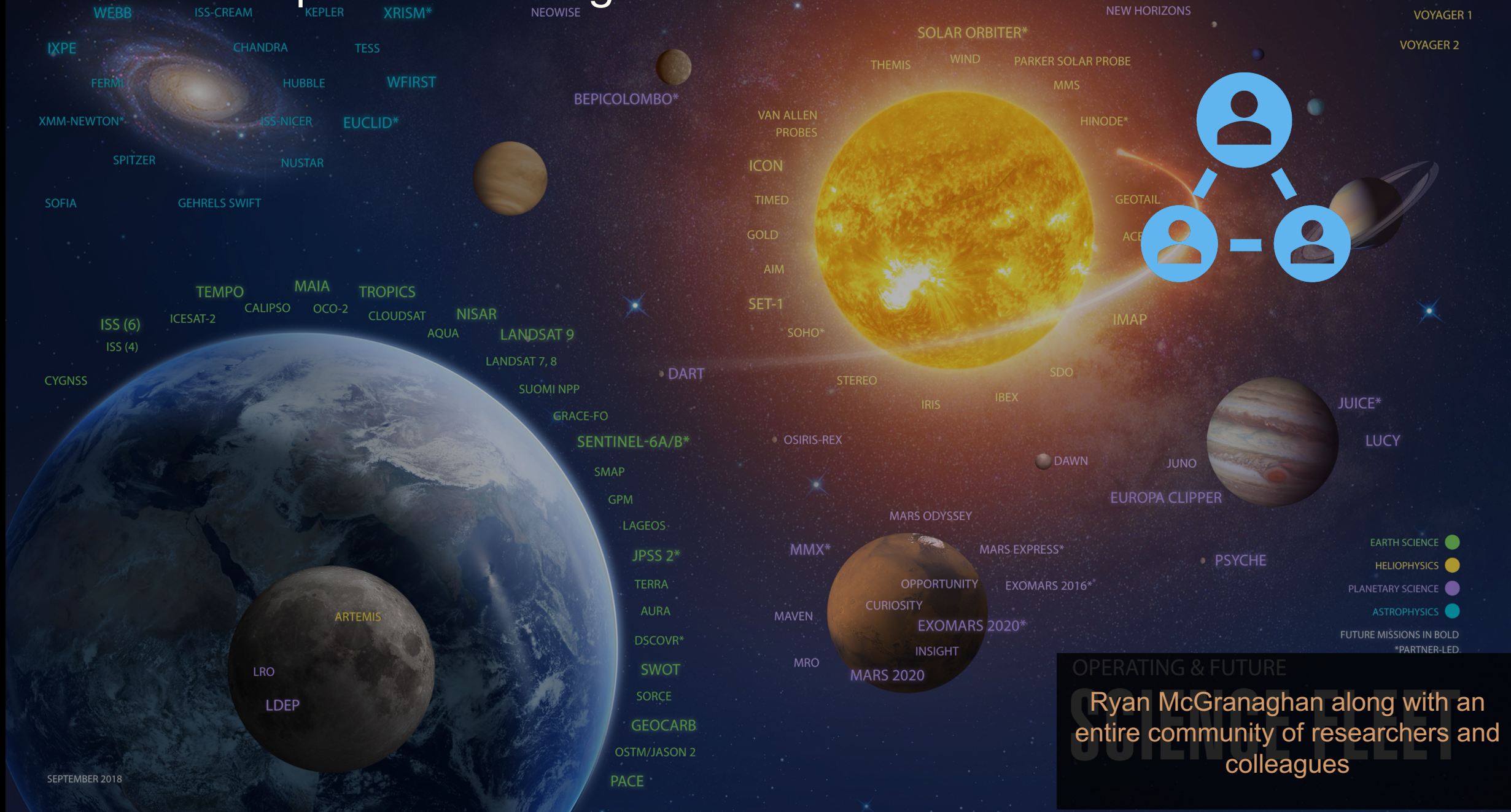


An Earth and Space Knowledge Commons



An Earth and Space Knowledge Commons



Land Acknowledgement – Washington, DC

We acknowledge that Washington DC is the traditional territory of Nacotchtank/Anacostan/Piscataway people. We acknowledge this legacy and find inspiration from this land. This land, and other native lands in the US, can be explored at <https://native-land.ca/>

By acknowledging territory or land we may recognize Indigenous presence as we convene for the ESIP Webinar Series today.

We each have a responsibility to consider what it means to acknowledge the history and legacy of colonialism in our history as a nation and as a community. We note the privileges we enjoy today because of colonialism and we strive to not perpetuate colonial futurity.



<https://swizec.com>

“

If large portions of the world remain unseen or inaccessible to us, we must consider the meaning of the word ‘reality’ with great care.

”

-Marcelo Gleiser, *The Island of Knowledge* [2014]

Why we need the space-based perspective in ESIP:

Interconnectedness of Earth and Space Science

Hydro-Quebec
Power Grid, 1989



Why we need the space-based perspective in ESIP:

Interconnectedness of Earth and Space Science

Hydro-Quebec
Power Grid, 1989

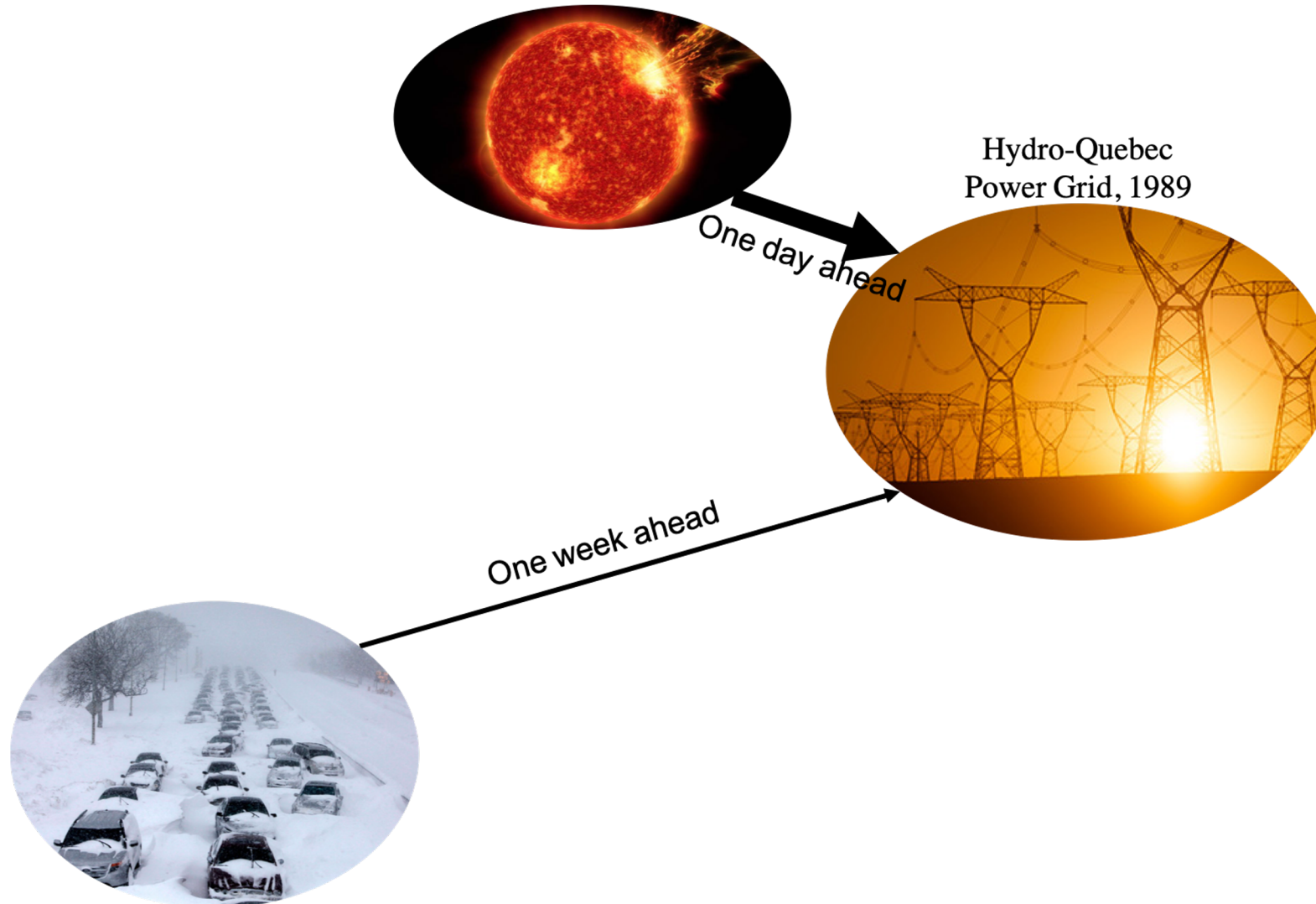


One week ahead



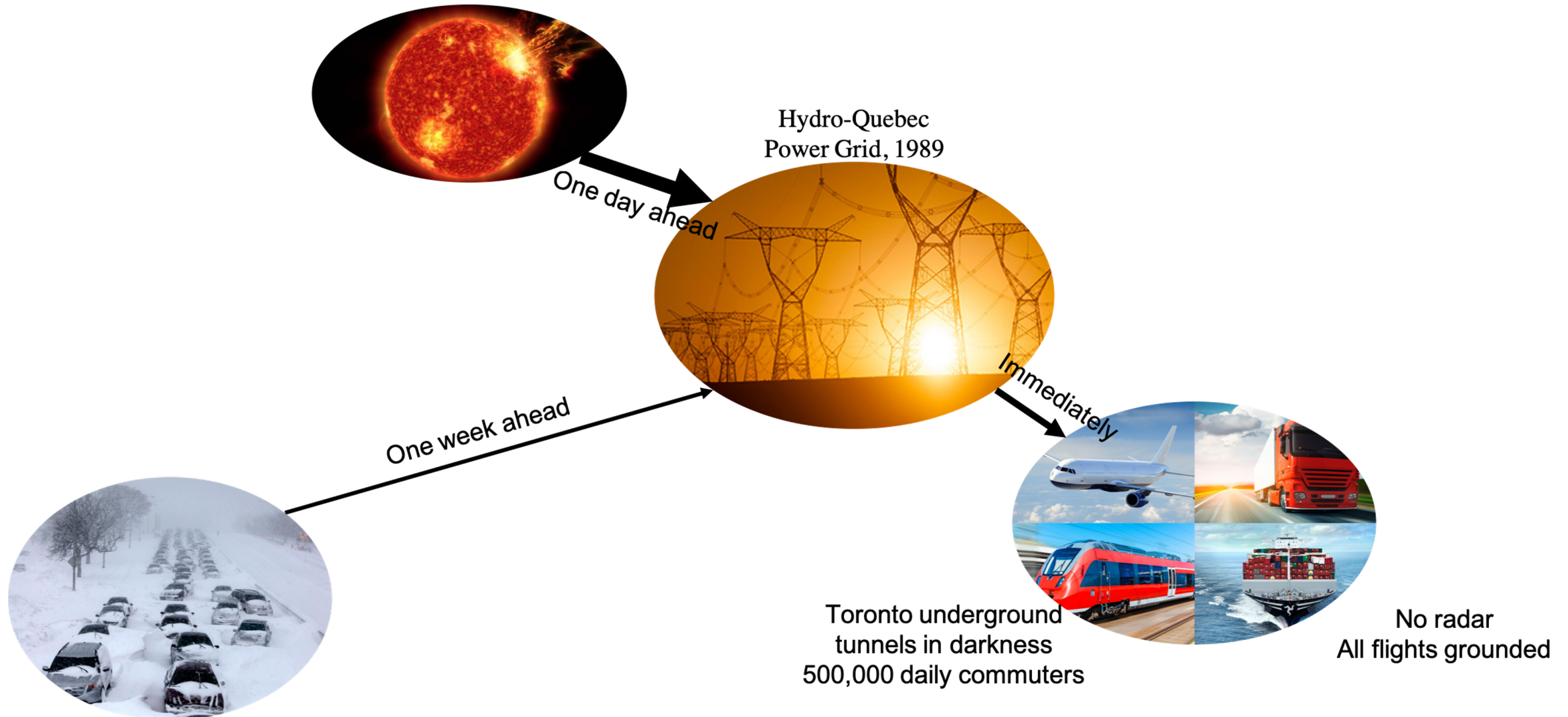
Why we need the space-based perspective in ESIP:

Interconnectedness of Earth and Space Science



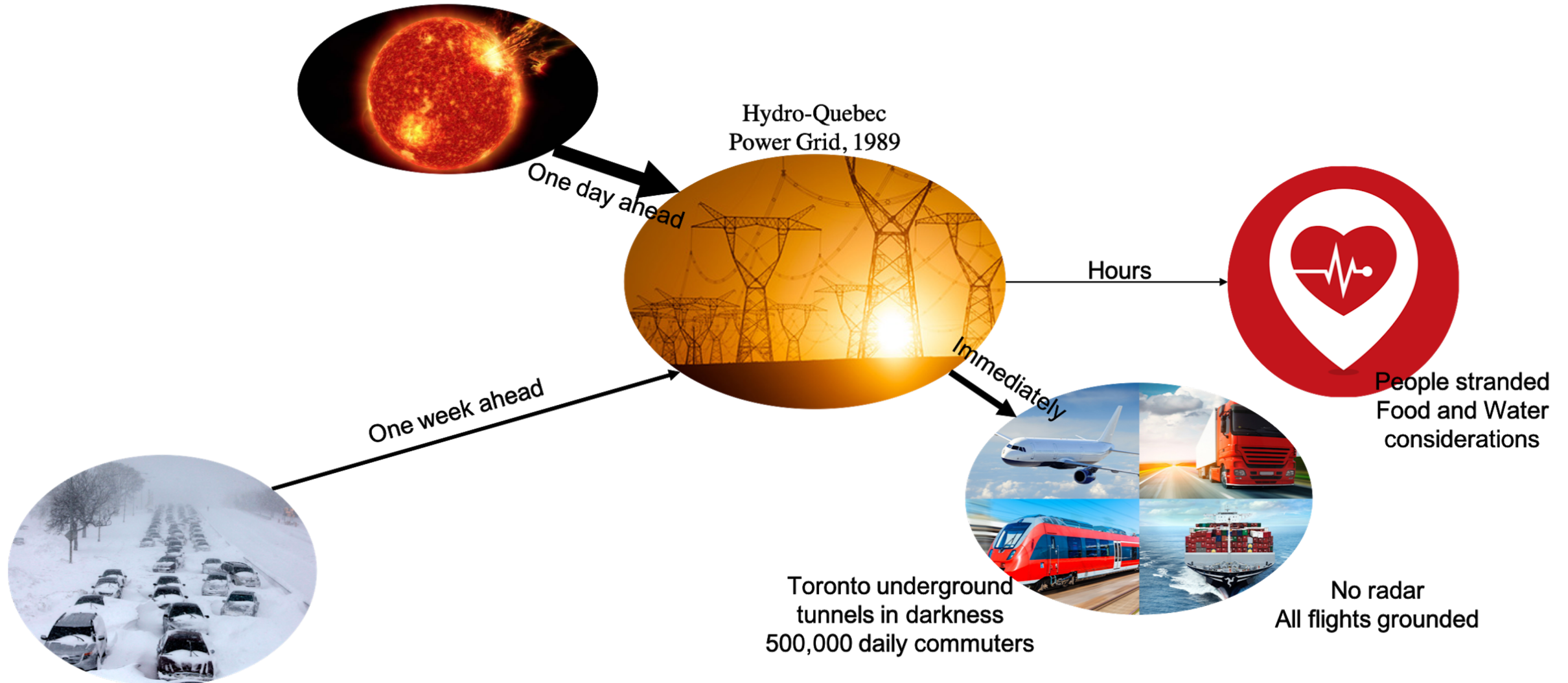
Why we need the space-based perspective in ESIP:

Interconnectedness of Earth and Space Science



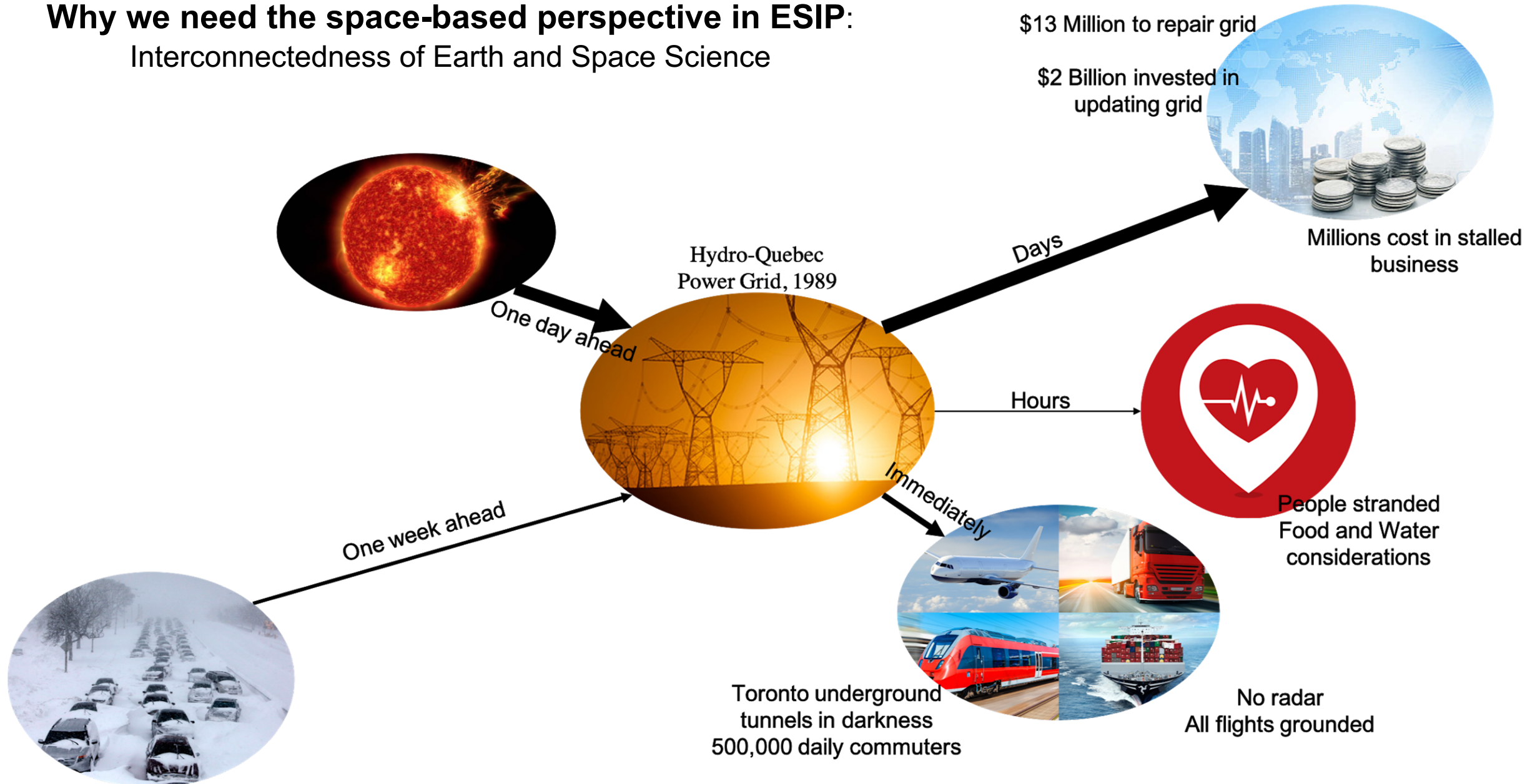
Why we need the space-based perspective in ESIP:

Interconnectedness of Earth and Space Science



Why we need the space-based perspective in ESIP:

Interconnectedness of Earth and Space Science



“

The most fruitful areas for the growth of the sciences were those which had been neglected as a no-man's land between the various established fields.

”

- Norbert Wiener, *Cybernetics* [1961]



Albert-László Barabási

Mona Lisa

Da Vinci

Date of birth: April 15, 1452
Date of death: May 2, 1519
(age 67 years)

Italy

Michelangelo

Social Networks/Communities



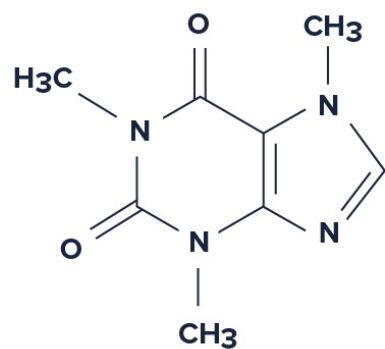
Communication



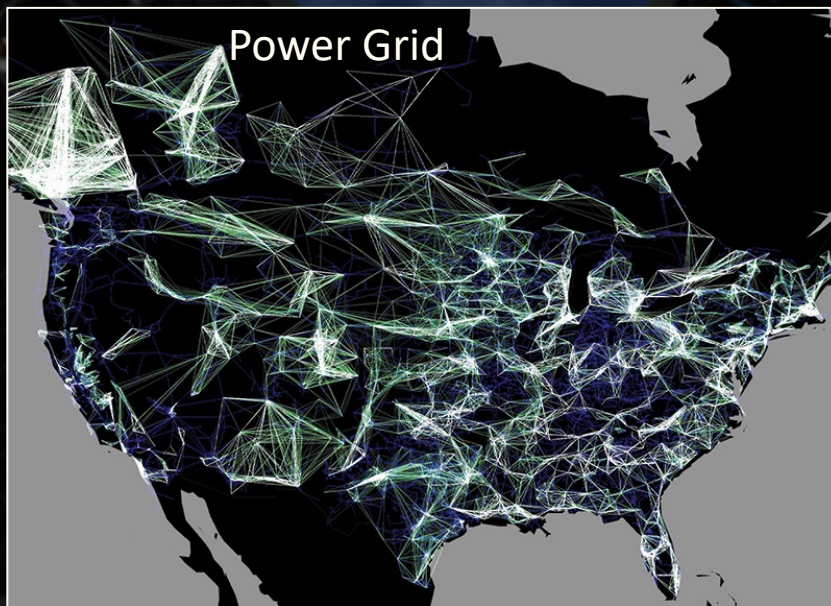
Neuroscience



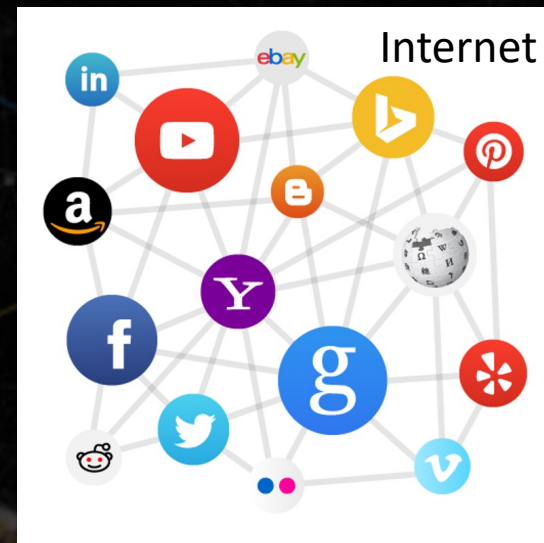
Molecules



Power Grid



Internet



Google

NASA

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NASA

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HDEV - Tour - Space To Ground - Media Resources - ...


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Hubble Space Telescope

Hubble Spies Galaxy through Cosmic Lens. Hubble ...


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NASA

2 days ago



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NASA

2 days ago


People also ask

What NASA stands for?

Knowledge Panel

NASA

Federal agency



nasa.gov

The National Aeronautics and Space Administration is an independent agency of the U.S. federal government responsible for the civilian space program, as well as aeronautics and space research. NASA was established in 1958, succeeding the National Advisory Committee for Aeronautics. [Wikipedia](#)

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NASA

From Wikipedia, the free encyclopedia

For other uses, see [NASA \(disambiguation\)](#).

The **National Aeronautics and Space Administration** (**NASA** /næsə/) is an independent agency of the U.S. federal government responsible for the civilian [space](#) program, as well as [aeronautics](#) and [space](#) research.^[*note*] ^[*?*]

NASA was established in 1958, succeeding the [National Advisory Committee for Aeronautics](#) (NACA). The new agency was to have a distinctly civilian orientation, encouraging peaceful applications in [space science](#).^[*?*]^[*?*] Since its establishment, most US [space](#) exploration efforts have been led by NASA, including the [Apollo Moon](#) landing missions, the [Skylab](#) space station, and later the [Space Shuttle](#). NASA is supporting the [International Space Station](#) and is overseeing the development of the [Orion spacecraft](#), the [Space Launch System](#), and [Commercial Crew](#) vehicles. The agency is also responsible for the [Launch Services Program](#), which provides oversight of launch operations and countdown management for uncrewed NASA launches.

NASA's science is focused on better understanding [Earth](#) through the [Earth Observing System](#),^[*?*] advancing [heliophysics](#) through the efforts of the [Science Mission Directorate's](#) Heliophysics Research Program,^[*?*] exploring bodies through the [Great Observatories](#) and as

Contents [hide]

- History
 - Creation
 - Insignia
 - Foundational human spaceflight
 - X-15 program (1954–1968)
 - Project Mercury (1958–1968)
 - Project Gemini (1961–1968)
 - Project Apollo (1960–1972)
 - Skylab (1965–1979)
 - Apollo-Soyuz (1972–1975)
 - Leadership
 - Facilities
 - Inherited from NACA
 - Transferred from the Army
 - Built by NASA
 - Modern human spaceflight programs
 - Space Shuttle program (1972–2011)


Heliophysics is the science of the physical connections between the Sun and the Solar System. NASA defines heliophysics as "(1) the comprehensive new term for the science of the Sun - Solar System Connection, (2) the exploration, discovery, and

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Coordinates: 38°52′59″N 77°0′59″W﻿ / ﻿


National Aeronautics and Space Administration




NASA seal



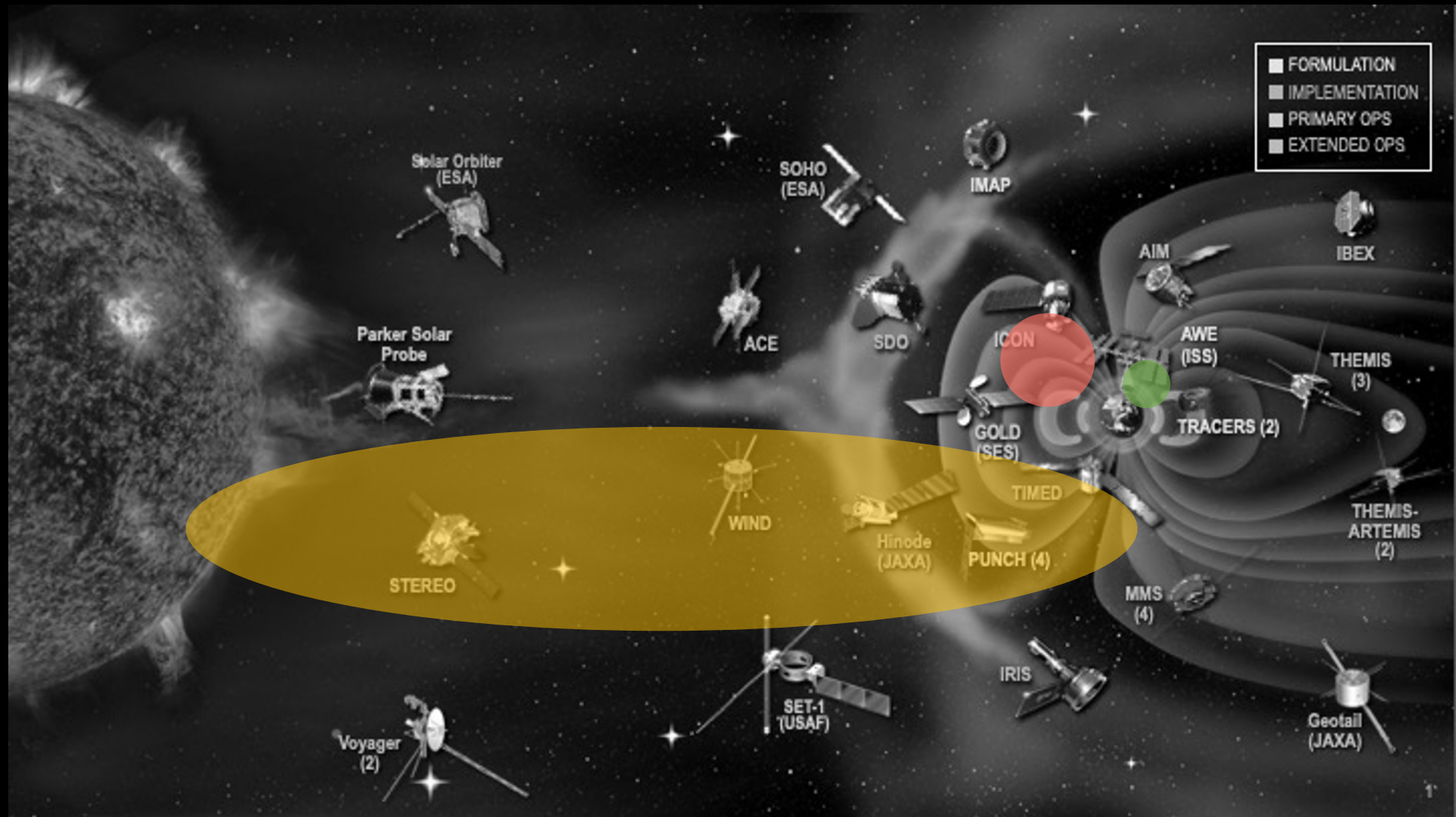
NASA "meatball" insignia



NASA "worm" logotype



What is emerging from across space?



Background Image: NASA Science Visualization Studio

What is emerging from across space?

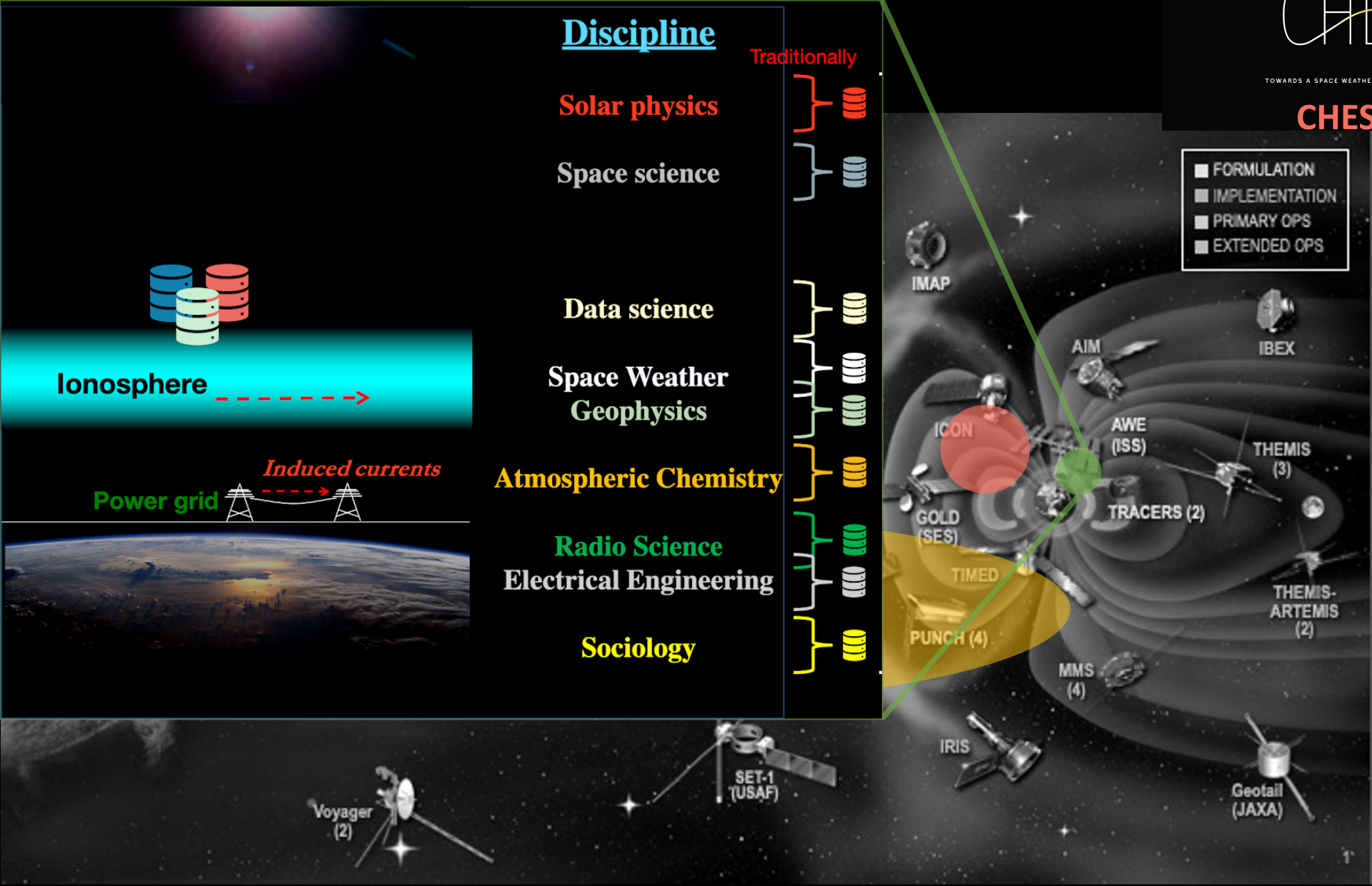
McGranaghan et al., [2020]

THE CONVERGENCE HUB FOR THE
EXPLORATION OF SPACE SCIENCE
(CHESSE) #1752

CHESSE

TOWARDS A SPACE WEATHER OPEN KNOWLEDGE NETWORK

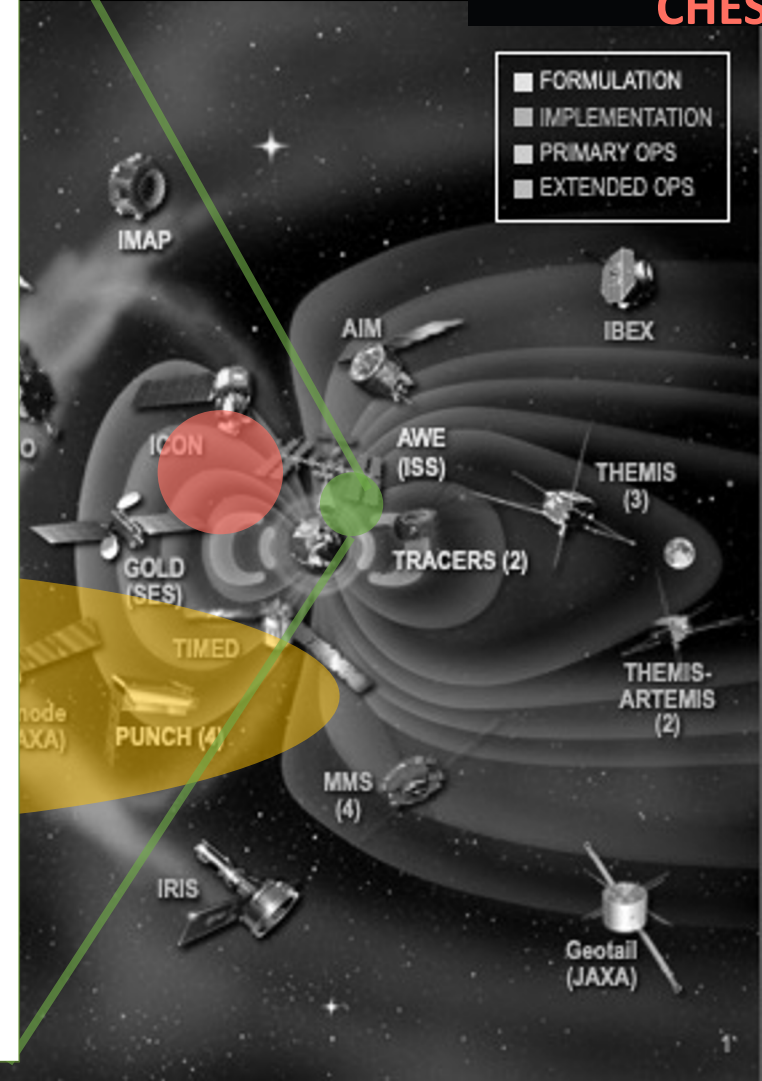
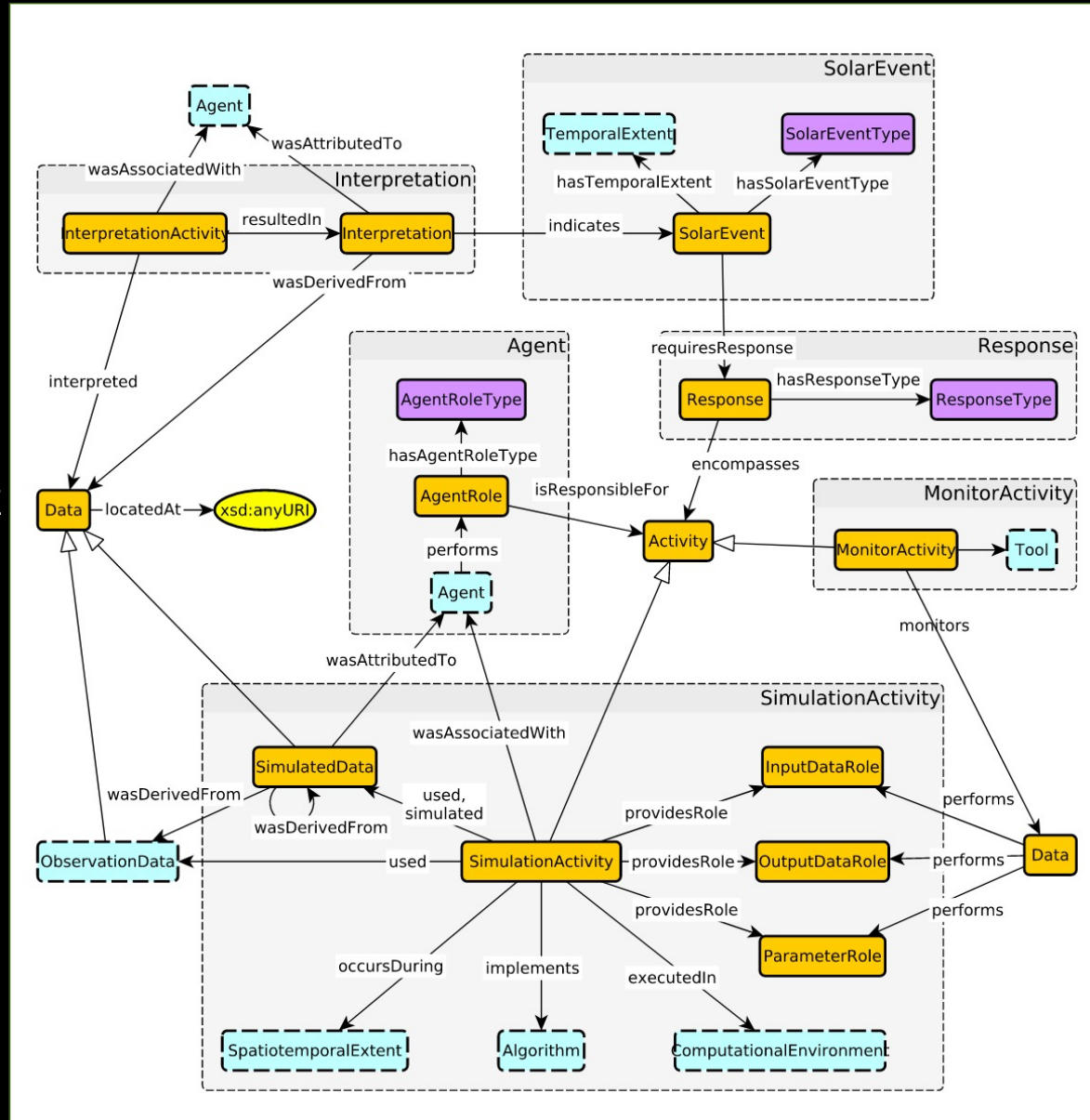
CHESSEscience.com



Background Image: NASA Science Visualization Studio

What is emerging from across space?

Shimizu et al., [2020]



Background Image: NASA Science Visualization Studio

What

McGranaghan et al. [2020]

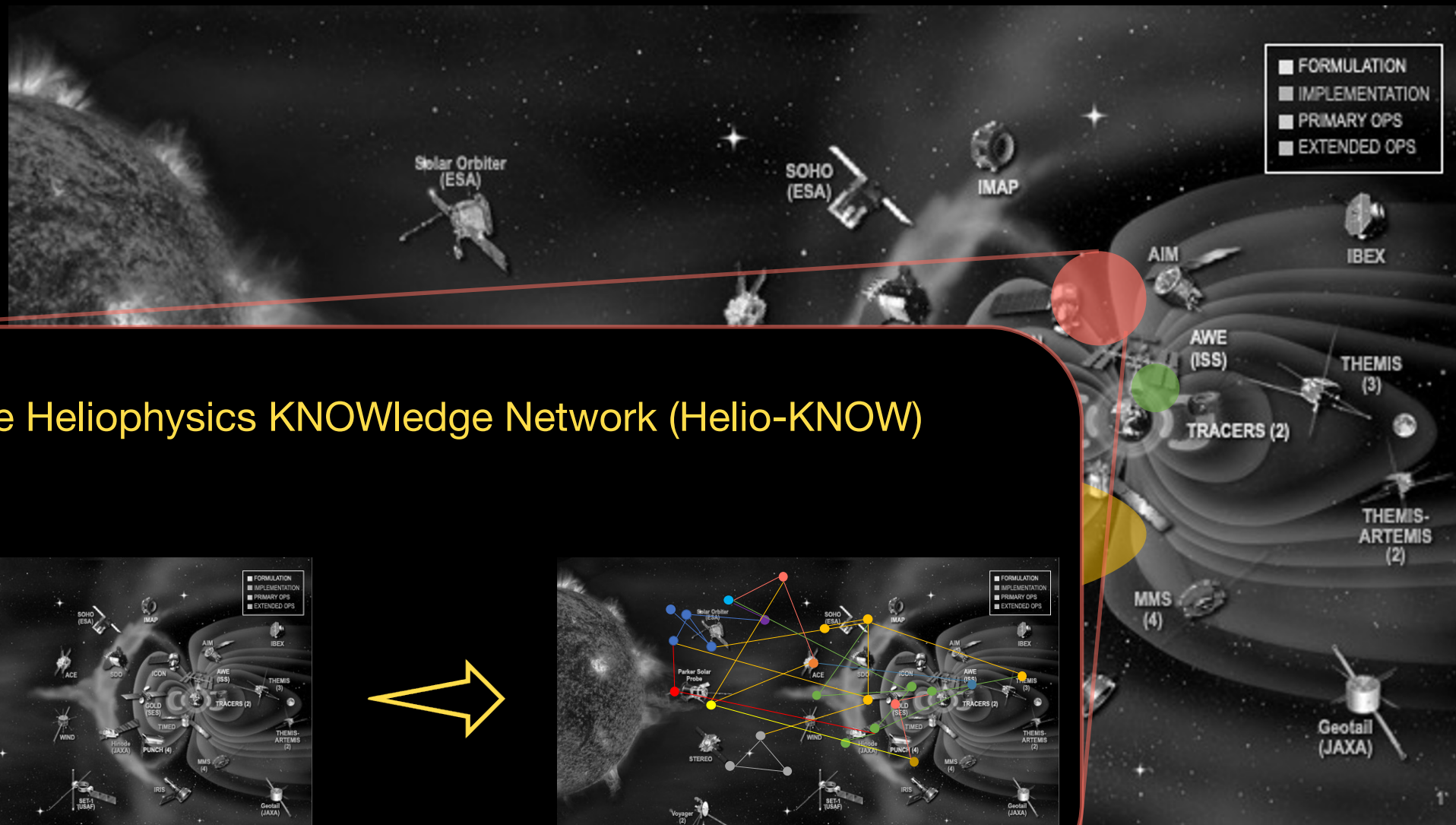
THE CONVERGENCE HUB FOR THE
EXPLORATION OF SPACE SCIENCE



Background image: NASA Science visualization Studio

.com

What is emerging from across space?



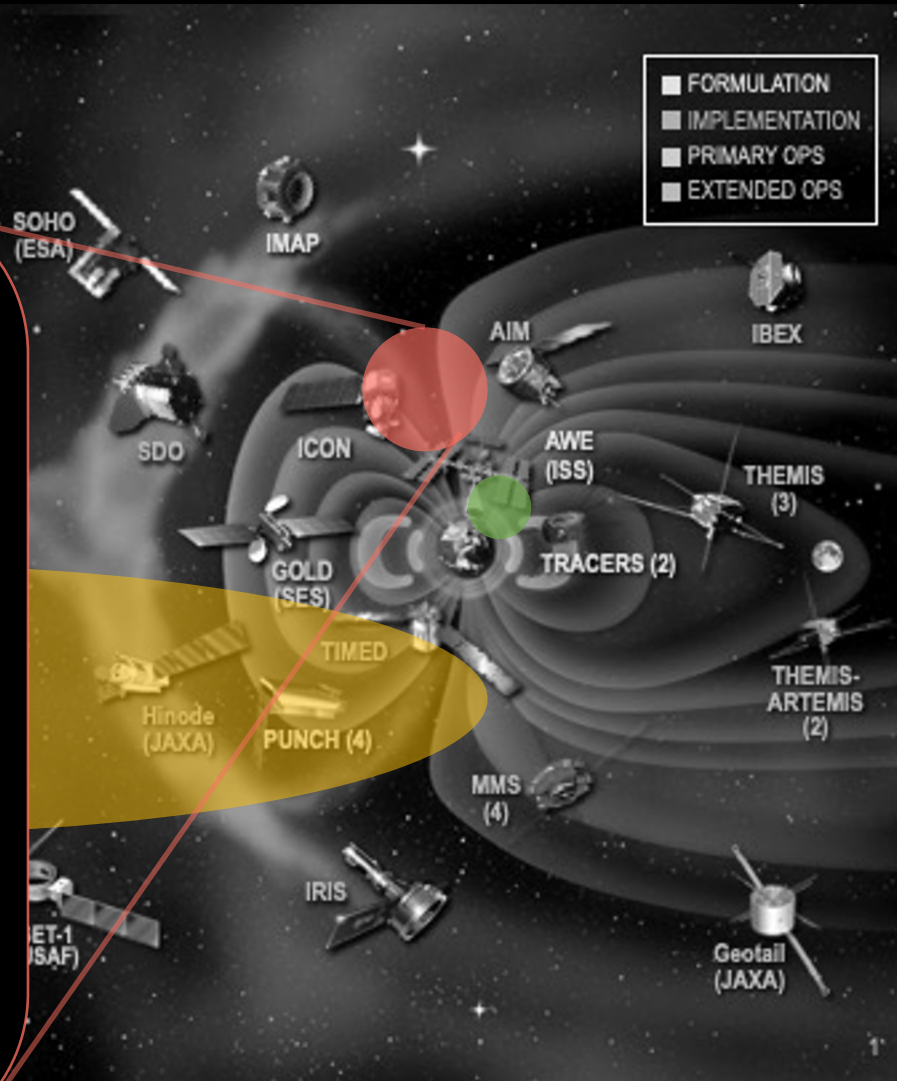
Visualization Studio

What is emerging from across space?

Helio-KNOW solution

- Better connect data and tools and communities for Heliophysics research – creating an ecosystem
- Use knowledge graphs and connect different knowledge graphs together into knowledge networks

Helio-KNOW first focuses on the magnetosphere-ionosphere system as a demonstrable use case to develop the methods and foundation to create a full Heliophysics knowledge network

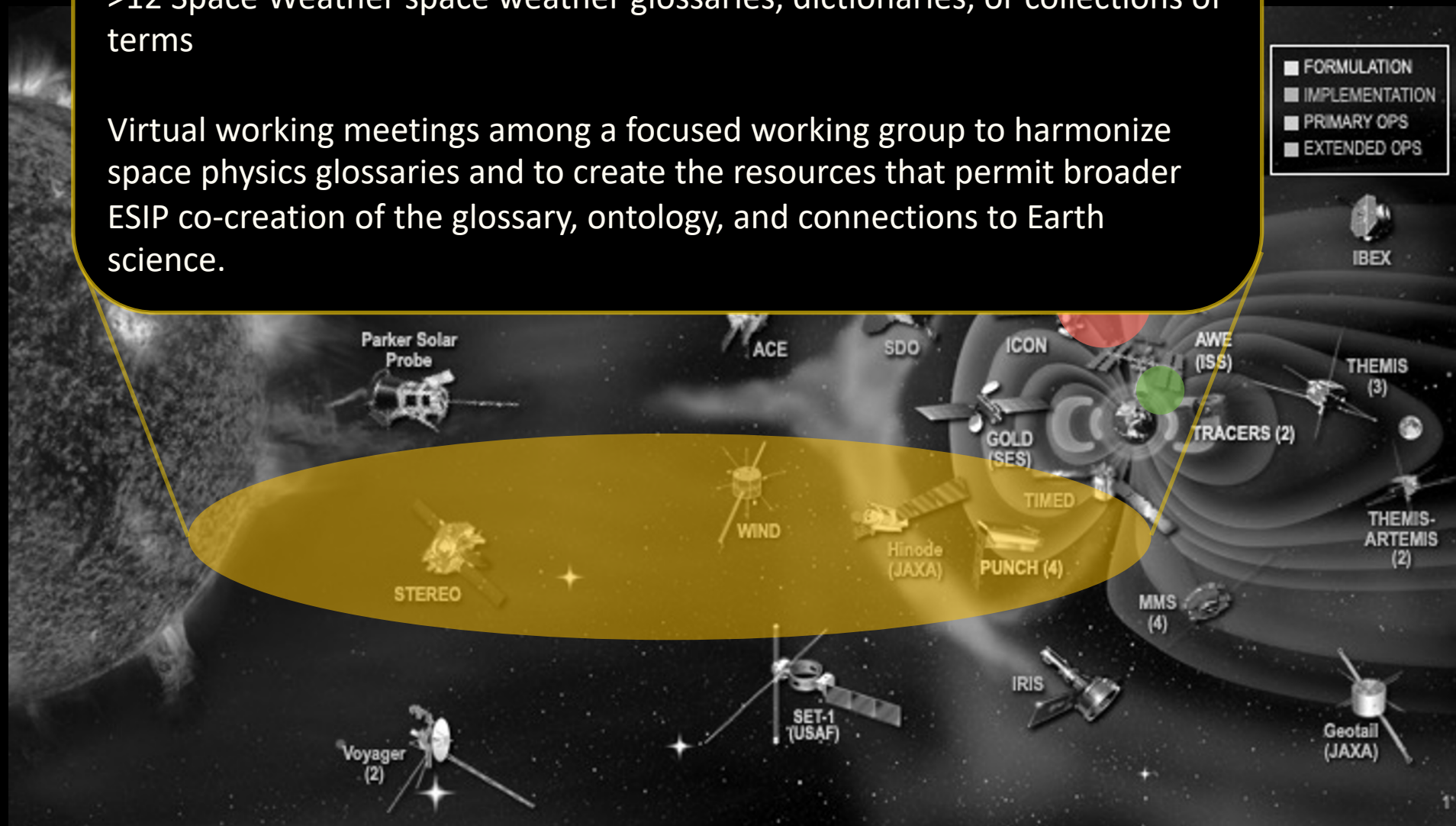
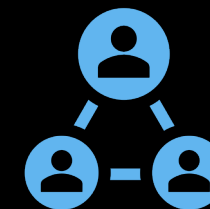


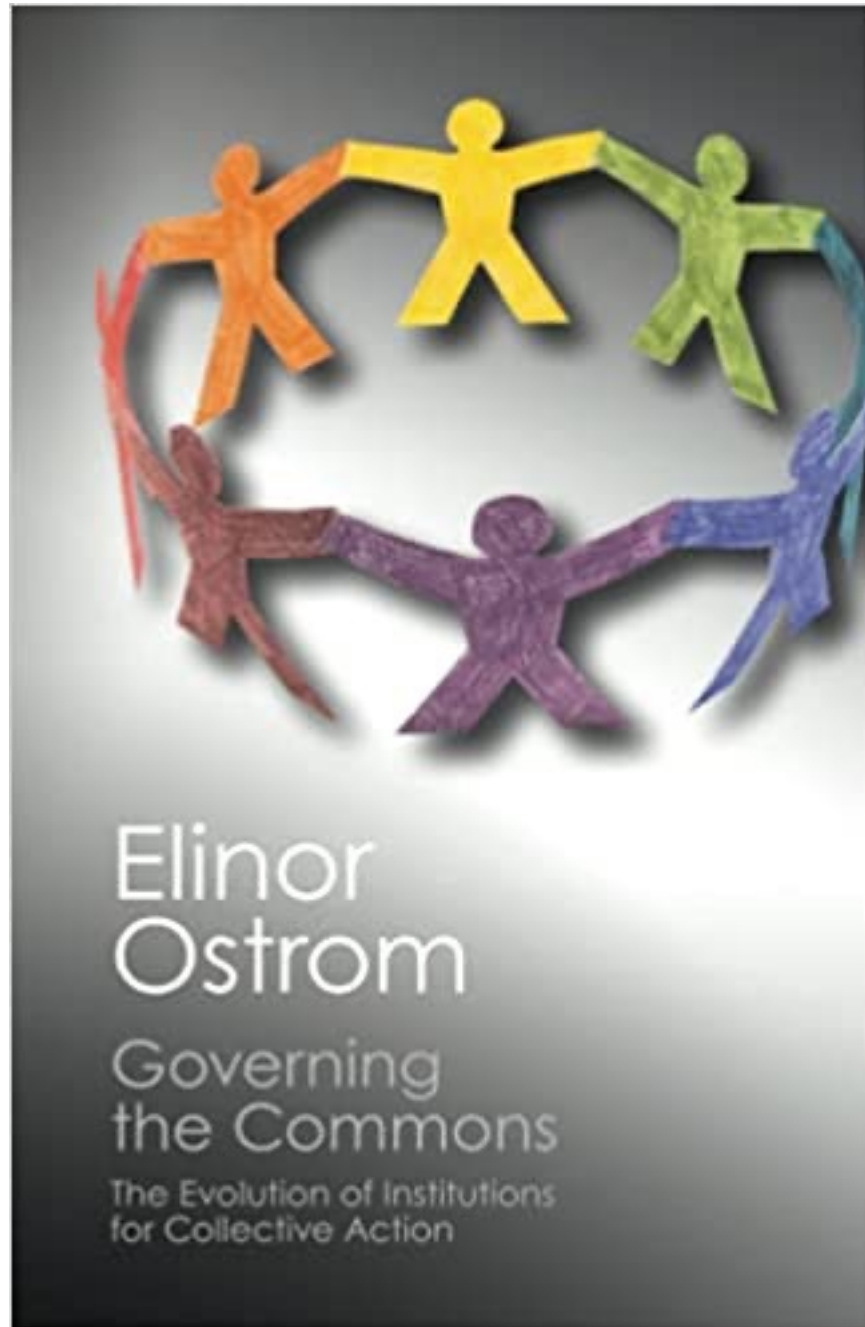
Ground Image: NASA Science Visualization Studio

FUNding Friday Grant: Space Weather Glossary Harmonization

>12 Space Weather space weather glossaries, dictionaries, or collections of terms

Virtual working meetings among a focused working group to harmonize space physics glossaries and to create the resources that permit broader ESIP co-creation of the glossary, ontology, and connections to Earth science.



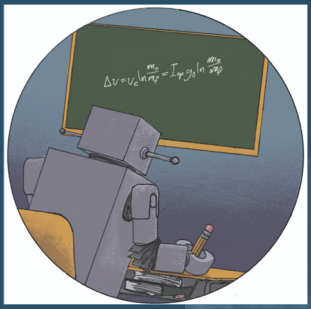


“

*What we have ignored is what citizens
can do and the importance of real
involvement of the people...*

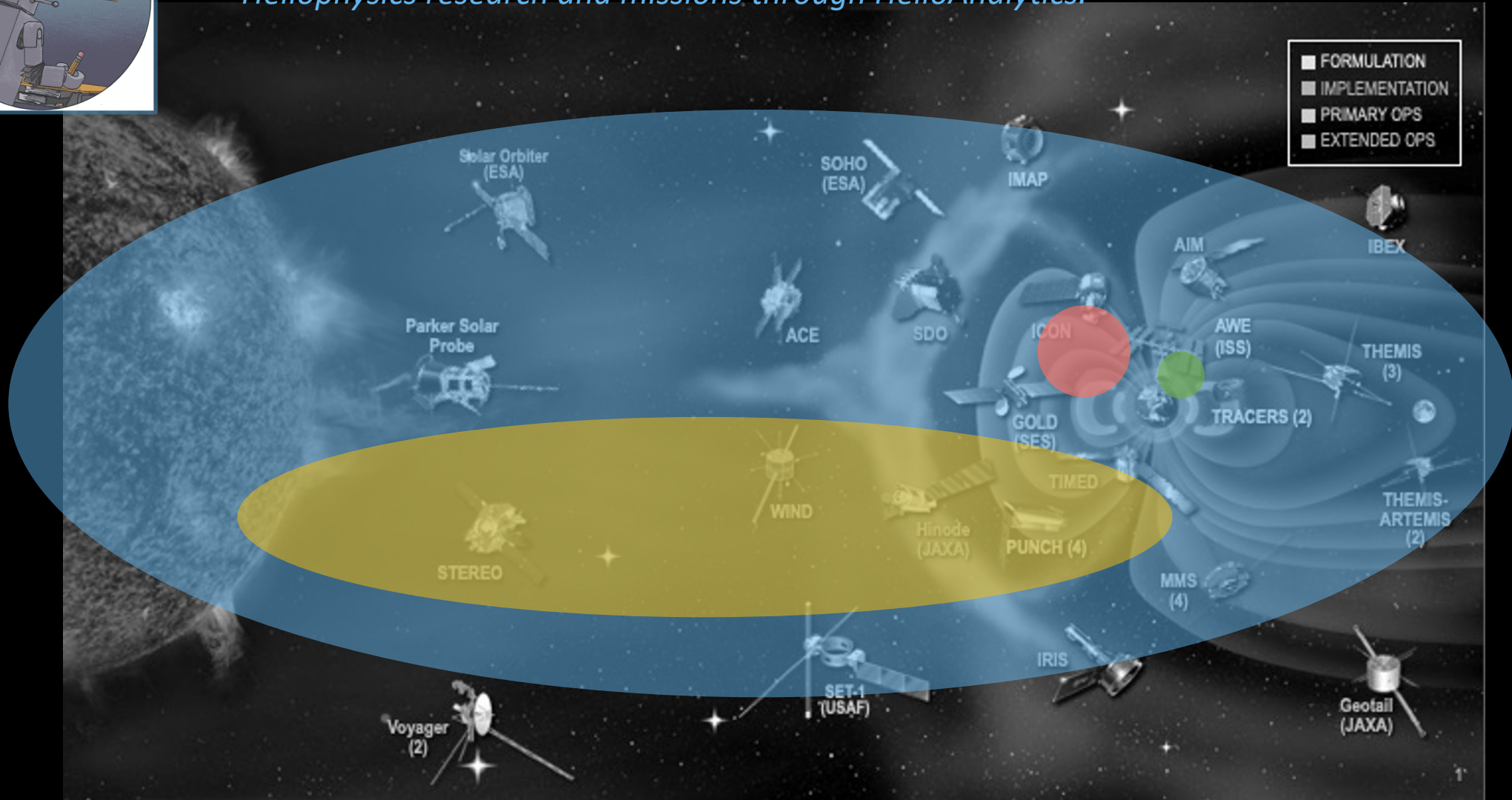
”

-Elinor Ostrom, *Governing the Commons* [1990]



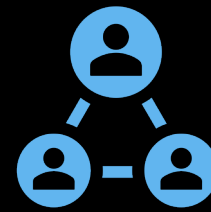
The NASA Center for HelioAnalytics

Establish a “Community of Practice” to expand the discovery potential for key Heliophysics research and missions through HelioAnalytics.



Background Image: NASA Science Visualization Studio

Space Data Knowledge Commons



Structuring Collective Knowledge

Create Pub Search Dashboard

HOME IAP 2021 IAP 2019 UNDERLAY WORKSHOP

Space home +

Published on Aug 16, 2021

SHOW DETAILS

The need for a Space Data Knowledge Commons

As our society expands technologically and physically into space, our flourishing is inextricable from the space environment. However, our data and knowledge infrastructure has not kept pace with this rapid change.

by Ryan McGranaghan, Samuel J. Klein, Agnes Cameron, Ellie Young, Sam Schonfeld, Aleida Higginson, Rebecca Ringuette, Alexa Halford, Chris Bard, Ayris Narock, and Barbara Thompson

PUB SETTINGS

CITE

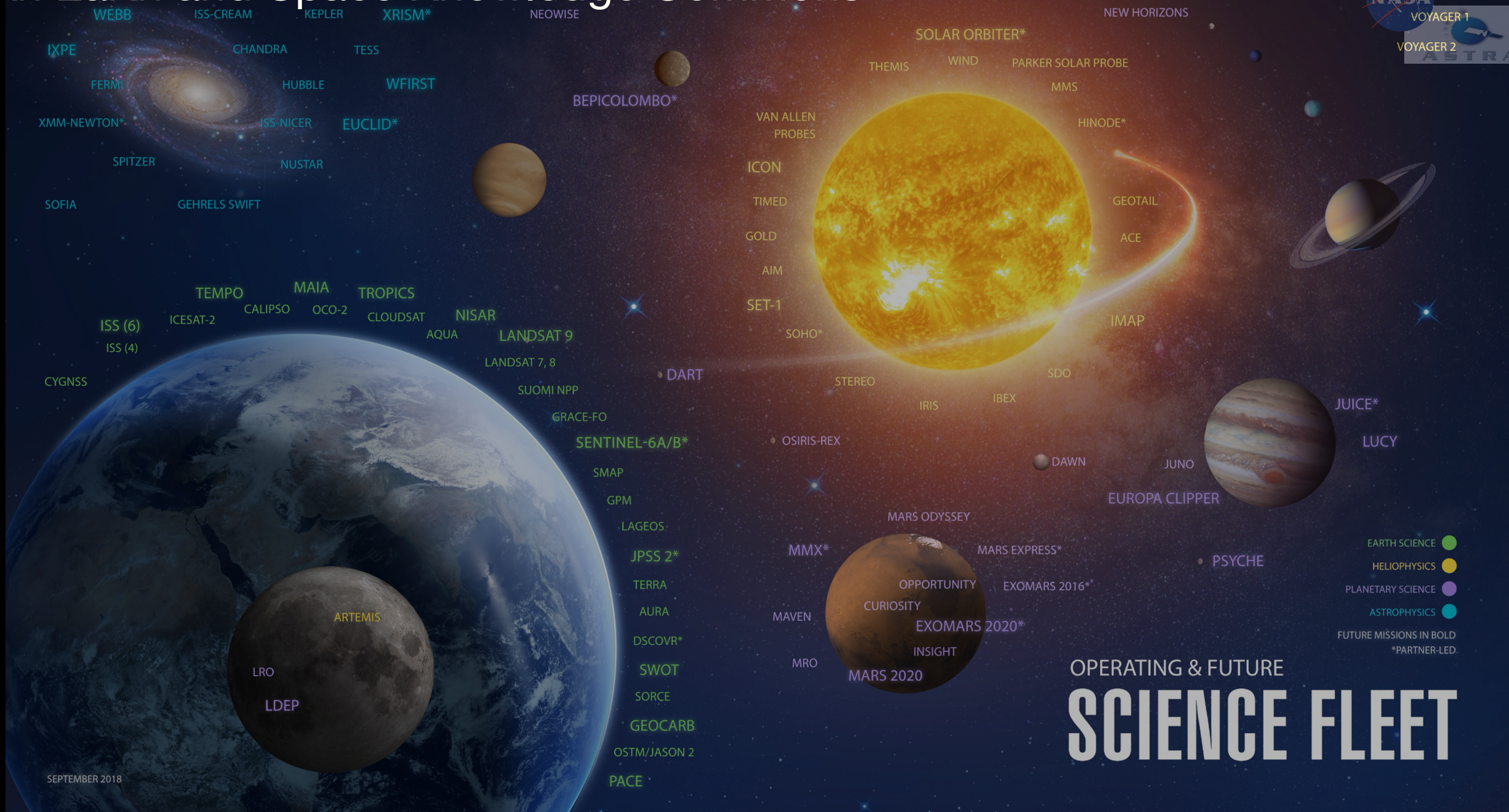
SOCIAL

DOWNLOAD







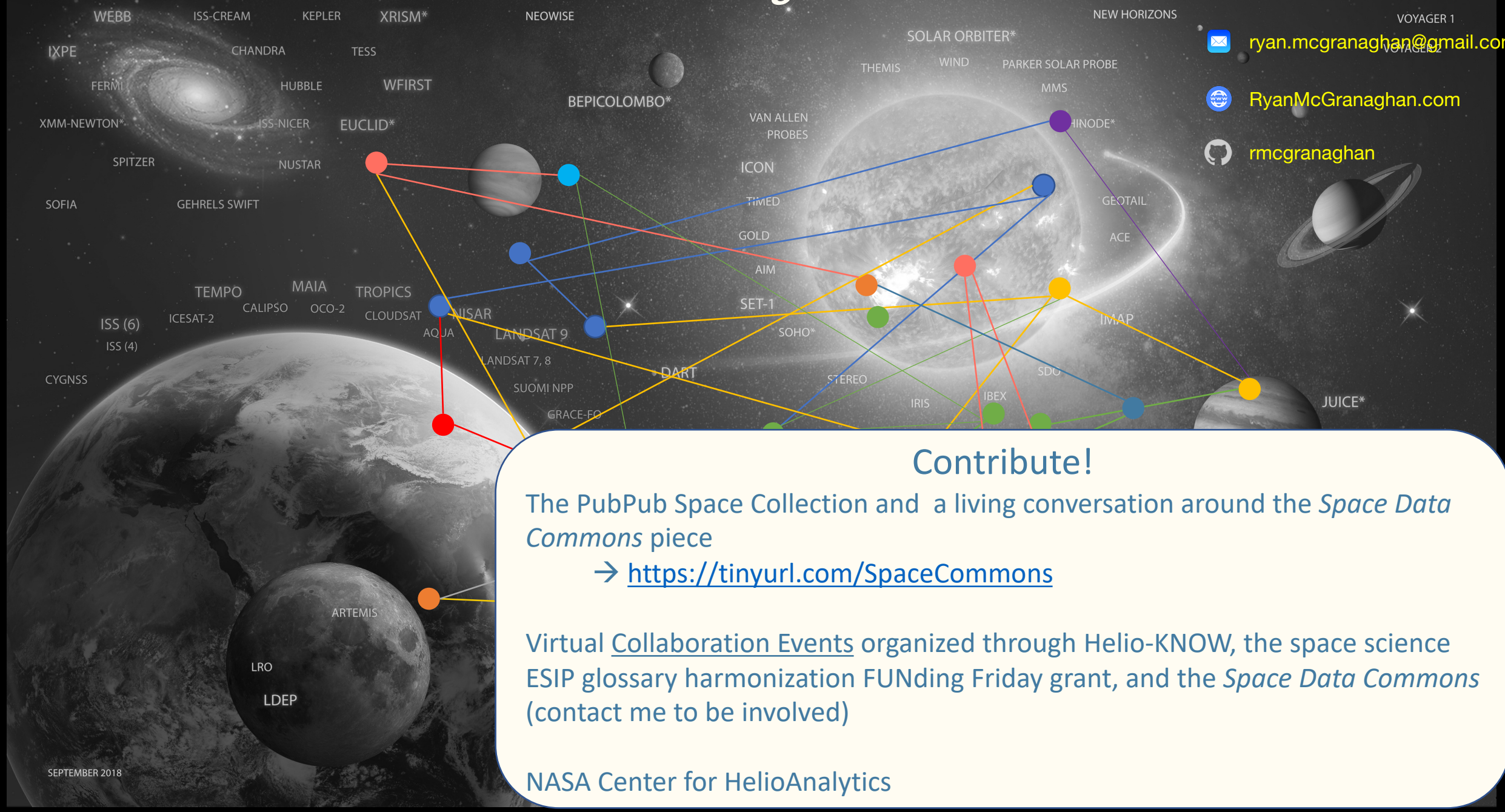
Background Image: NASA Science Visualization Studio

An Earth and Space Knowledge Commons



Contribute to the innovation: The *Knowledge Commons*

 @AeroSciEngineer
 ryan.mcgranaghan@gmail.com
 RyanMcGranaghan.com
 rmcgranaghan



Contribute!

The PubPub Space Collection and a living conversation around the *Space Data Commons* piece

→ <https://tinyurl.com/SpaceCommons>

Virtual Collaboration Events organized through Helio-KNOW, the space science ESIP glossary harmonization FUNding Friday grant, and the *Space Data Commons* (contact me to be involved)

NASA Center for HelioAnalytics

Back up slides

Discussion

What is the overlap between these space commons efforts and ESIP commons efforts?



- Semantic Technologies Cluster
 - (Spin-off Cluster) Semantic Harmonization - <https://wiki.esipfed.org/SemanticHarmonization>
 - focus is on bringing the SWEET ontology up-to-date while harmonizing it with other commonly used ontologies such as ENVO
 - (managed resource) Community Ontology Repository - <http://cor.esipfed.org/>
 - (managed resource, proposed new Cluster) SWEET Ontology
 - (Relationship?) Federation of Semantic Resources for Earth and Environmental Science (SeREEN Federation) (Federation effort is positioned at Semantic knowledge resources with primary focus of improving interoperability within Earth science observation information space)
- (Related Cluster) ESIP Discovery Cluster - ESIP people interested in making Earth Observation discovery work better - http://wiki.esipfed.org/index.php/Discovery_Cluster
- (Related Cluster) Science on Schema.org - http://wiki.esipfed.org/index.php/Schema.org_Cluster
- (Related Cluster) Open Geospatial Consortium

Discussion

What are the social/cultural components of building a knowledge commons?



- Platform, Access, Co-Creation
 - How do we provide the resources/artifacts/technologies that we develop in a way that the community can participate in their creation and evolution?
- Trust
 - How can a semantic technology encourage listening and dialogue?
 - What helps build trust?
 - What does a platform that engenders trust look like?
- Governance
 - Governance addresses both the aspirational ('who do we want to be?') and mundane ('who can do what?')
 - What are the elements of a governance strategy?
 - Explicit vision and objectives
 - Clearly defined roles and responsibilities
 - Design to maintain agility and flexibility
 - Large-scale strategy with room for local-scale experimentation
 - SWEET Governance ESIP Summer Meeting session [[session google doc](#)]
 - Who, or whom, evaluates the issues or proposals?
 - How does the community arrive at a decision?
 - How is that decision recorded and/or documented for the community?
 - How or what is put in place to help ensure every member is abiding by those decisions?
- Work with *Community Resilience Cluster* https://wiki.esipfed.org/Community_Resilience

Discussion



How do we find more common language/ways to communicate between semantic technology and Earth and Space Science?

(non semantic technology experts) What semantic technology term or concept would you like to know more about or do you think is important that you know more about?

(semantic technology experts) What semantic technology term or concept ought to be more widely known?

Open Science

“

Open science is transparent and accessible knowledge that is shared and developed through collaborative networks

”

- [Vicente-Saez & Martinez-Fuentes \[2018\]](#)

Relationship to Heliophysics knowledge efforts

- Knowledge Networks can democratize access to information
- Seeks to create the collaborative community to share the knowledge and know how