

Innovation und Nachhaltigkeit: Beobachtungen und Lektionen von zwei Kontinenten

Dr. Thomas H. Zurbuchen

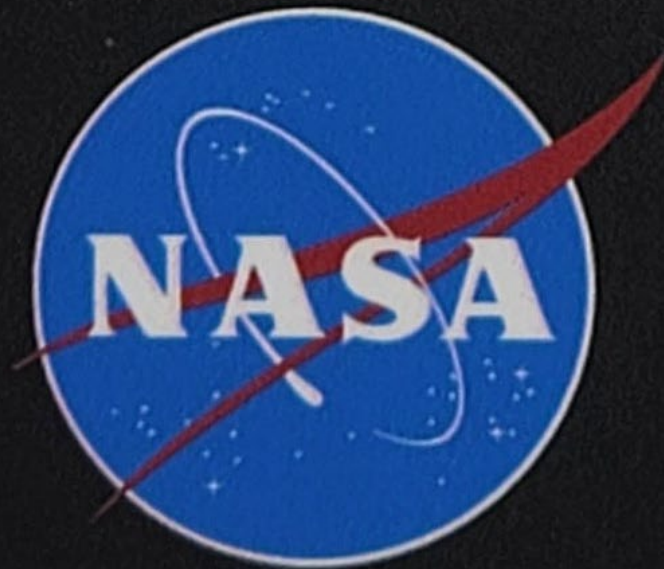
Prof and Director, ETH Zürich | Space
NASA Science Associate Administrator, 2016 – 22

@Dr_ThomasZ thomaszurbuchen.com

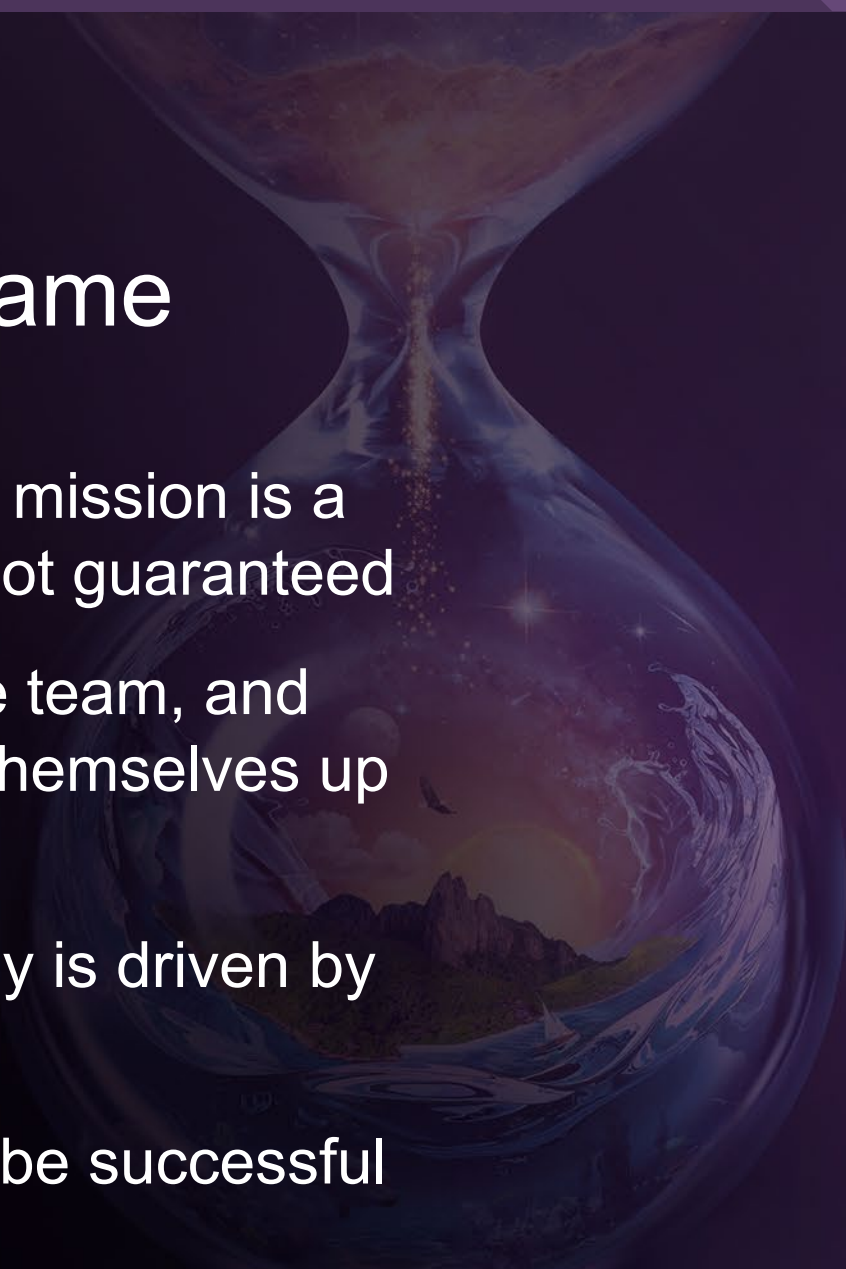




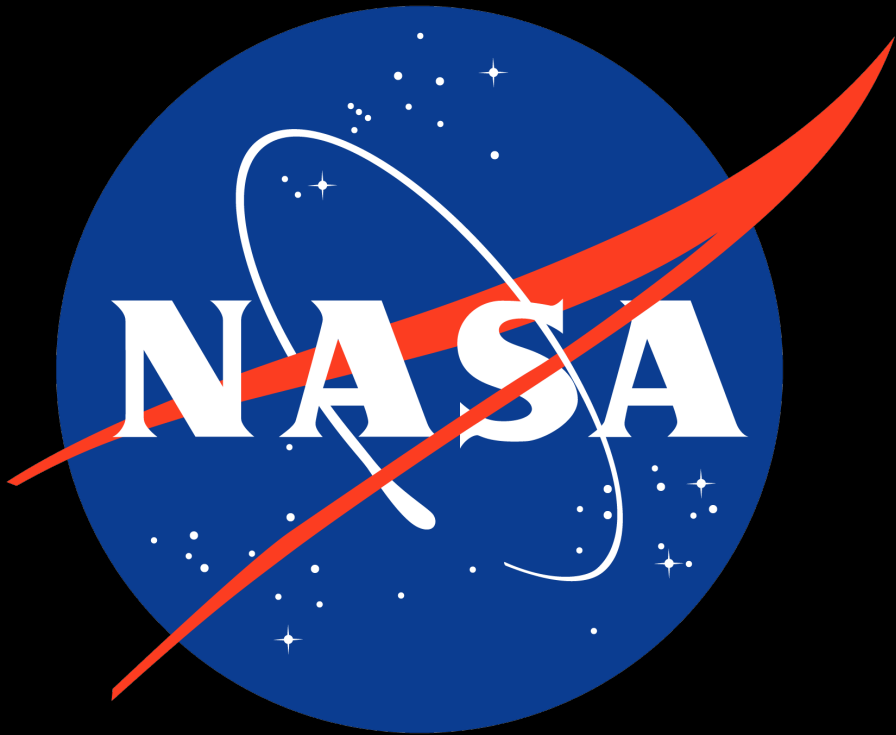
FAILURE IS
NOT
AN OPTION



NASA – Companies; What is the Same

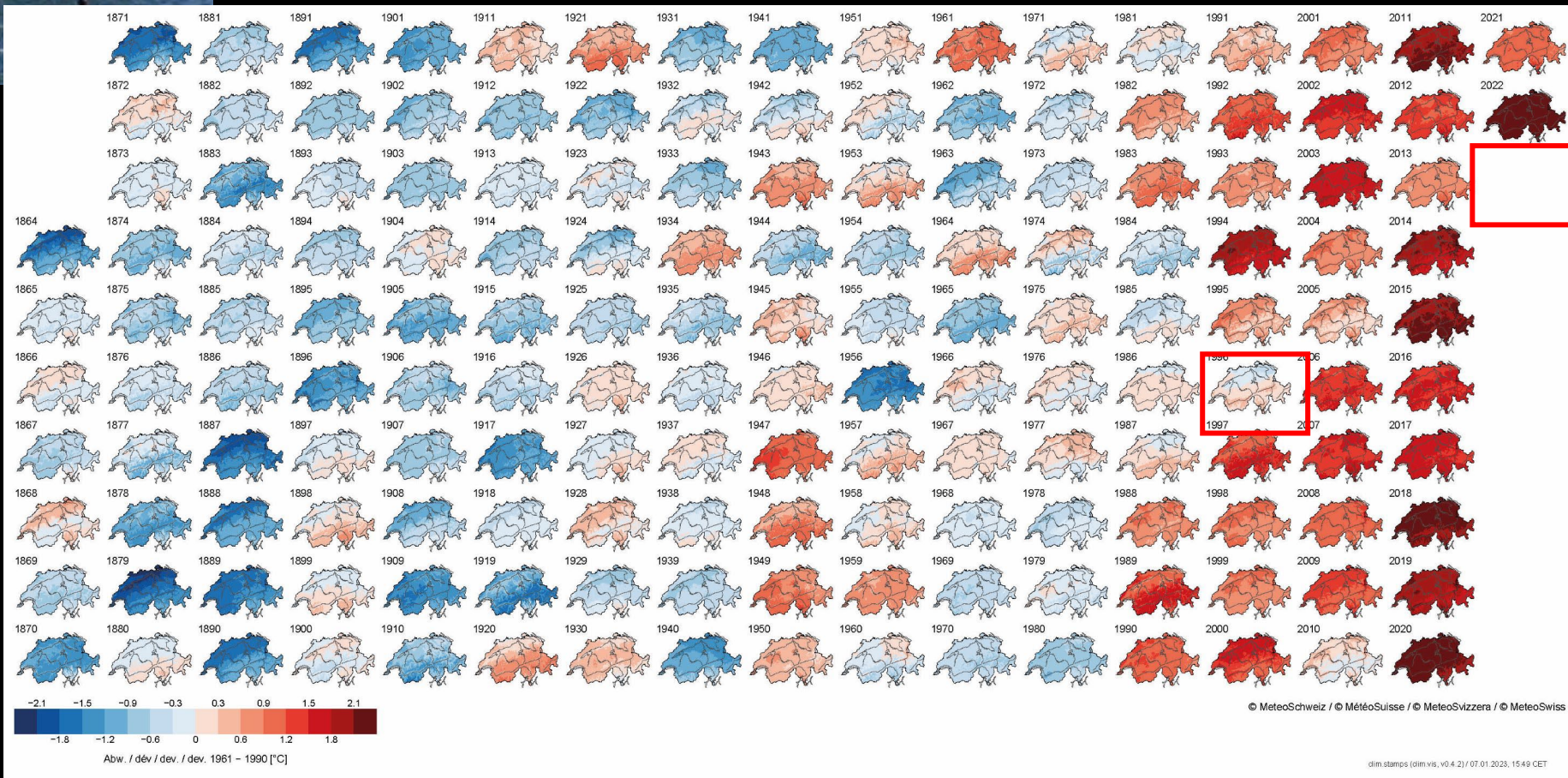
- Challenge – each company, each space mission is a very difficult endeavor where success is not guaranteed
 - Leadership and Team – it is all about the team, and leaders who get the best out of them set themselves up for success
 - Ambiguity – each mission, each company is driven by forces not under control of the leaders
 - Resilience – only those who persist can be successful
- 
- An hourglass is positioned on the right side of the slide. The top bulb is empty, while the bottom bulb contains a vibrant, colorful scene of a sunset or sunrise over a landscape with mountains and a body of water. The scene is framed by the glass of the hourglass, and a stream of golden particles flows from the top bulb into the bottom one.

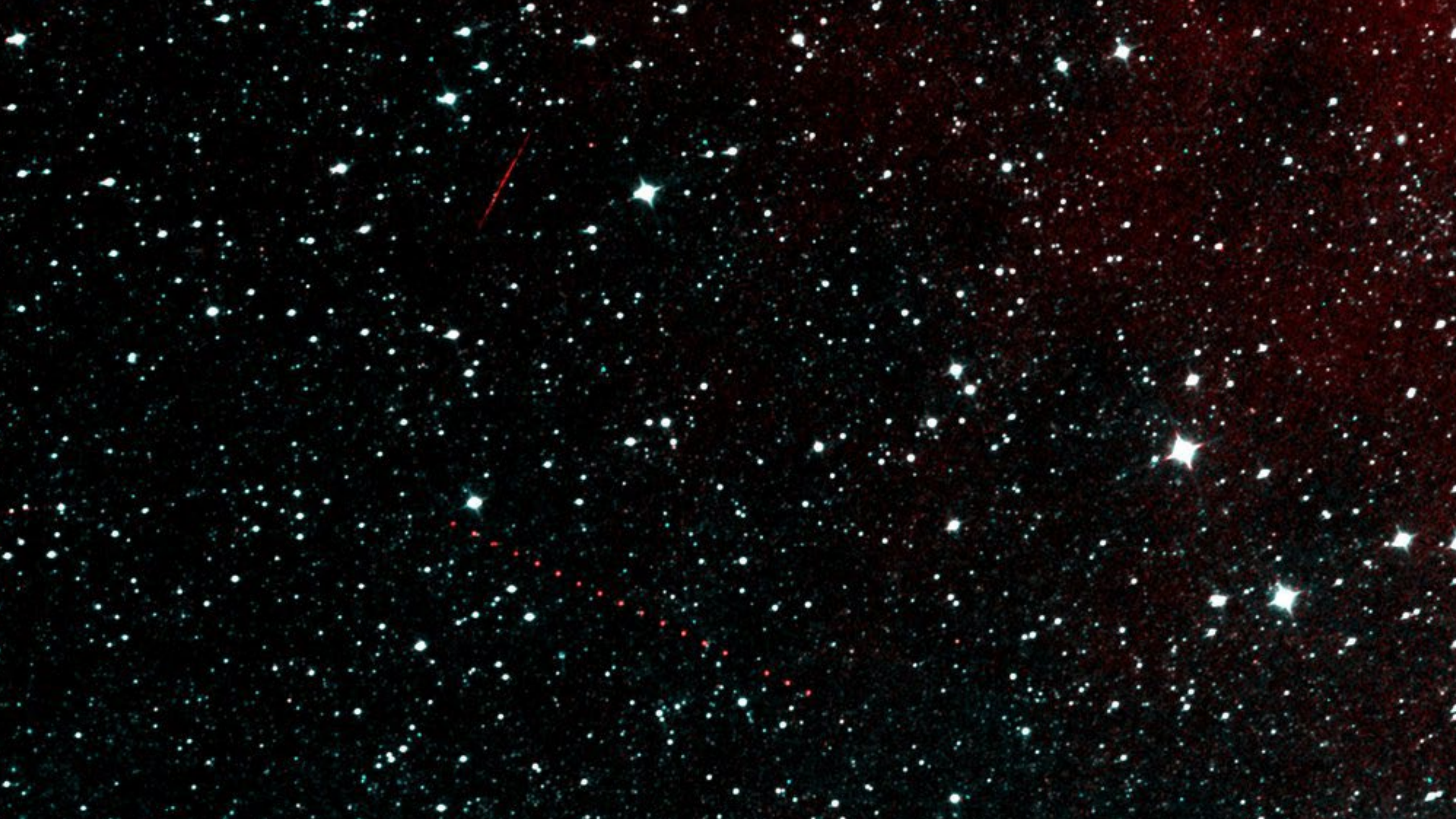
Key Lessons of Leadership in Time of Change

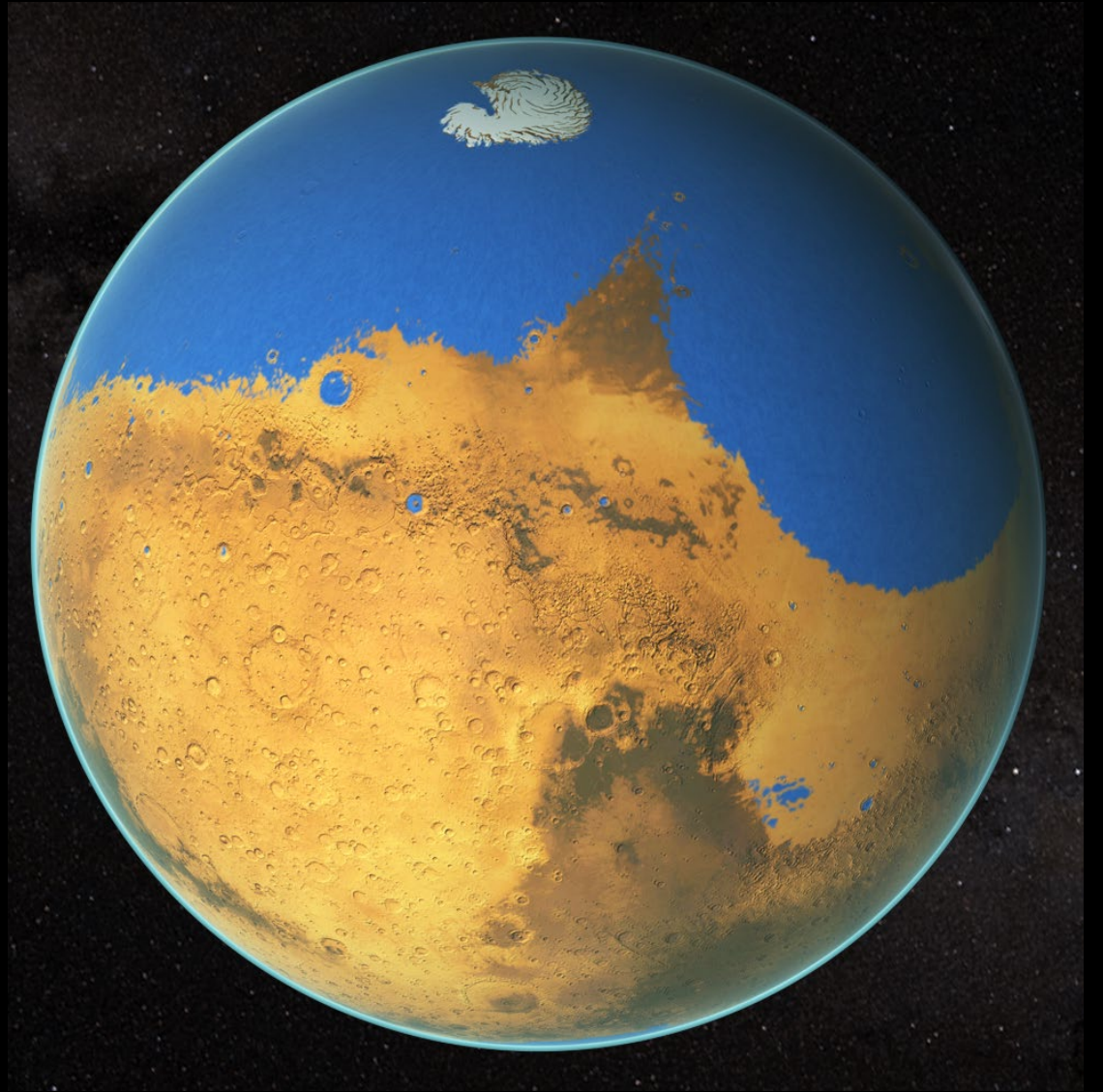
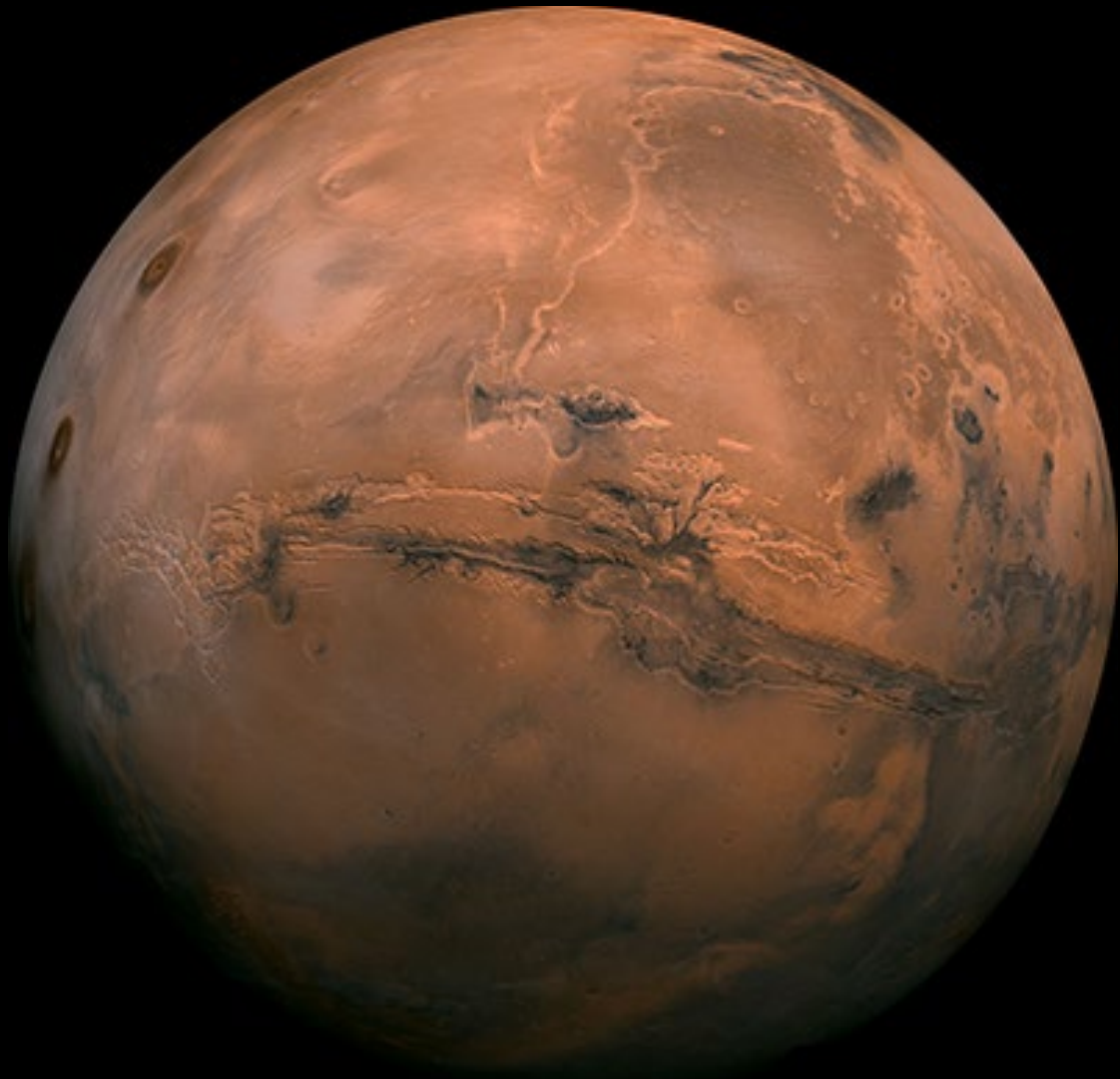


- Know and Act Considering that Change is Ever-Present
- Learn to Struggle Internally with Opposing Thoughts – Team Roles
- Practical Change Strategies can be Learned and Applied





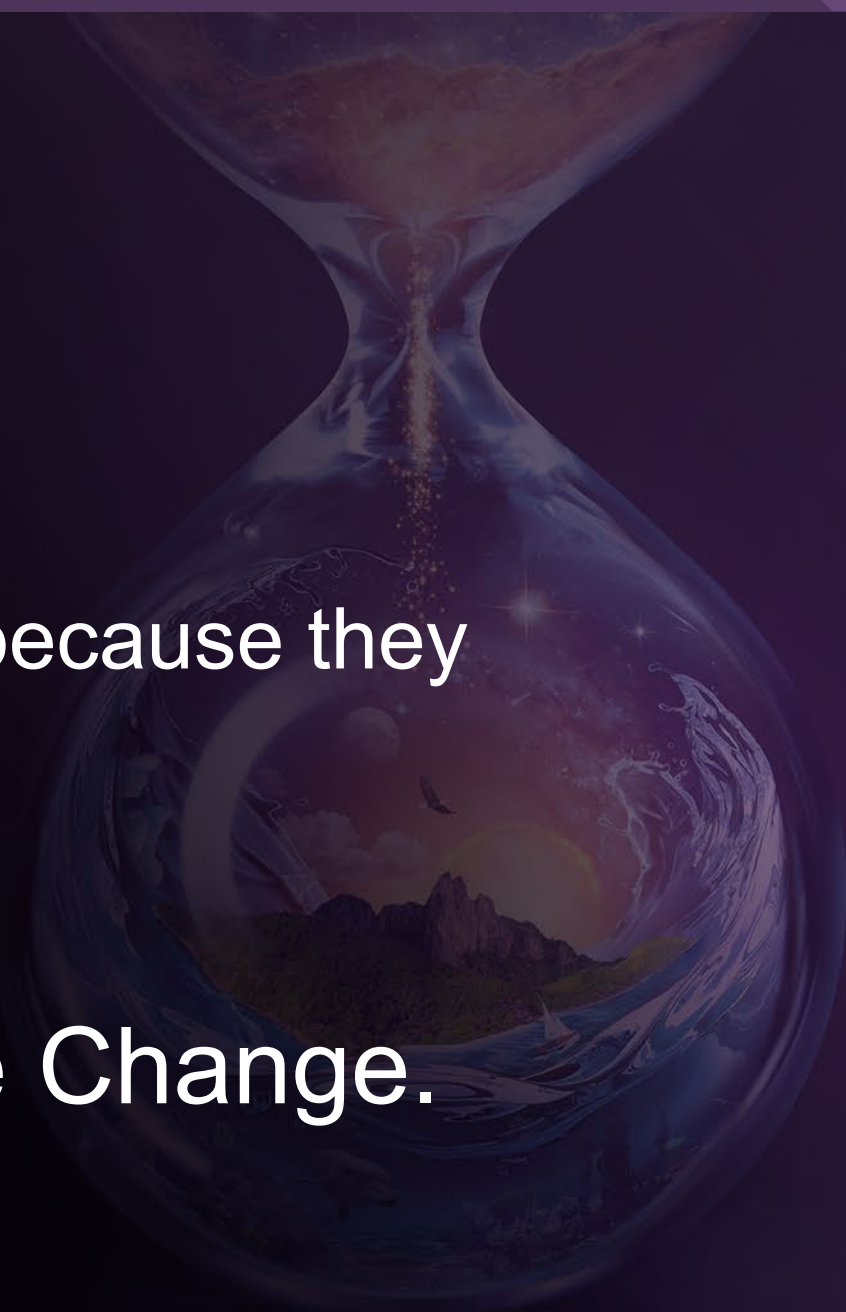




The Law of Nature is Change

... some things look stable because they change slowly.

Embrace Change.



Big Change Topics

1. Workforce Changes (Work percentages, remote/in person)
2. Supply Chain issues
3. Artificial Intelligence
4. Environmental Drivers/Sustainability
5. Exchange Rates
6. Worldwide Political Forces (China, Russia, etc)
7. ...

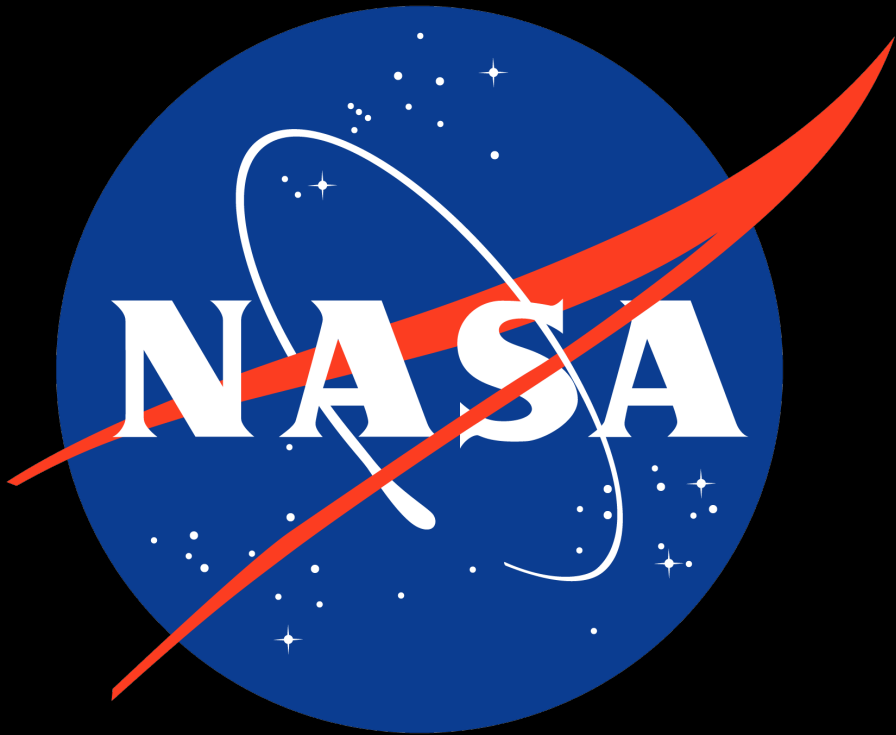
How Do We Frame Decisions?

- Recognize Change
- Abundance of Ideas vs Single Minded Approach
- Flexibility in Thought vs Rigidity
- Curiosity vs Bias
- Risk Taking as we Confront the Unknown vs Caution





Key Lessons of Leadership in Time of Change



- Know and Act Considering that Change is Ever-Present
- **Learn to Struggle Internally with Opposing Thoughts – Team Roles**
- Practical Change Strategies can be Learned and Applied



Scott Fitzgerald

true leadership

“The test of a ~~first-rate intelligence~~ is the ability to hold two opposing ideas in mind at the same time and still retain the ability to function. One should, for example, be able to see that things are hopeless yet be determined to make them otherwise.”



Irrelevant ← Innovation → Impossible



Too Much ← Patience → Too Little



The Power of Teams to Help Find Balance: Lessons



- Success >> Ego: “Work on the best idea, not your best idea”
- Add more perspectives for deeper thought, actively drive them
- Attack ideas, never attack people



JOHN HOPKINS
APPLIED PHYSICS LABORATORY



THIS IS A TEST



D

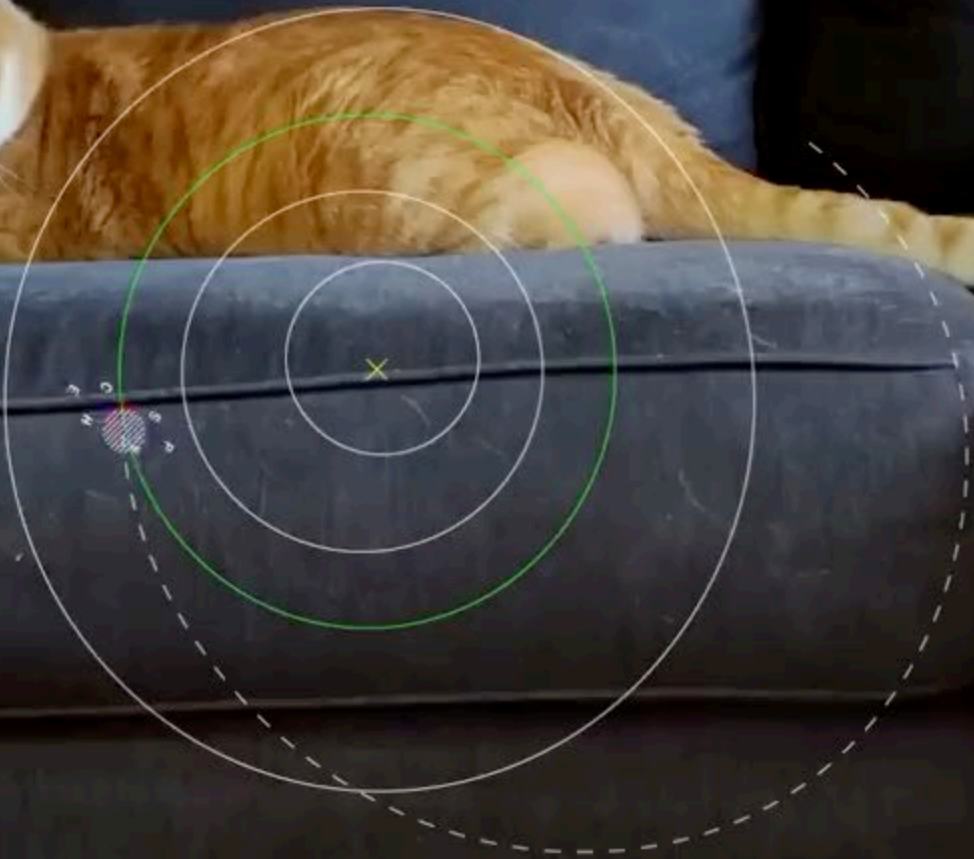
S

O

C

DISTANCE: 0.93 100
SNSPO COUNT: 16

110



UPLINK DATA RATE: 1.6Kb/s
[EXPECTED] DOWNLINK DATA RATE: 100.00 Mb/s

LASER POWER: 2-4 WATTS
TIME STAMP: 00:00:01

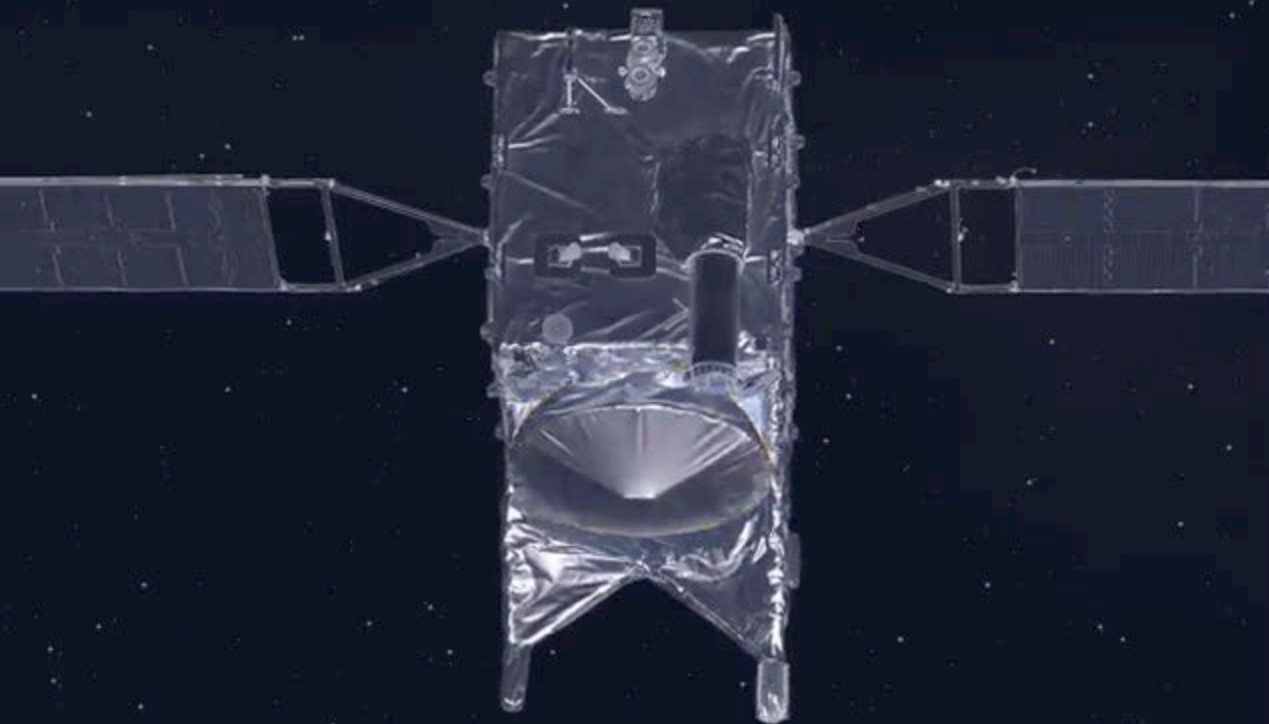
0 1 110 BPM

SUBJECT: TATERS THE CAT
SPECIES: ORANGE TABBY
LIFE: 5/9

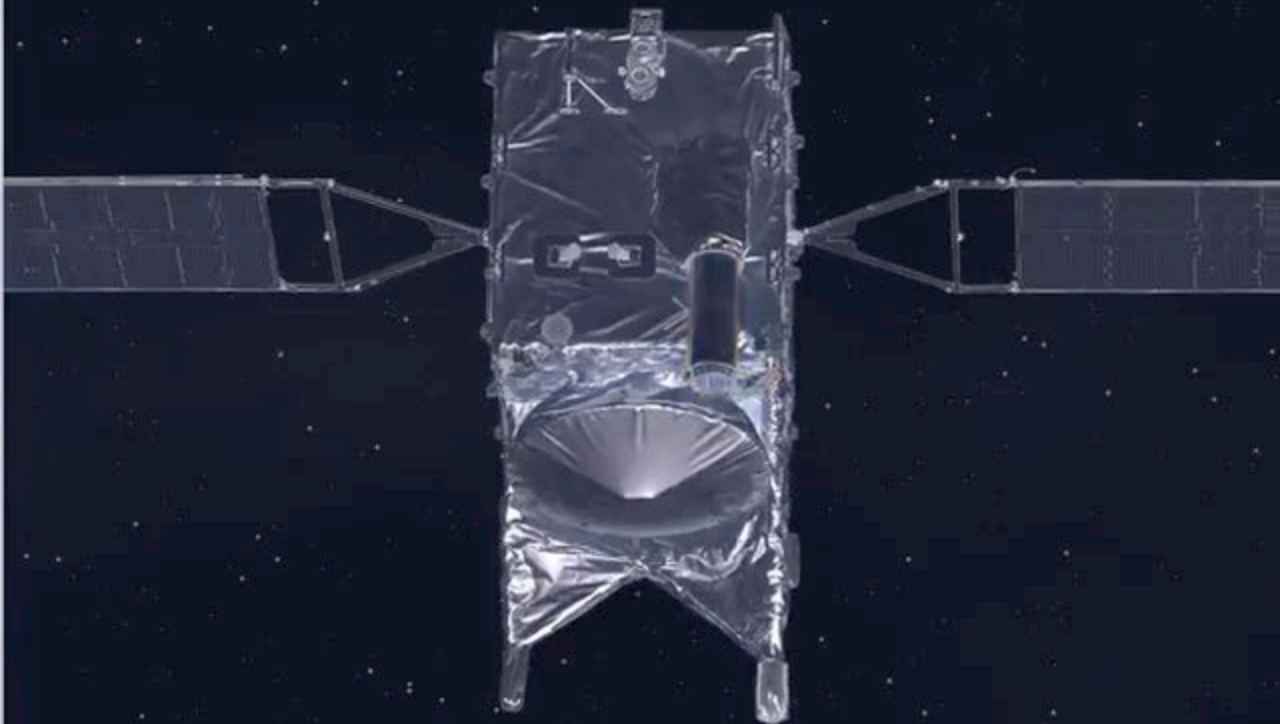
THIS IS A TEST

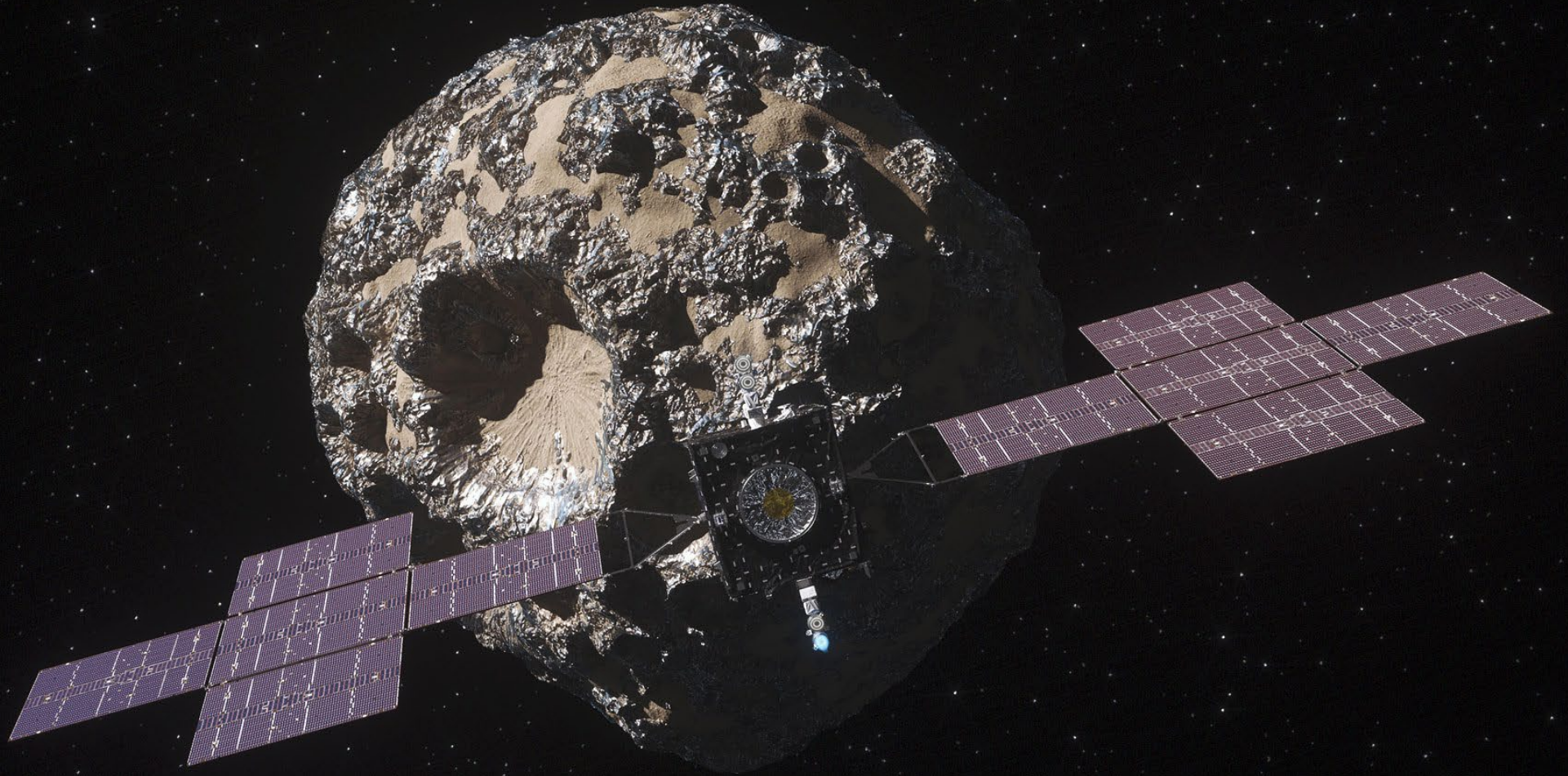


RADIO TELECOMMUNICATIONS SYSTEM



DEEP SPACE OPTICAL COMMUNICATIONS (DSOC)





Psyche Launch, October 13, 2023

The Story ...



THIS IS A TEST



D

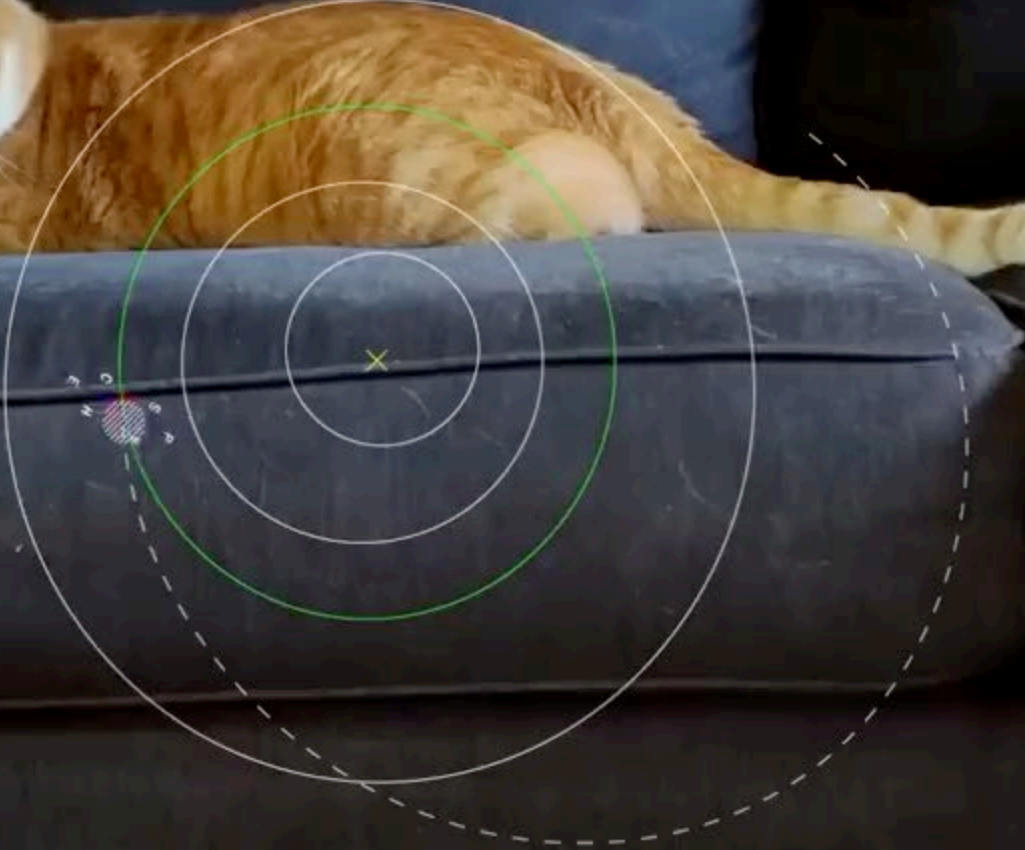
S

O

C

DISTANCE: 0.93 100
SNSPO COUNT: 16

110



UPLINK DATA RATE: 1.6Kb/s
[EXPECTED] DOWNLINK DATA RATE: 100.00 Mb/s

LASER POWER: 2-4 WATTS
TIME STAMP: 00:00:01



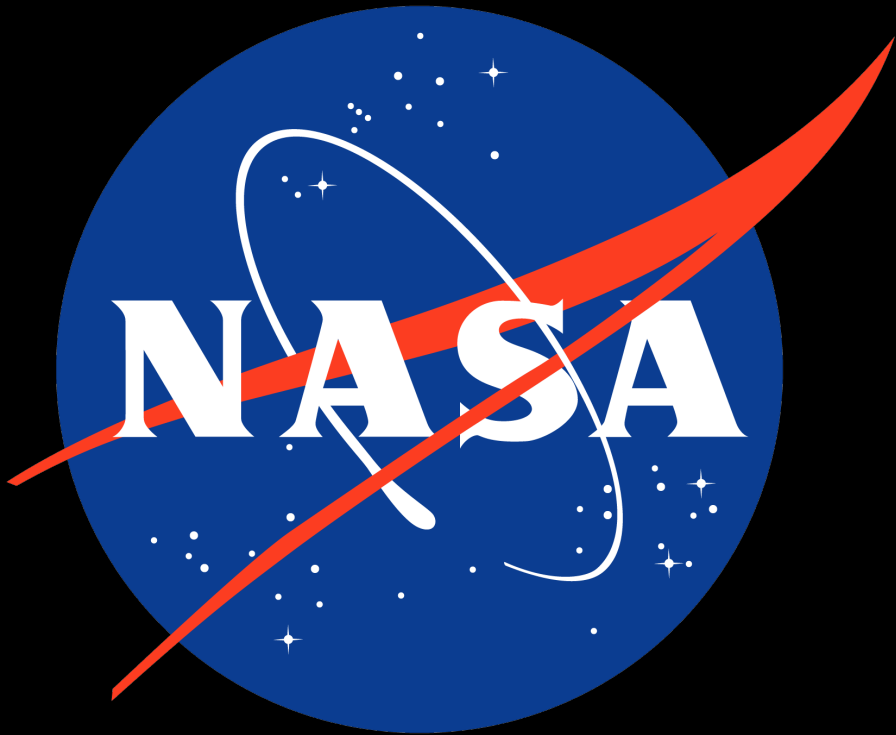
0 1 110 BPM

SUBJECT: TATERS THE CAT
SPECIES: ORANGE TABBY
LIFE: 5/9

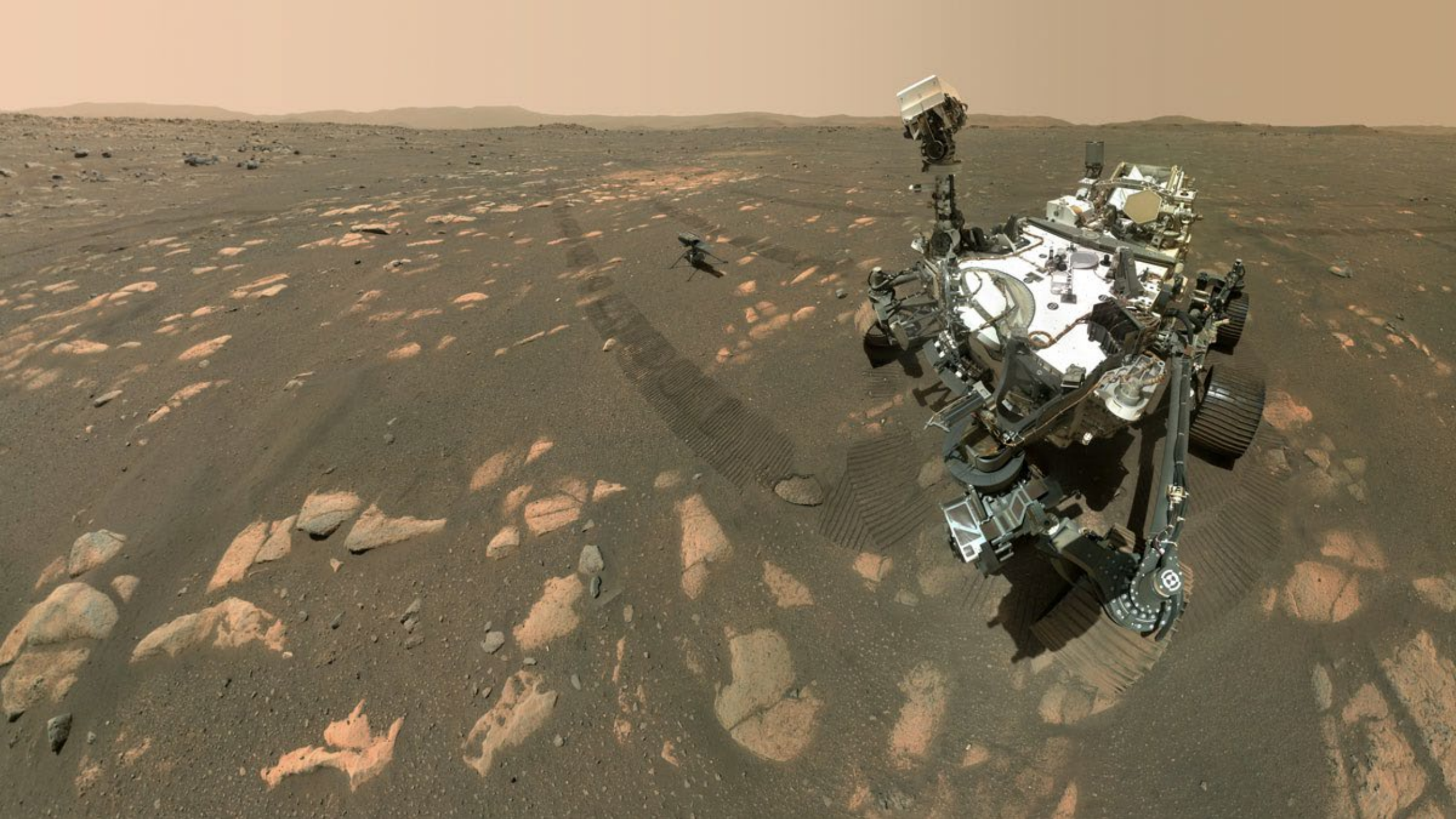
THIS IS A TEST



Key Lessons of Leadership in Time of Change

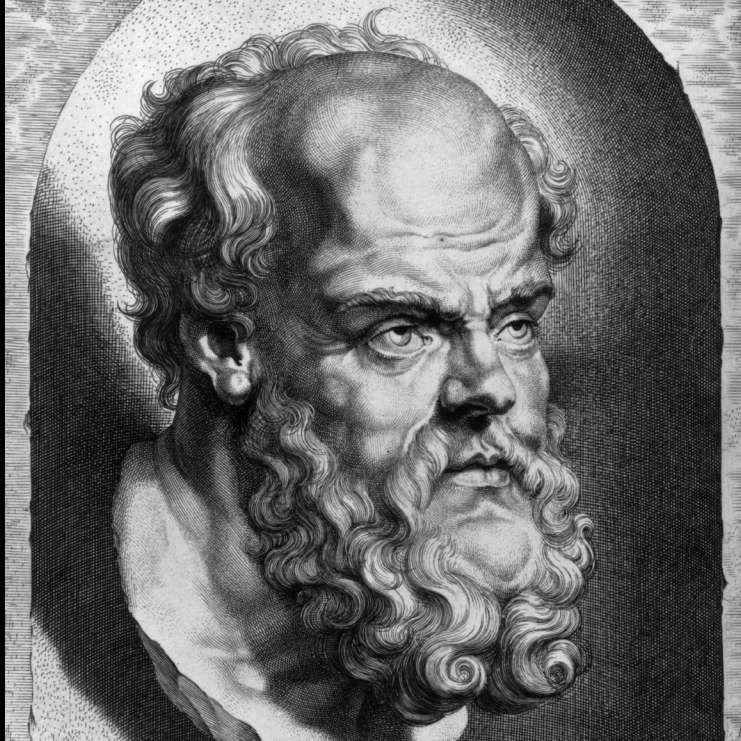


- Know and Act Considering that Change is Ever-Present
- Learn to Struggle Internally with Opposing Thoughts – Team Roles
- **Practical Change Strategies can be Learned and Applied**



Sustaining Innovation in Changing Environment

1. Build Awareness and Muscle Memory that Change is Normal and Expected – Adjust Team if Needed
2. Create Data-based Feedback Mechanisms to Detect Change, and Act Based on Data
3. Communicate Actively about Change and Learnings (Success>Ego)
4. Build in Flexibility to Account for the Unknown: Deliberately Avoid Freezing Plans too early – go from Gel to Freeze as you Learn. Focus on Scenarios
5. Build in Check-points and Involve non-Advocates to Learn More
6. React Quickly to Abrupt Changes
7. Add Active Experimentation, Learn Steadily



“The secret of change is to focus all of your energy, not on fighting the old, but building on the new.”

Socrates (470-399 BC), Philosopher