

A Pathway to Innovation

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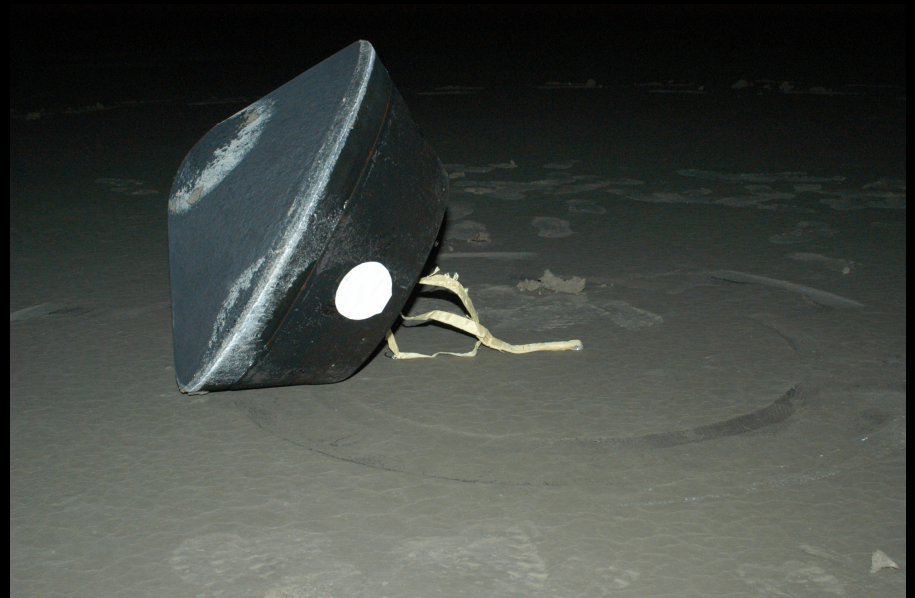
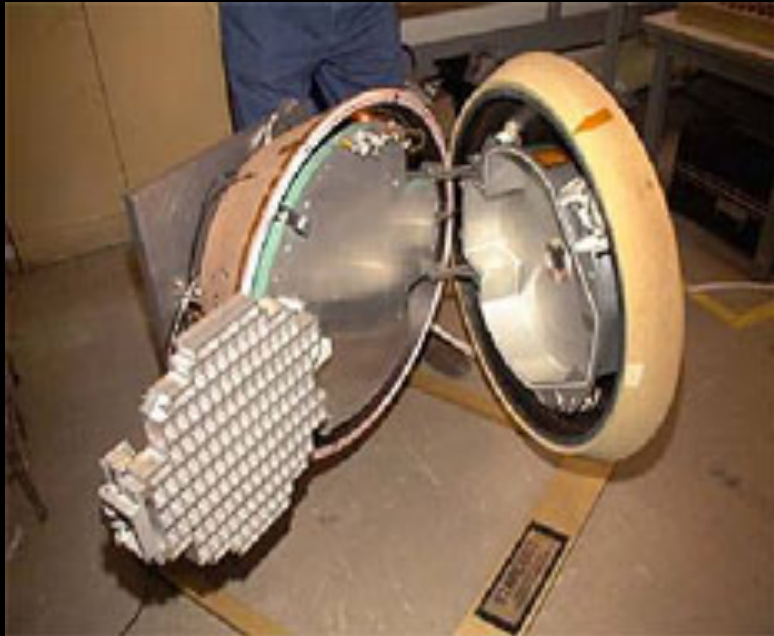
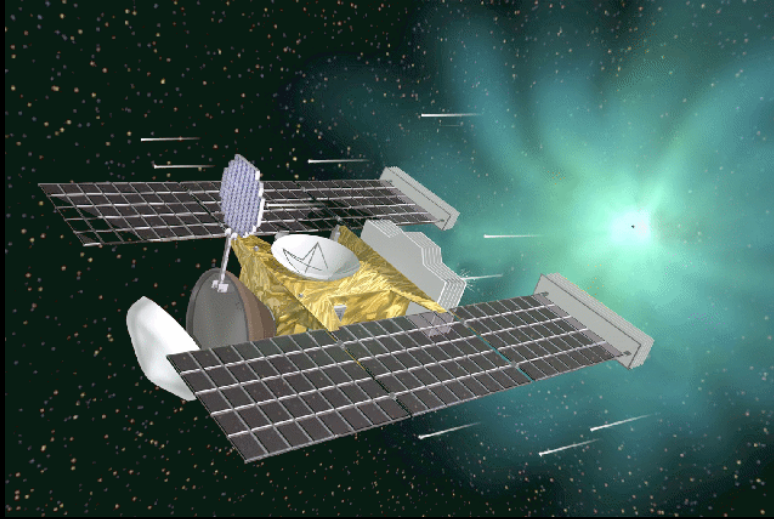
August 2, 2016



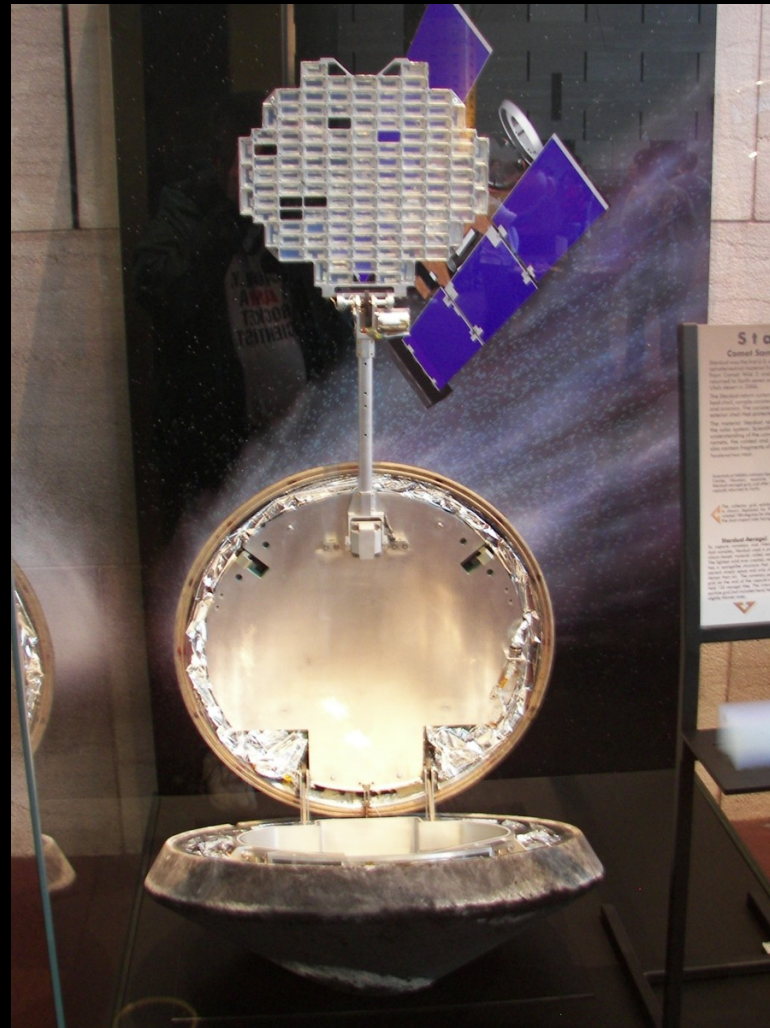
Stardust Capsule Re-entry, 1/15/2006



Stardust Capsule



Stardust Capsule at the National Air & Space Museum, Washington, DC



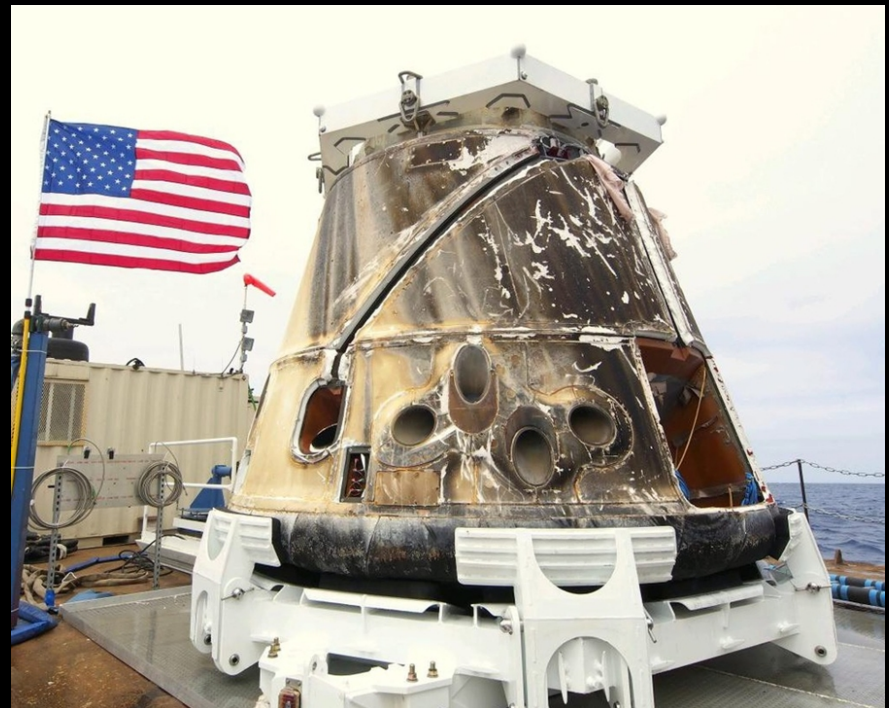
Fastest entry ever of a Man-made object at Earth, $\sim 13\text{km/s}$

SpaceX Dragon Re-entry

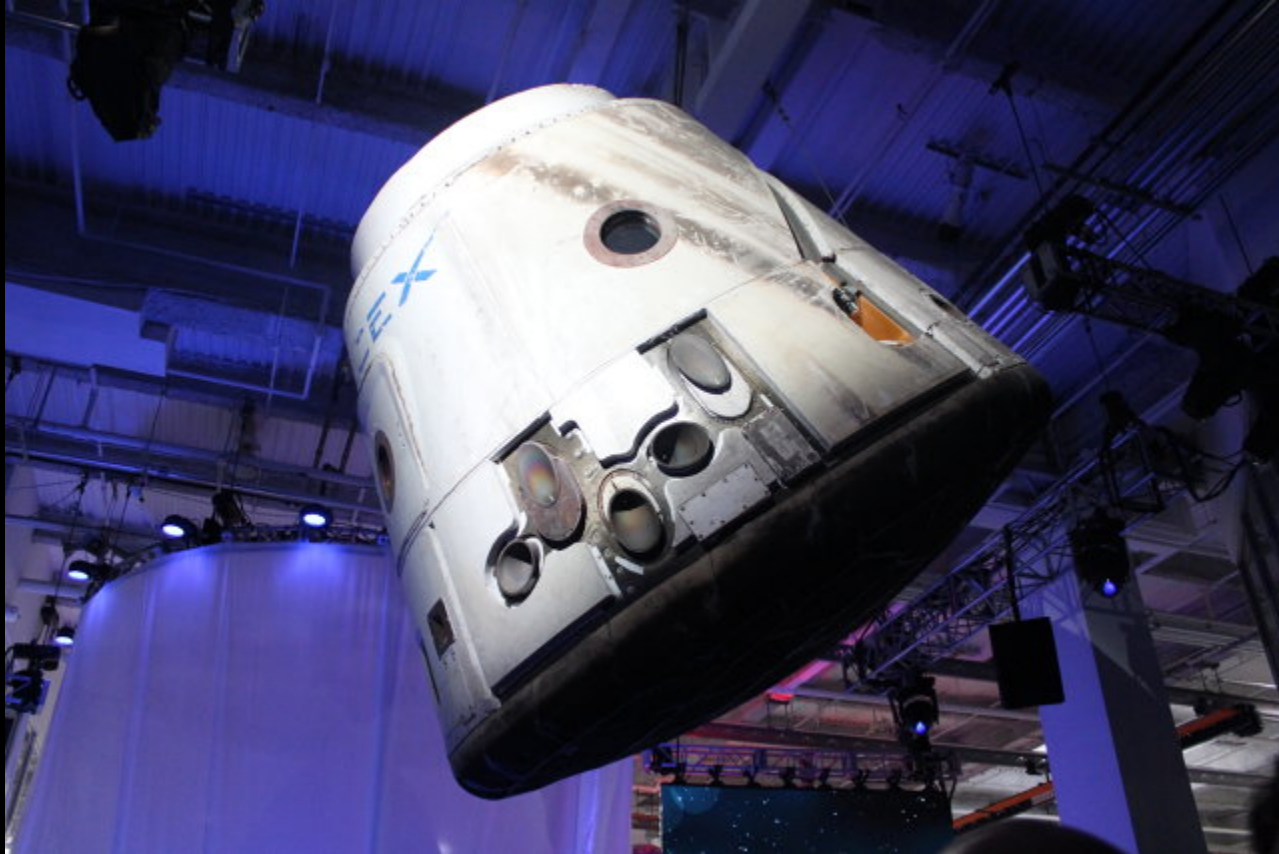


December 8, 2010 - first orbital flight; May 22, 2012 - first cargo delivery to ISS

SpaceX Dragon

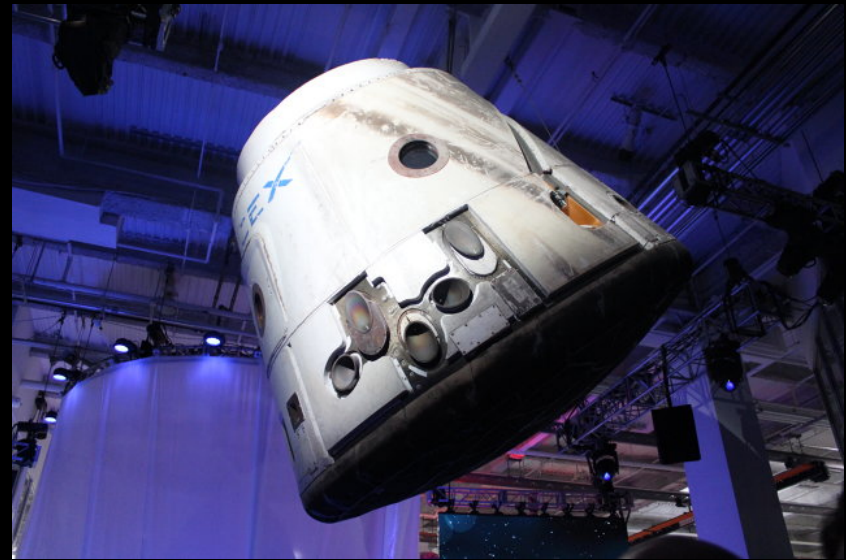
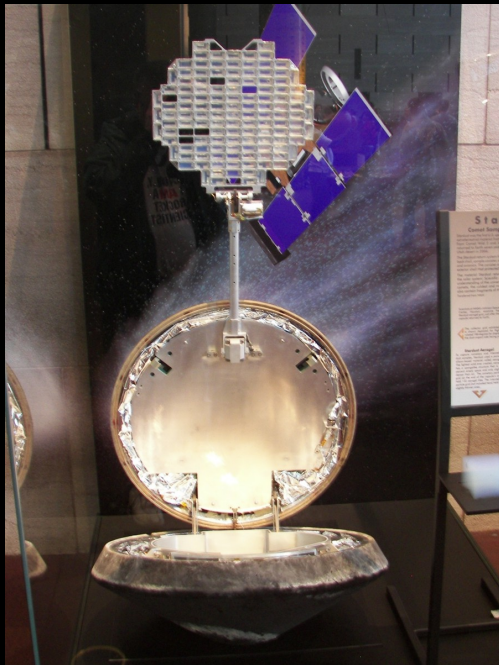


Recovered Dragon C1 Capsule at SpaceX HQ

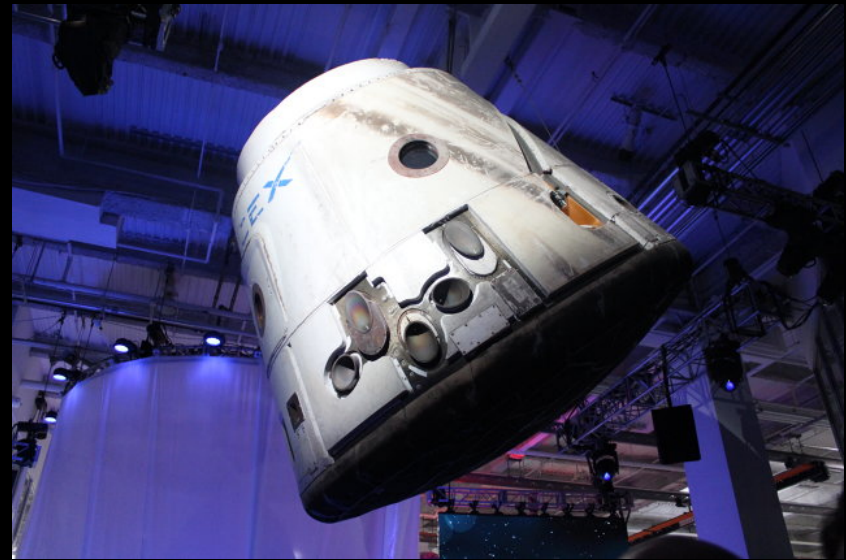
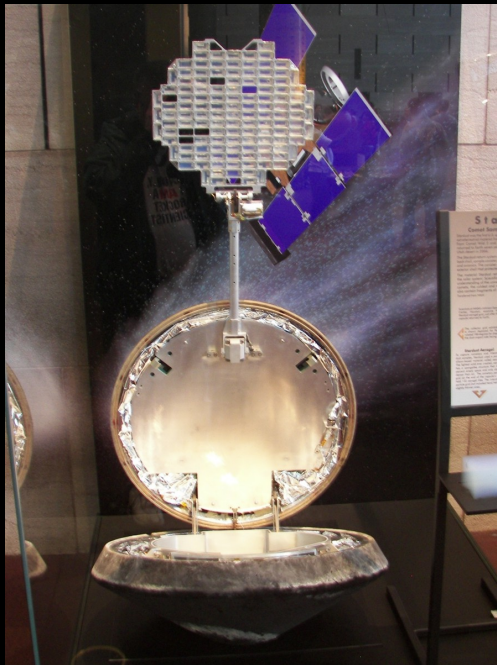


First ever commercial re-entry capsule

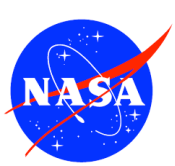
How Were These Innovations Accomplished?



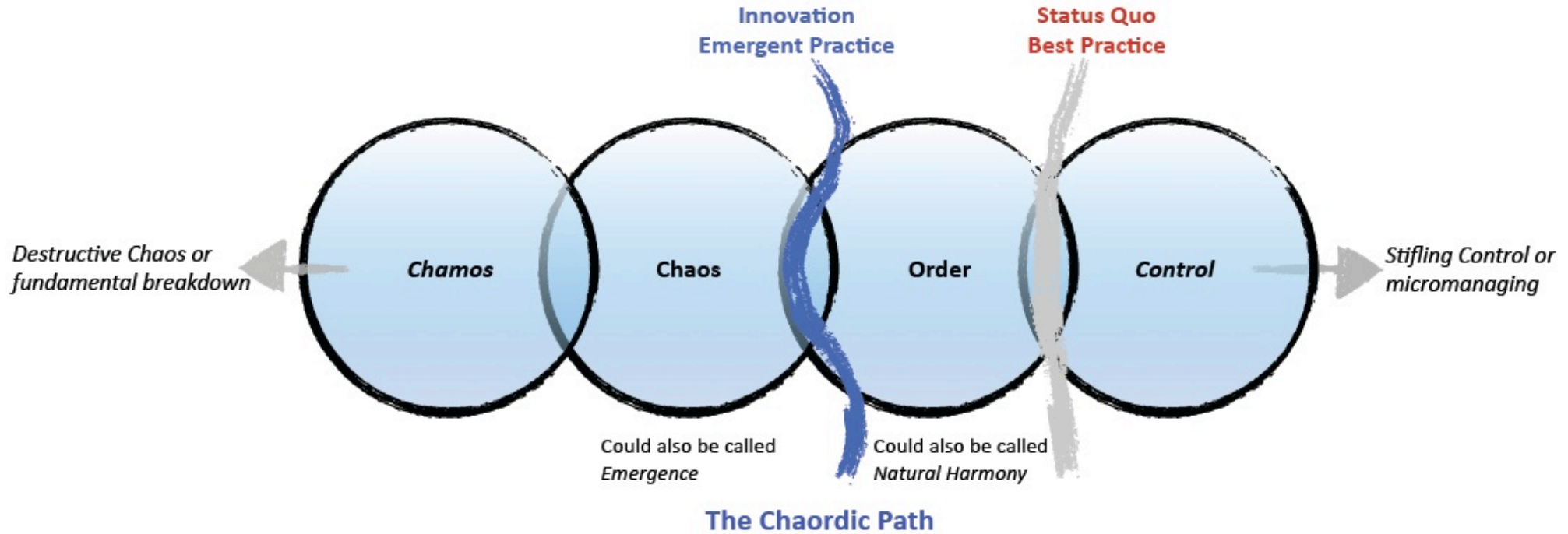
How Were These Innovations Accomplished?



By Pursuing Innovative Paths



Innovation and the Chaordic Path*



* - <http://www.dailygood.org/story/445/transformation-by-design-melissa-hoffman>

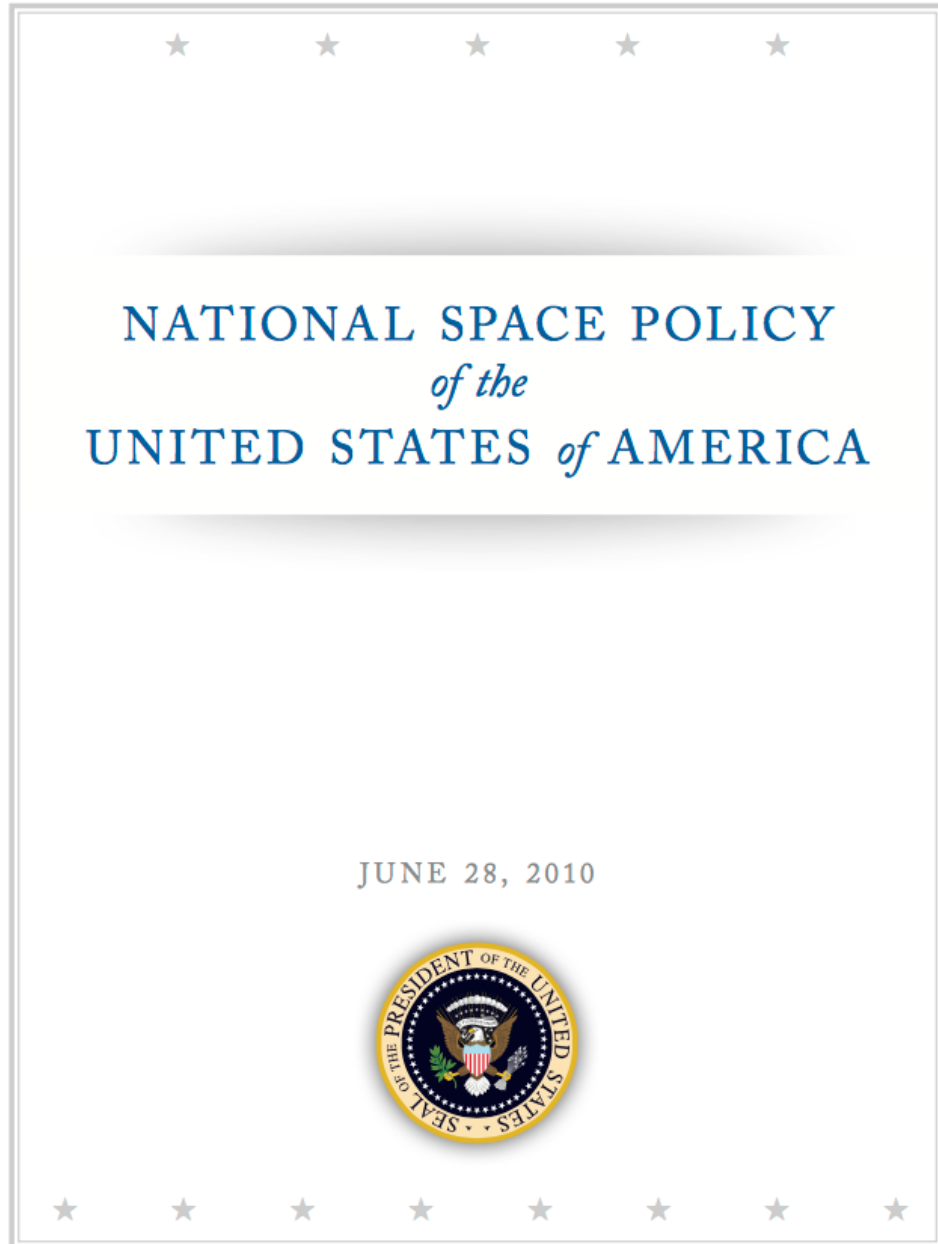


Some Observations on Innovation

1. Innovation is fragile and easily inhibited
2. Innovation is in itself an exploration:
 - Its not clear where the path will lead, and there will be surprizes – both good and bad – along the way
 - Not possible to know when you'll reach the desired goal, if ever; i.e., innovation is very difficult to schedule
 - Innovators need to be given “room to roam” and to “follow their curiosities and hunches” if you want them to innovate
3. There are those naturally oriented to innovation (inventors), and those who oriented against it (process and control people). Both types have important roles, and both have trouble understanding each other.
4. There is a natural tension between Innovation and Control in an organization; a balance is needed to allow innovation, but still maintain reasonable order and effective processes
5. A healthy organization needs a portfolio of activities – mostly “best practice” – but with some level of “emergent practice” along the chaordic path to keep things fresh
6. Driven in-part by the rapidly evolving emerging commercial space industry, NASA is deliberately pursuing more innovative approaches at the present time



National Space Policy



Introduction

- *"Fifty years after the creation of NASA, our goal is no longer just a destination to reach. **Our goal is the capacity of people to work and learn and operate and live safely beyond the Earth for extended periods of time, ultimately in ways that are more sustainable and even indefinite.**"*

Principle #2

- *"A robust and competitive commercial space sector is vital to continued progress in space. **The United States is committed to encouraging and facilitating the growth of the U.S. commercial space sector that supports U.S. needs, is globally competitive, and advances U.S. leadership in the generation of new markets and innovation-driven entrepreneurship.**"*



ANNOUNCING DAYA NEWMAN AS A BIF2016 STORYTELLER

The Business Innovation Factory is excited to announce that Dava Newman, Deputy Administrator of NASA and Professor of Aeronautics and Astronautics and Engineering Systems at MIT, will be one of 32 Storytellers at this years annual Innovation Summit known as BIF2016.

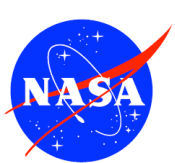


Dava Newman was nominated as Deputy Administrator by President Barack Obama in January of 2015 and confirmed by the U.S. Senate in April 2015.

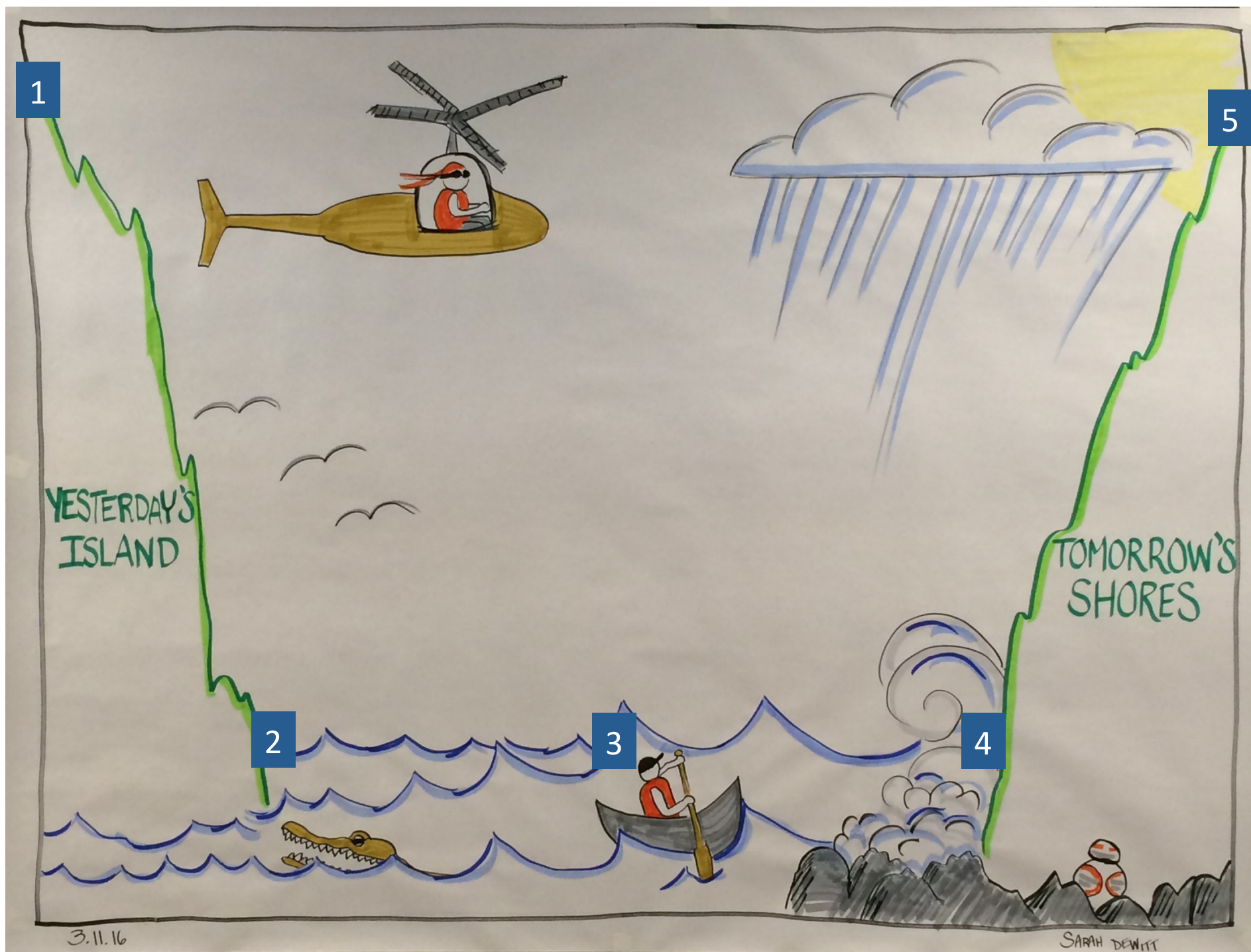
This will be Dava's second time speaking at the BIF Summit, having joined us once before at BIF-9.

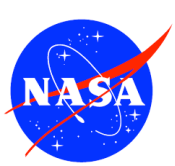
Among Dava's many accomplishments and impressive career, perhaps she is best known for promoting the development of space activity suit, namely the **Bio-Suit**, which would provide pressure by tension in the suit's textile weave, rather than with pressurized gas. The suit is designed to help

astronauts move around more easily than gas-filled suits allow.

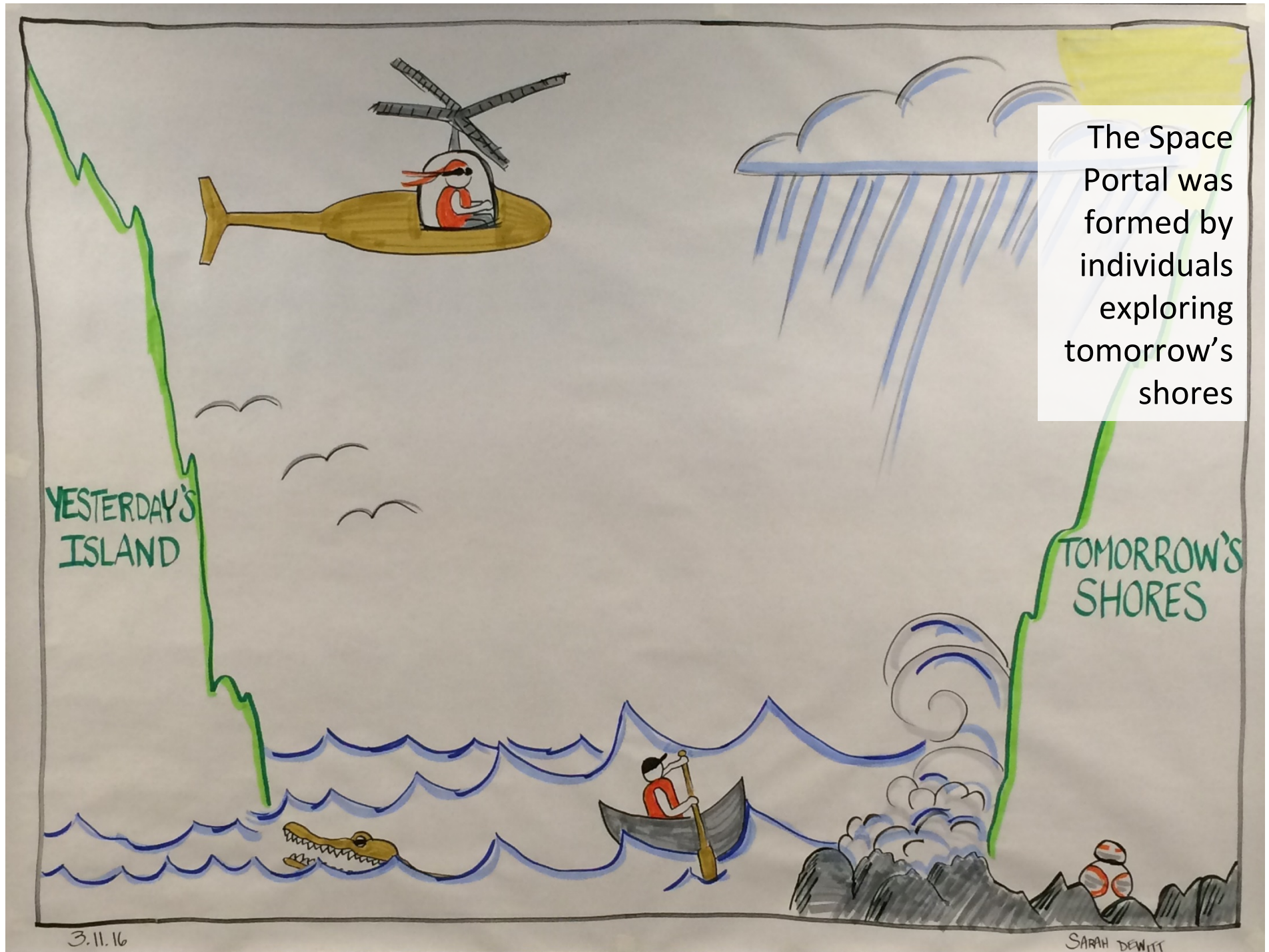


Managing Transition – NASA Executive Summit (July, 2016)





Managing Transition – NASA Executive Summit (July, 2016)





Space Portal Commercial Space Network

Google™

MADE
IN SPACE

SPACEX

ULA®
United Launch Alliance

ASTROBOTIC

SKYCORP

Masten
SPACE SYSTEMS

Virgin
GALACTIC



Blue Origin

PARAGON
SPACE DEVELOPMENT CORPORATION



SPACE PORTAL
for enterprise and commerce

DSi™
DEEP SPACE INDUSTRIES



NANORACKS

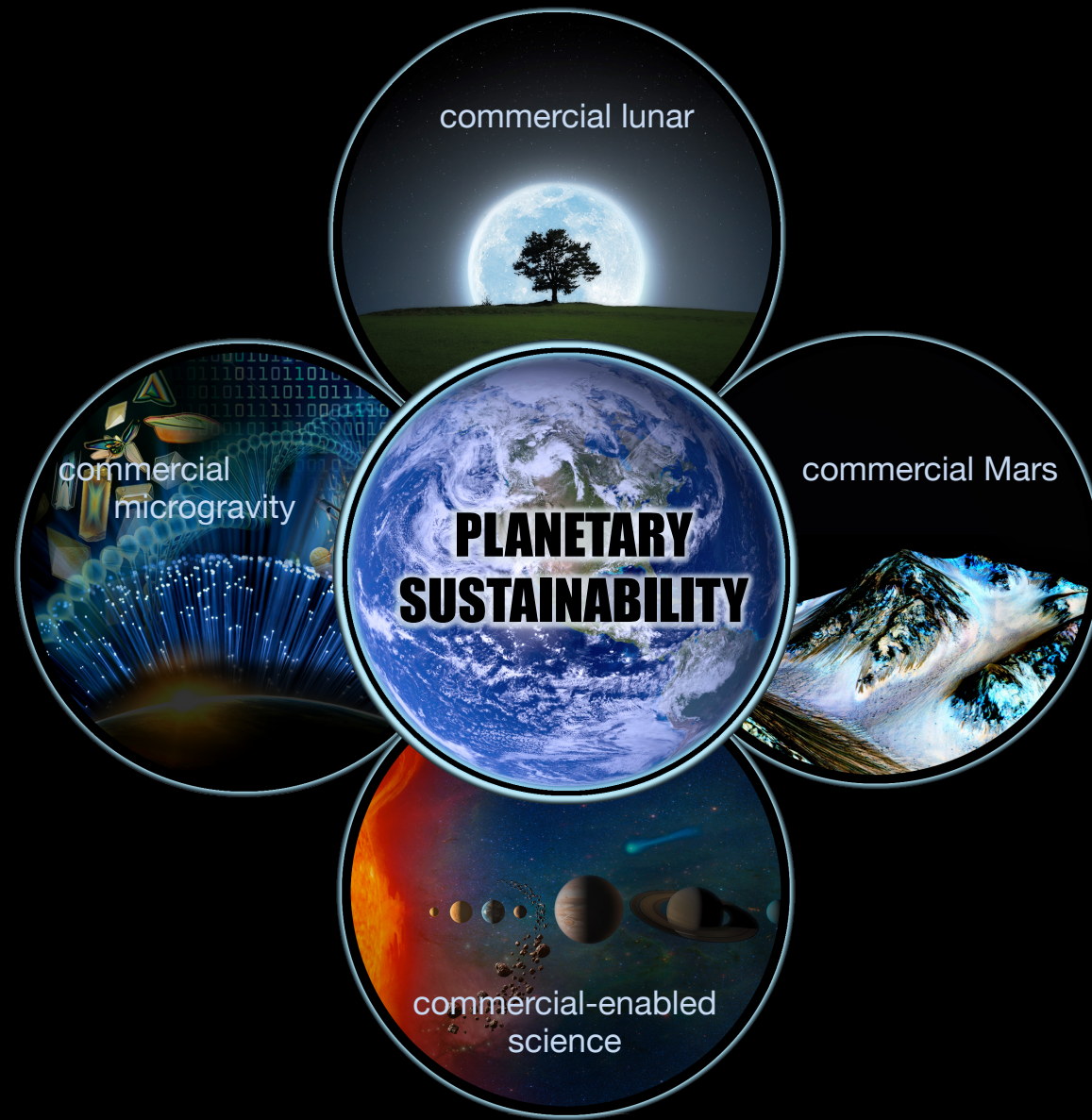
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Space Portal Development Thrusts



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Planetary Sustainability



Our mission is to apply NASA's unique talents, capabilities, and culture to create new public/private partnerships. These partnerships will work to develop effective solutions for current and future planetary sustainability challenges.

The 2014 NASA Strategic Plan calls upon the agency to meet the challenges of environmental change, and to improve life on our planet. It also directs NASA to advance our understanding of the Earth and to develop technologies to improve the quality of life on our home planet. NASA will do this by partnering with other federal government agencies, local governments, universities, international agencies, and others to provide science data products and applications that enable policy, business, and management decisions. (Management and Performance report, M&P-49)

NASA's Expertise

NASA has a number of new tools, techniques and approaches for closely monitoring global climate change, and advancing climate modeling. Our [Super and Quantum Computer Facility](#) allows for advanced simulation and modeling. NASA, also, has in house expertise in [Earth Sciences and Planetary atmospheres](#) and can access its [small satellites program](#) (e.g. Cubesats, Nanosats), as well as [aircrafts](#) and [unmanned aerial vehicles](#).

NASA Tools to Enable Decision Makers

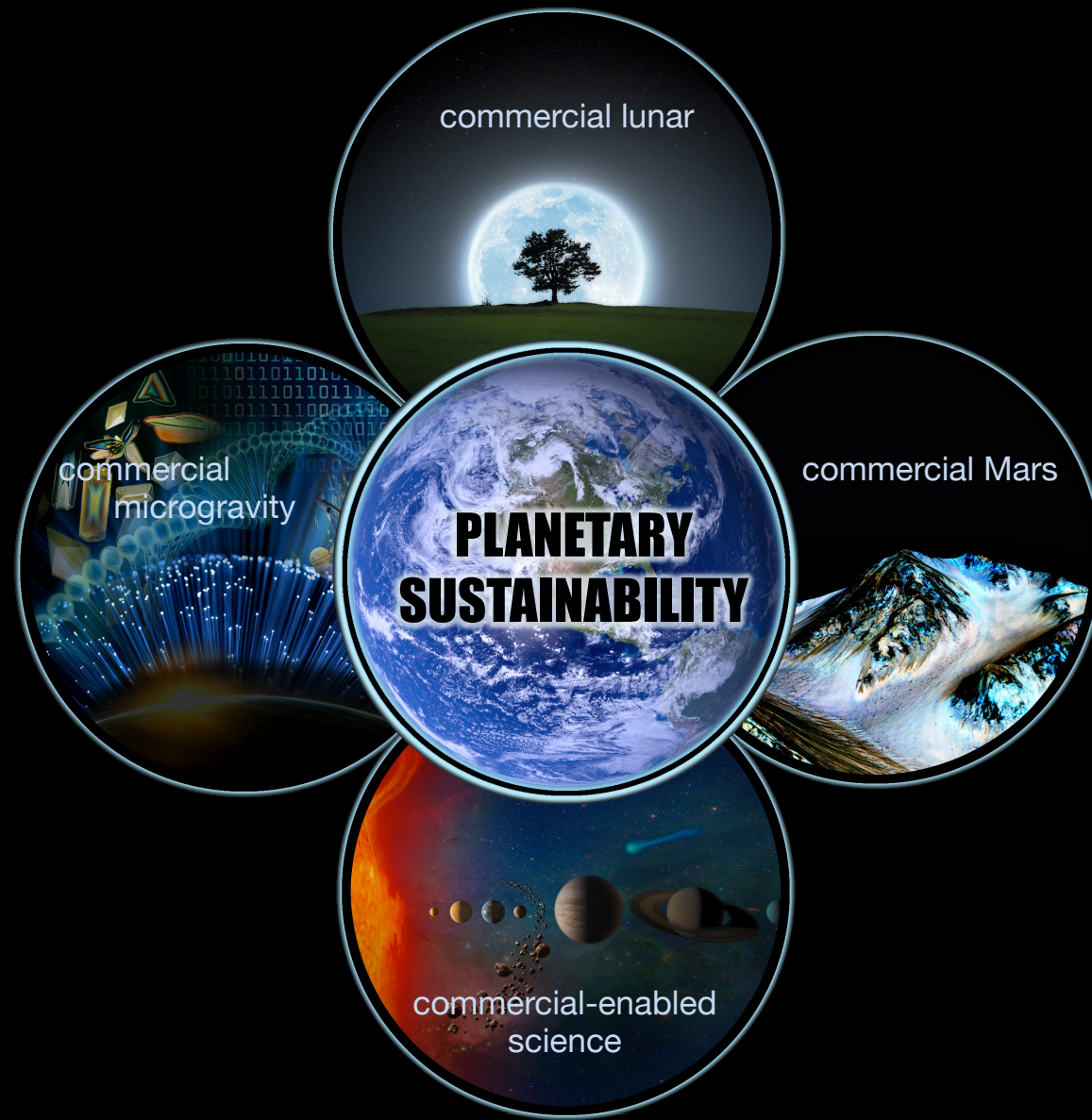
NASA's large suite of Earth modeling and monitoring tools can aid decision making. These tools include 25, and growing, [Earth observing satellites](#) and the [NASA Earth Exchange](#), a common interface for collating these various data sources. Together, they create a portal to support decision makers by providing an integrated assessment using critical climate and economic information to understand the effects of climate change.

Examples of Monitoring and Modeling Scenarios

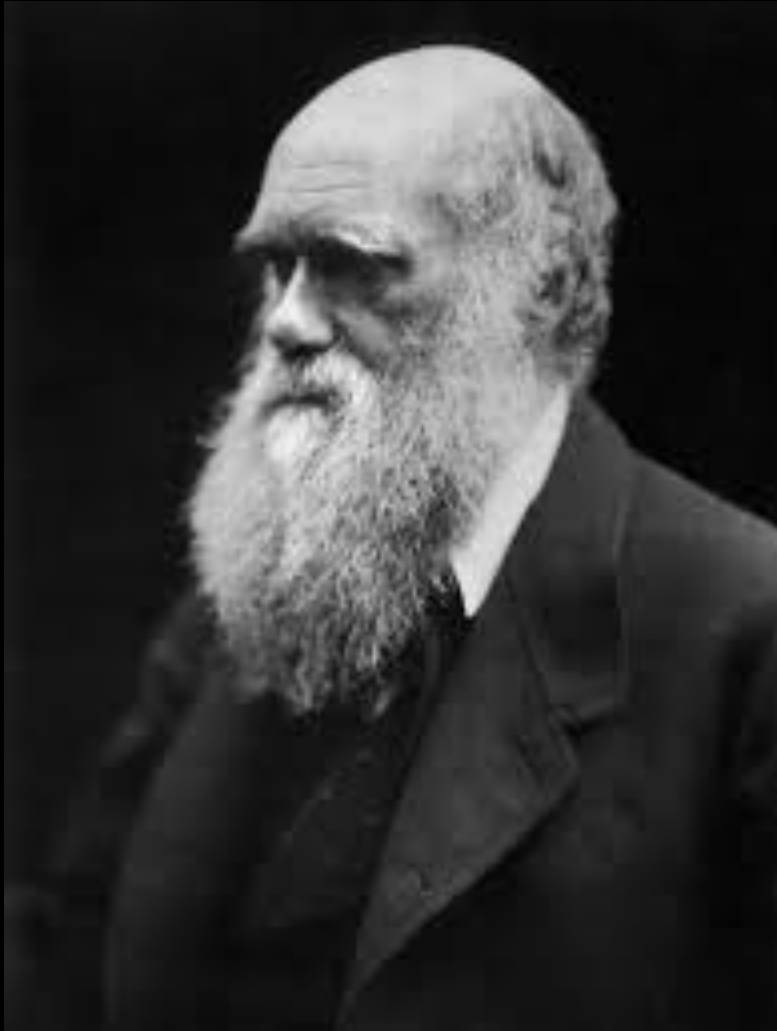
- Drought and snowpack level impacts on irrigation and water management.
- Sea level rise and changes in ocean health.
- Changes in forest biomass and CO₂ cycling.
- Changes in agriculture (e.g. food, wine, industry).



Space Portal Development Thrusts



Using Space to Benefit Earth and Advance Humanity



Charles Darwin

*"It is not the
strongest of the
species that
survives, nor the
most intelligent..."*

*It is the one that is
most adaptable to
change."*

