

SMALL SAMPLING OF HISTORY

Shown below are **Historical Movements** (that represent values, narratives, and deep assumptions).

Systems (infrastructure, institutions, and rules) that have influenced the West over the last 500 years.

The dimension of time flows outward from the core theme, like ripples on a pond. And at the intersection of the ripples are examples of **implications**.

What values and systems will shape the experiences of tomorrow? Some ideas are shown here in **red**. Add your own conclusions... after studying the map of the future!



GO AHEAD, EXPLORE!

Along the way you may find exotic characters, curious artifacts, and many surprises.

Watch for space shocks, leapfrogs, and breakthrough events that have their own ripple effects—sudden jumps from one possibility to a startling new one, or a shortcut to transformation.

It may all be overwhelming, but let this map be your guide in exploring the topsy-turvy, uncertain, murky, and fantastical possibilities of the future!

Go ahead, open it up, take it all in, and awaken your curiosity. Whatever you do, don't fight the possibilities. They are just that: possibilities to ponder. Embrace the journey and get ready to explore the future wonders of the space enterprise...

< FLIP OPEN

LOST?

In our search for clarity about the future, identifying major unknowns can help us **hone in on** relevant divergent future possibilities. Our research team has identified two critical uncertainties:

- 1. The degree in which space will be “commercialized.”**
How much will space exploration and exploitation be designed to seed the commercial ecosystem?
- 2. The evolution and potential transformation of global power states.**
What space-based leverage points could change the terrestrial power balance?

LOOKING BACK FROM THE JOURNEY

Food for thought to as you travel back to the present. We see two major cross-cutting takeaways:

HOMO DEUS

We are on the precipice for directly controlling our own evolution through our DNA and, in parallel, moving toward creating a generalized AI. Space is very much a part of the human journey of our self-exploration.

*What does it mean to be human?
What is our purpose?
How did we get here?
Where do we want to go?*

JEWELS OF SPACE

We see many unique ways in which space can benefit society.

*What new wealth will arise from a booming space economy?
Will there be a national advantage?
What new scientific discoveries will be made?
How will space entertain and inspire us?*

THE FUTURE OF SPACE IS YOU

The budding, complex, mighty, and vibrant space ecosystem is on a very exciting journey. And guess what. You are part of weaving its future fabric (whether you know it or not).

We hope this map helps you reflect on the potential concerns, pitfalls, hype, underdogs, hopes, dreams, treasures and surprises that may lie ahead.

Furthermore, we hope it sparks you to imagine your preferred future and work toward actively shaping it today.

The Strategic Foresight Initiative at Aerospace is dedicated to expanding the futures mindset for the space enterprise.

Expanded research and citation list for this map is also featured on our online website.

Interested in learning more? Email us at Futures@aero.org or check us out at Aerospace.org/policy.

©2020 The Aerospace Corporation. All trademarks, service marks, and trade names contained herein are the property of their respective owners. Approved for public release; distribution unlimited. OTR202000565

OPEN ME!



PATHFINDER'S GUIDE

TO THE SPACE ENTERPRISE

A magnificent journey through the unknown



// START JOURNEY

©2020 THE AEROSPACE CORPORATION

OPEN ME!

HOW TO READ THIS MAP

SETTING THE STAGE

Outer space may be a vacuum, but our concepts of the future don't develop in one. Centuries of human history have shaped where we are and will continue to help shape our future.

SOME QUESTIONS TO ASK AS YOU NAVIGATE THE MAP

What if some combination of these things happened?

What would that mean to me?

What are unforeseen opportunities and risks in the future?

CORE THEMES OF THE FUTURE OF SPACE

Hundreds of ideas from dozens of experts have been condensed into the seven core themes below. Each of these themes serves as an anchor in the present and a portal to the future.

These themes can overlap in virtually unlimited ways as time moves forward. The intersections along the ripples of the map aren't predictions, and they're not comprehensive, but they prompt us to ask critical questions that can help us shape the future towards preferred outcomes.

INTELLIGENCE INFRASTRUCTURE

Artificially “incubated” information available on demand

CONFLICT

Modalities and landscapes that change continuously and at exponential speed

WORKFORCE

The skills, capabilities, and social environments to deliver the future

RESOURCES

Physical and virtual space-based “jewels” that fuel exploration, development, and benefits to Earth

ACCESS

Physical and virtual delivery, usage, and connectivity, from Earth to space and intra-space

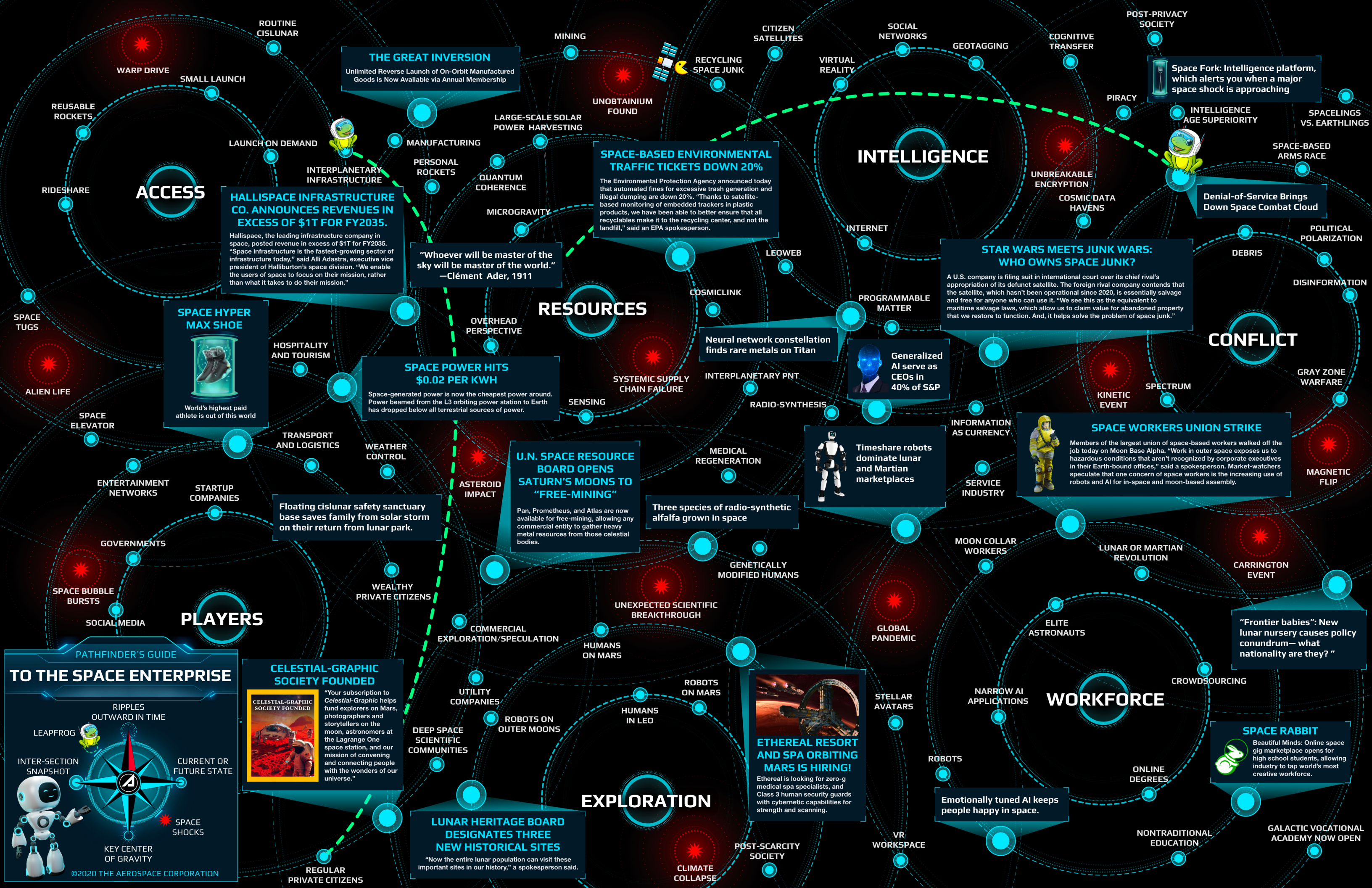
PLAYERS

Explorers, entrepreneurs, innovators, government leaders, service providers, and societal elements of the space ecosystem

EXPLORATION

The emergence of a space-faring society

FLIP OPEN >



ACCESS

HALLISPACE INFRASTRUCTURE CO. ANNOUNCES REVENUES IN EXCESS OF \$1T FOR FY2035.
 Hallispace, the leading infrastructure company in space, posted revenue in excess of \$1T for FY2035. "Space infrastructure is the fastest-growing sector of infrastructure today," said Alli Adastra, executive vice president of Halliburton's space division. "We enable the users of space to focus on their mission, rather than what it takes to do their mission."

SPACE HYPER MAX SHOE
 World's highest paid athlete is out of this world

THE GREAT INVERSION
 Unlimited Reverse Launch of On-Orbit Manufactured Goods is Now Available via Annual Membership

SPACE-BASED ENVIRONMENTAL TRAFFIC TICKETS DOWN 20%
 The Environmental Protection Agency announced today that automated fines for excessive trash generation and illegal dumping are down 20%. "Thanks to satellite-based monitoring of embedded trackers in plastic products, we have been able to better ensure that all recyclables make it to the recycling center, and not the landfill," said an EPA spokesperson.

INTELLIGENCE

STAR WARS MEETS JUNK WARS: WHO OWNS SPACE JUNK?
 A U.S. company is filing suit in international court over its chief rival's appropriation of its defunct satellite. The foreign rival company contends that the satellite, which hasn't been operational since 2020, is essentially salvage and free for anyone who can use it. "We see this as the equivalent to maritime salvage laws, which allow us to claim value for abandoned property that we restore to function. And, it helps solve the problem of space junk."

Denial-of-Service Brings Down Space Combat Cloud

RESOURCES

SPACE POWER HITS \$0.02 PER KWH
 Space-generated power is now the cheapest power around. Power beamed from the L3 orbiting power station to Earth has dropped below all terrestrial sources of power.

U.N. SPACE RESOURCE BOARD OPENS SATURN'S MOONS TO "FREE-MINING"
 Pan, Prometheus, and Atlas are now available for free-mining, allowing any commercial entity to gather heavy metal resources from those celestial bodies.

Neural network constellation finds rare metals on Titan

Generalized AI serve as CEOs in 40% of S&P

Timeshare robots dominate lunar and Martian marketplaces

CONFLICT

SPACE WORKERS UNION STRIKE
 Members of the largest union of space-based workers walked off the job today on Moon Base Alpha. "Work in outer space exposes us to hazardous conditions that aren't recognized by corporate executives in their Earth-bound offices," said a spokesperson. Market-watchers speculate that one concern of space workers is the increasing use of robots and AI for in-space and moon-based assembly.

PLAYERS

Floating cislunar safety sanctuary base saves family from solar storm on their return from lunar park.

CELESTIAL-GRAPHIC SOCIETY FOUNDED
 "Your subscription to *Celestial-Graphic* helps fund explorers on Mars, photographers and storytellers on the moon, astronomers at the Lagrange One space station, and our mission of convening and connecting people with the wonders of our universe."

EXPLORATION

LUNAR HERITAGE BOARD DESIGNATES THREE NEW HISTORICAL SITES
 "Now the entire lunar population can visit these important sites in our history," a spokesperson said.

ETHEREAL RESORT AND SPA ORBITING MARS IS HIRING!
 Ethereal is looking for zero-g medical spa specialists, and Class 3 human security guards with cybernetic capabilities for strength and scanning.

WORKFORCE

Emotionally tuned AI keeps people happy in space.

SPACE RABBIT
 Beautiful Minds: Online space gig marketplace opens for high school students, allowing industry to tap world's most creative workforce.

TO THE SPACE ENTERPRISE

PATHFINDER'S GUIDE

RIPPLES OUTWARD IN TIME

LEAPFROG

INTER-SECTION SNAPSHOT

CURRENT OR FUTURE STATE

SPACE SHOCKS

KEY CENTER OF GRAVITY

©2020 THE AEROSPACE CORPORATION