## *Laser Crosslink Experiment: Mission Review*

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*April 22, 2025*

Sean Stanko  
Scientist



# Mission Background



# Laser Crosslink Experiment (LaCE)



# NIWC Pacific

- Naval Information Warfare Center, Pacific
  - Navy laboratory in San Diego, California
- Space & Stratospheric Systems Team
  - Experimental payload flight group
  - Integration, testing, and operation capabilities
  - Over a dozen stratospheric & LEO launches



# Myself

- Sean Stanko
  - LaCE Mission Director
  - M.S. Aeronautics & Astronautics  
Stanford University
  - 7+ years in Navy Space
  - Hobby Astronomy & Aviation



*Pre-Launch at Vandenberg*



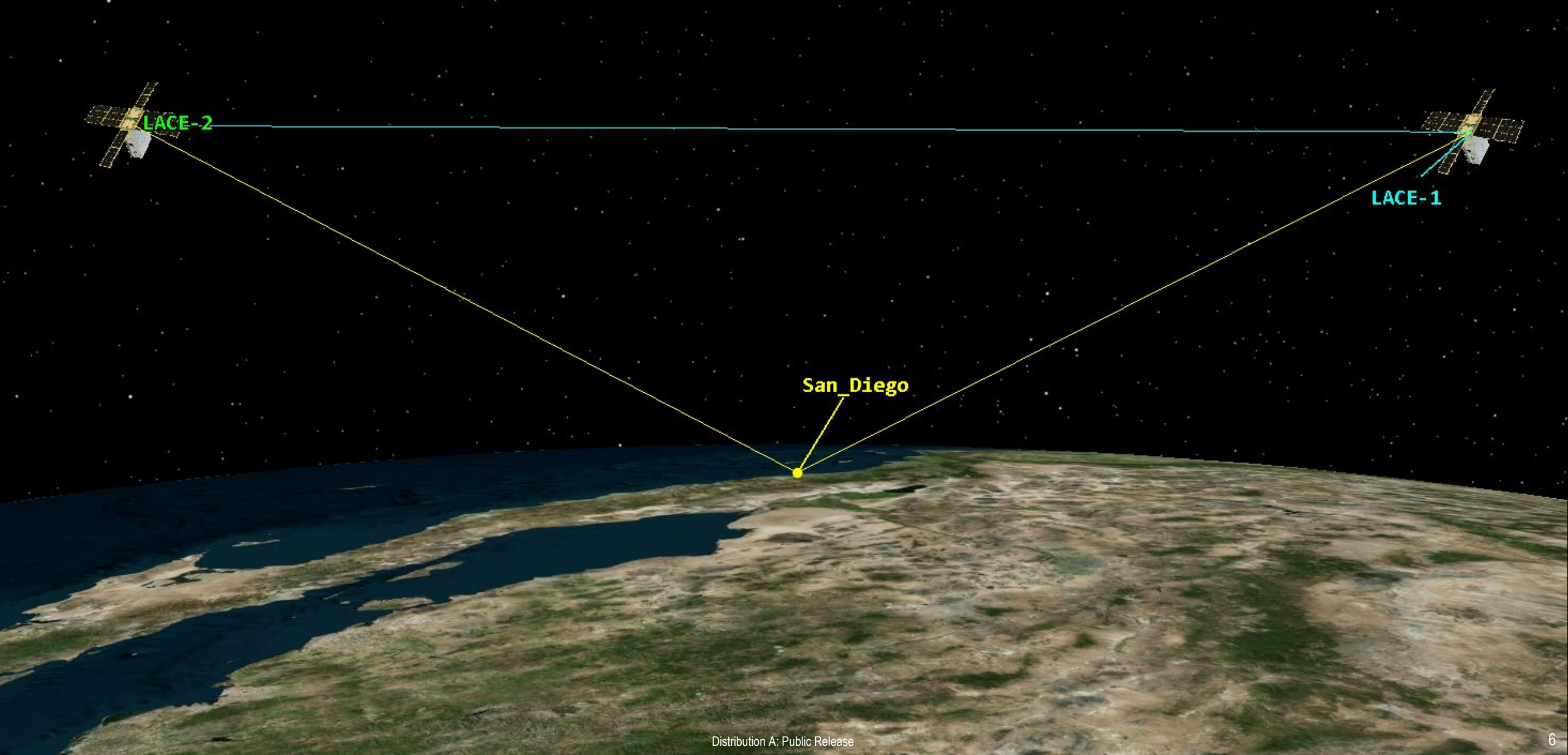
*General Aviation in KSDM*



*May 10 2025 Aurora visible in San Diego*



# Skylight Mission Concept (Primary)

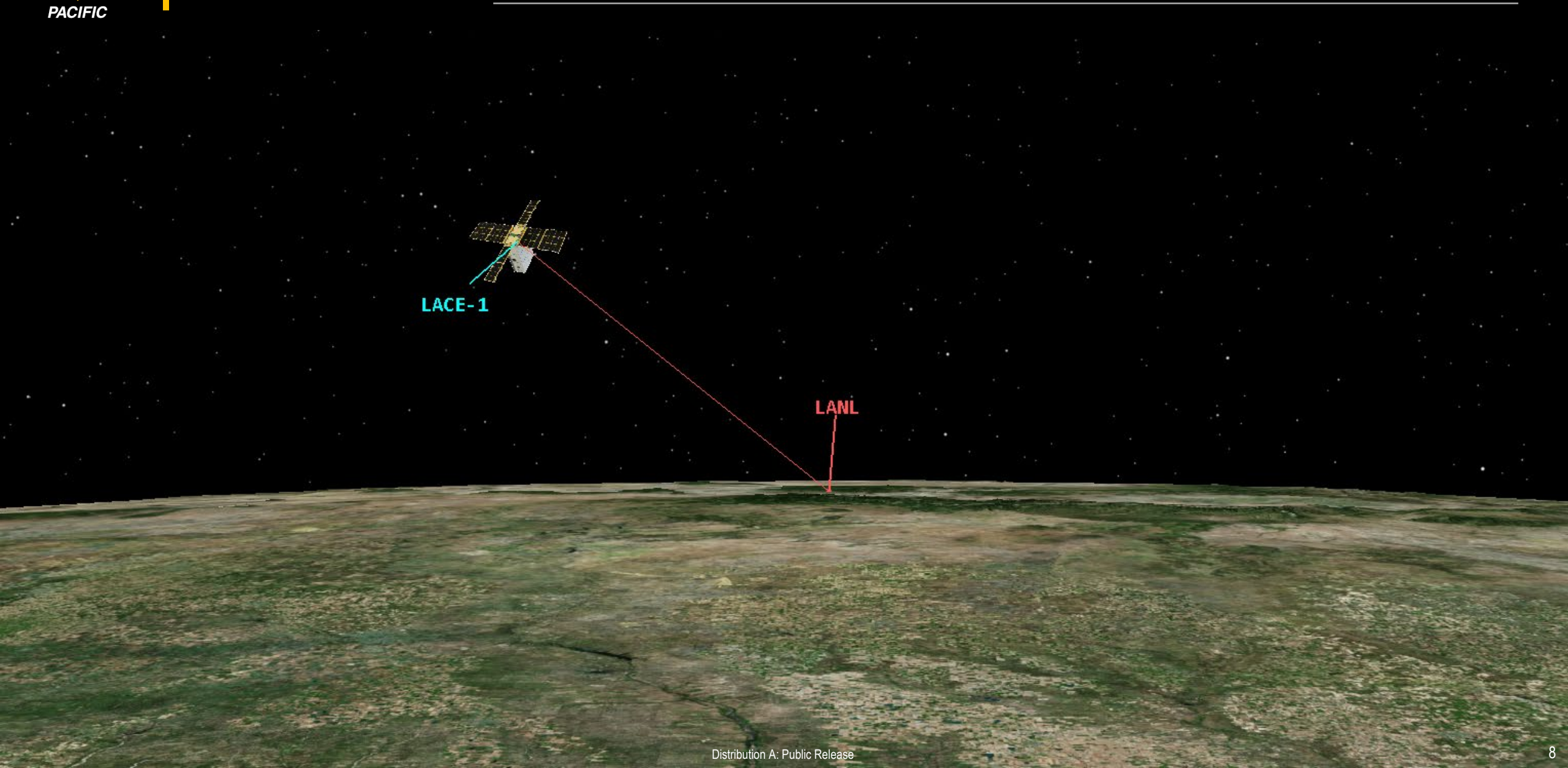


# Skylight Mission Concept (Alternate)





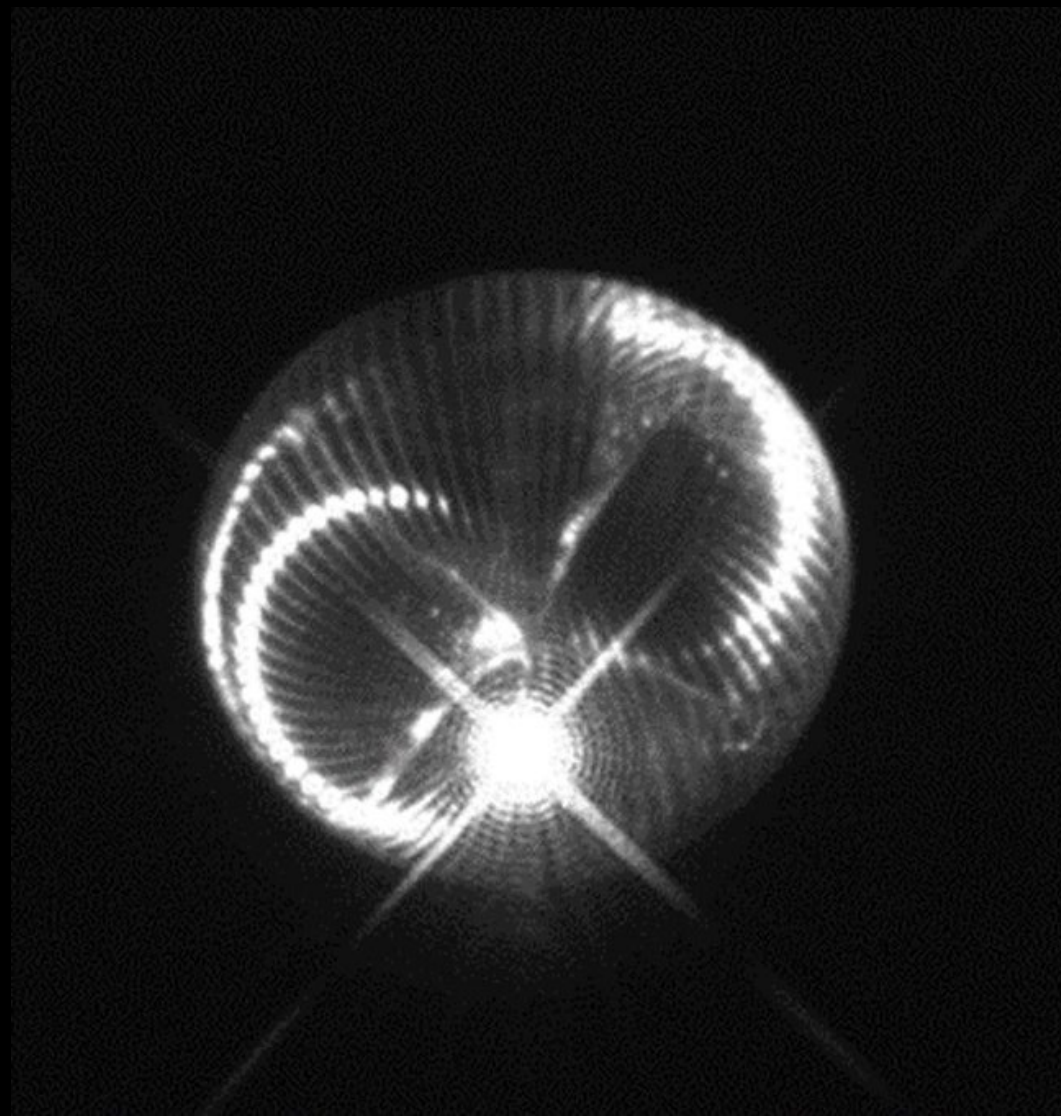
# ELROI Mission Concept





# Stratospheric Optical Link Demonstration (SOLD)

- Stratospheric Risk Reduction
  - Risk Reduction mission launched August 30, 2023
  - Steady 100mb/s optical uplink to stratosphere
- Benefits
  - Validated skylight in space-like conditions
  - Validated alternate space/ground mission concept
  - Flight hardware recovered and recycled in lab



*SOLD during flight operations*



# Mission Summary



# Mission Timeline

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# LaCE-2 Loss of Comms





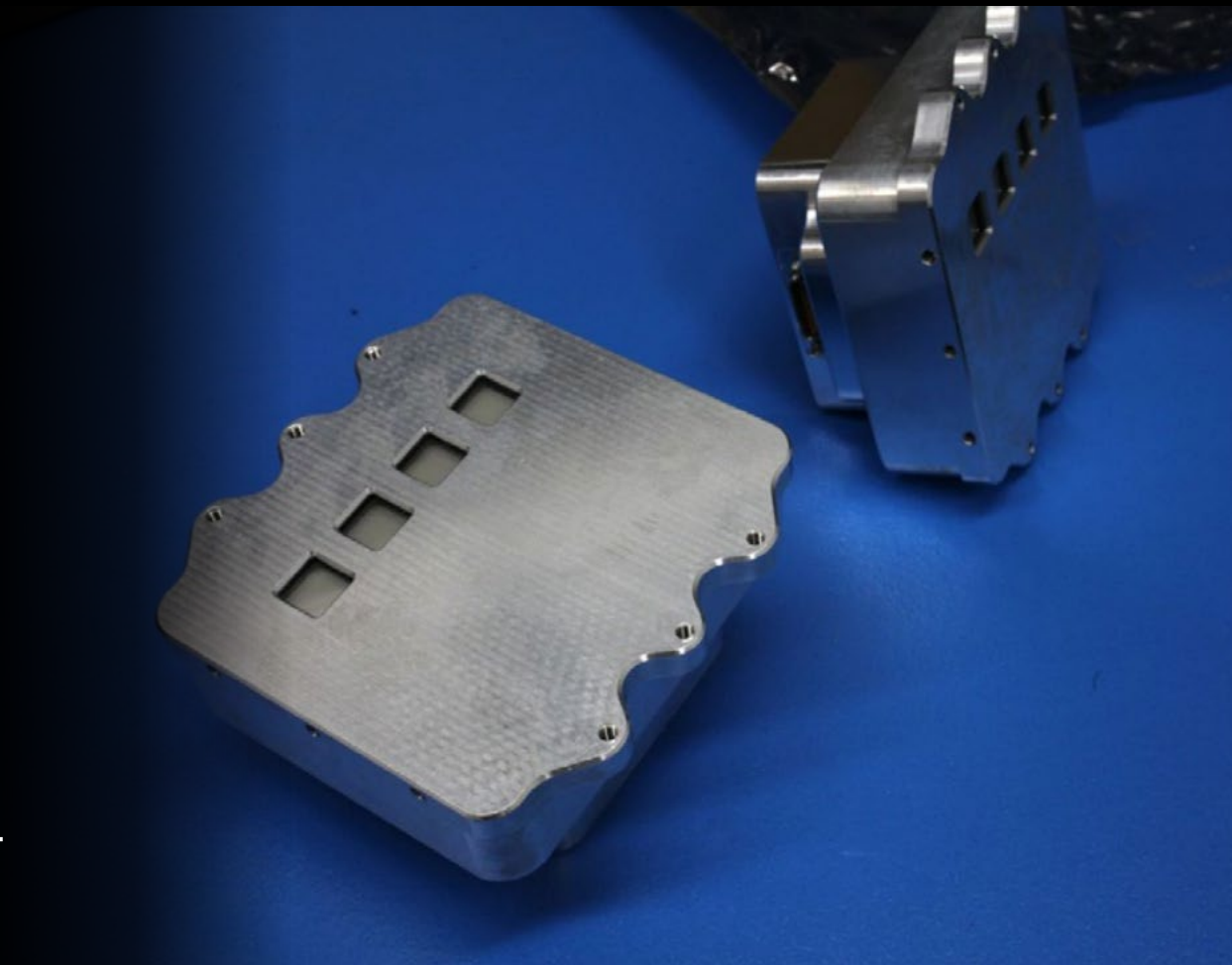
# ELROI Mission

## ■ Payload Overview

- Los Alamos National Laboratory
- Extremely Low Resource Optical Identifier
- 1/2U modulated laser beacon

## ■ Mission Results

- LaCE provides calibration target for ELROI ground node
- Multiple successful observations in June 2024



*ELROI Flight Units in lab*

# Skylight Mission





# Ground Station





# Lessons Learned

# Redundancy

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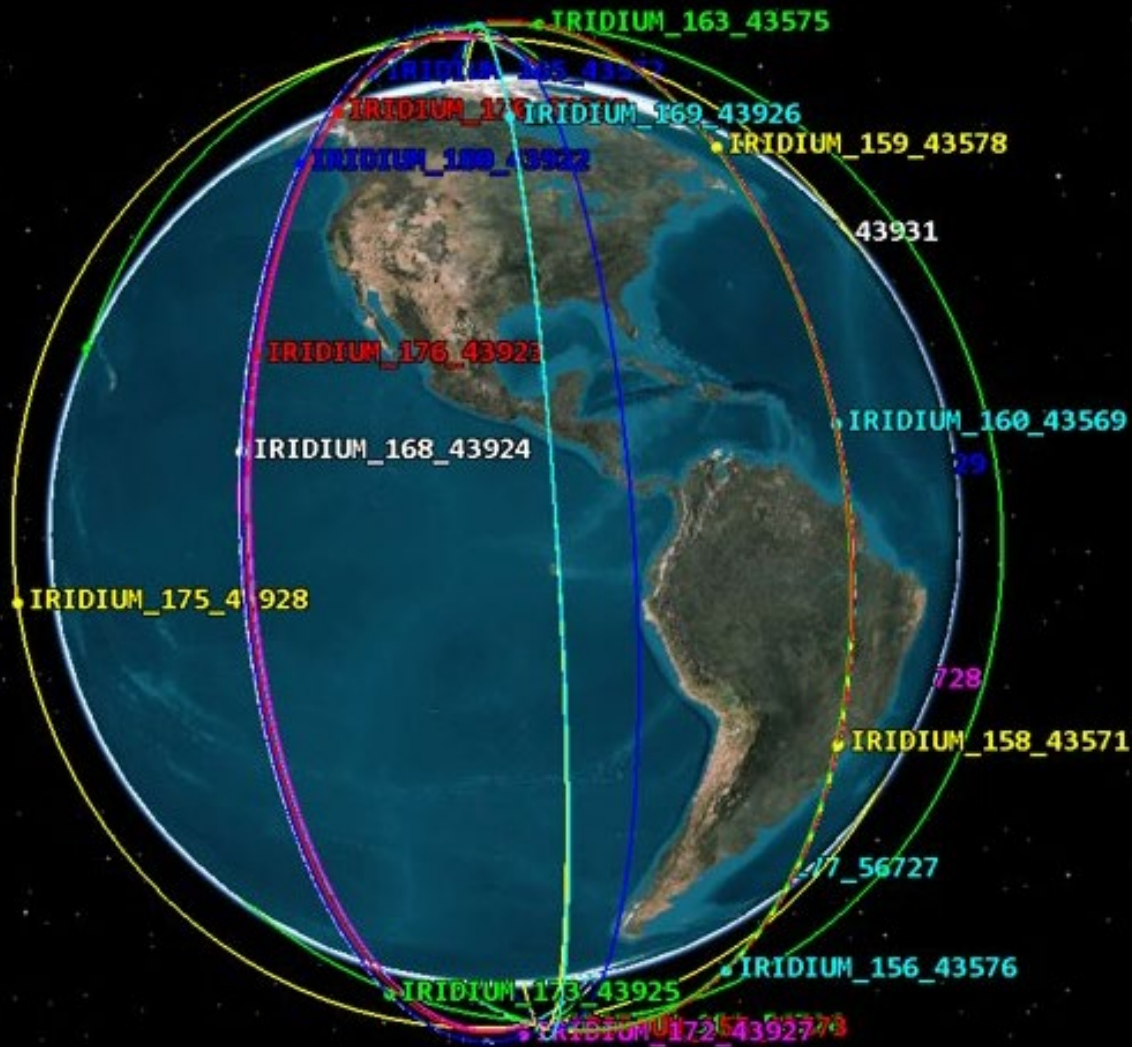
# Stratospheric Pre-Testing

- Low-Cost Risk Reduction
  - Stratospheric environment similar to Low Earth Orbit
  - Shorter / cheaper roadmap to launch
  - Validate hardware & mission concepts before committing to space
  - Payload is recovered (usually)
- Alternate Execution Path
  - Additional environment for tech demonstrations
  - Utilize engineering/flight spares

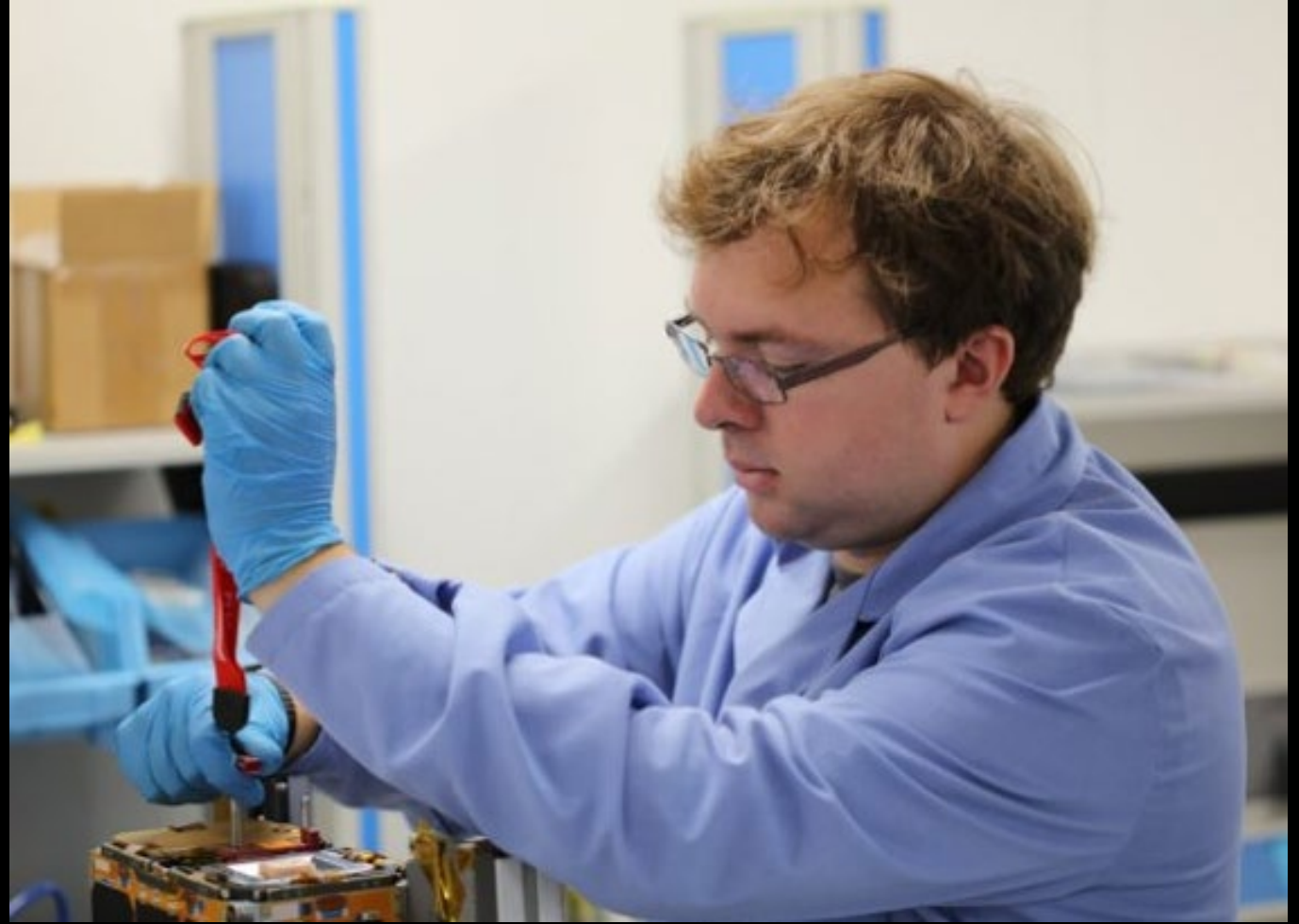


**SOLD Balloon Launch**

# Iridium SatComm

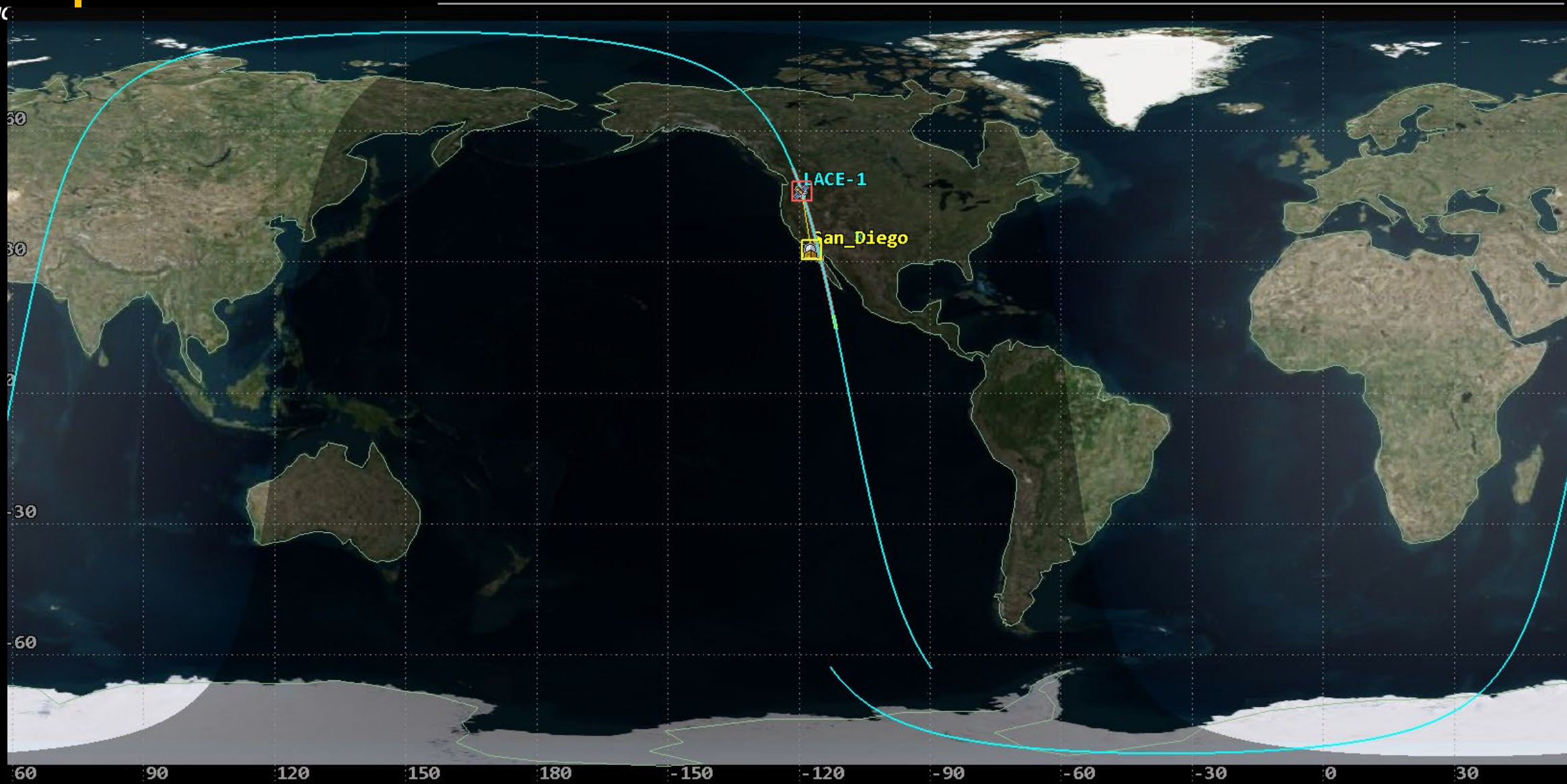


# Flight System Development





# Flight System Operation



# Ground System Operation

- Identify site-specific challenges
  - Installation Schedules
  - Terrain
  - Weather
- Start early
  - Installation Timelines
  - Approval Timelines

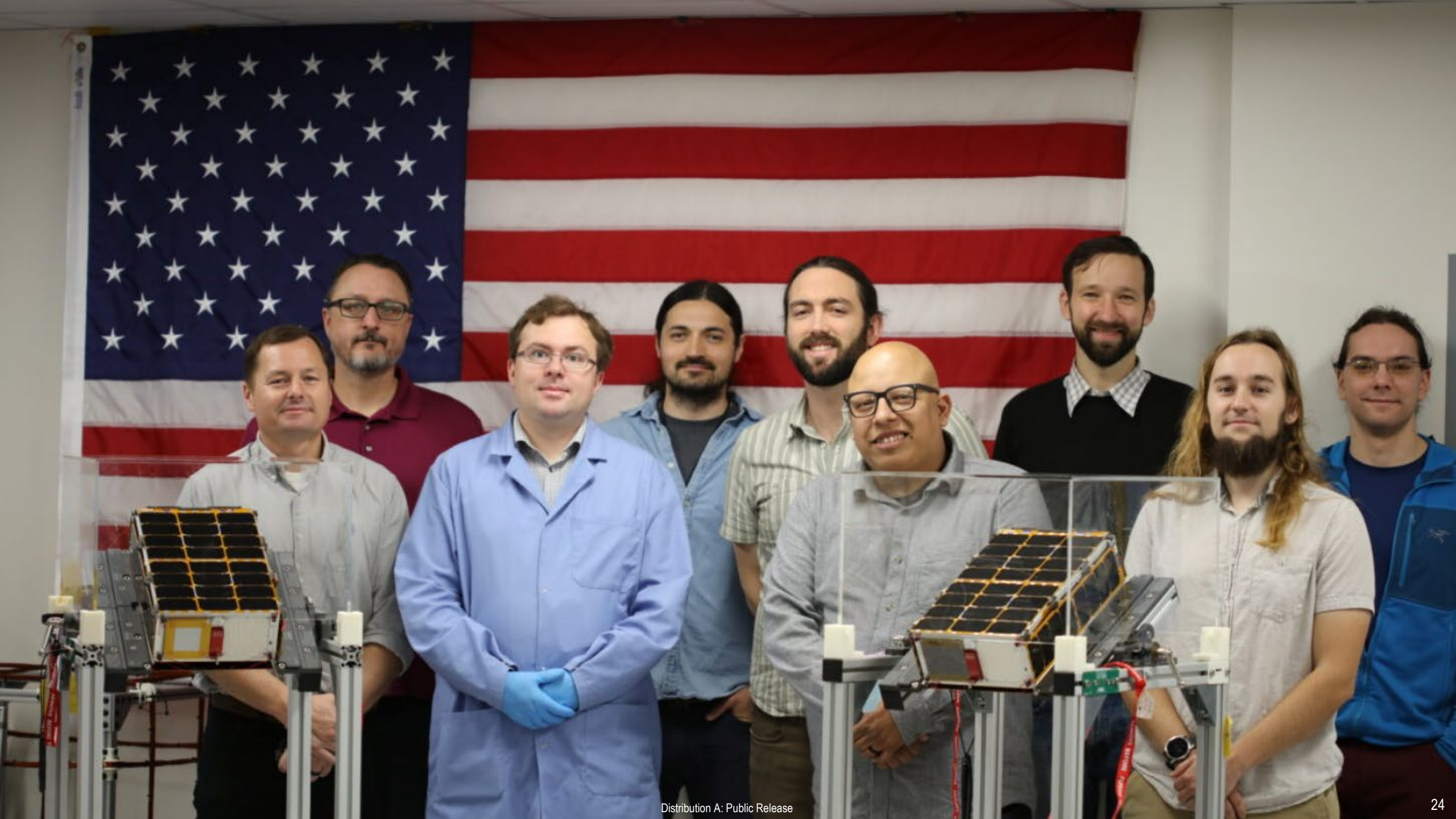


*Radome Installation*

# Acknowledgements

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**BRINGING THE POWER OF  
INFORMATION TO THE FIGHT!**

