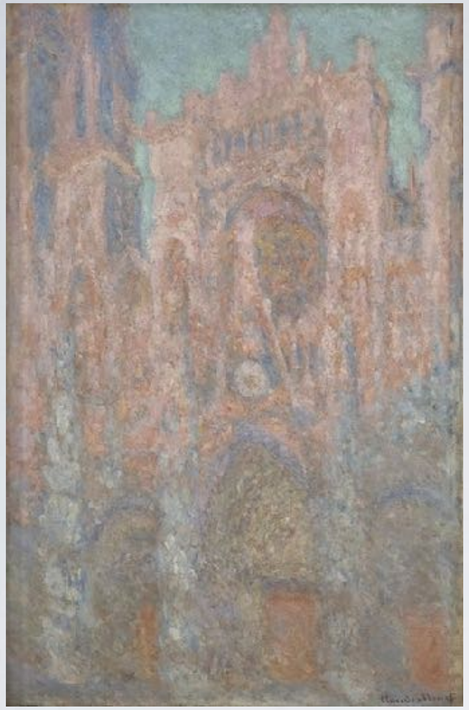
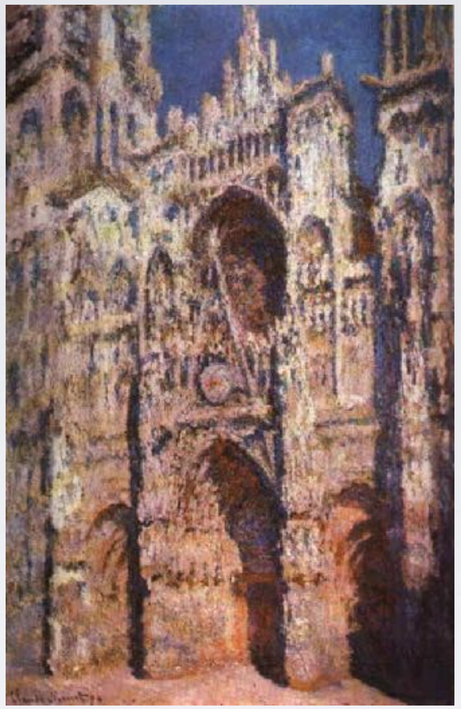
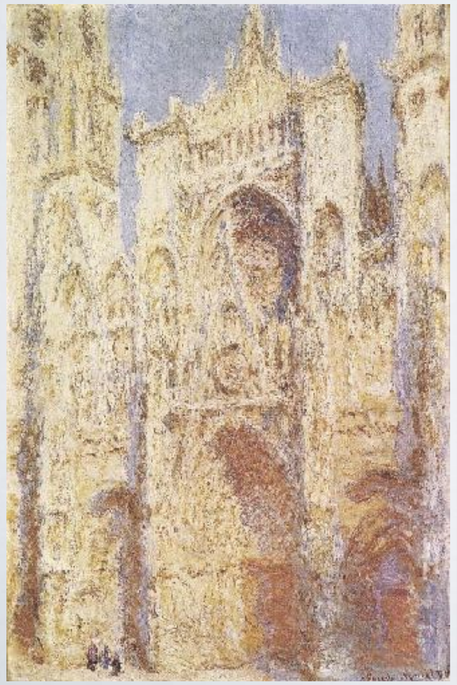
MIT SEDS Talk

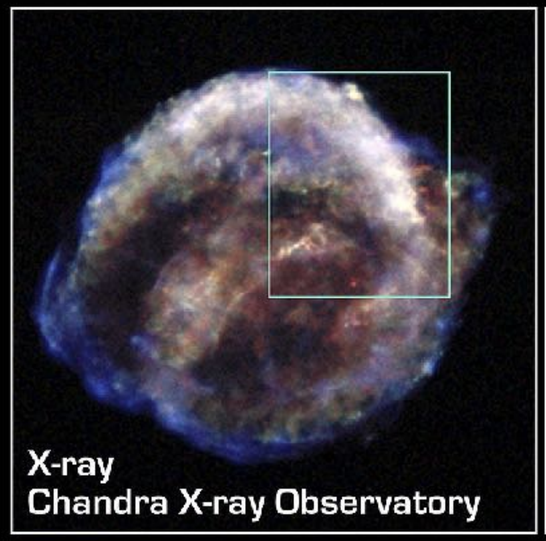
Art

1832 "The Studio”
Katherine Park, Designer Nov 20, 2019

Jet Propulsion Laboratory
California Institute of Technology

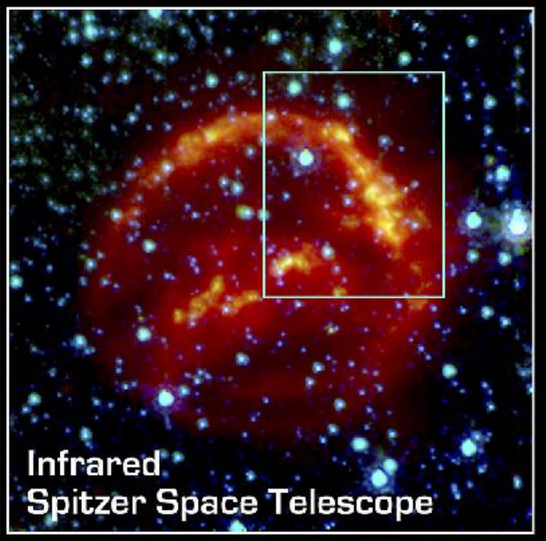


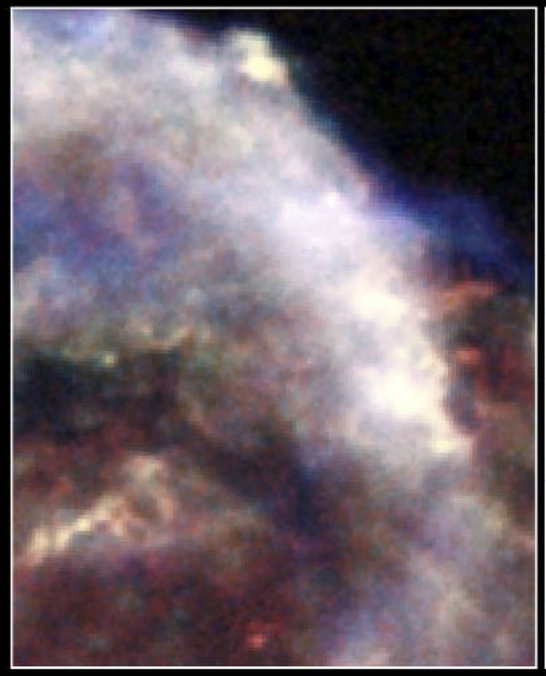



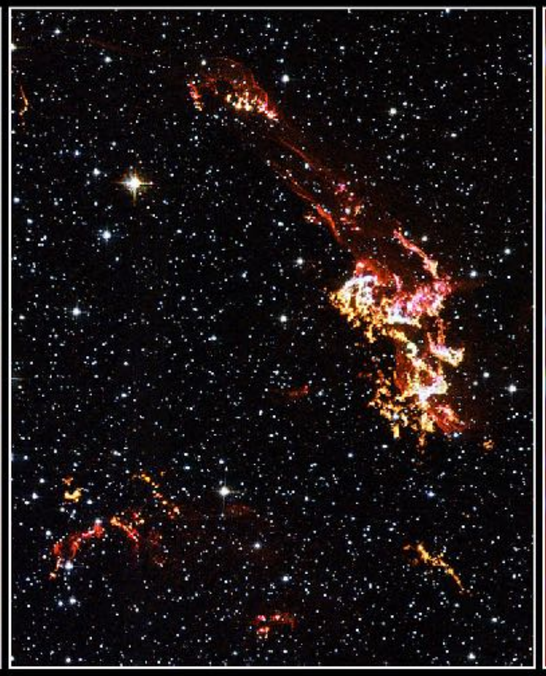
X-ray
Chandra X-ray Observatory

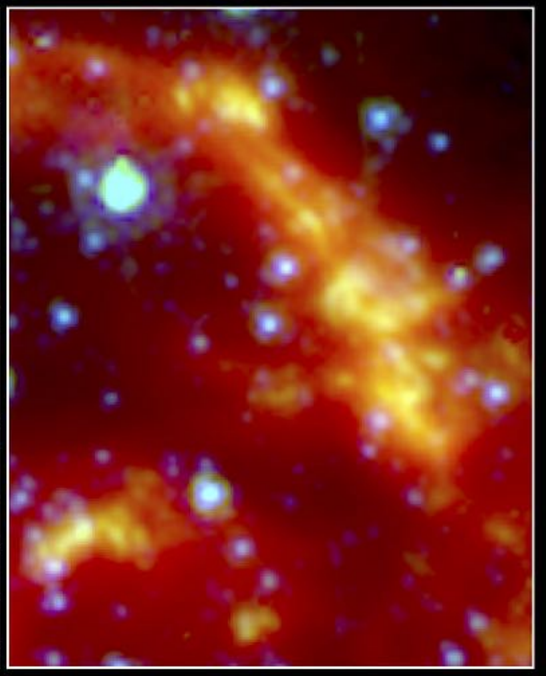
Visible
Hubble Space Telescope



Infrared
Spitzer Space Telescope







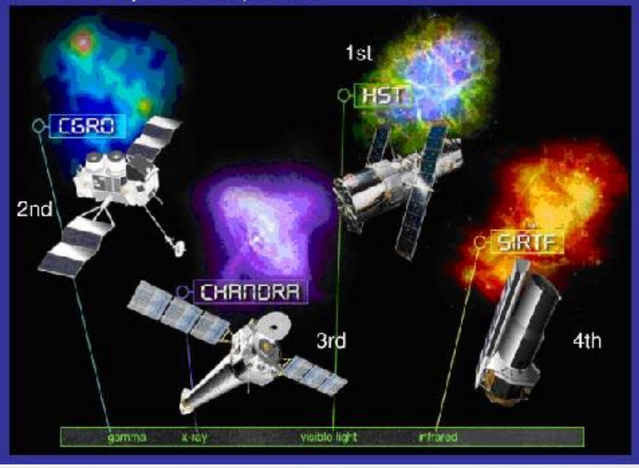
Kepler's Supernova Remnant • SN 1604

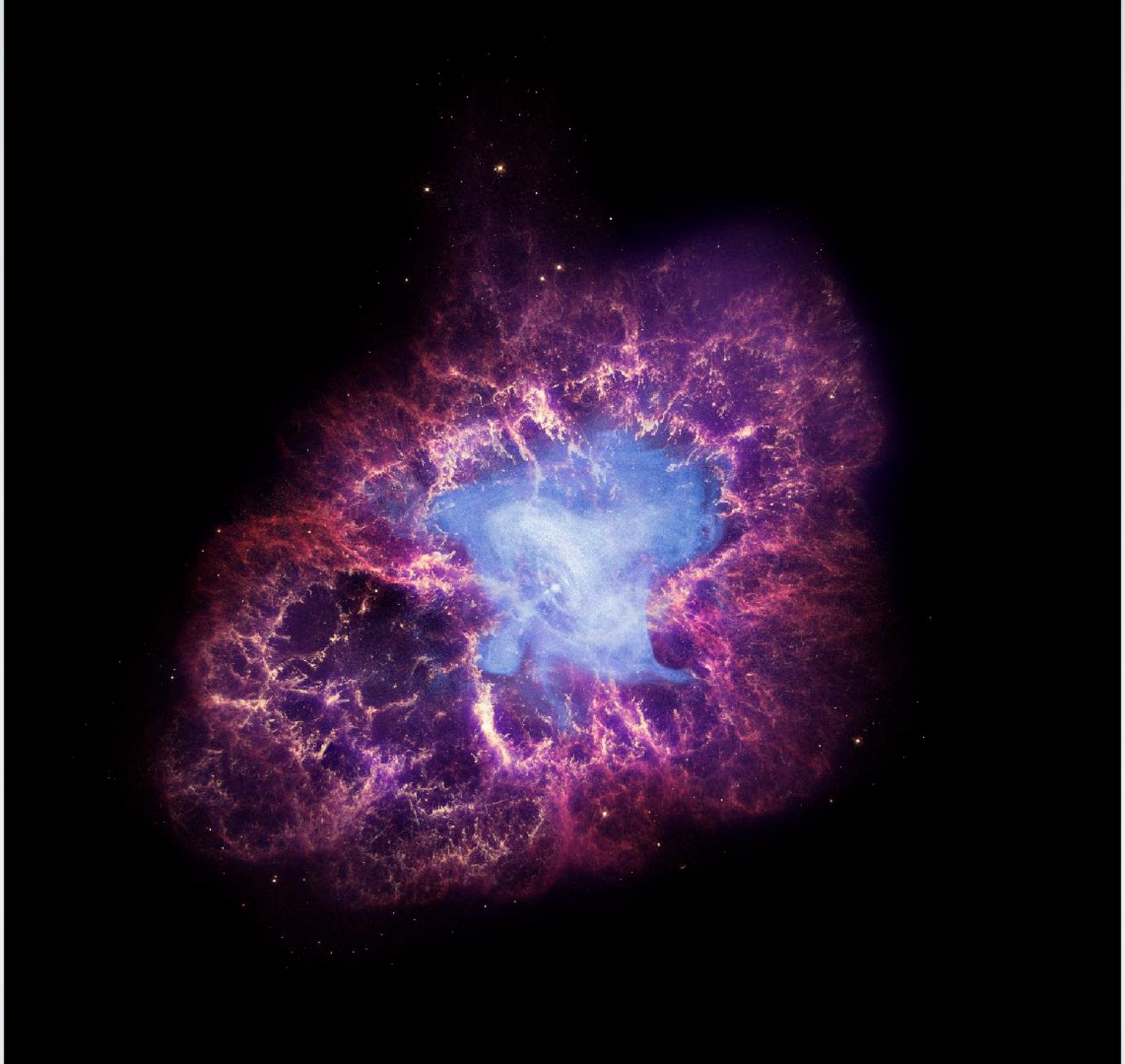
NASA, ESA / JPL-Caltech / R. Sankrit & W. Blair (Johns Hopkins University)

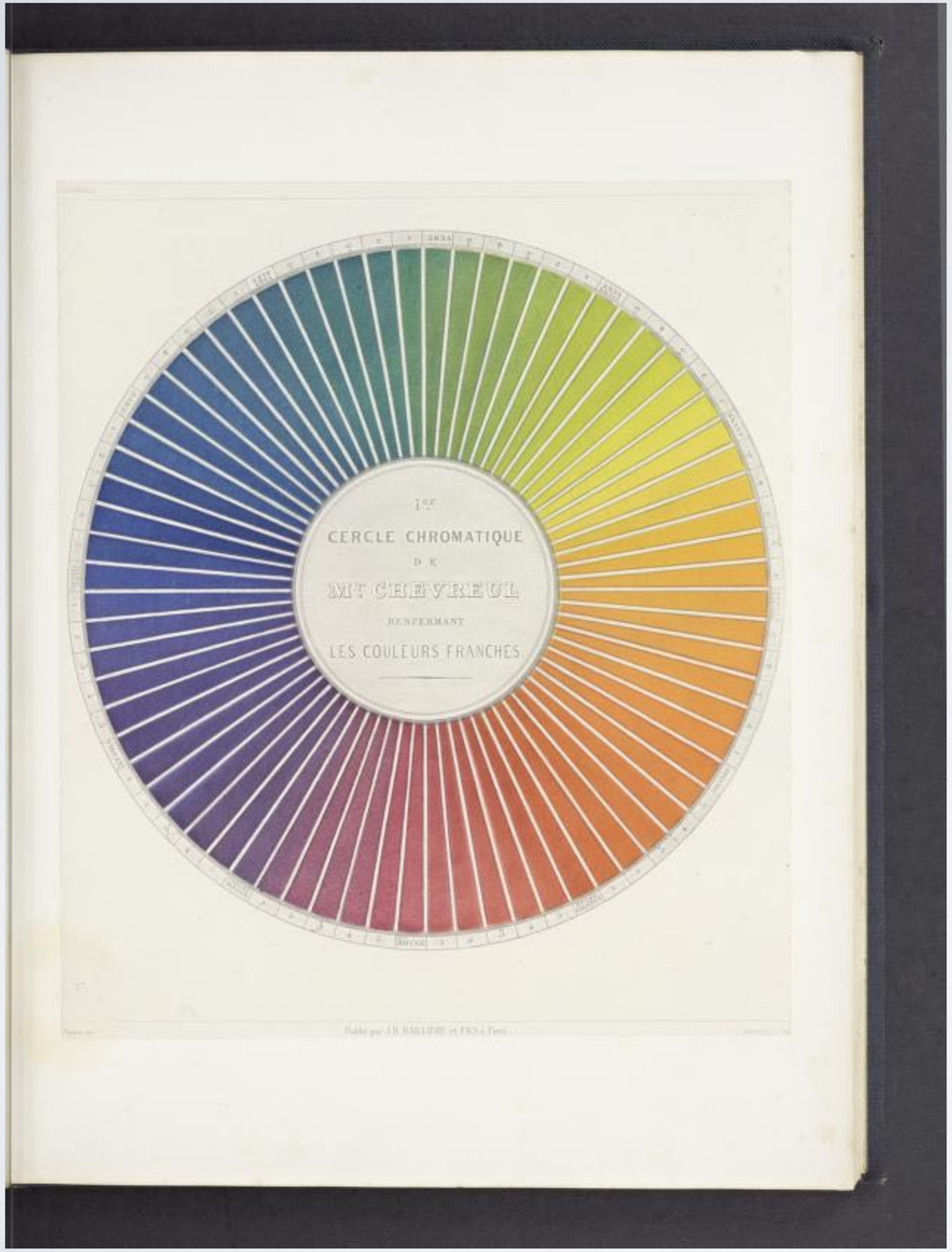
ssc2004-15b

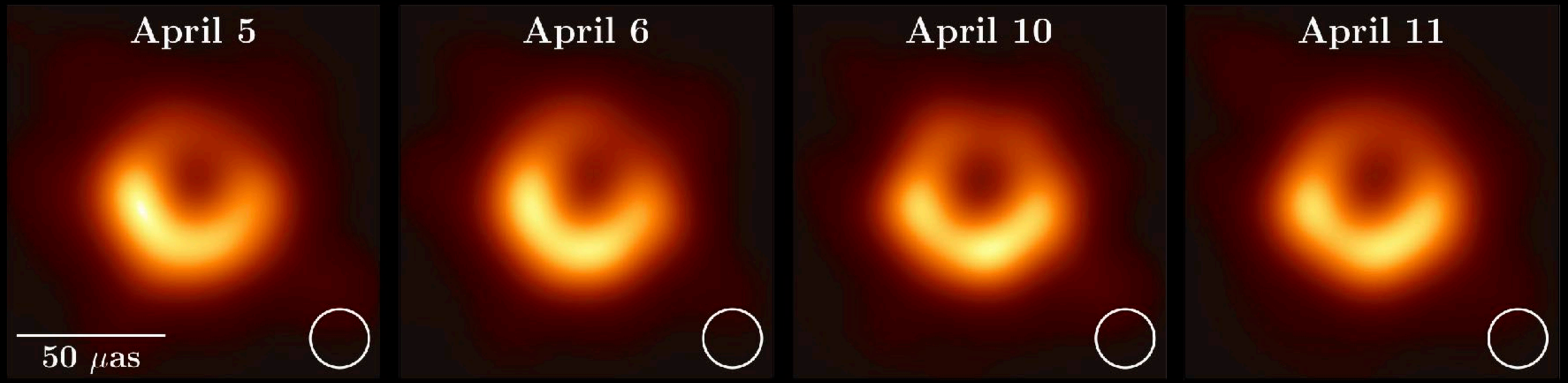
Great Observatories

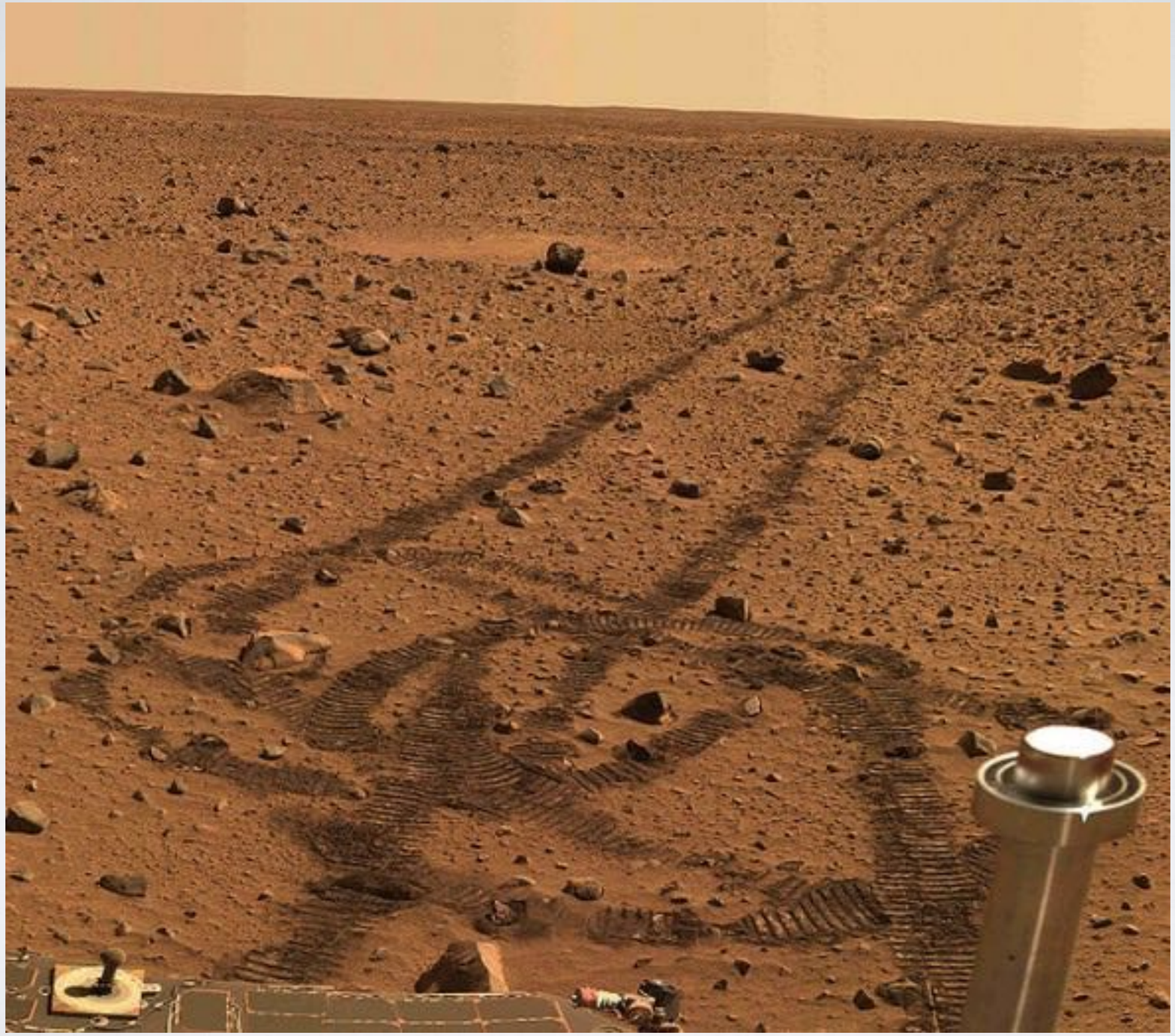
NASA's "Great Observatories" program used four separate satellites to cover a different part of the spectrum.






Ier
CERCLE CHROMATIQUE
DE
M.r CHEVREUL
RENFERMANT
LES COULEURS FRANCHES.

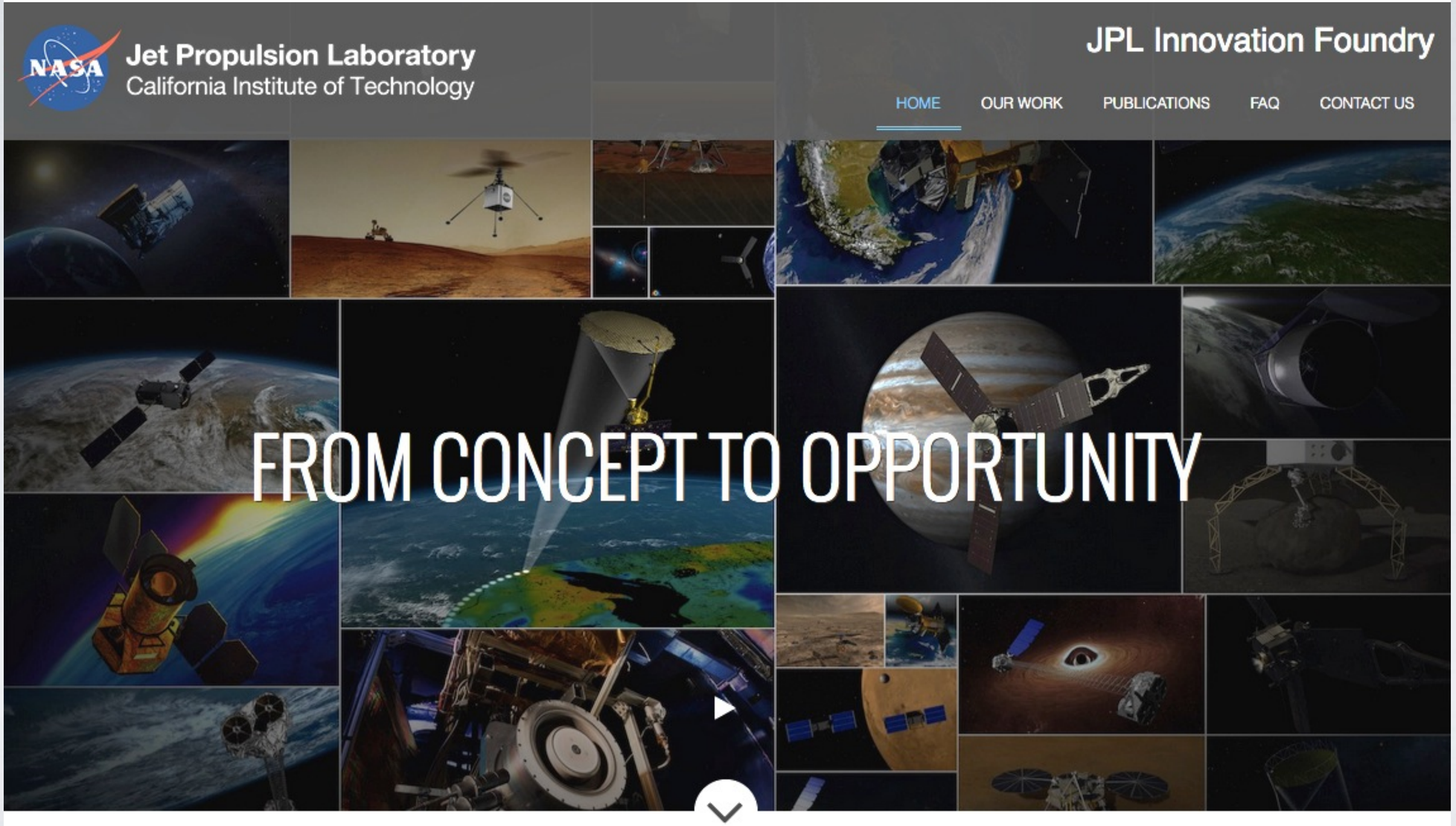

April 5
April 6
April 10
April 11
50 μas



JPL Innovation Foundry

JPL’s Innovation Foundry

jplfoundry.jpl.nasa.gov

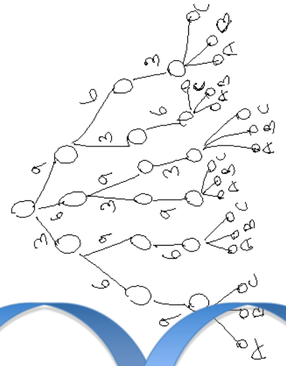


JPL Innovation Foundry

CMLs: A Powerful Communication Tool

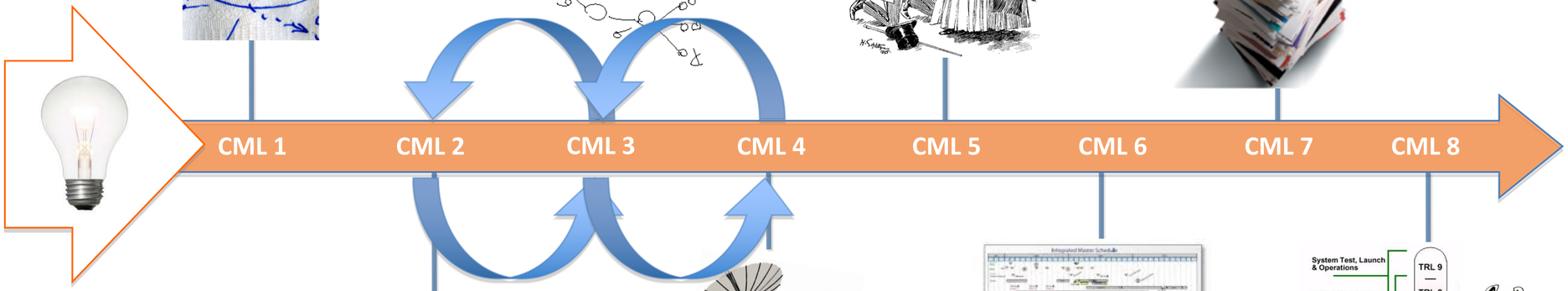
Cocktail Napkin

Trade Space



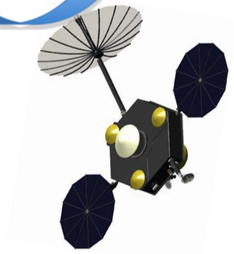
Baseline Concept

Preliminary Implementation Baseline

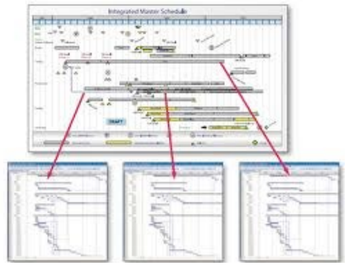


F=ma

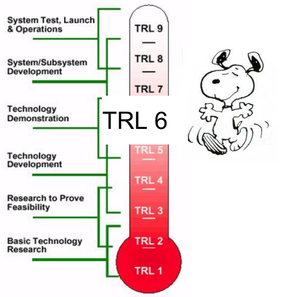
Initial Feasibility



Point Design



Integrated Concept

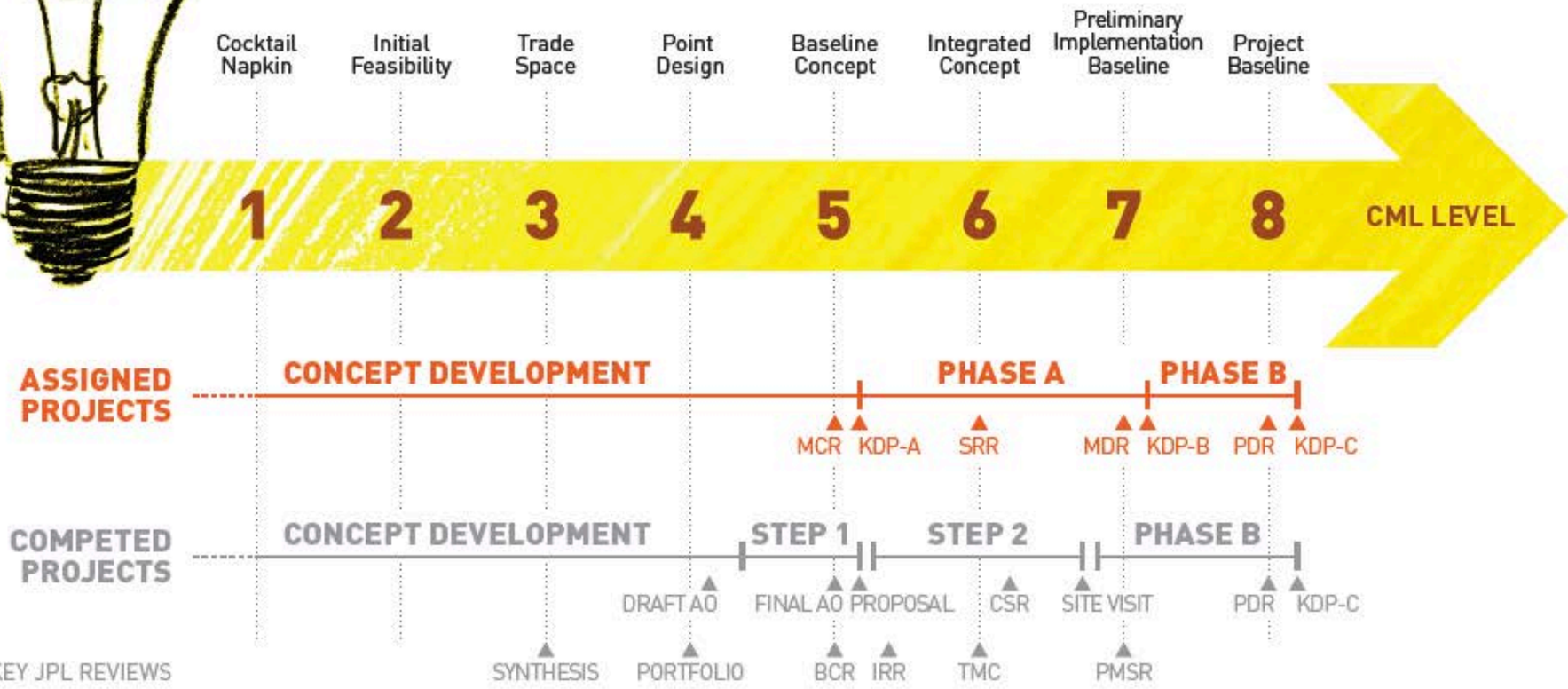


Integrated Baseline

JPL Innovation Foundry

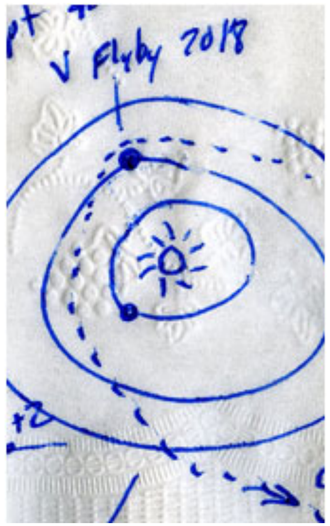
CONCEPT MATURITY LEVELS (CML)

for NASA Competed and Assigned Projects



JPL Innovation Foundry

…then the concept is developed



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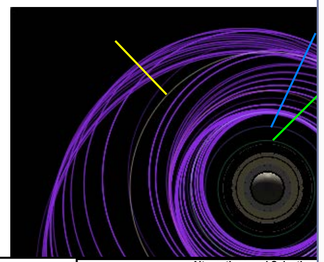
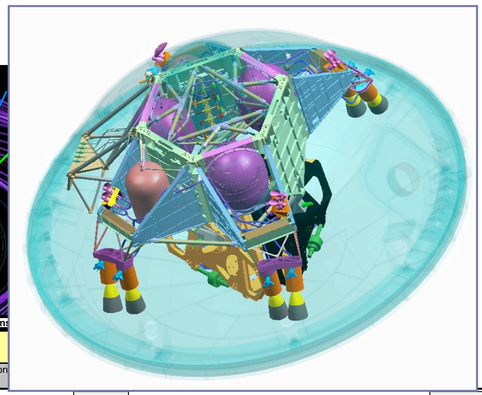
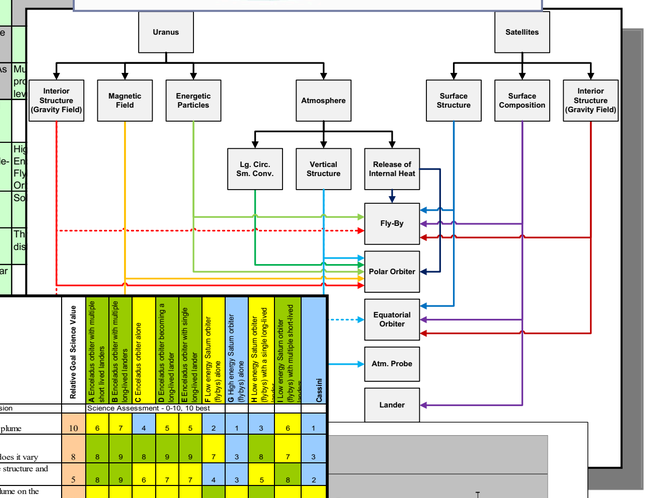
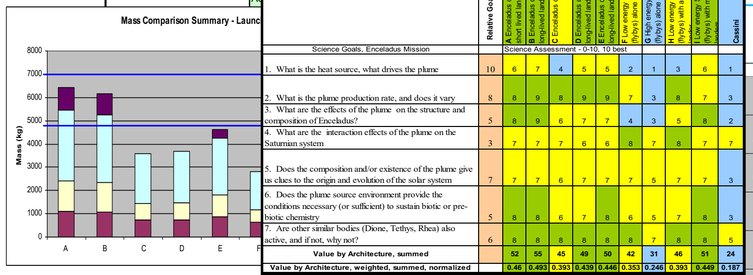


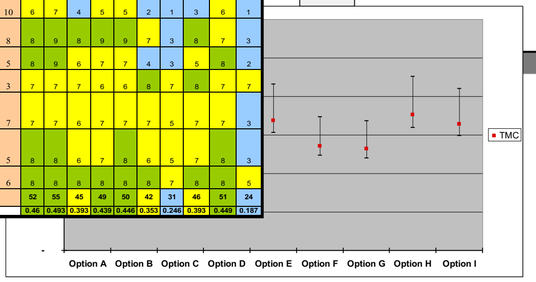


Trades	Alternatives and Selections		
Launch vehicle	Atlas V	Delta IV-Heavy	Ares V
Cruise propulsion	SEP + GAs	Chemical + GAs	Propulsive on
Capture into Saturn system	Titan aerocapture (aerogravity assist)	Propulsive capture	
Pump-down mission design	Enceladus/Titan GAs only	Multiple moon GAs only	Mu pro lev
RPS type	MMRTG	ARPS (advanced Stirling)	
Orbiter implementation	Enceladus Orbiter	Low-Energy Enceladus Multiple-Flyby (Saturn Orbiter)	Hig En Fly Orb
Lander/Probe implementation	Fly-Through Probes and Impactors	Rough Landers	So
Number of landers	None	One	Th dis
Lander lifetime/duration	Short-lived (~2 weeks on primary	Long-lived (~1 year on RPS)	
Lander mobility type	St		





Science Goals, Enceladus Mission	Relative Goal Science Value	A: Enceladus orbiter with multiple short lived landers	B: Enceladus orbiter with multiple long-lived landers	C: Enceladus orbiter alone	D: Enceladus orbiter becoming a long-lived lander	E: Enceladus orbiter with single long-lived lander	F: Low energy Saturn orbiter (flybys) alone	G: High energy Saturn orbiter (flybys) alone	H: Low energy Saturn orbiter (flybys) with single short-lived lander	I: Low energy Saturn orbiter (flybys) with multiple short-lived landers	Cassini
Science Assessment - 0-10, 10 best											
1. What is the heat source, what drives the plume	10	6	7	4	5	5	2	1	3	6	1
2. What is the plume production rate, and does it vary	8	8	9	8	9	9	7	3	8	7	3
3. What are the effects of the plume on the structure and composition of Enceladus?	5	8	9	6	7	7	4	3	5	8	2
4. What are the interaction effects of the plume on the Saturnian system	3	7	7	7	6	6	8	7	8	7	7
5. Does the composition and/or existence of the plume give us clues to the origin and evolution of the solar system	7	7	7	6	7	7	7	5	7	7	3
6. Does the plume source environment provide the conditions necessary (or sufficient) to sustain biotic or pre-biotic chemistry	5	8	8	6	7	8	6	5	7	8	3
7. Are other similar bodies (Dione, Tethys, Rhea) also active, and if not, why not?	6	8	8	8	8	8	8	7	8	8	5
Value by Architecture, summed		52	55	45	49	50	42	31	46	51	24
Value by Architecture, weighted, summed, normalized		0.46	0.493	0.393	0.439	0.446	0.353	0.246	0.393	0.449	0.187

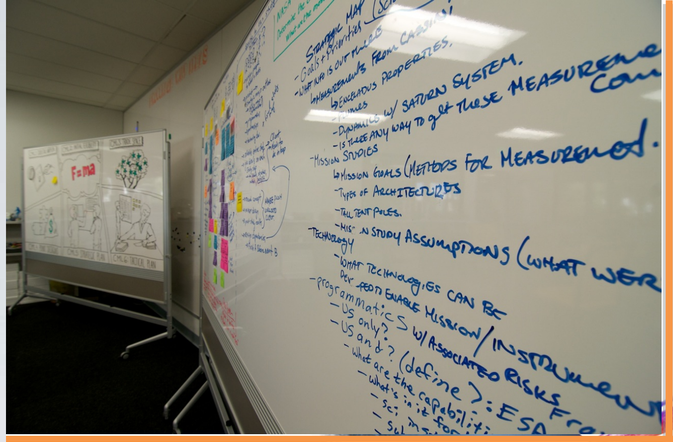


One person's concept is another's doodle…

JPL's Innovation Foundry

jplfoundry.jpl.nasa.gov

- JPL supports the science community to ideate, mature, and propose concepts for new NASA missions
- Continuously "system engineer" requirements and solutions to develop compelling new missions
- The JPL Innovation Foundry is JPL's engine for formulation of exciting, new space mission concepts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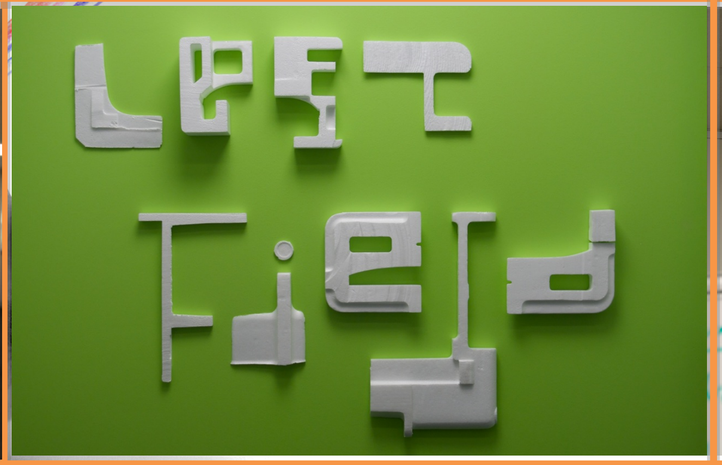
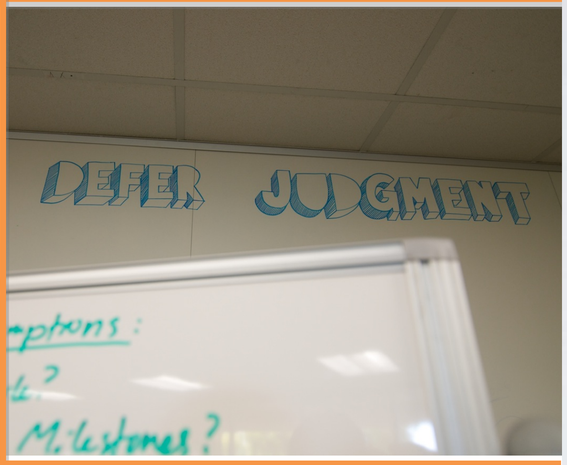
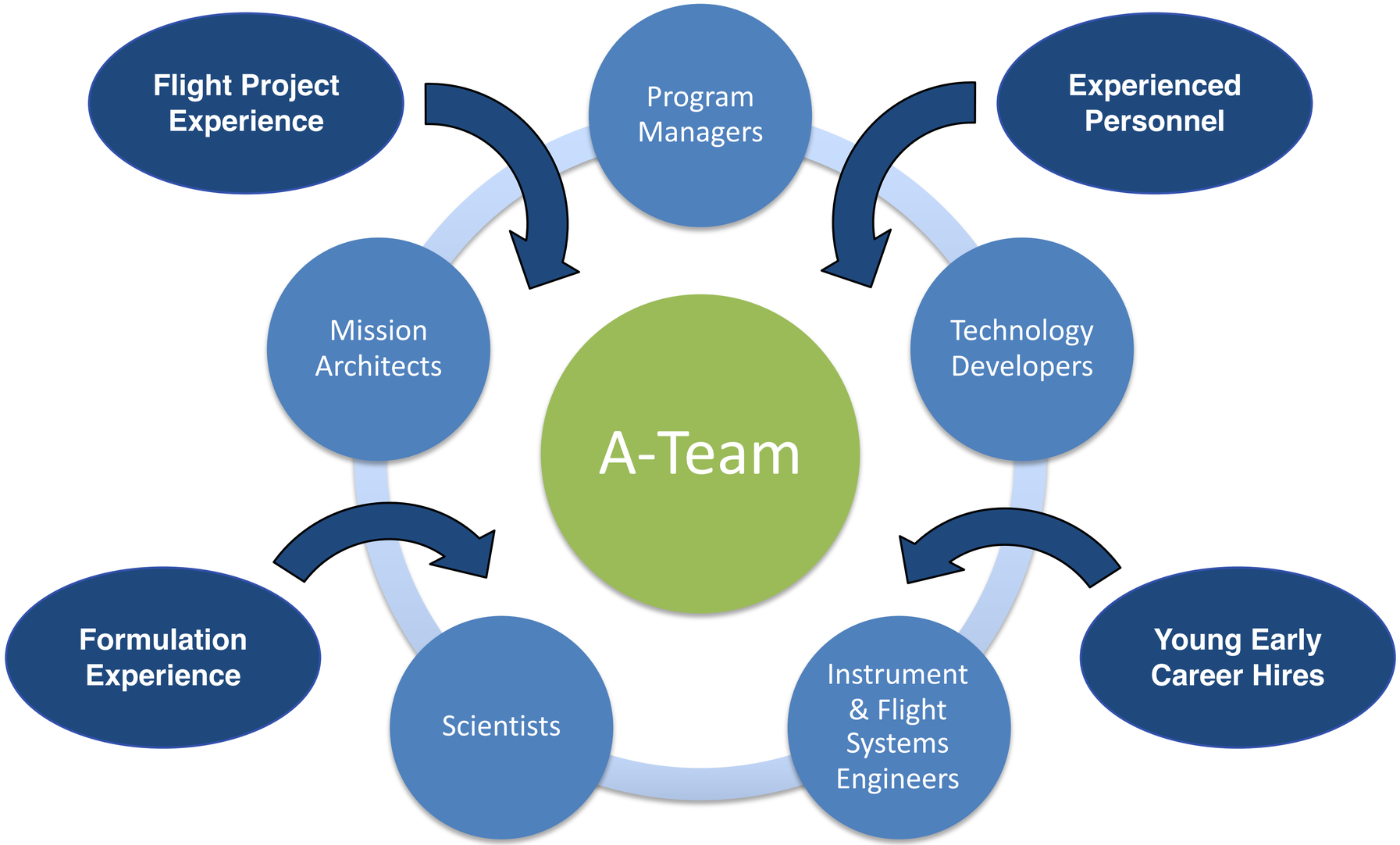

LEFT
FIELD

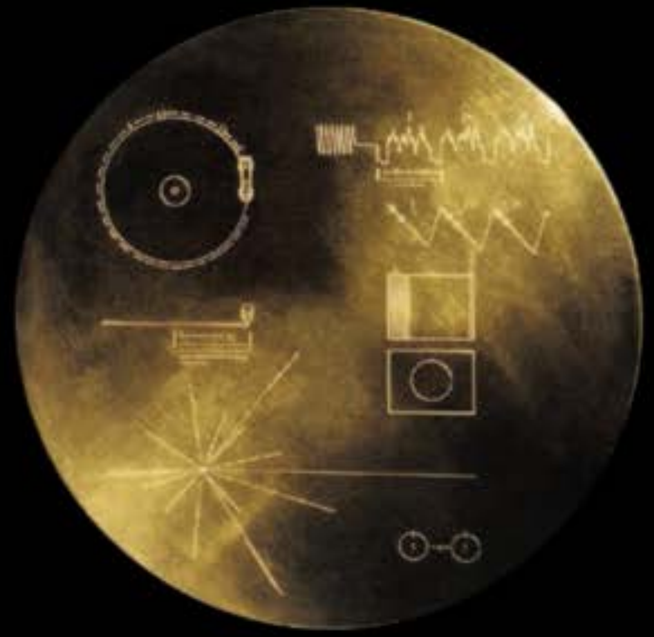

DEFER JUDGMENT


F=ma

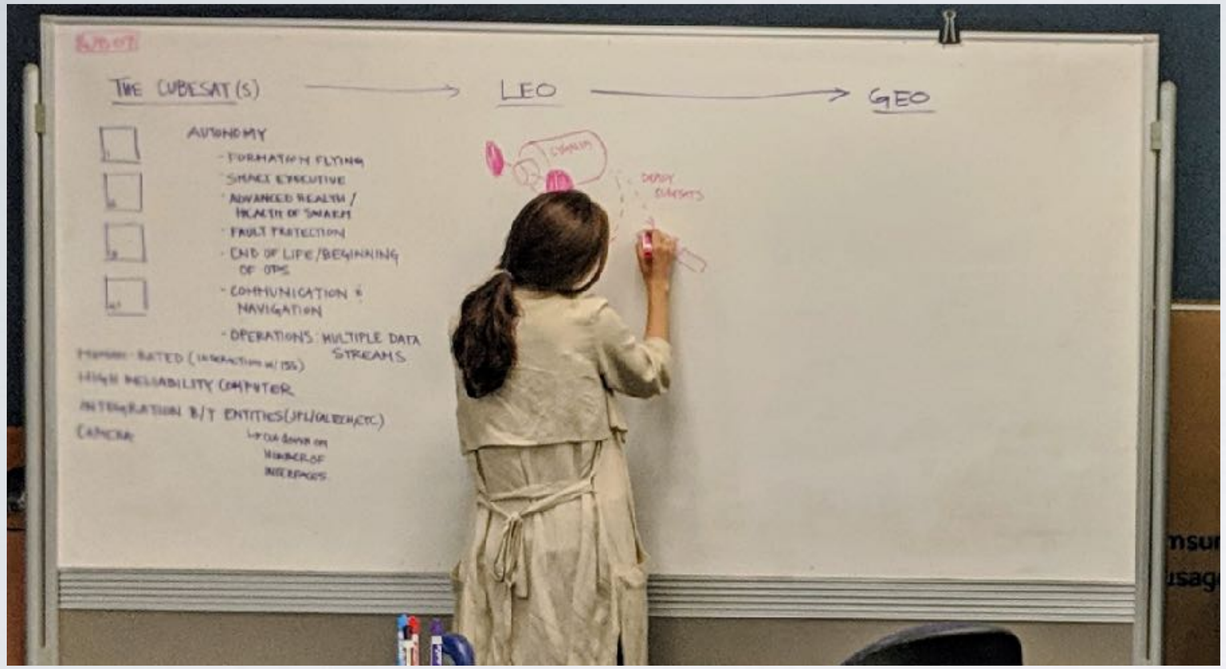
JPL Innovation Foundry

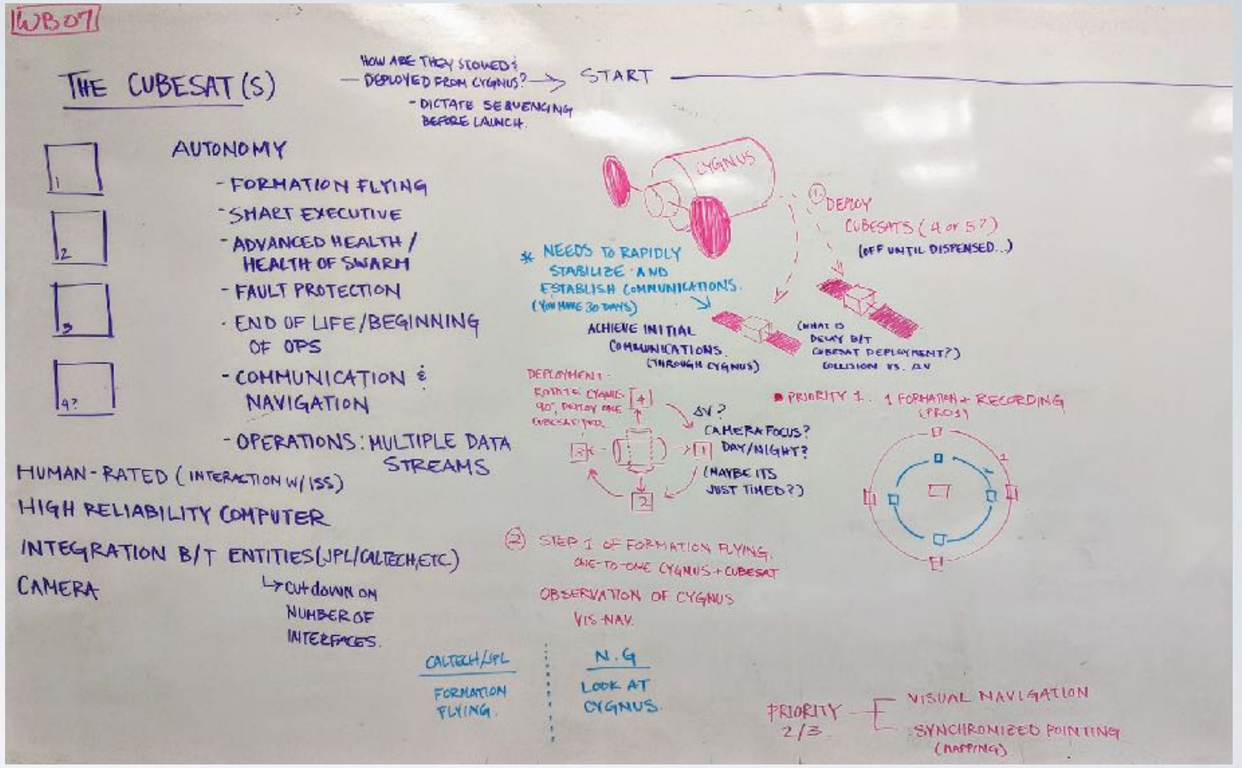
Key Aspect to A-Team Innovation: People



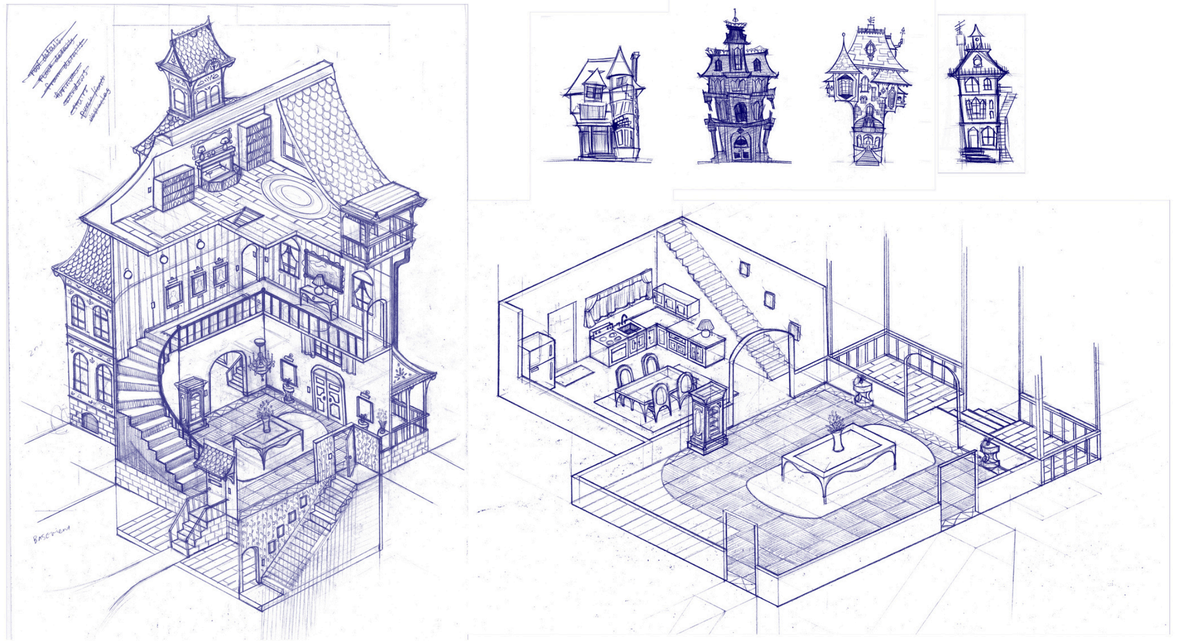


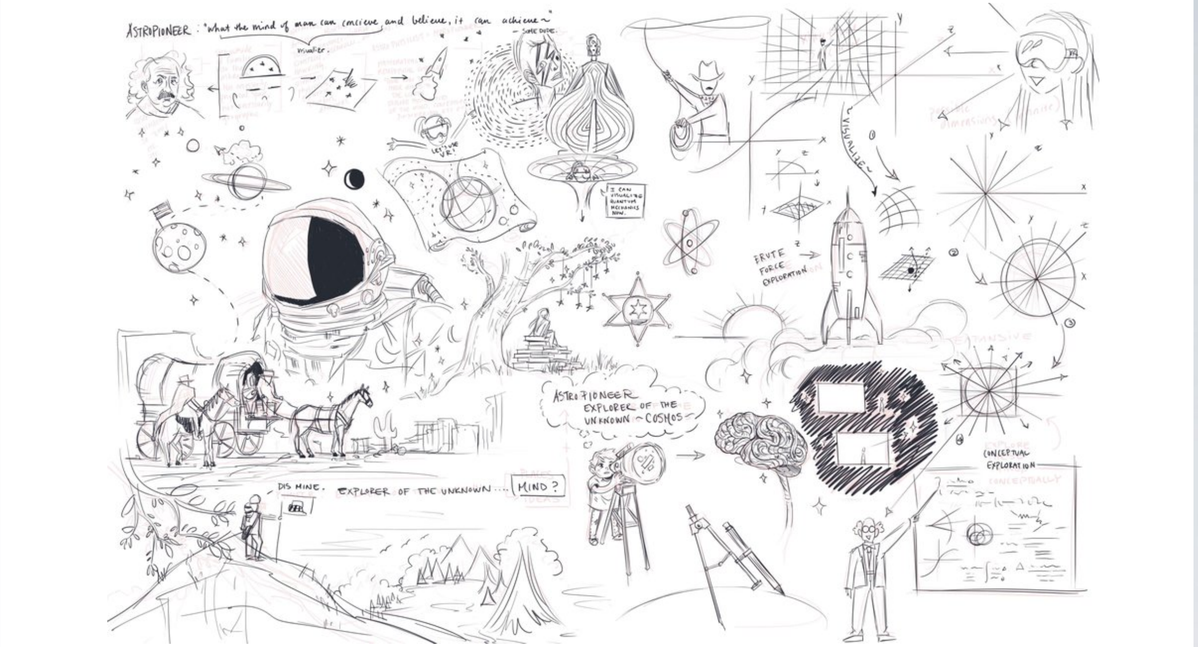

Agenda: February 14, 2019
JPL
Start Time
Dur
Topic
Who
Ground Systems
Deputy Systems
9:11
Thursday, February 14

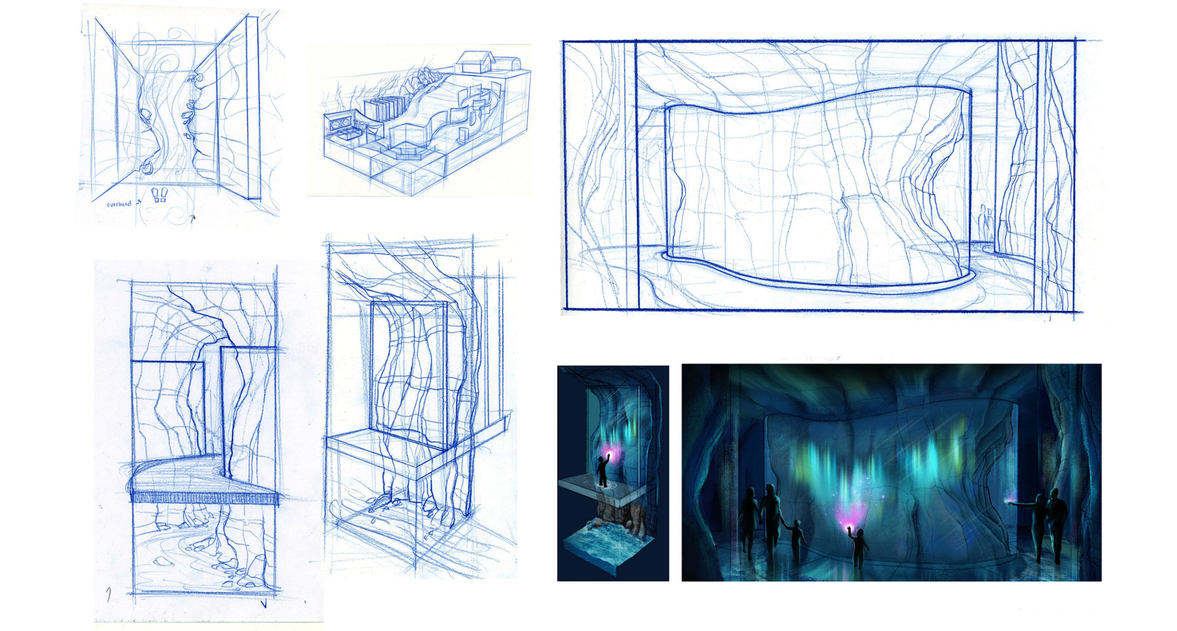

WB07
THE CUBESAT(S)
LEO
GEO
AUTONOMY
- FORMATION FLYING
- SMART EXECUTIVE
- ADVANCED HEALTH / HEALTH OF SWARM
- FAULT PROTECTION
- END OF LIFE/BEGINNING OF OPS
- COMMUNICATION & NAVIGATION
- OPERATIONS: MULTIPLE DATA STREAMS
HUMAN-RATED (INTERACTION W/ ISS)
HIGH RELIABILITY COMPUTER
INTEGRATION B/T ENTITIES (JPL/CALTECH, ETC)
CAMERA
CYGNUS
DEPLOY CUBESATS

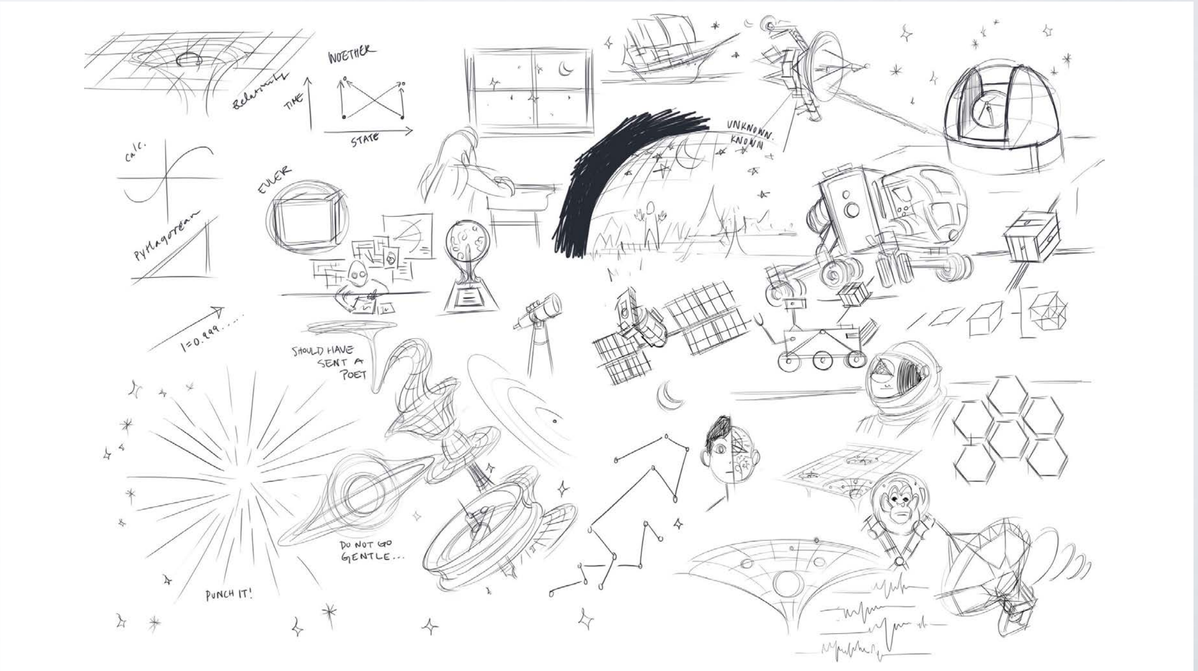

WB07
THE CUBESAT(S)
HOW ARE THEY STOWED & DEPLOYED FROM CYGNUS?
- DICTATE SEQUENCING BEFORE LAUNCH.
START
AUTONOMY
- FORMATION FLYING
- SMART EXECUTIVE
- ADVANCED HEALTH / HEALTH OF SWARM
- FAULT PROTECTION
- END OF LIFE/BEGINNING OF OPS
- COMMUNICATION & NAVIGATION
- OPERATIONS: MULTIPLE DATA STREAMS
HUMAN-RATED (INTERACTION W/ ISS)
HIGH RELIABILITY COMPUTER
INTEGRATION B/T ENTITIES (JPL/CALTECH, ETC)
CAMERA
↳ CUT DOWN ON NUMBER OF INTERFACES.
CYGNUS
(1) DEPLOY CUBESATS (4 OR 5?)
(OFF UNTIL DISPENSED...)
* NEEDS TO RAPIDLY STABILIZE AND ESTABLISH COMMUNICATIONS.
(WITHIN 30 DAYS)
ACHIEVE INITIAL COMMUNICATIONS.
(THROUGH CYGNUS)
(WHAT IS DELAY B/T CURRENT DEPLOYMENT?)
COLLISION VS. ΔV
DEPLOYMENT:
ROTATE CYGNUS 90°, DEPLOY ONE CUBESAT/TIME
ΔV?
CAMERA FOCUS?
DAY/NIGHT?
(MAYBE ITS JUST TIMED?)
PRIORITY 1: 1 FORMATION + RECORDING (PROX)
(2) STEP 1 OF FORMATION FLYING.
ONE-TO-ONE CYGNUS + CUBESAT
OBSERVATION OF CYGNUS
VIS-NAV
CALTECH/JPL
FORMATION FLYING
N.G
LOOK AT CYGNUS
PRIORITY 2/3:
VISUAL NAVIGATION
SYNCHRONIZED POINTING (MAPPING)

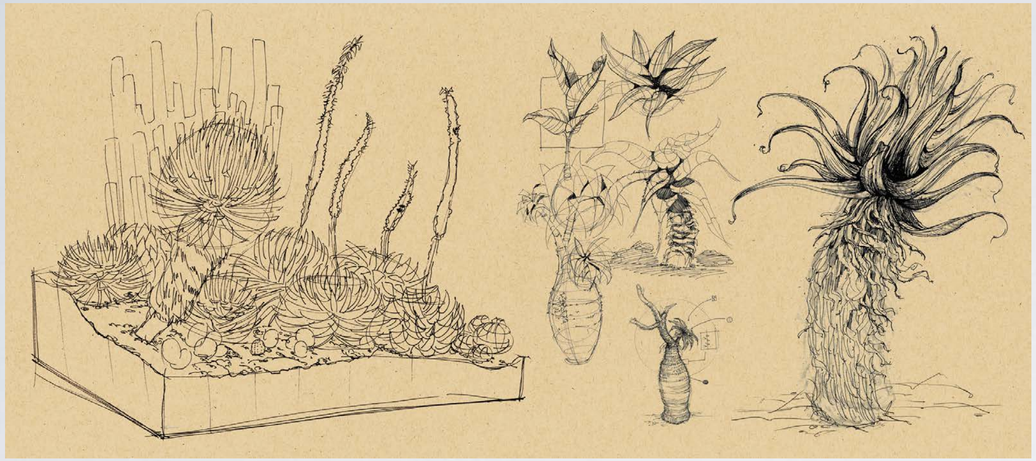

TEAM X

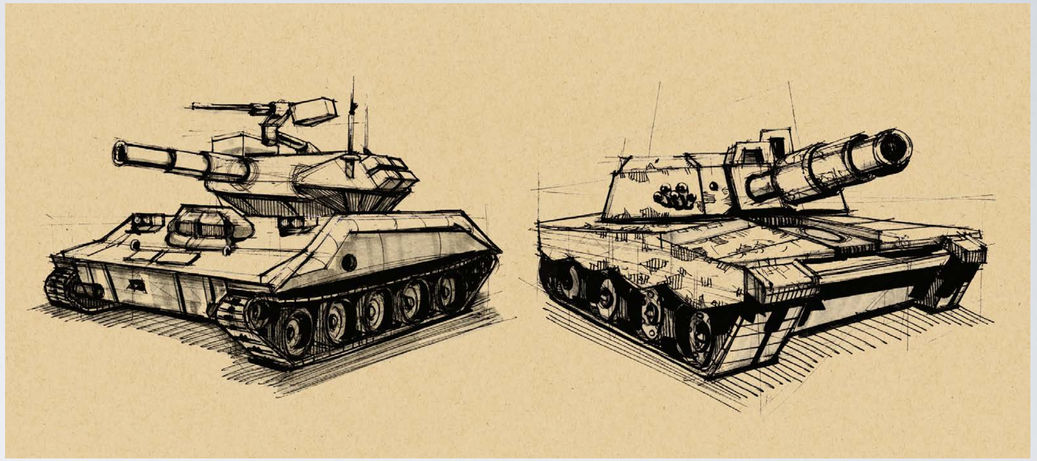


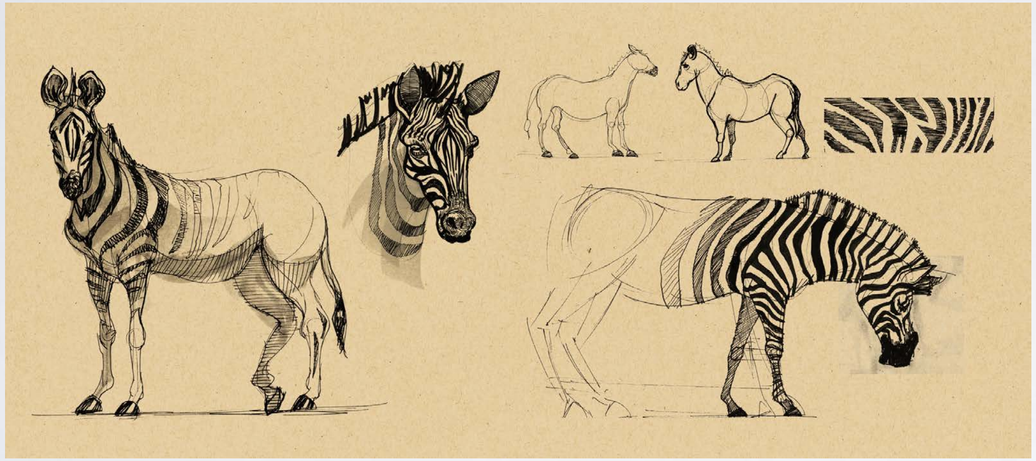

ASTRIPIONEER: "what the mind of man can conceive and believe, it can achieve"
SAME DUDE
VISUALIZE
I CAN STUDY THE QUANTUM MECHANICS NOW.
FRUTE FORCE EXPLORATION
ASTRIPIONEER EXPLORER OF THE UNKNOWN ~COSMOS
DIS MINE. EXPLORER OF THE UNKNOWN.... MIND?
CONCEPTUAL EXPLORATION

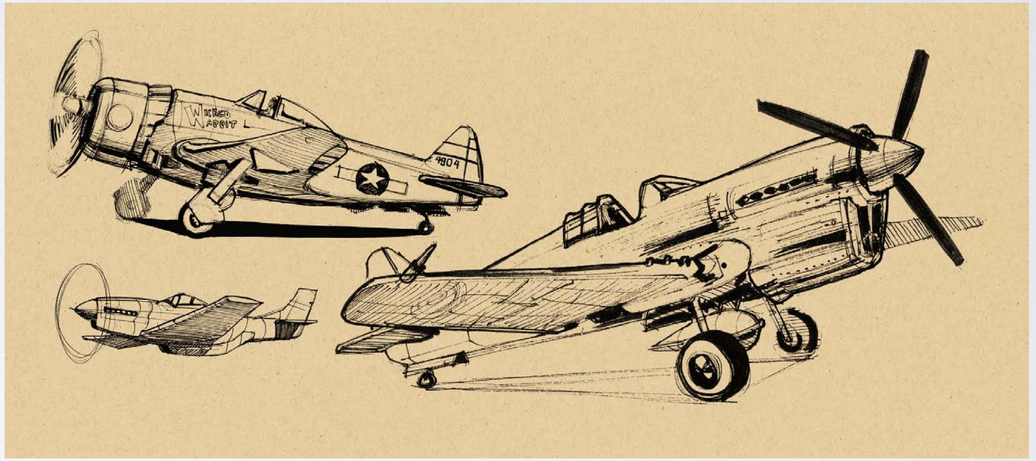


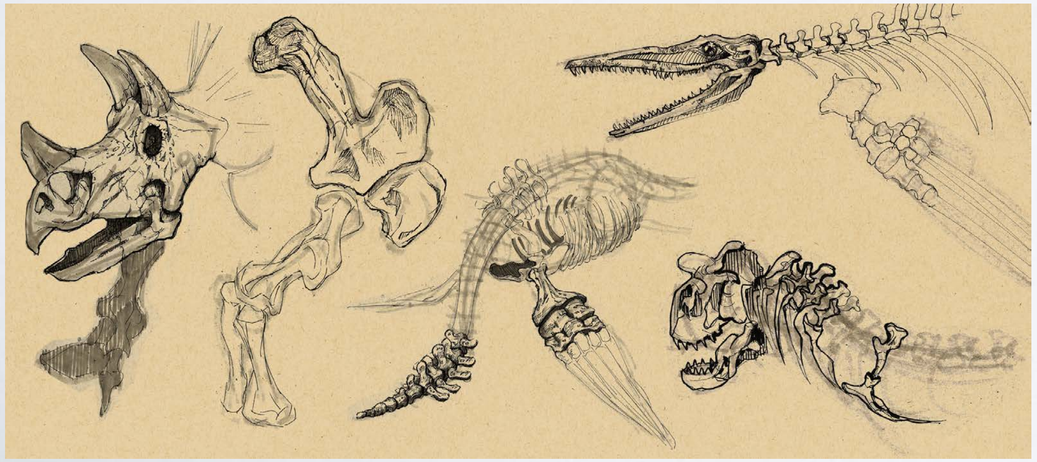

WEATHER
TIME
STATE
UNKNOWN KNOWN
EULER
SHOULD HAVE SENT A POET
DO NOT GO GENTLE...
PUNCH IT!

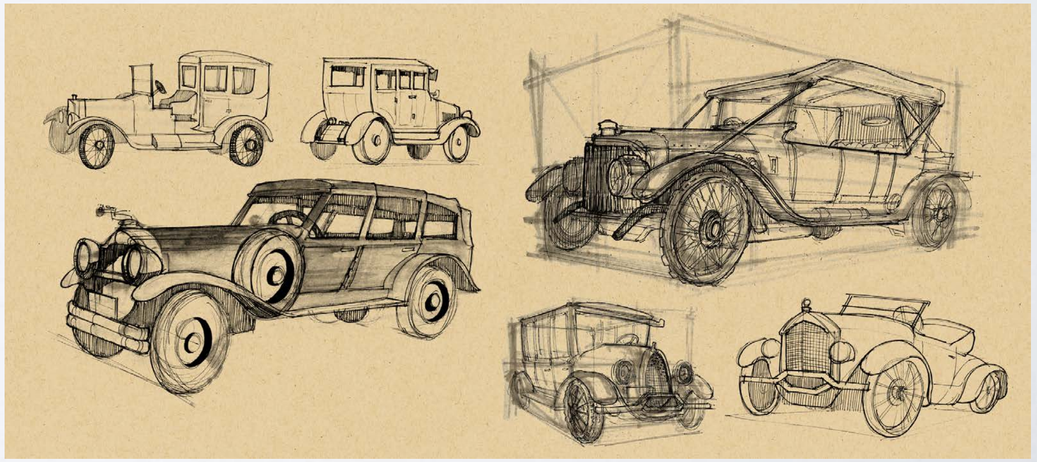








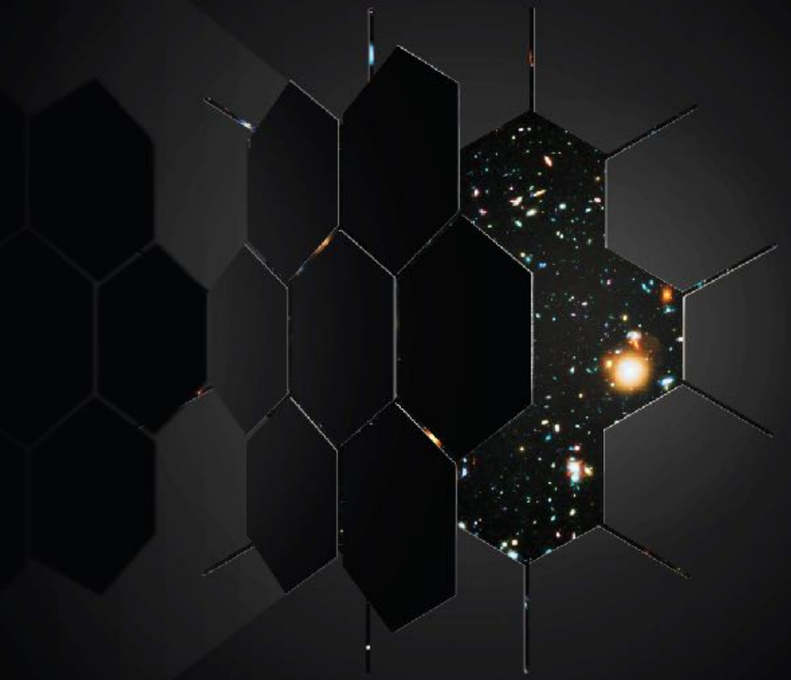





STELLAR SPECTRA
>100 MILLION
QUASAR SPECTRA
>1 MILLION
GALAXY REDSHIFTS
>450 MILLION
PROTOPLANETARY
DISKS
YOUNG SOLAR
SYSTEMS
EXOPLANET TARGET STARS
>600 THOUSAND
ASTEROID/COMET
SPECTRA
>100 THOUSAND
ICE ABSORPTION SPECTRA
>750 THOUSAND

Galaxy Evolution Probe

Polycyclic aromatic hydrocarbons (PAH) are key probes for investigating the evolution of galaxies.

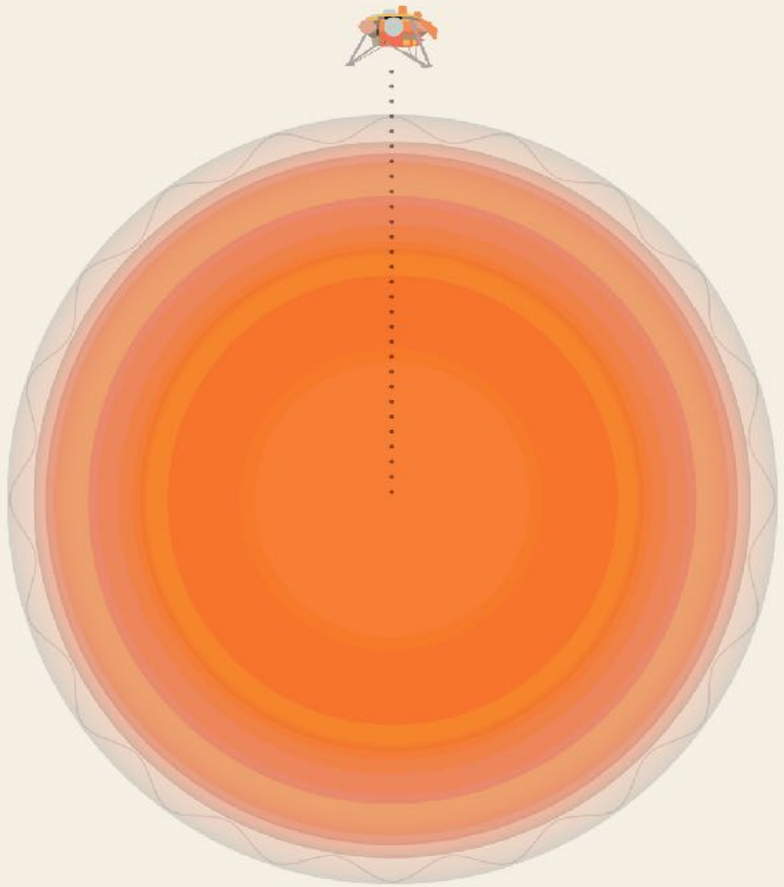


Principal Investigator:
Jason Glenn
University of Colorado Boulder

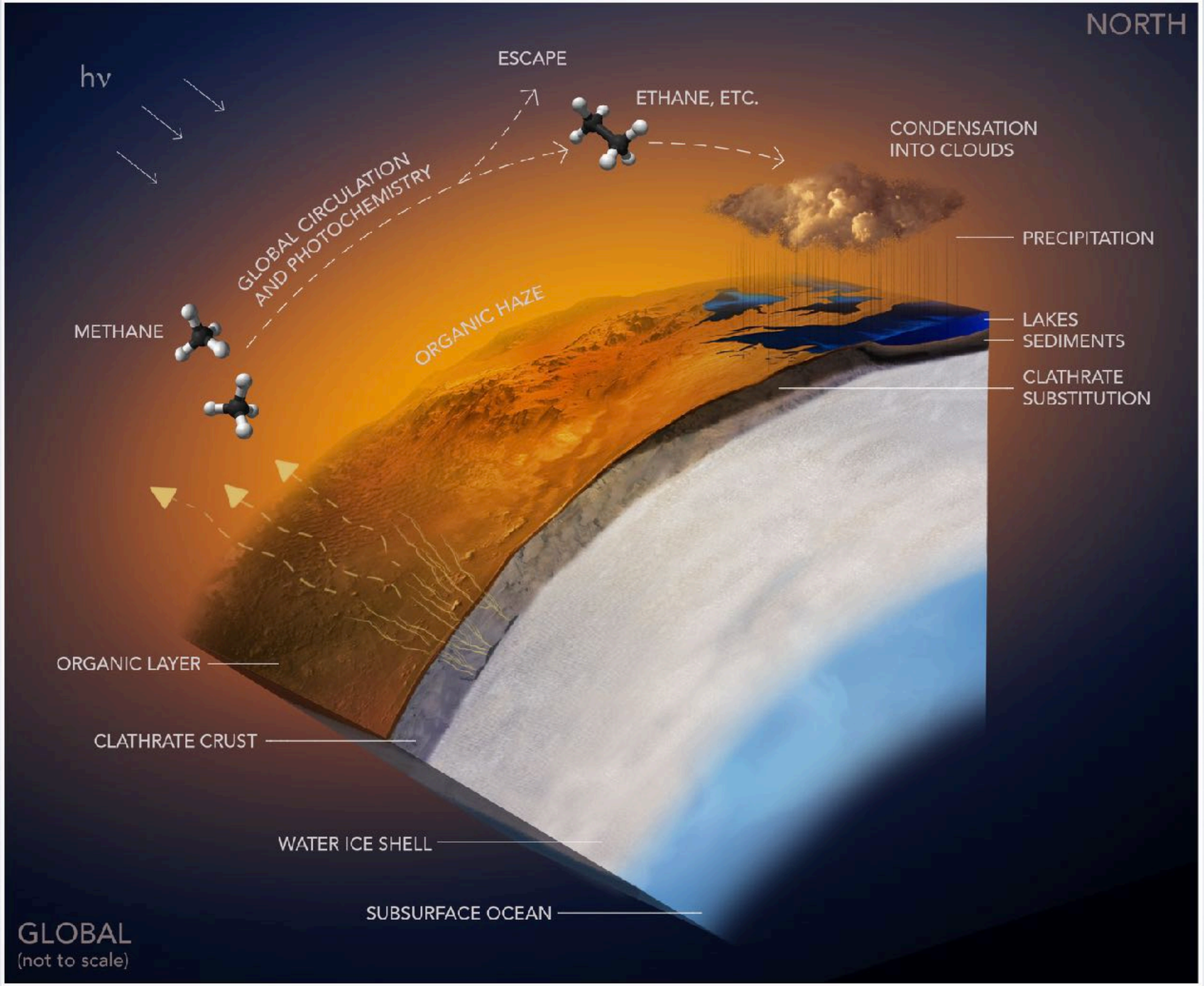
Prepared For:
National Aeronautics and Space Administration
Science Mission Directorate

INSIGHT LANDING

REVEALING THE HEART OF MARS



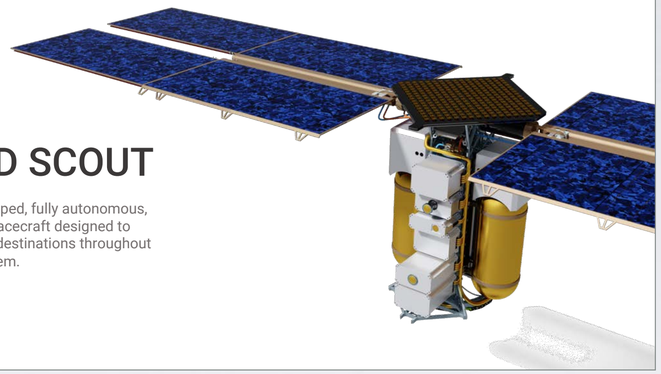
11.26.2018 JET PROPULSION LAB


NORTH
hν
ESCAPE
ETHANE, ETC.
CONDENSATION
INTO CLOUDS
GLOBAL CIRCULATION
AND PHOTOCHEMISTRY
PRECIPITATION
METHANE
ORGANIC HAZE
LAKES
SEDIMENTS
CLATHRATE
SUBSTITUTION
ORGANIC LAYER
CLATHRATE CRUST
WATER ICE SHELL
SUBSURFACE OCEAN
GLOBAL
(not to scale)

SPACE TECHNOLOGY OFFICE

RAPID SCOUT

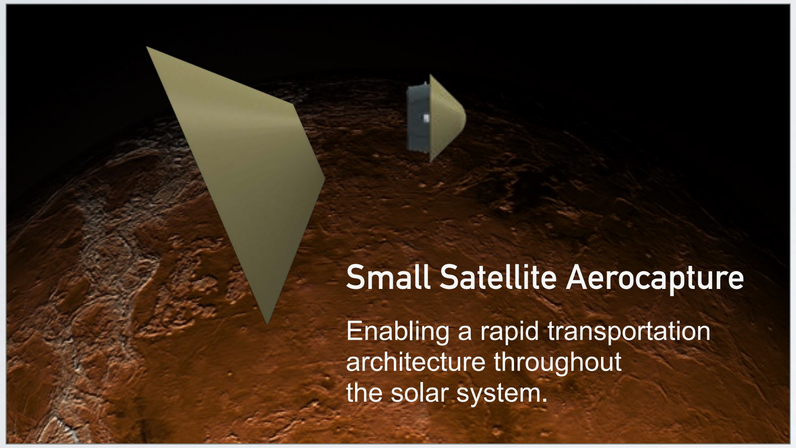
Rapidly developed, fully autonomous, responsive spacecraft designed to quickly reach destinations throughout the Solar System.



HONEYCOMB

PI: Garrett Johnson

OPSLAB



Small Satellite Aerocapture

Enabling a rapid transportation architecture throughout the solar system.

REFERENCE MISSION SYSTEM

A-Team Studies

Visual Strategy | Core Team Strategy

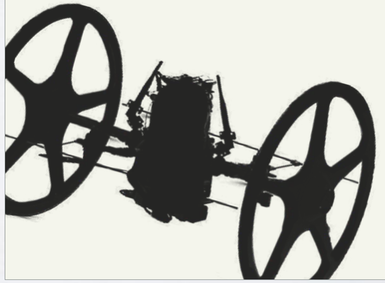
FPRIME

Flight Software at JPL

EXPLORATION GROUND SYSTEMS

BUILD • LAUNCH • RECOVER

Kennedy Space Center
Exploration Ground Systems
Program Strategic Planning



ROBOTICS OUTREACH CONTENT

THE SPACE TECHNOLOGY OFFICE

WE BUILD CAPABILITIES FOR THE NEXT GENERATION OF MISSIONS

The Space Technology Office looks beyond the horizon of current missions and capabilities, leading the development and infusion of technologies and advanced engineering systems vital for future missions. It is part of the Office of the Associate Director for Strategic Integration and is the interface to NASA's Space Technology Mission Directorate.

The Office is tasked to formulate in-house technologies and identify out-of-house opportunities at universities and external companies. These systems are driven by requirements and are developed through rapid iteration and proof of concept validation. Successful technologies infuse into missions under concept development and guide the development of key future capabilities.

SPACE TECHNOLOGY OFFICE

FORMULATES, DEVELOPS, AND INFUSES KEY TECHNOLOGIES FOR FUTURE NASA JPL MISSIONS

NASA Space Technology
Mission Directorate

STMD

STMD is responsible for developing the crosscutting, pioneering, new technologies and capabilities needed by NASA to achieve its current and future missions

STO

FORMULATION — LOW-MID TRL DEVELOPMENT

PARTNERSHIPS — EXTERNAL COLLABORATION

INFUSION — MISSION INFUSION

PARTNERSHIPS

JPL NEXT PRESENTS:

A thematic, internal conversation series with industry technology leaders to seed relationships and new concepts in JPL's largest internal strategic investment program through Lab-wide exposure to technology trends occurring in the commercial sector.

Rob Meyerson, President, Blue Origins discusses reusable rockets with Adam Steltzner

Andrew Anagnost, CEO Autodesk. Dave Gallagher, Associate Lab Director, and Morgan Cable, Ocean Worlds Research Scientist discuss generative design and Ocean Worlds

Jon Thomason, VP Engineering, Uber ATG discusses self-driving cars with Brett Kennedy

Peter Willis, OWLS Science Lead and Chris Lindensmith, OWLS Co-PI present the OWLS project, introduced by Dave Gallagher, Associate Lab Director

LOOKING OUTSIDE

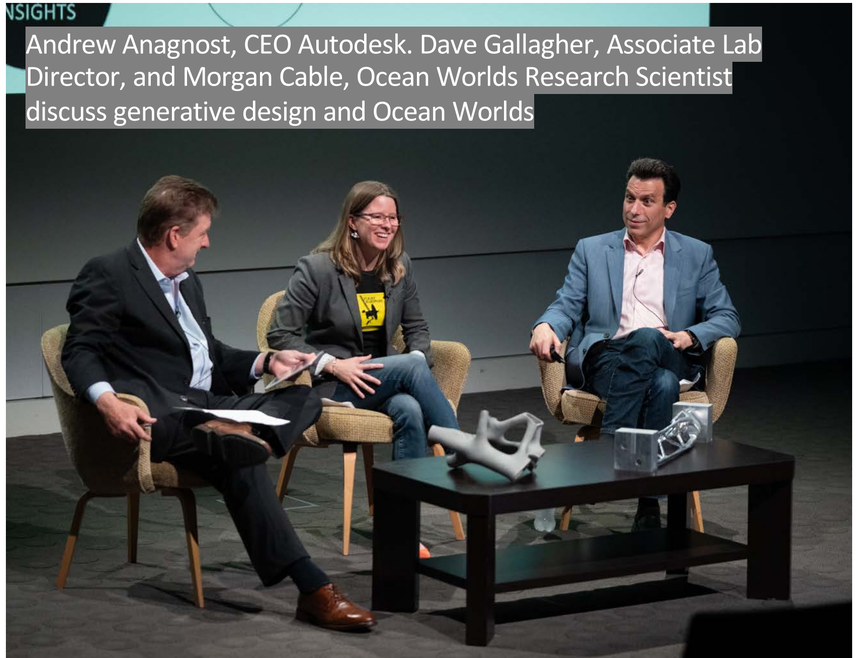
JPL NEXT PRESENTS:

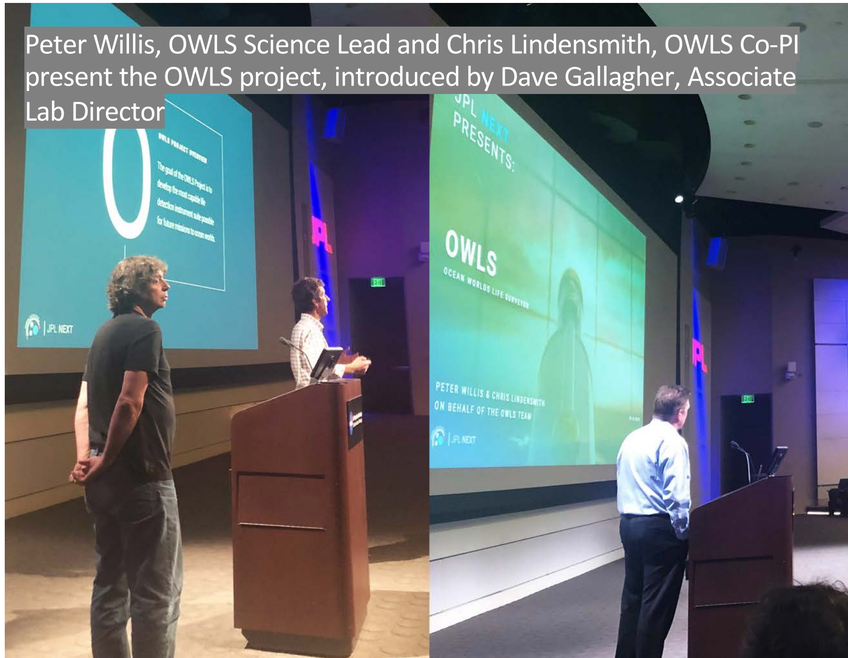
1. JPL NEXT projects are encouraged to include external partners that bring unique capabilities or strategic value.

2. JPL NEXT Presents conversations highlight compelling commercial technology trends and drive a conversation about technology partnering opportunities

3. Typical schedule includes networking events, senior leadership exchanges, workshops with tech stakeholders, and a Lab-wide produced conversation

Jon Thomason, VP Engineering, Uber ATG discussing self-driving cars


Andrew Anagnost, CEO Autodesk. Dave Gallagher, Associate Lab Director, and Morgan Cable, Ocean Worlds Research Scientist discuss generative design and Ocean Worlds



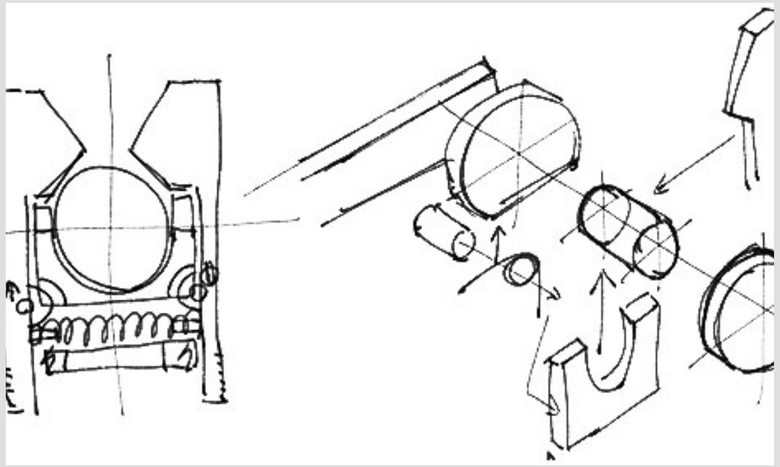
Peter Willis, OWLS Science Lead and Chris Lindensmith, OWLS Co-PI present the OWLS project, introduced by Dave Gallagher, Associate Lab Director

TRANSFORMATIONAL IDEAS & TECHNOLOGY

JPL NEXT: INSPIRING OUR NEXT DISCOVERIES

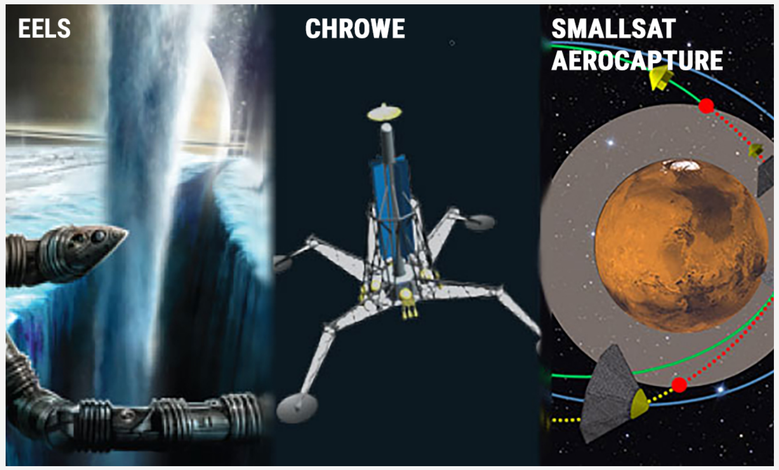
A successful JPL Next project brings fundamental strategic benefit to JPL/NASA:

- JPL is a mission house
- JPL Next technology enables future great missions



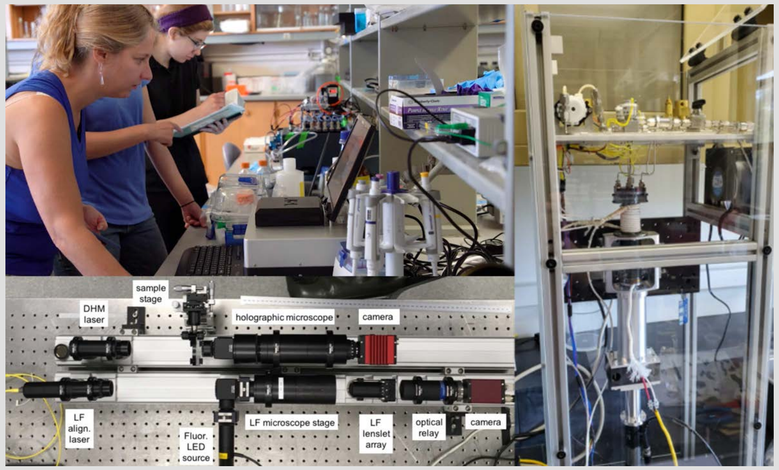
ACCELERATORY

Six months to develop idea into a concept



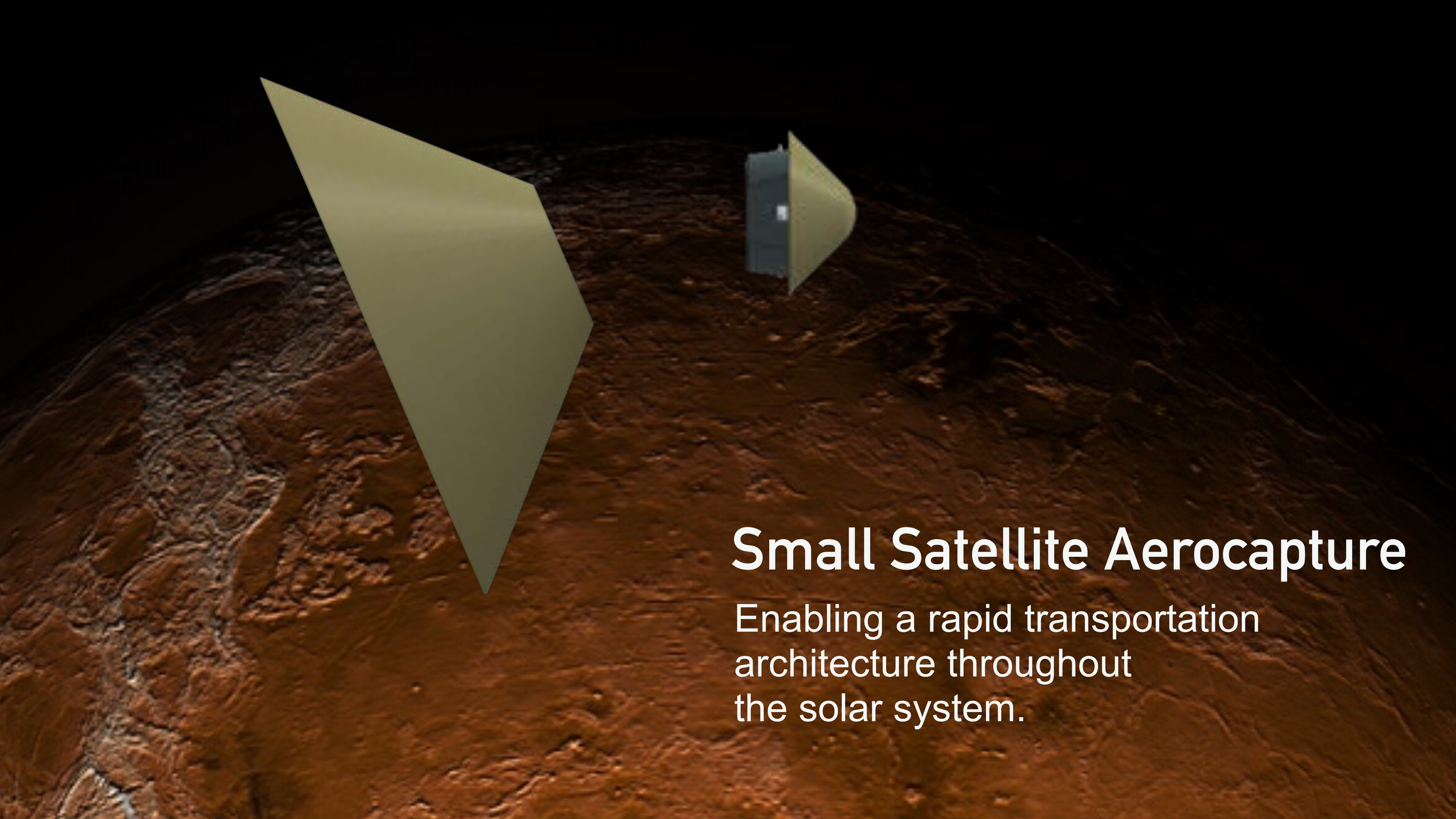
CONCEPT

Nine months to develop concept lifecycle plan



PROJECT

Full project phase to execute tech build & demonstration

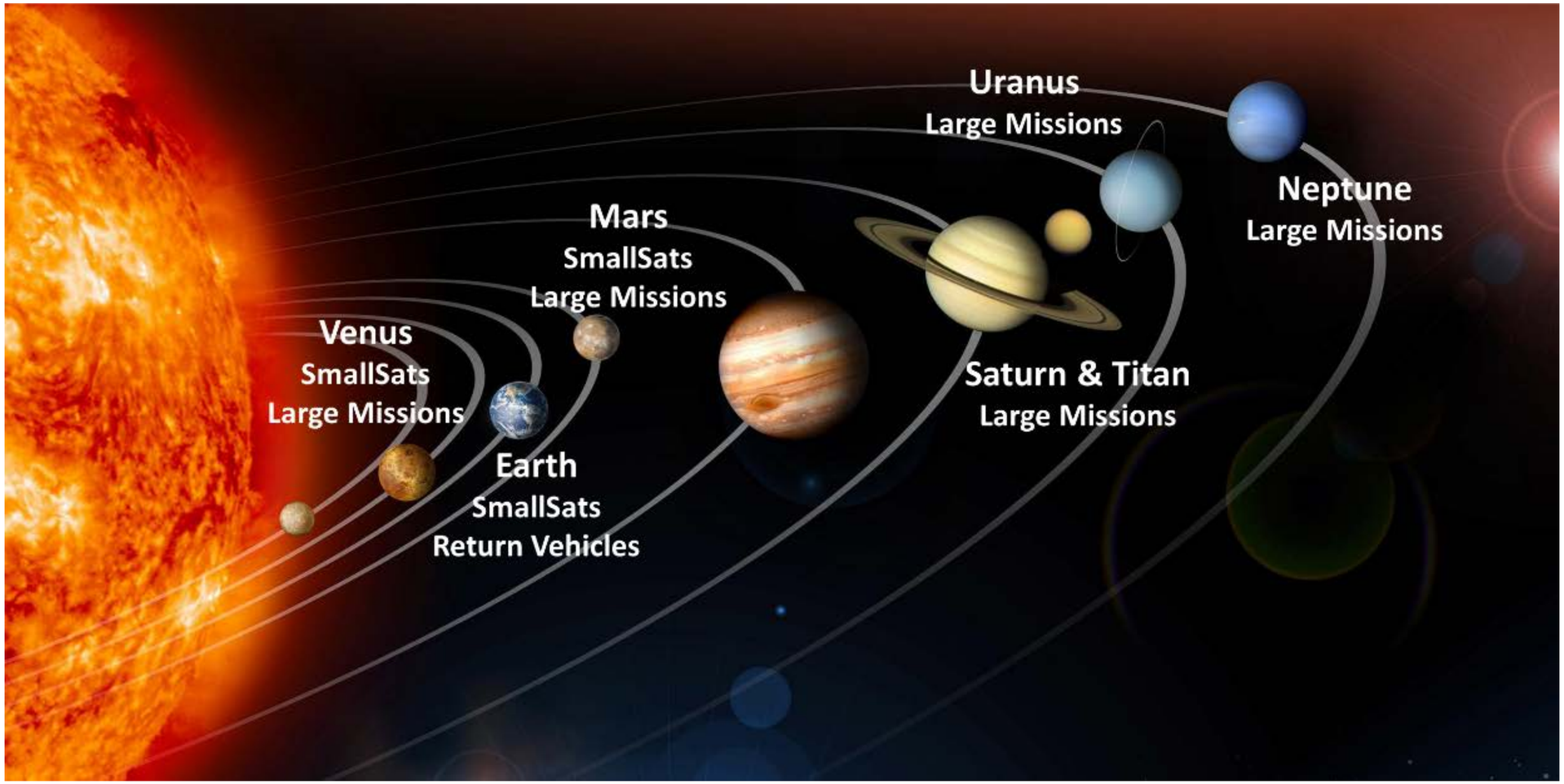


Small Satellite Aerocapture

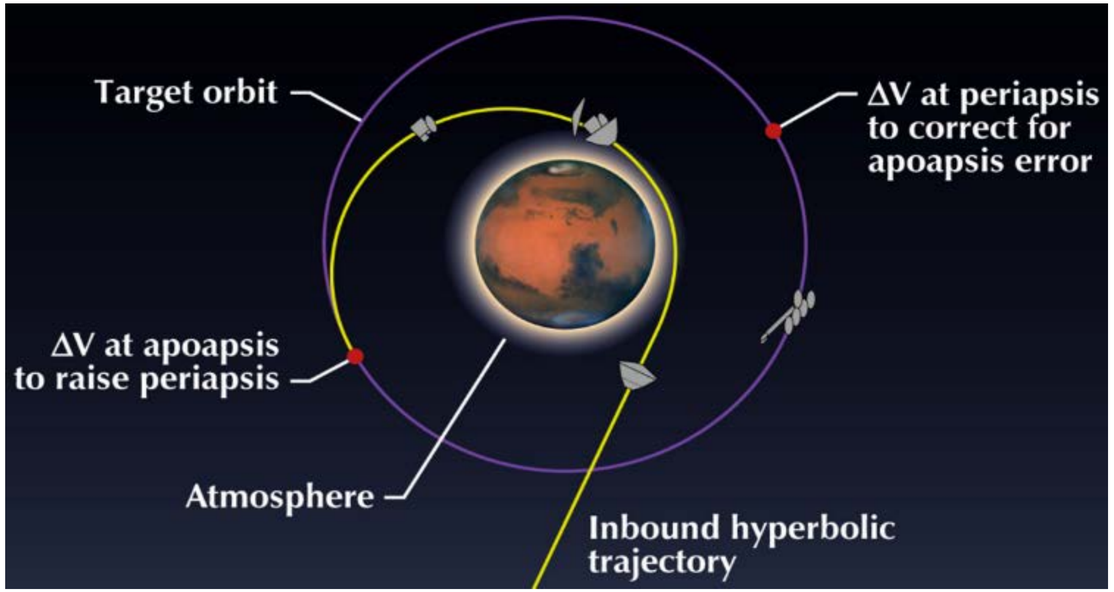
Enabling a rapid transportation architecture throughout the solar system.

Aerocapture Mission Options

Aerocapture technology development creates a capability for missions at destinations throughout the solar system, both large and small

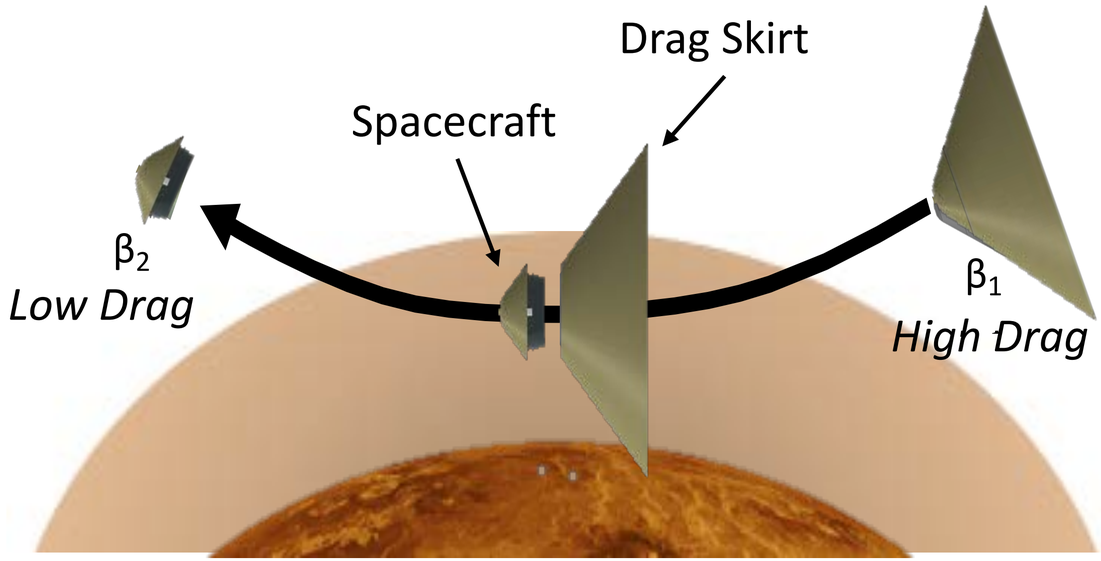


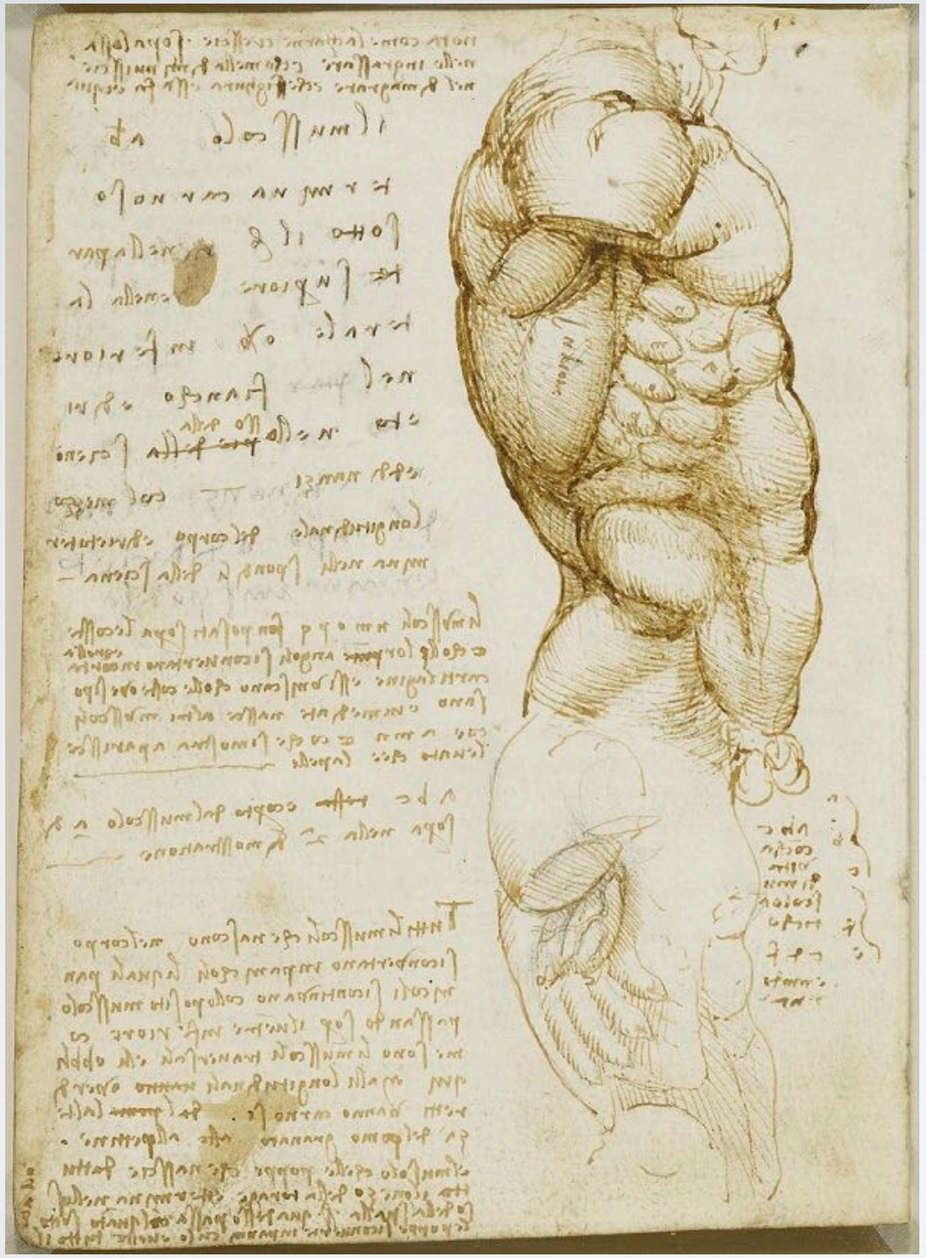
Aerocapture Overview

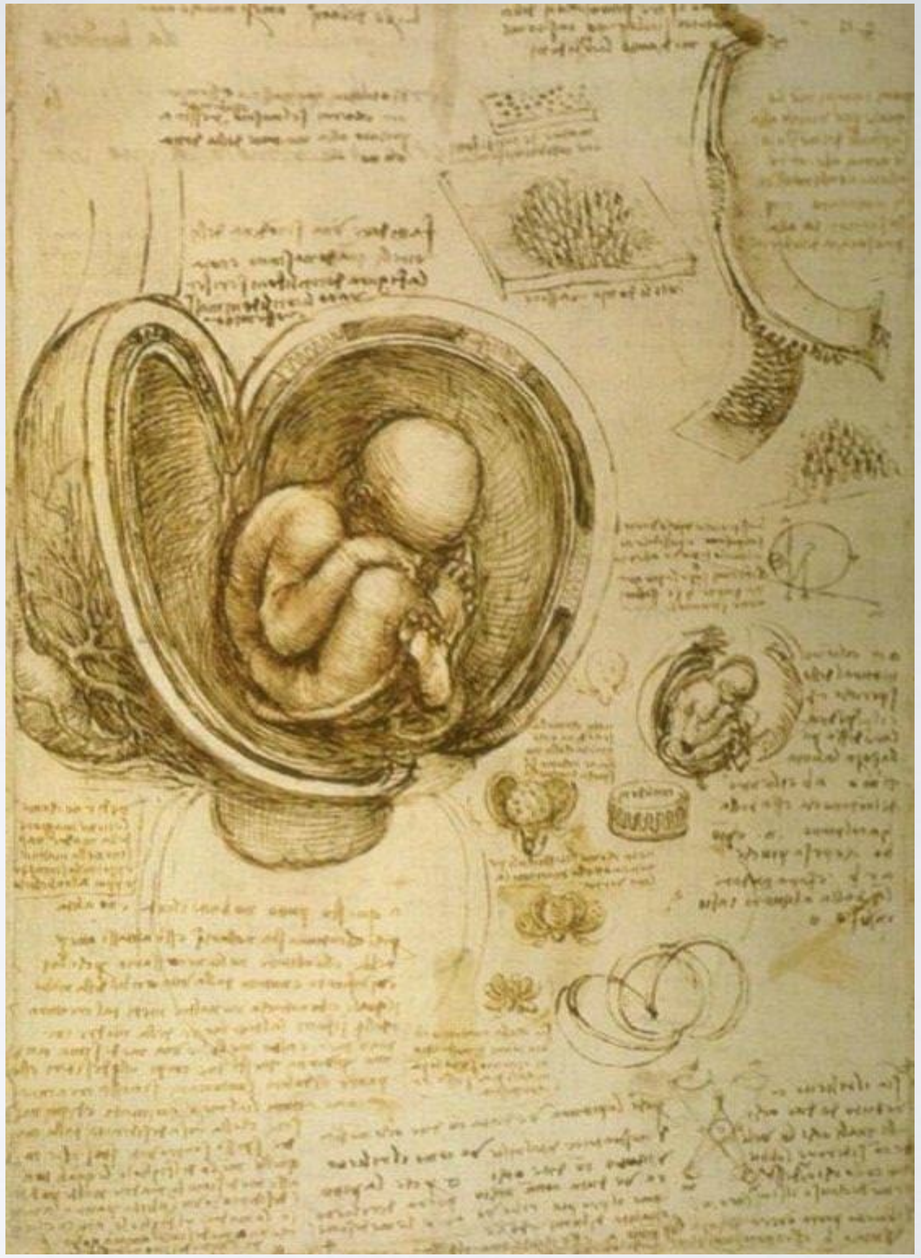


Aerocapture uses the drag from a single pass through the atmosphere to slow down and enter orbit, rather than a large burn from a propulsion system

By modulating the time that a drag skirt is jettisoned from the spacecraft, a specific orbit can be targeted







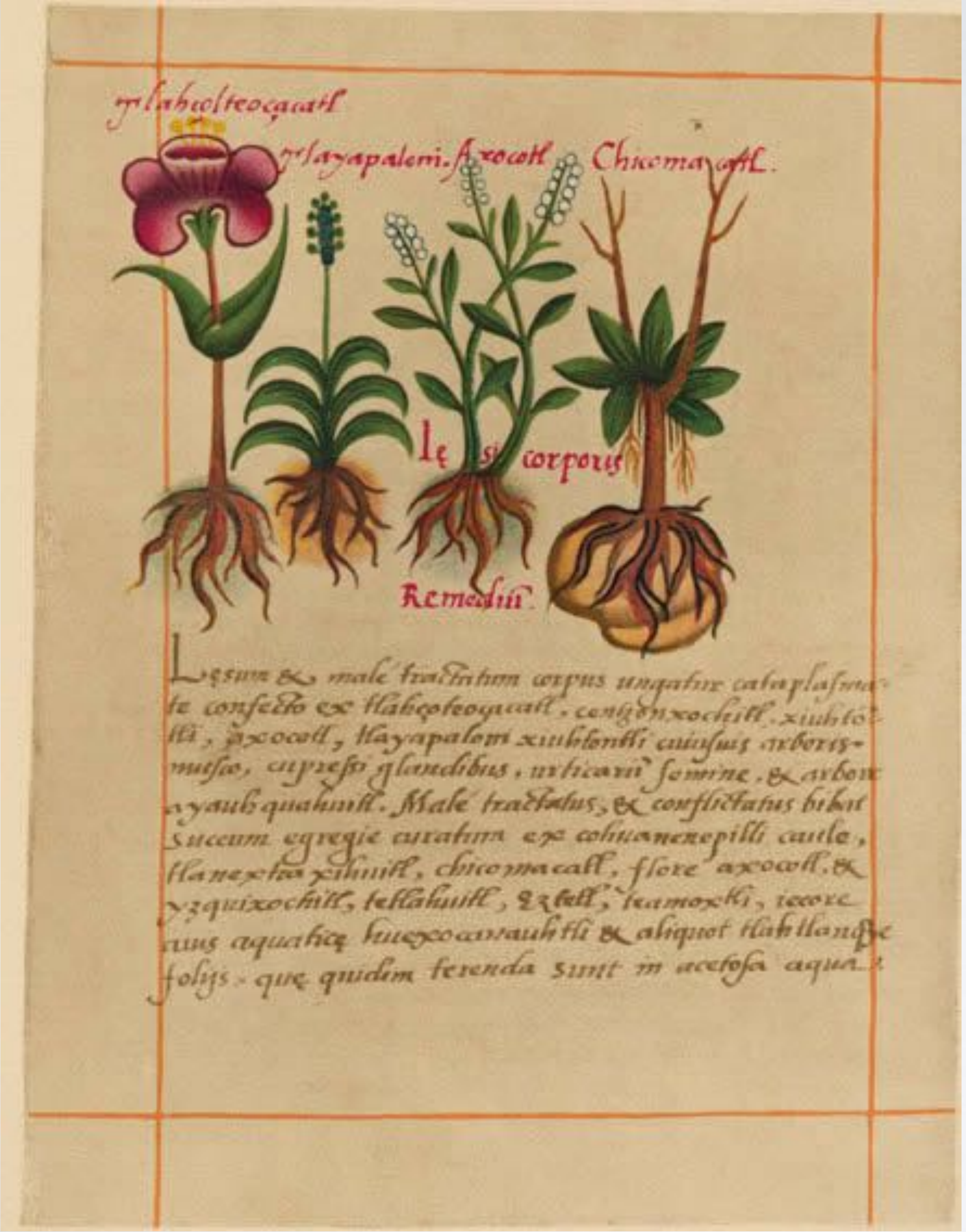

Tlayapaloni. Axocotl
Chicomacatl.
Læsi corporis
Remedium.
Læsum & male tractatum corpus ungatur cataplasmate confecto ex tlaheçoteoçuatl, cempoalxochitl, xiuhtotli, axocotl, tlayapaloni xiuhtontli cuiusuis arboris musco, cupressi glandibus, urticarum semine, & arbor ayauhquahuitl. Male tractatus, & conflictatus bibat succum egregie curatum ex cohuanenepilli caule, tlanextia xihuitl, chicomacatl, flore axocotl, & yzquixochitl, tetlahuitl, eztetl, teamoxtli, tecoce rius aquatica huexocanauhtli & aliquot tlatlanquaye folijs: quæ quidem terenda sunt in acetosa aqua.

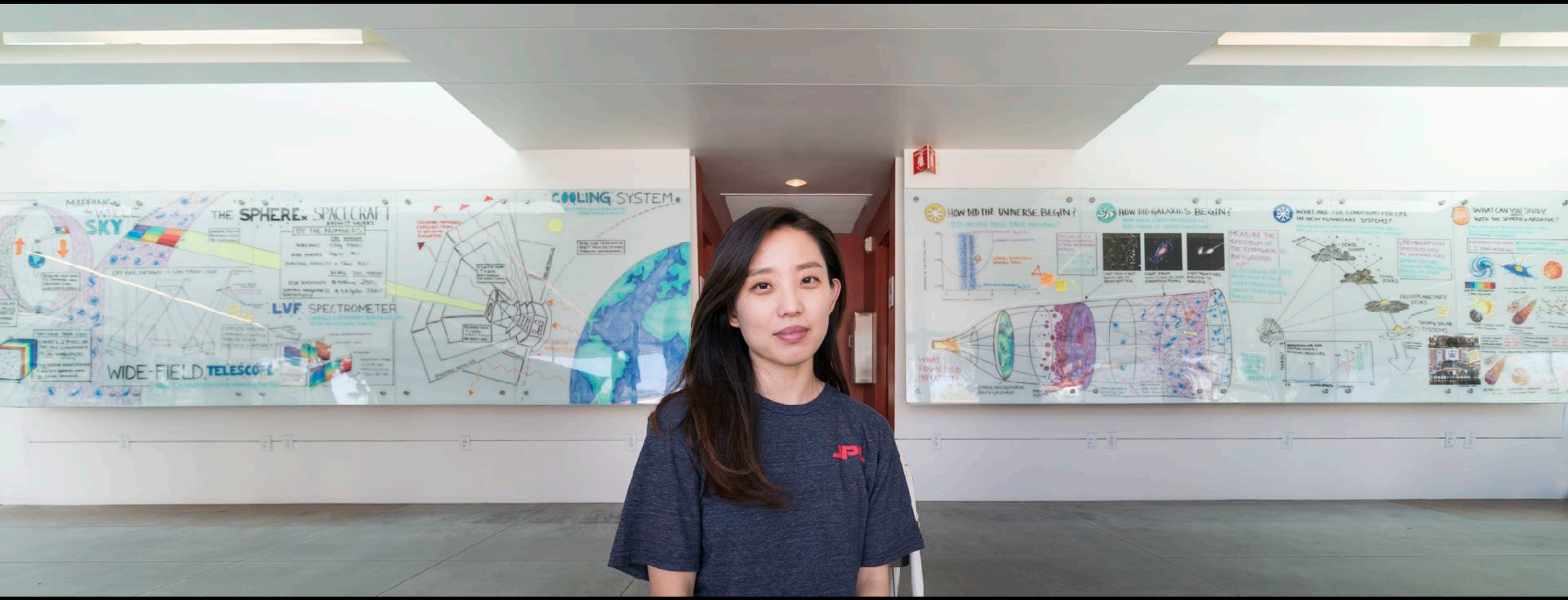

Fig. 1 HURÆ Tab. XXXIV floris fructusque partes
Fig. 2 MAGNOLIÆ Tab. XXXIII floris fructusque partes

301, 1st Floor

301, 1st Floor

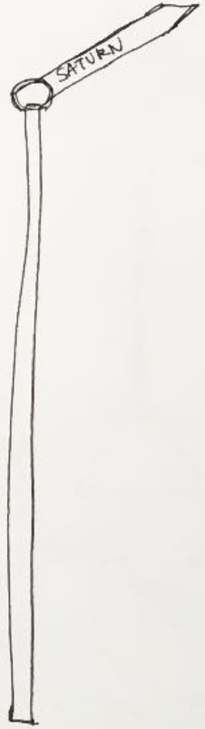

303, 4th Floor


THE KECK CENTER
IN HONOR OF W.M. KECK JR.

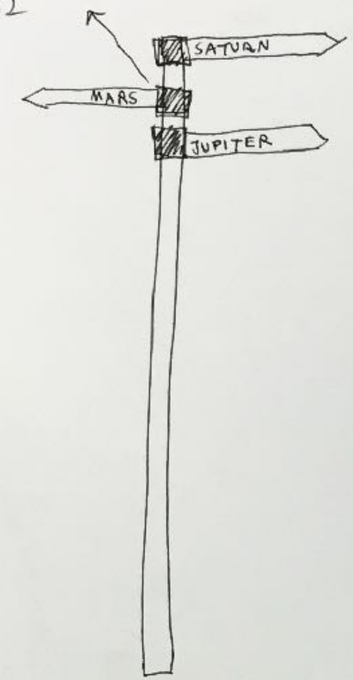

MAPPING THE WHOLE SKY
THE SPHERE× SPACECRAFT
BY THE NUMBERS
LVF SPECTROMETER
WIDE-FIELD TELESCOPE
COOLING SYSTEM
HOW DID THE UNIVERSE BEGIN?
HOW DID GALAXIES BEGIN?
WHAT ARE THE CONDITIONS FOR LIFE IN NEW PLANETARY SYSTEMS?
WHAT CAN YOU STUDY WITH THE SPHERE× ARCHIVE?
MEASURE THE SPECTRUM OF THE EXTRAGALACTIC BACKGROUND LIGHT
YOUNG STARS
PROTO-PLANETARY DISKS
YOUNG SOLAR SYSTEMS


LINE OF SIGHT

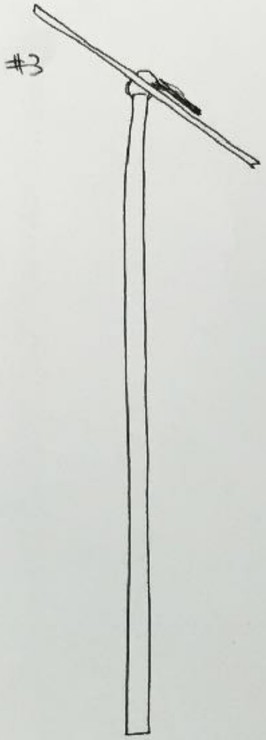
#1



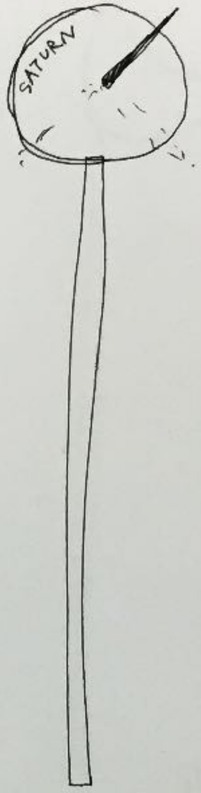
#2



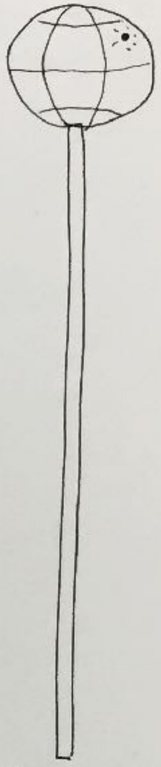
#3



#4

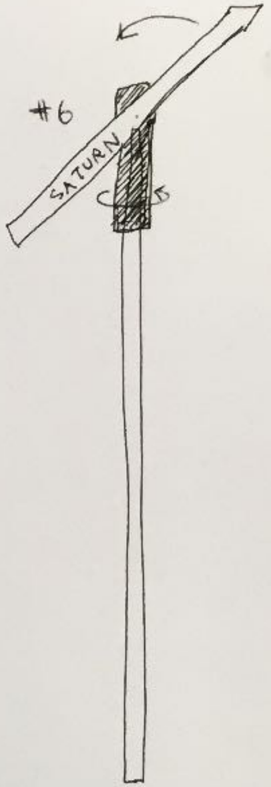


#5



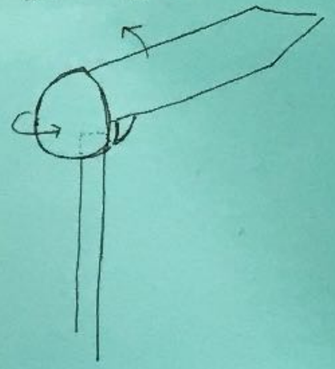
Mechanz.

#6



easier version of #1

BALL JOINT



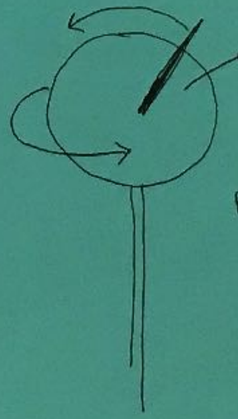
NOT ORBITING IN THE SAME PLANE

"STREET SIGN"

TOP VIEW

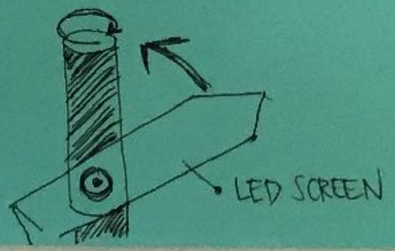
Clock format?

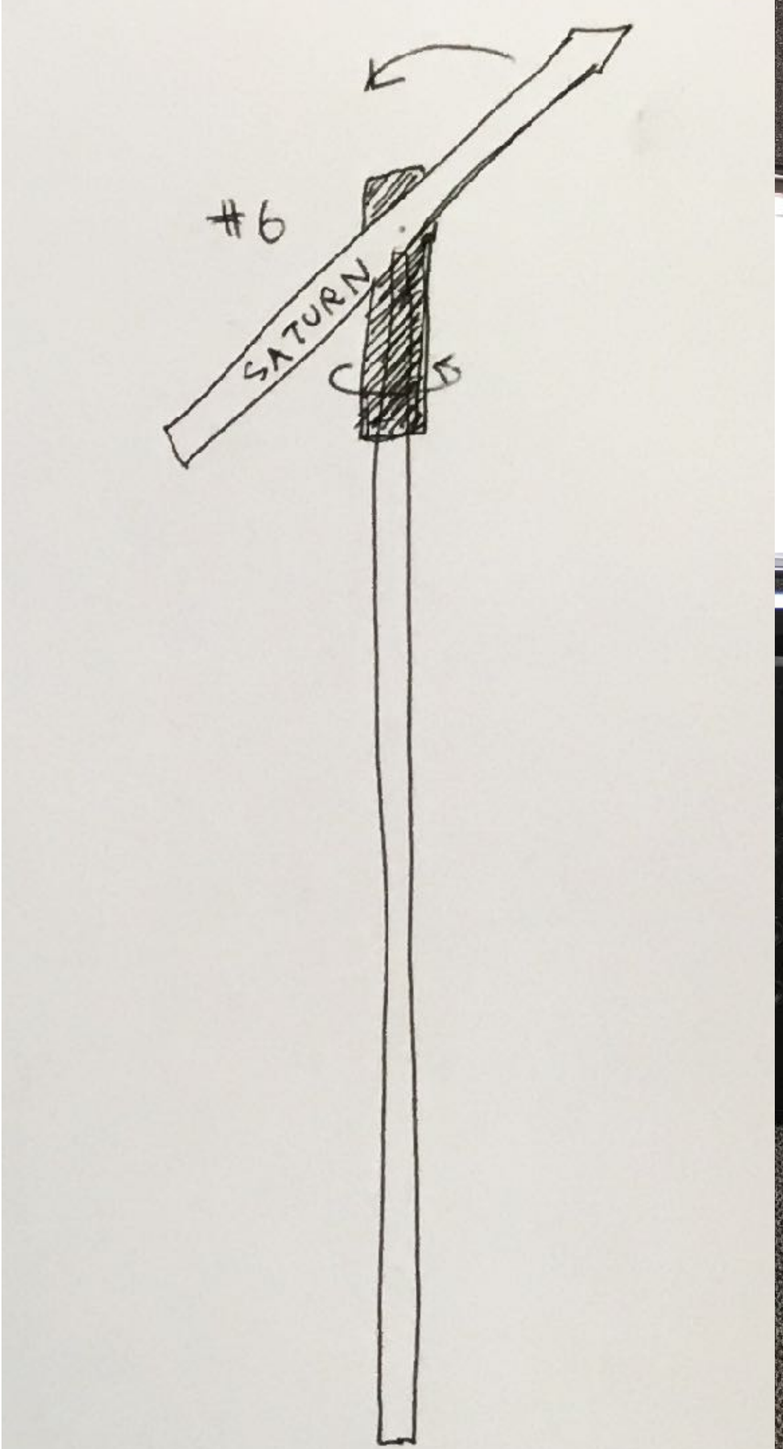
Not readable.



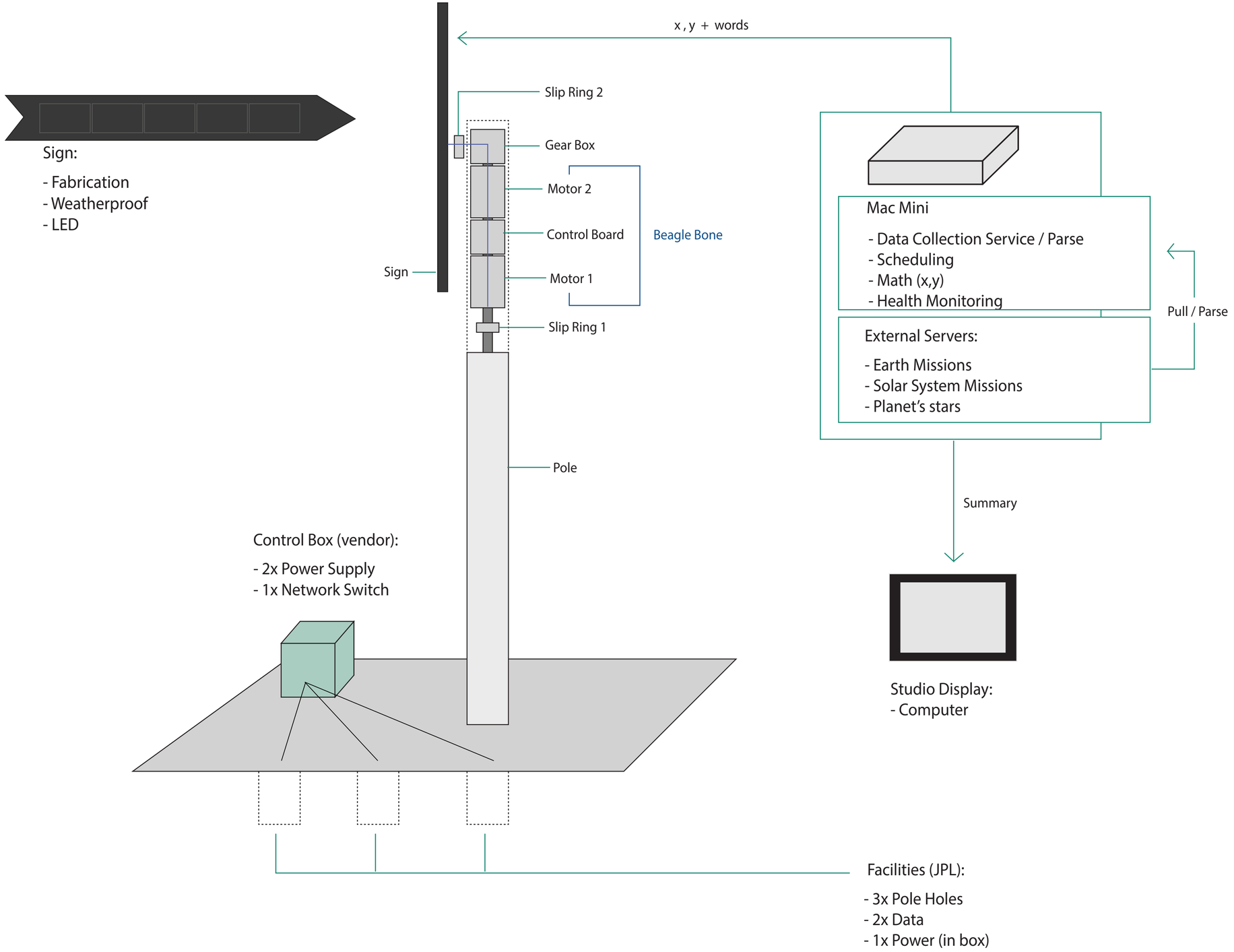
ROUND LED BOARD?

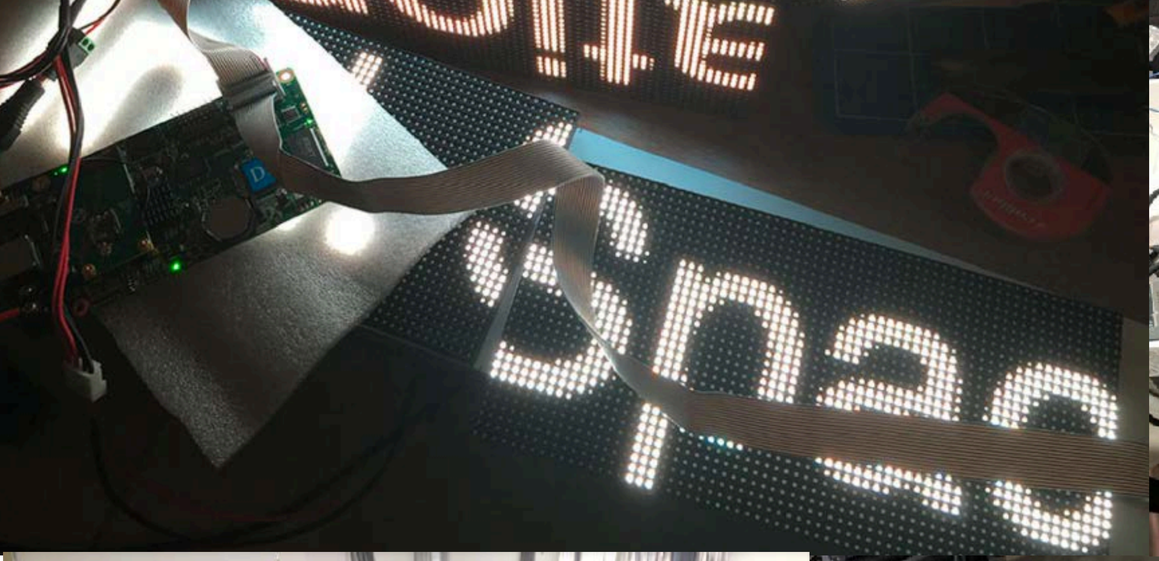
GLOBE (LIGHTS ANIMATING)

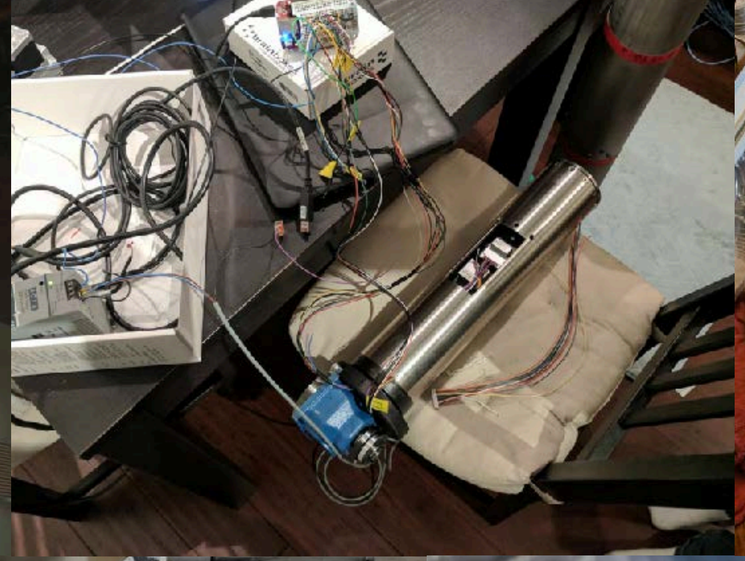



#6
SATURN


KEPLER-186f


x , y + words
Slip Ring 2
Gear Box
Motor 2
Control Board
Beagle Bone
Sign
Motor 1
Slip Ring 1
Pole
Sign:
- Fabrication
- Weatherproof
- LED
Mac Mini
- Data Collection Service / Parse
- Scheduling
- Math (x,y)
- Health Monitoring
External Servers:
- Earth Missions
- Solar System Missions
- Planet's stars
Pull / Parse
Summary
Control Box (vendor):
- 2x Power Supply
- 1x Network Switch
Studio Display:
- Computer
Facilities (JPL):
- 3x Pole Holes
- 2x Data
- 1x Power (in box)






KAESER


SJIII 3219
SKYJACK
AHERN
SKYJACK
SKYJACK
142784


INTL SPACE STATION

AIGA Eye on Design

BRANDING

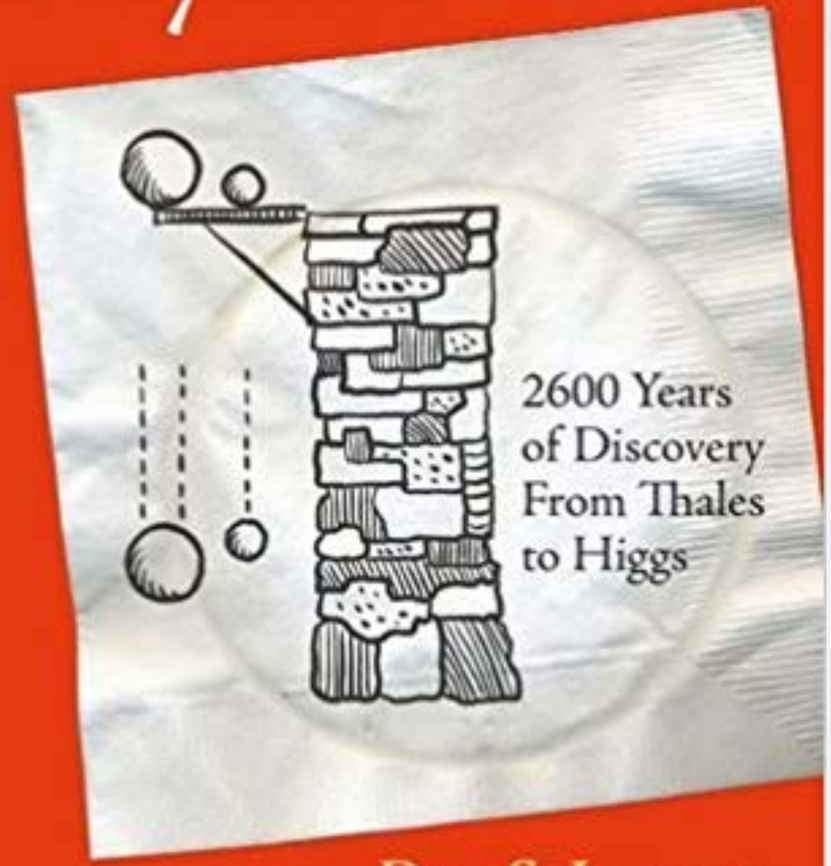
For a Brief Moment in Every NASA Mission, Astronauts Become Designers

The surprisingly whimsical art of the space patch


ARMSTRONG
SCOTT

Often, the ideation session served as **more than an aesthetic flex**. It was how the crew agreed on the ethos of the journey on which they were about to embark. “It was a way for the astronauts to express their creativity,” said Dr. Teasel Muir-Harmony, curator at the Smithsonian Air and Space Museum and author of *Apollo to the Moon: A History in Fifty Objects*. “**And it was a nice opportunity for them to get together and talk through what they thought the individual mission symbolized**.”

Drawing Physics

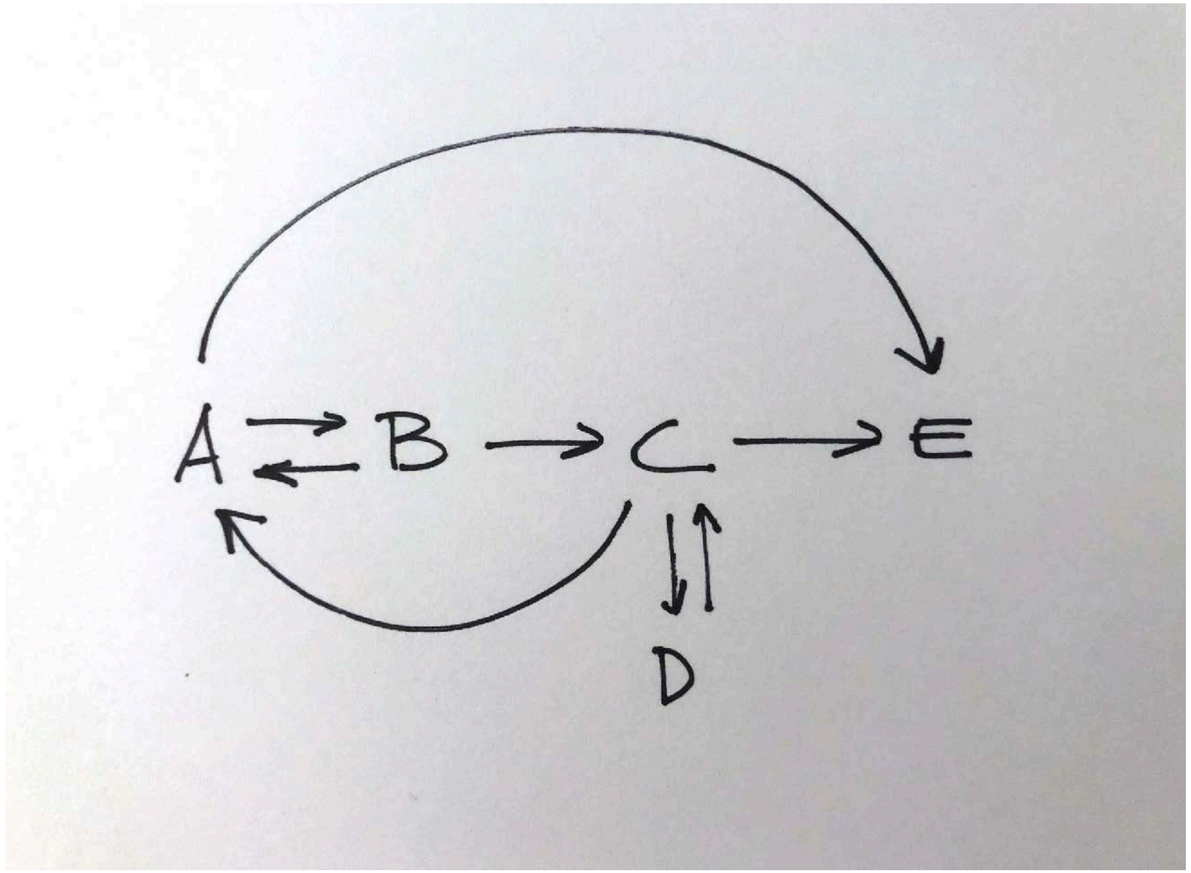


2600 Years
of Discovery
From Thales
to Higgs

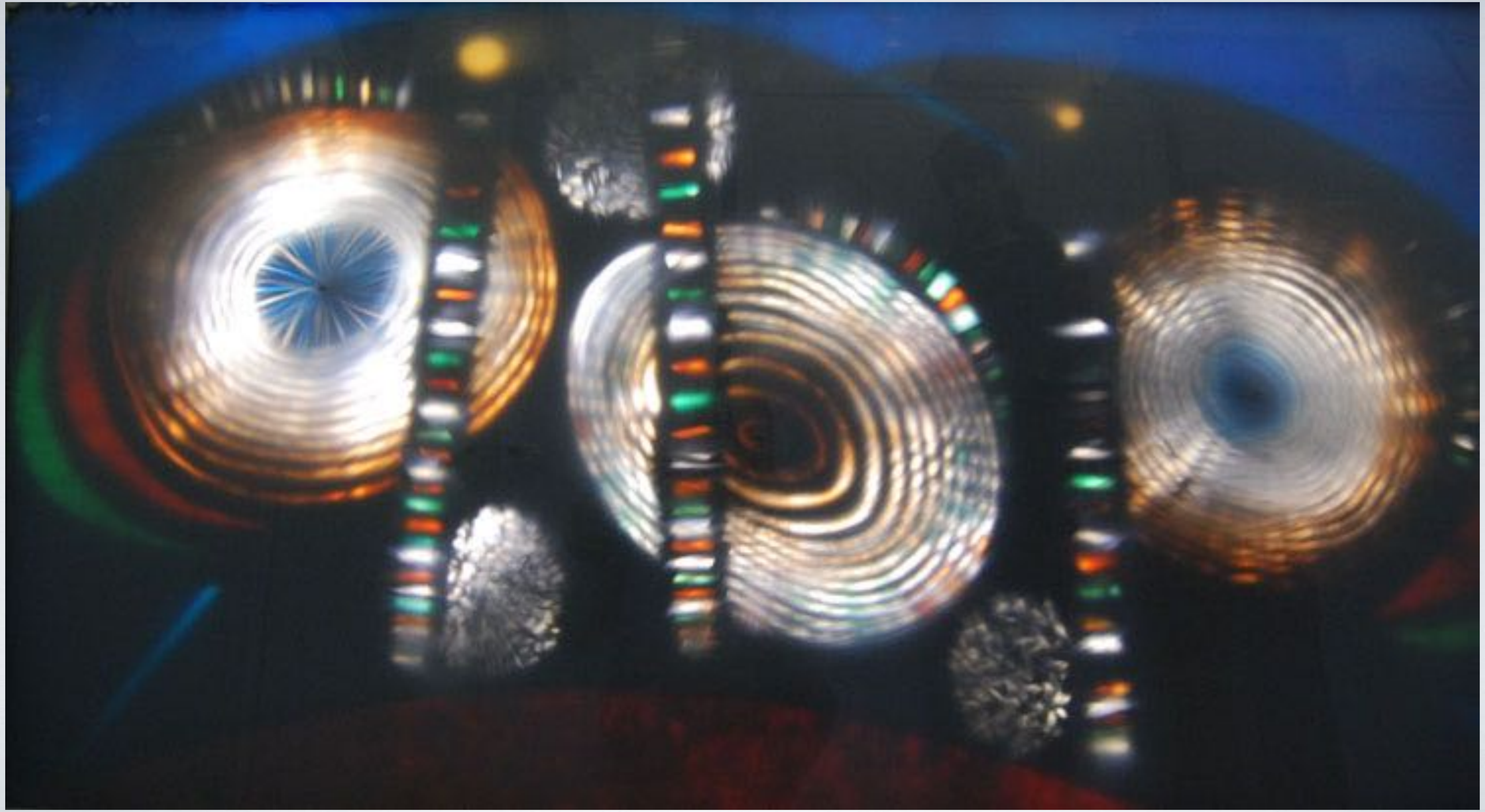
Don S. Lemons

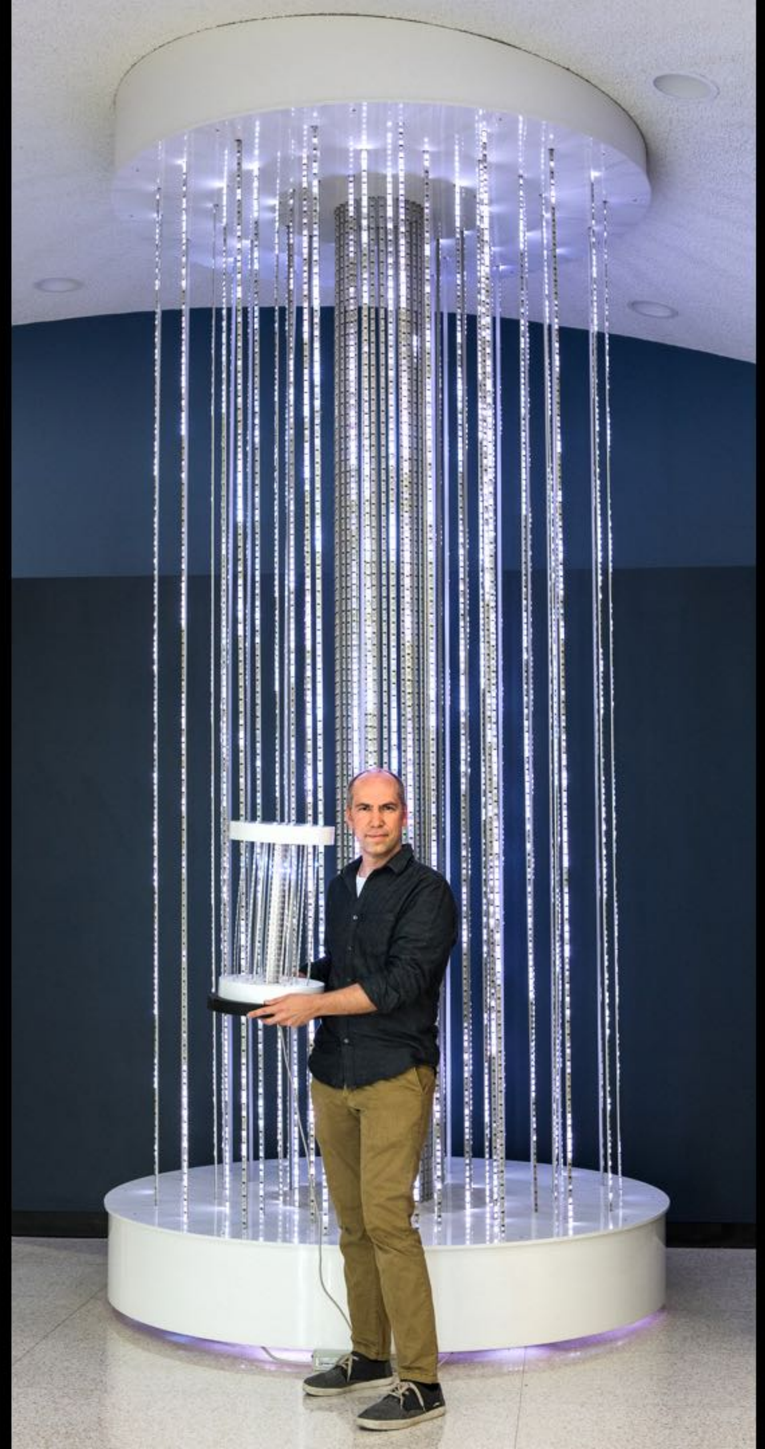
Humans have been **trying to understand** the physical universe since antiquity. Aristotle had one vision (the realm of the celestial spheres is perfect), and Einstein another (all motion is relativistic). **More often than not, these different understandings begin with a simple drawing, a pre-mathematical picture of reality.** Such drawings are a humble but effective tool of the physicist's craft, part of the tradition of thinking, teaching, and learning passed down through the centuries.

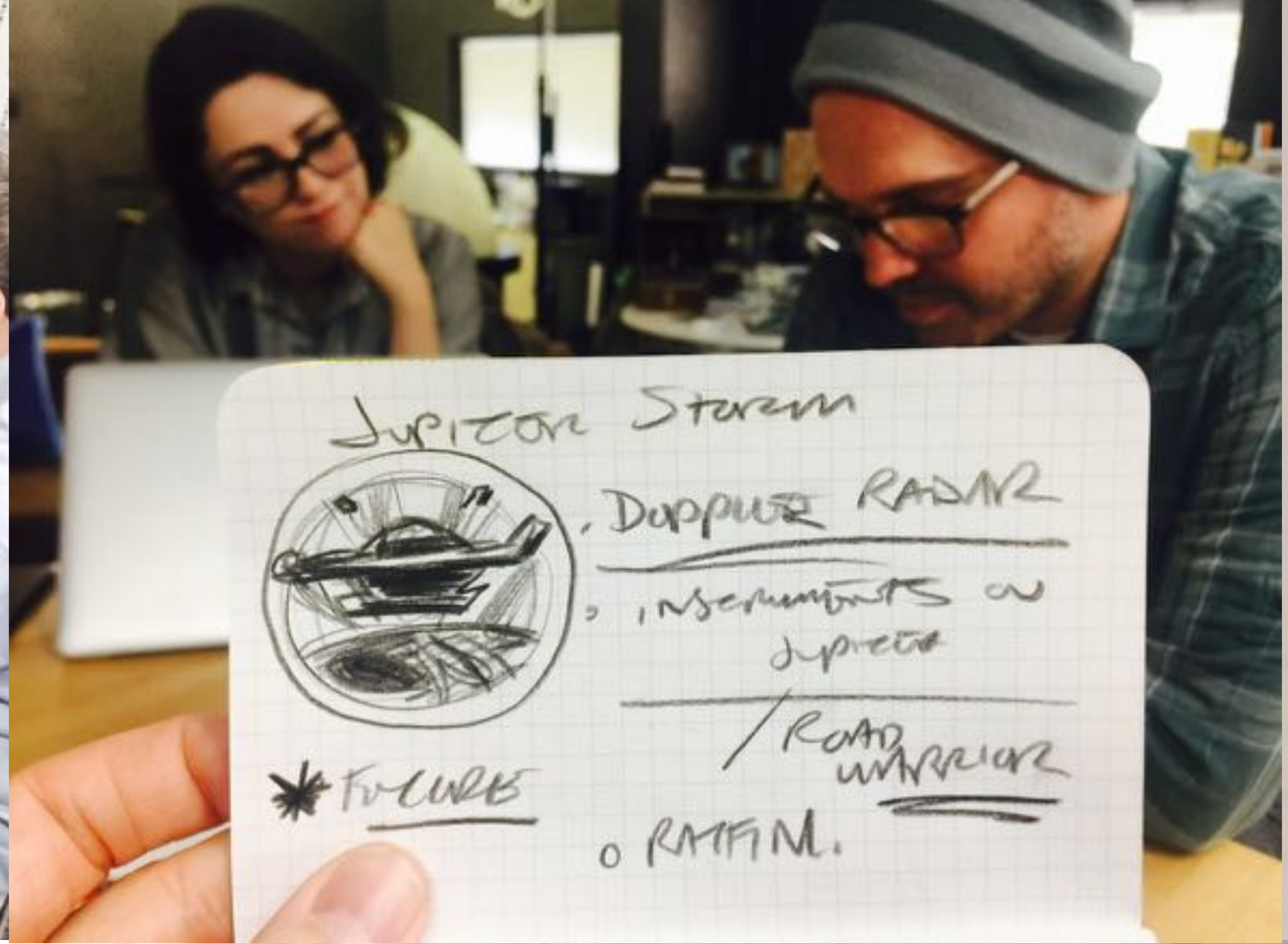
Albany to Boston
Albany to Elmira
Boston to Albany
Boston to Concord
Concord to Albany
Concord to Danbury
Concord to Elmira
Danbury to Concord

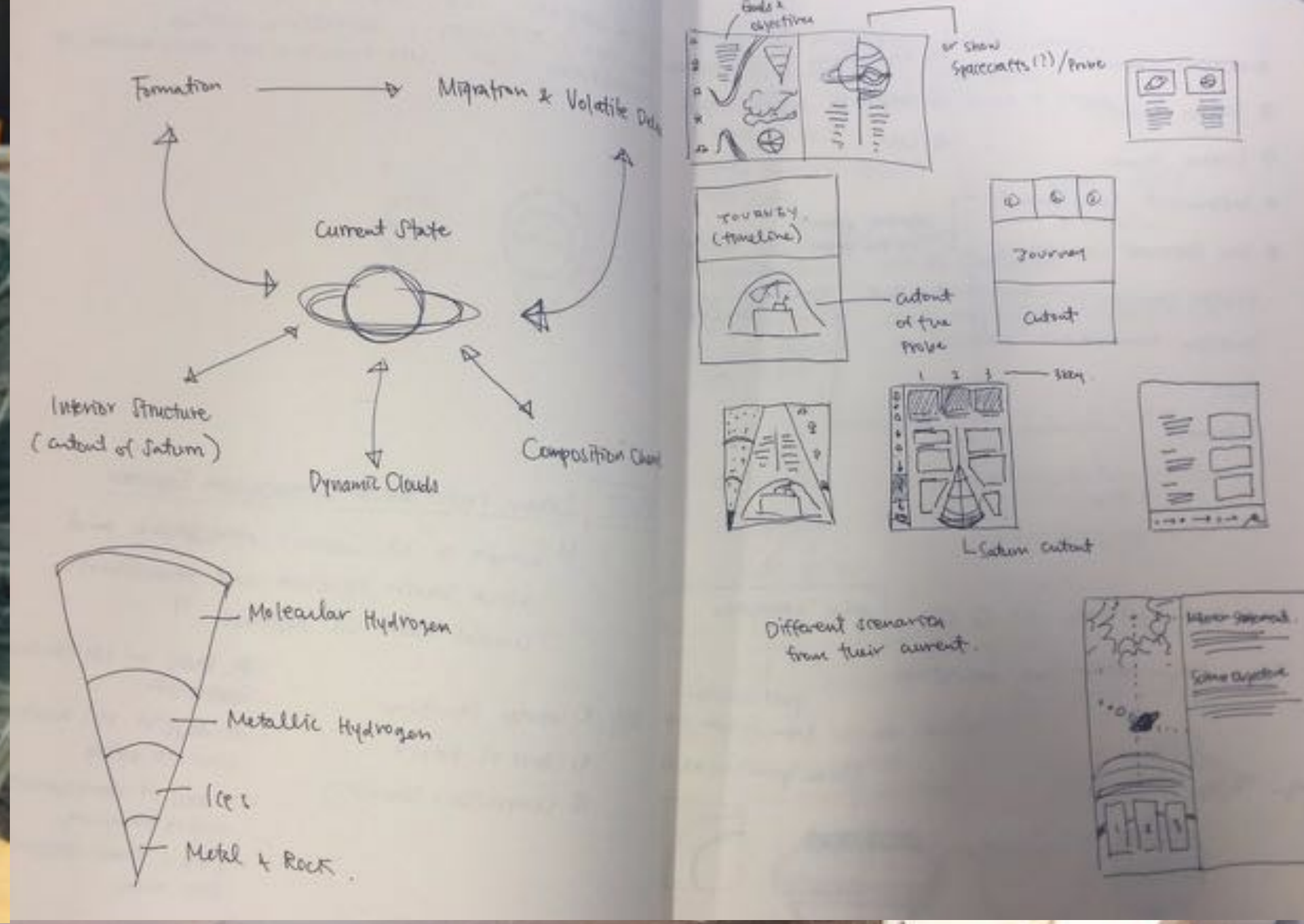


An airline serves five northeastern cities within a twelve-hour period- Concord, New Hampshire; Albany, New York; Danbury, Connecticut; Elmira, New York; and Boston Massachusetts. Their flights run from Boston to Concord, Danbury to Concord, Albany to Boston, Concord to Elmira, Albany to Elmira, Concord to Danbury, Boston to Albany, Concord to Albany. **What is the shortest way to make a round trip from Albany to Danbury?**

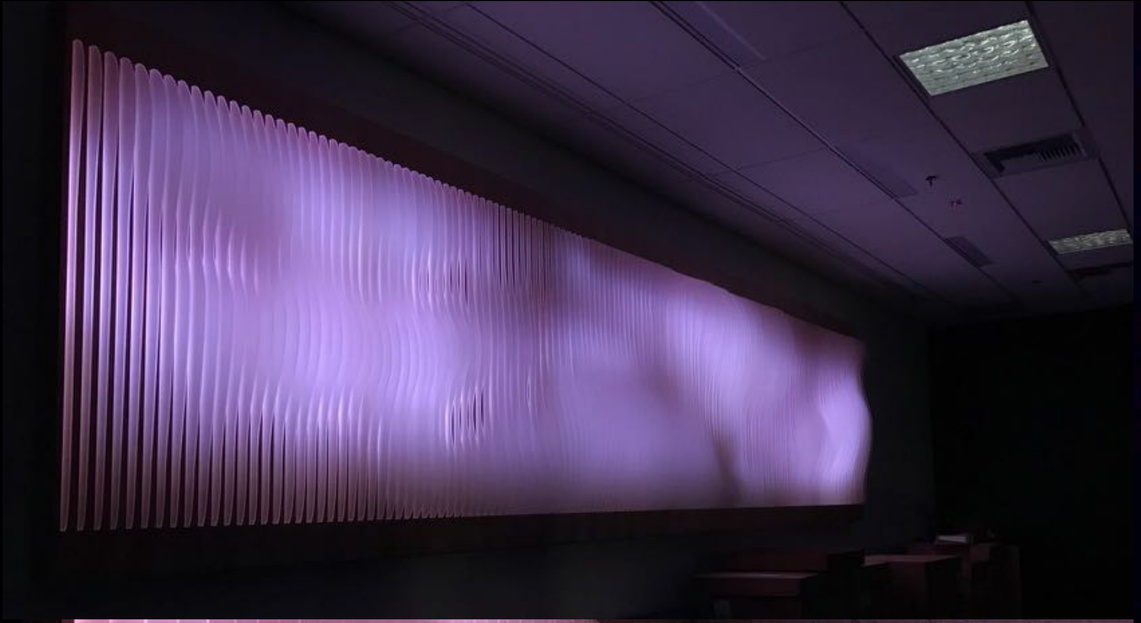


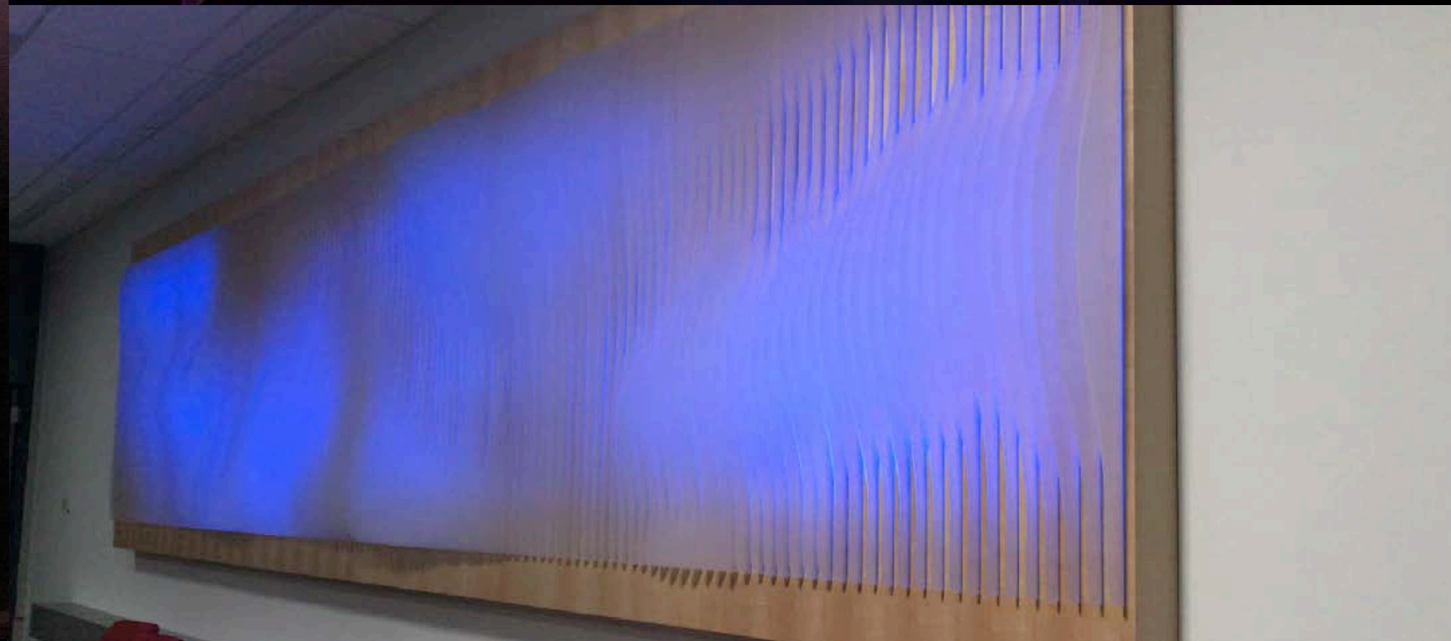



Jupiter Storm
DOPPLER RADAR
ROAD WARRIOR
FUTURE

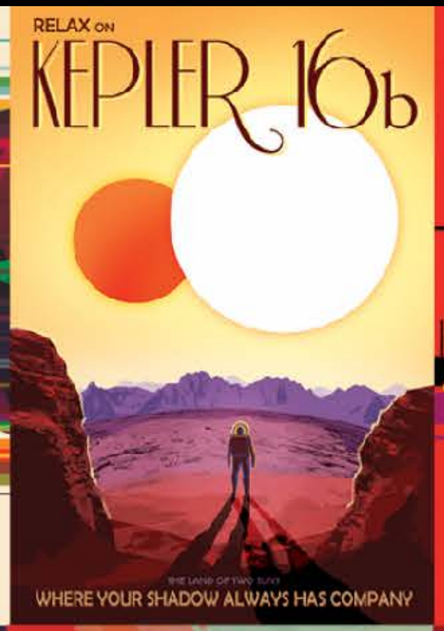

Formation
Current State
Interior Structure
(cutout of Saturn)
Dynamic Clouds
Molecular Hydrogen
Metallic Hydrogen
Ices
Metal & Rock


It's all good.

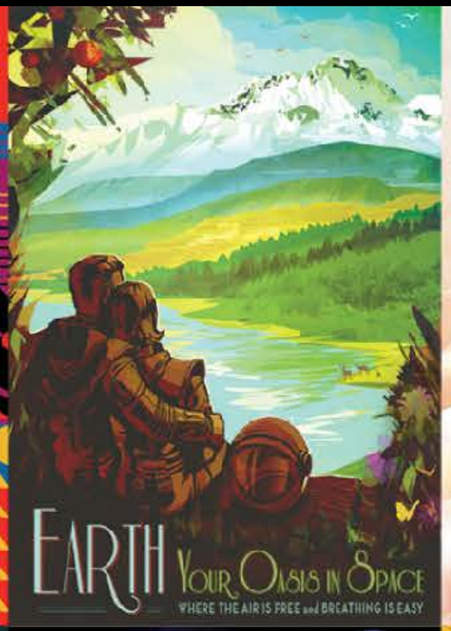




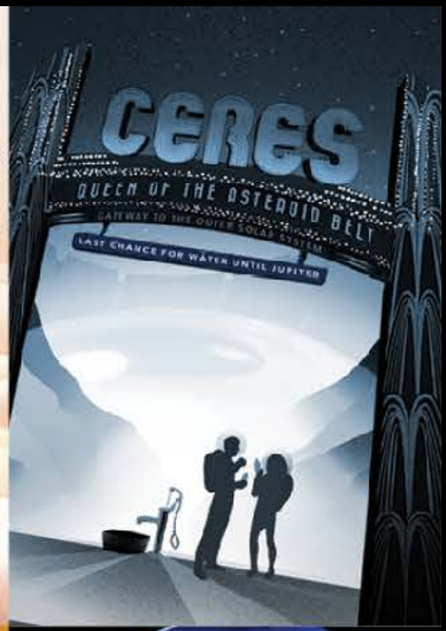

A ONCE IN A LIFETIME GETAWAY
THE GRAND TOUR
JUPITER / SATURN / URANUS / NEPTUNE
EXPERIENCE THE CHARM OF GRAVITY ASSISTS
EVERY 175 YEARS
NOW BOARDING


RELAX ON
KEPLER 16b
WHERE YOUR SHADOW ALWAYS HAS COMPANY


VISIT THE
HISTORIC SITES
MARS
MULTIPLE TOURS AVAILABLE


EARTH Your Oasis in Space
WHERE THE AIR IS FREE and BREATHING IS EASY


VENUS
SEE YOU AT THE CLOUD 9 OBSERVATORY


CERES
QUEEN OF THE ASTEROID BELT
LAST CHANCE FOR WATER UNTIL JUPITER

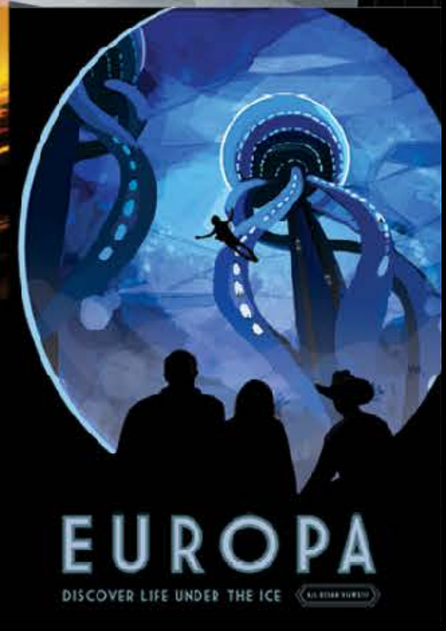

EXPERIENCE THE MIGHTY AURORAS OF
JUPITER


Kepler-186f
WHERE THE GRASS IS ALWAYS REDDER ON THE OTHER SIDE


VISIT BEAUTIFUL SOUTHERN
ENCELADUS

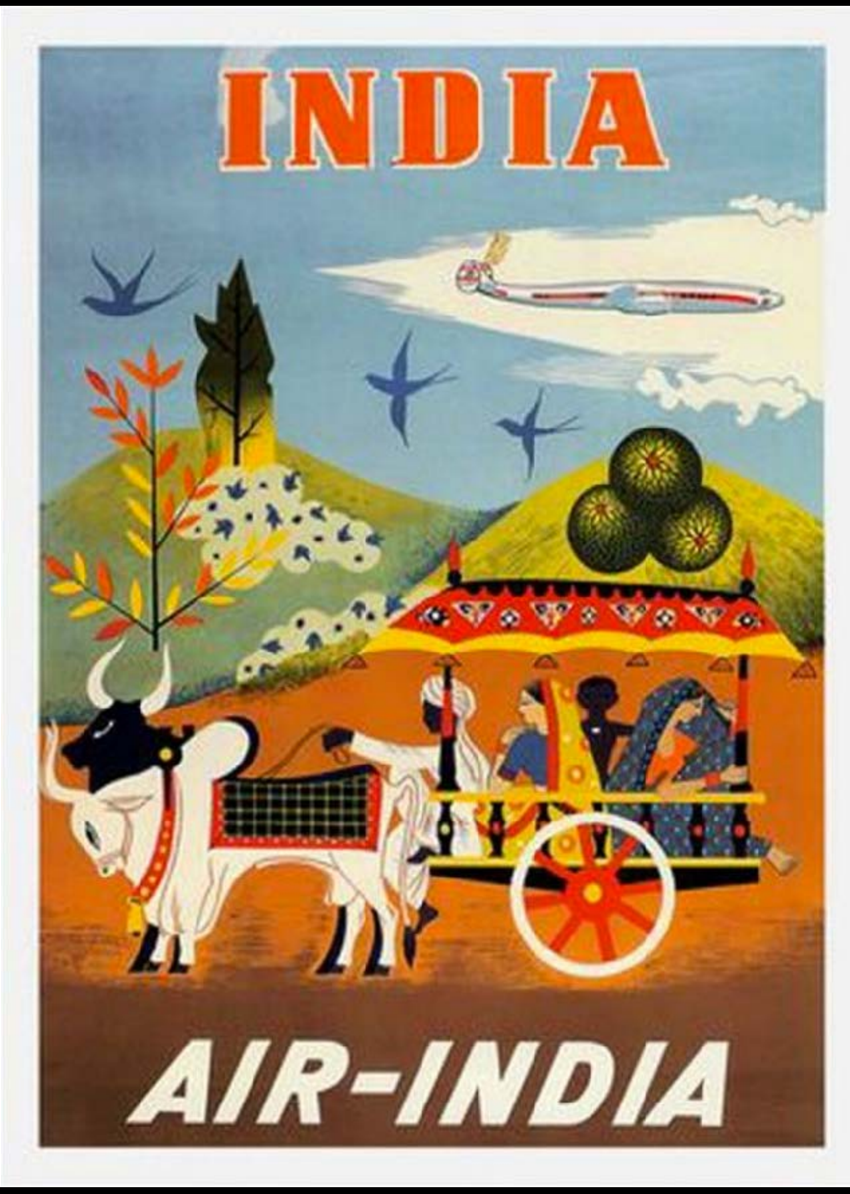

PSO J318.5-22

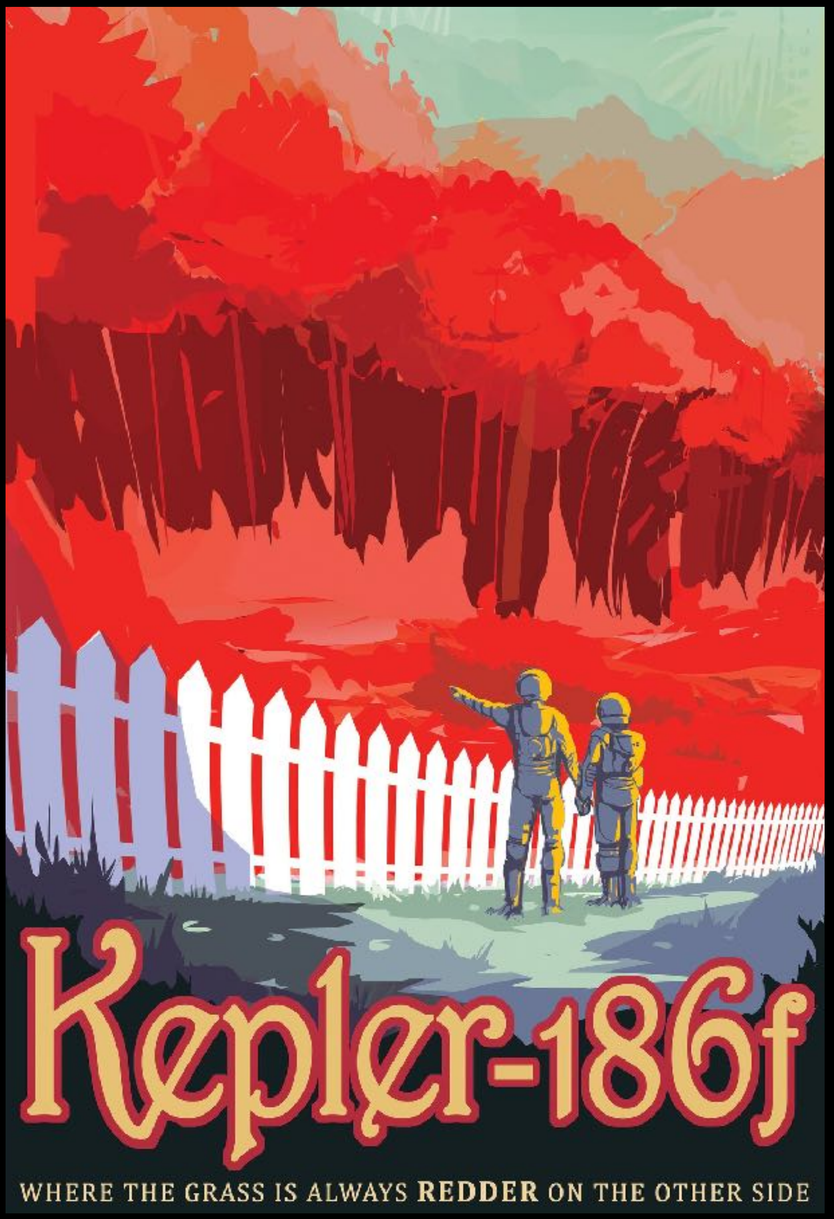

TITAN

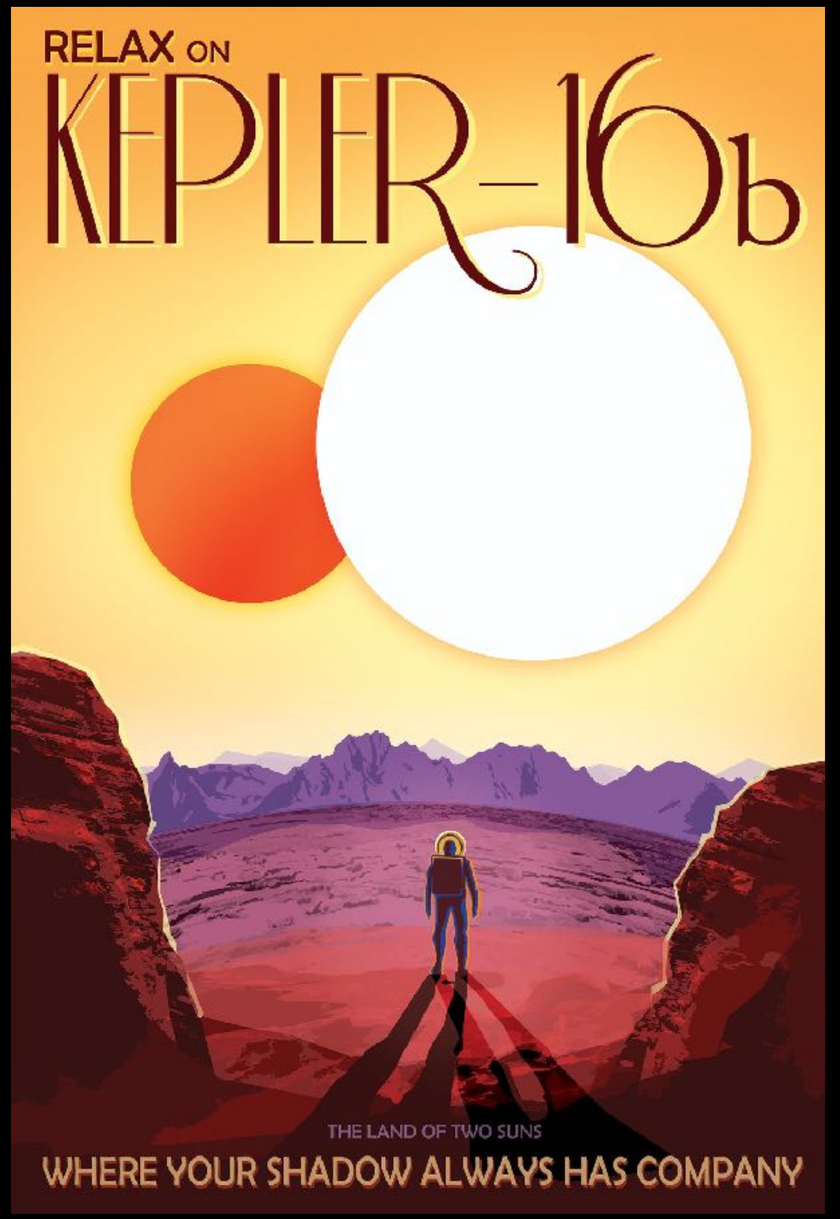

EUROPA
DISCOVER LIFE UNDER THE ICE


Come to
EGYPT
FOR SUNNY DAYS & MAGIC NIGHTS


L'AMERIQUE DU SUD
PAR LE PAQUEBOT
"L'ATLANTIQUE"
(40000 T.)
COMPAGNIE DE NAVIGATION
SUD-ATLANTIQUE
© BNPS.CO.UK


INDIA
AIR-INDIA


Kepler-186f
WHERE THE GRASS IS ALWAYS REDDER ON THE OTHER SIDE


RELAX ON
KEPLER-16b
THE LAND OF TWO SUNS
WHERE YOUR SHADOW ALWAYS HAS COMPANY

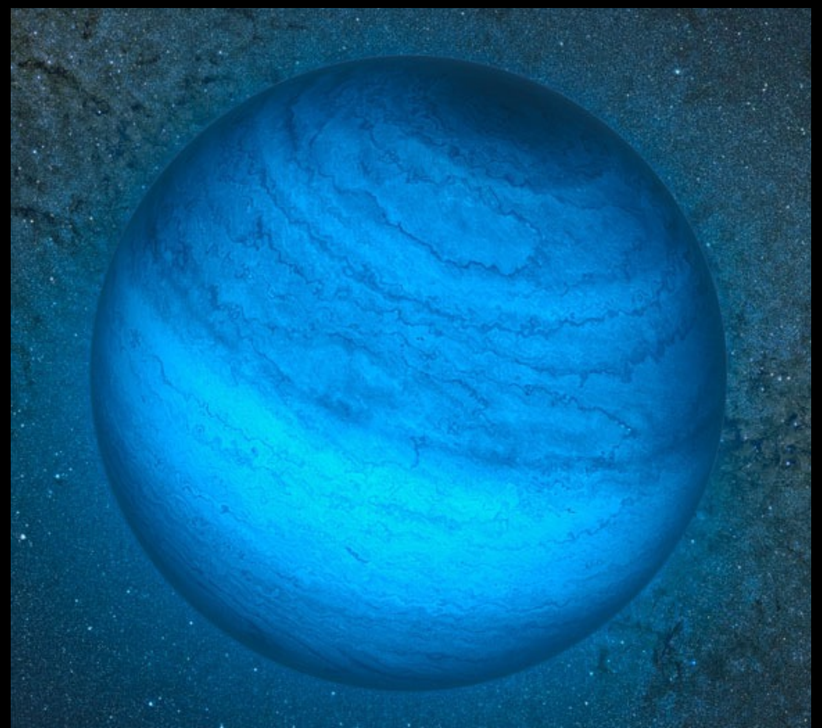

EXPERIENCE THE GRAVITY OF
HD 40307g
A SUPER EARTH

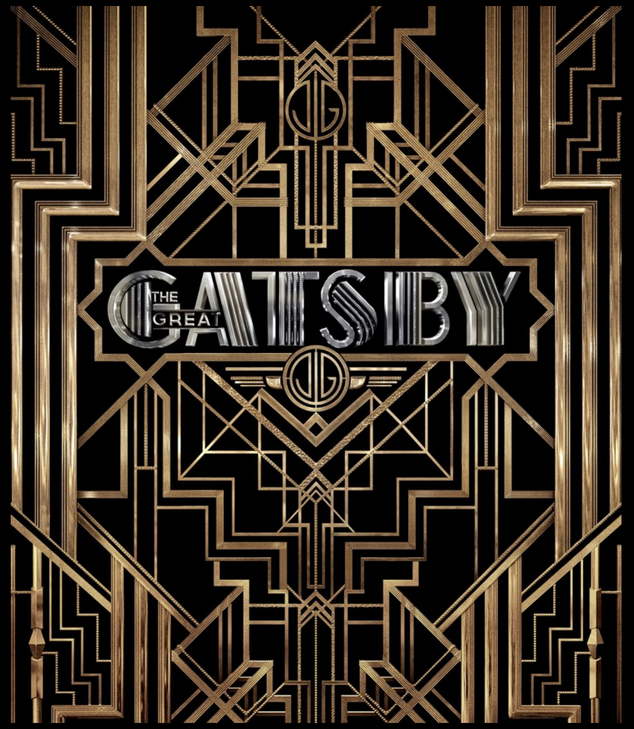

It's
all
good.

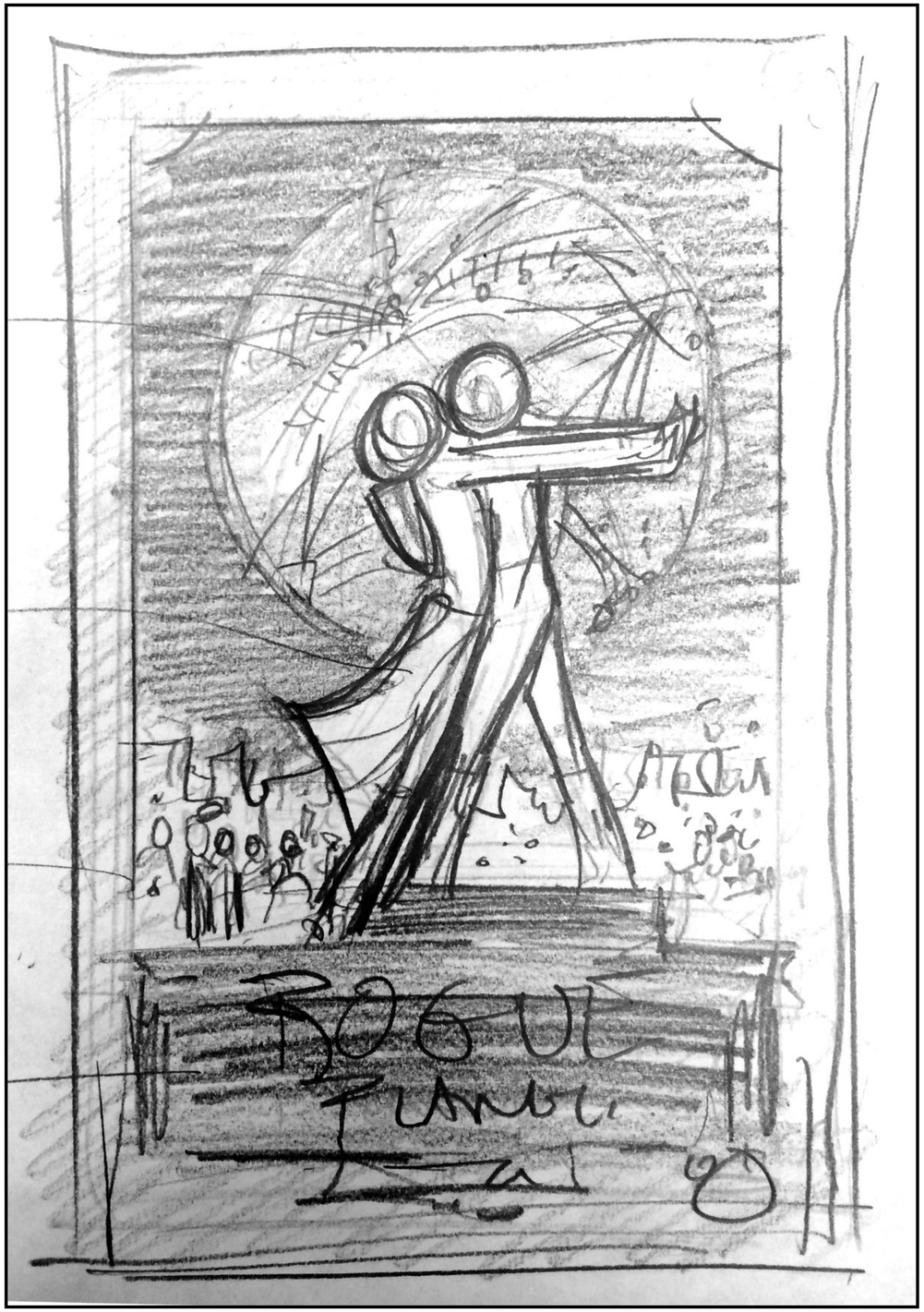
*visit **OTS 44** (switched later to PSO J318.5 -22)*

the planet with no star

punch line:
where the nightlife never ends

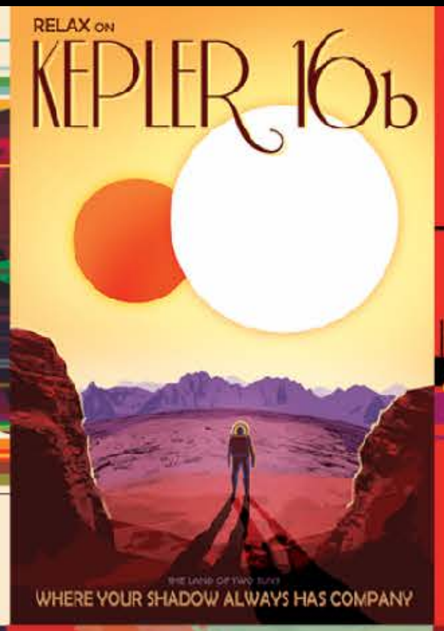




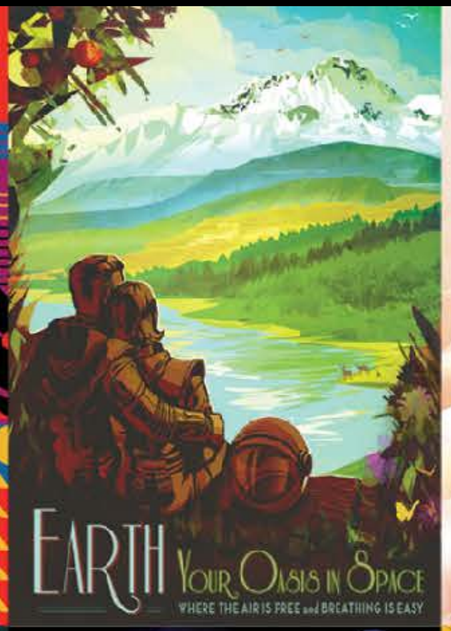



VISIT THE PLANET WITH NO STAR
PSO J318.5-22
WHERE THE NIGHTLIFE NEVER ENDS!

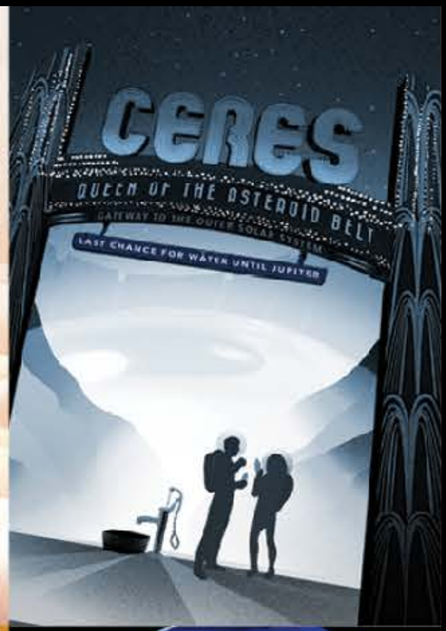

A ONCE IN A LIFETIME GETAWAY
THE GRAND TOUR
JUPITER / SATURN / URANUS / NEPTUNE
EXPERIENCE THE CHARM OF GRAVITY ASSISTS
EVERY 175 YEARS
NOW BOARDING


RELAX ON
KEPLER 16b
WHERE YOUR SHADOW ALWAYS HAS COMPANY


VISIT THE
HISTORIC SITES
MARS
MULTIPLE TOURS AVAILABLE


EARTH Your Oasis in Space
WHERE THE AIR IS FREE and BREATHING IS EASY


VENUS
SEE YOU AT THE CLOUD 9 OBSERVATORY


CERES
QUEEN OF THE ASTEROID BELT
LAST CHANCE FOR WATER UNTIL JUPITER

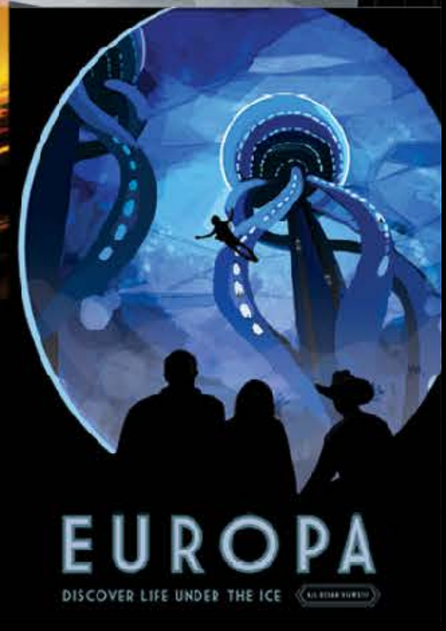

EXPERIENCE THE MIGHTY AURORAS OF
JUPITER


Kepler-186f
WHERE THE GRASS IS ALWAYS REDDER ON THE OTHER SIDE


VISIT BEAUTIFUL SOUTHERN
ENCELADUS


PSO J318.5-22


TITAN


EUROPA
DISCOVER LIFE UNDER THE ICE


NASA


ET HOP FROM
RAPPIST-1e
THE GRAND TOUR
A ONCE IN A LIFETIME GETAWAY
JUPITER / SATURN / URANUS / NEPTUNE
EXPERIENCE THE CHARM OF GRAVITY ASSISTS
NASA
EUROPA
Parkway
EST 1911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EUROPA


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Kepler-186f


HD 40307g
A SUPER EARTH


KEPLER-16b

Retro NASA Travel Poster - Kepler 186f Hip Flasks

"Where The Grass Is Always Redder On The Other Side". Kepler-186f is
'habitable zone' around another star, where ...

See more details at Zazzle »

$30.95

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Zazzle

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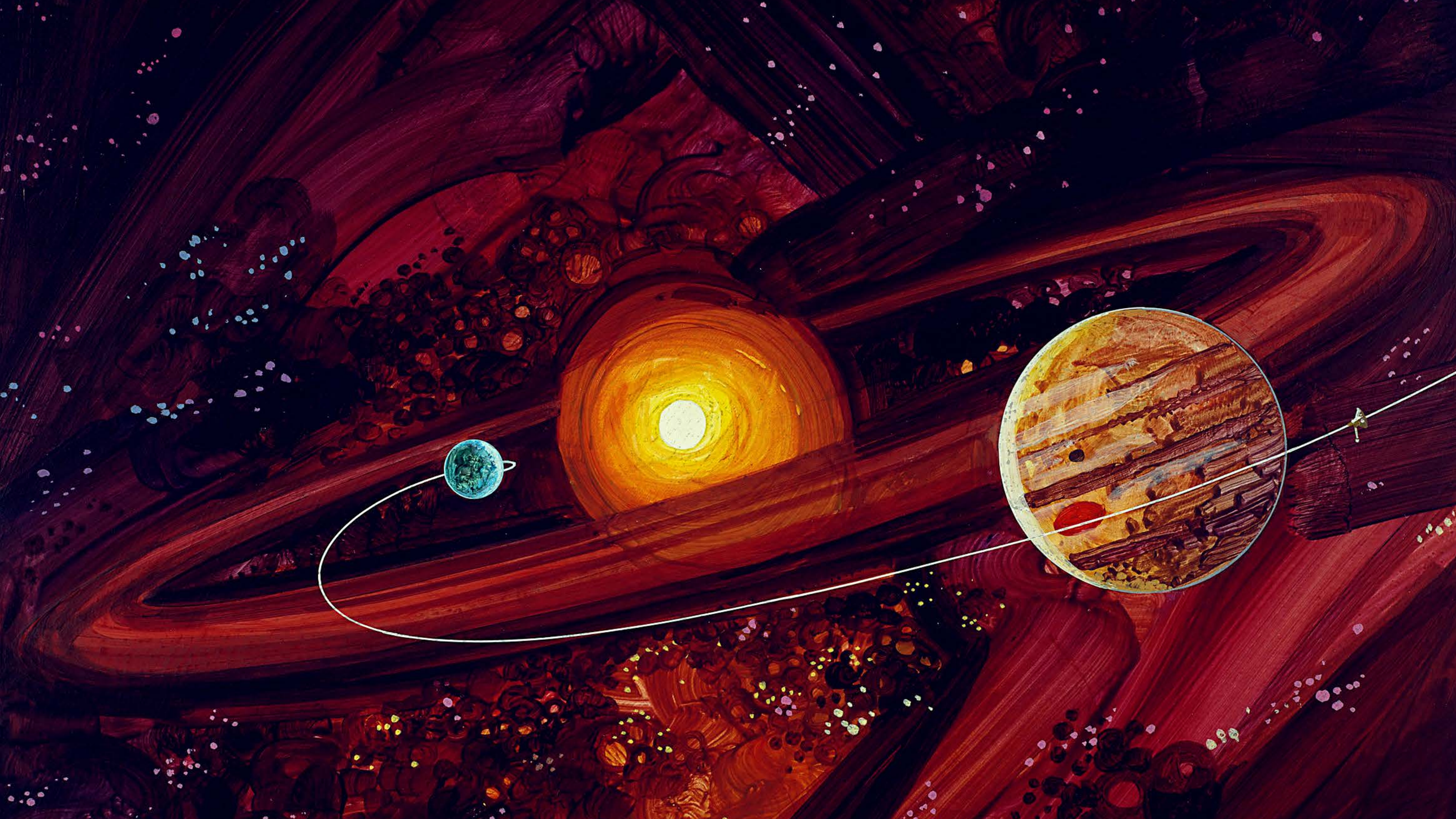
RELAX ON
KEPLER-16b
NASA
Italy
France

> ...I would like to acquire the posters so I can hang them in our child's nursery. My wife isn't pregnant now, but we plan to start trying in the next few months. I would like my son/daughter to grow up dreaming big,



Jet Propulsion Laboratory
California Institute of Technology