Psyche Inspired Copper Class

A Collection of Artworks

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See these QR codes?

These allow you to experience more Psyche content online. To start, open the camera app on your iPhone/iPad or download and open a free app, such as “QR Code Scanner” from the Google Play store for Android. Hold your smartphone or tablet over these barcodes. Once scanned, follow the generated link on your device to experience our interactive content online and enjoy.

What is Psyche Inspired?

Psyche Inspired is a program that brings undergraduate students from any discipline or major together to share the excitement, innovation, and scientific and engineering content of NASA's Psyche mission with the public in new ways through artistic and creative works.

Foreword From Lindy

Pasadena, California

What a pleasure it is to present the art from this year's Psyche Inspired program. In our fifth year we had the participation of interns, known as the Copper Class, from 14 colleges and universities from around the country. The Copper Class included undergraduates in majors ranging from engineering and graphic design to communication and the sciences. They experimented with works in digital media, makeup artistry, painting, fashion design, electronics, and beyond. Every year it seems we find artists in new media, new genres.

The Psyche mission continues to work to overcome challenges, alongside the student artists as they balance their university classes and their craft. Through Psyche Inspired we invite interns to contribute their fresh creative perspectives and passion for exploration and communication. Together with the interns, we want to remind the world that it takes all of society to explore space. It is for artists, educators, accountants, engineers, lawyers, scientists, students, and anyone else who is interested in being part of the journey.

This year, and every year, the program has touched the public and the mission team in so many ways - more than we could have anticipated when we started Psyche Inspired. To everyone in our Psyche Inspired program I share my sincerest appreciation. I salute the hard work, long hours, and the great accomplishments of the Copper Class!

Linda T. Elkins-Tanton
Principal Investigator, NASA Psyche Mission

A Note From Kax & Tyler

Tempe, Arizona

As space exploration continues to push forward, it becomes more important than ever to communicate with and invite the public to join the journey - in Psyche's case, to a unique metallic world. This goal provides the inspiration for the Psyche Inspired program. Through the creative arts, the mission extends information about its scientific endeavors, engineering processes, innovations, and teamwork to the public through a means that is both understandable and enjoyable.

This year's Psyche Inspired class, the Copper Class, represents the fifth cohort of the Psyche Inspired program. Competitively chosen from a national pool of applicants, these fifteen interns hail from fourteen different institutions in pursuit of degrees ranging from graphic design and animation to engineering and physics. Despite their different aspirations and geographic locations, these interns came together throughout the 2021-2022 academic year to create approximately 60 artworks about the NASA Psyche mission. Taking inspiration from Psyche mission staff, scientists, engineers, and artists, the knowledge and passion cultivated by these interns is represented in their creative works stretching from the digital world with posters and animations to the physical world with sculptures and game consoles.

Through the creativity demonstrated by each of these Copper Class interns, they remind us to feel proud of our pursuit of knowledge and to look forward to the amazing journey ahead of us, whether on Earth or in space. In honor of this, we are proud to present the Copper Class's works within the pages of this book and to see them off to new and exciting adventures.

Kaxandra Nessi & Tyler Burnside
Psyche Inspired Student Managers

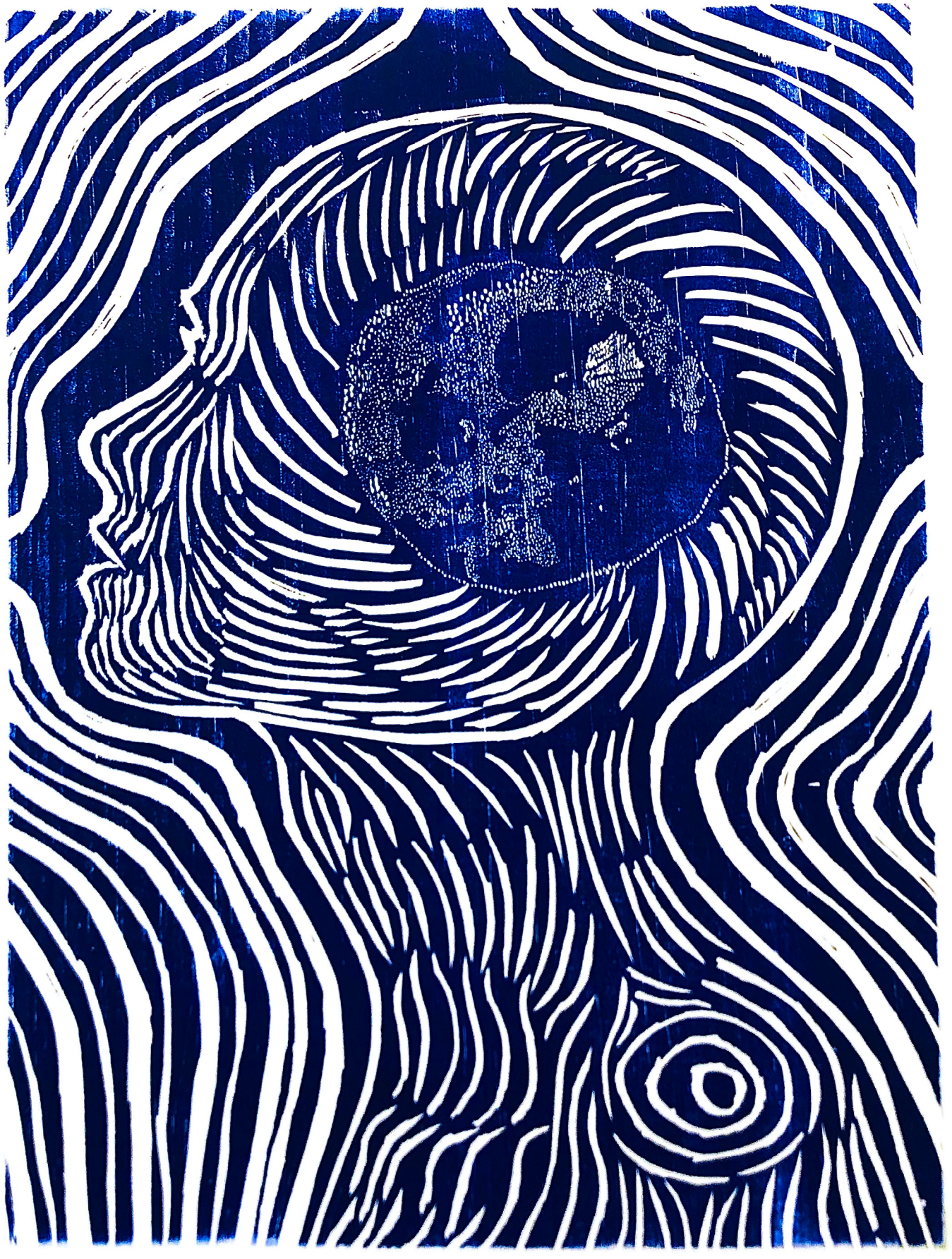
Mythology

Early asteroids that were discovered, including Psyche, were named after gods and goddesses from ancient Greek mythology. After discovering the 16th asteroid in 1852, Italian astronomer Annibale de Gasparis named it Psyche, after the Greek goddess of the soul, who is often symbolized by a butterfly. Because Psyche was the 16th asteroid to be discovered, it is sometimes referred to as (16) Psyche.

The Mind and Soul

Mary Pyrdol
Printmaking/Woodcut/Ink/Masa

Considering the name of the asteroid, “Psyche” defines a number of significant things. The goddess from Greek mythology, the human experience, and the tangible, metal-rich asteroid. For my final project, I aimed to explore the combination of these concepts into a piece titled “The Mind and Soul”. Pictured in the print design is the silhouette of a human figure, and at the center of the skull is an imprint of the asteroid Psyche. Placing the asteroid in the location of the brain pictorially captures my interpretation of our fascination with the cosmos. In terms of the ‘mind and soul’ concept of this piece, the asteroid essentially becomes the mind, and our desire to explore it is the soul of the mission.



where
ART
meets
SCIENCE

Where Art Meets Science

Britney Hill
Mixed Media: Oil Paint, Digital Art (Photoshop)

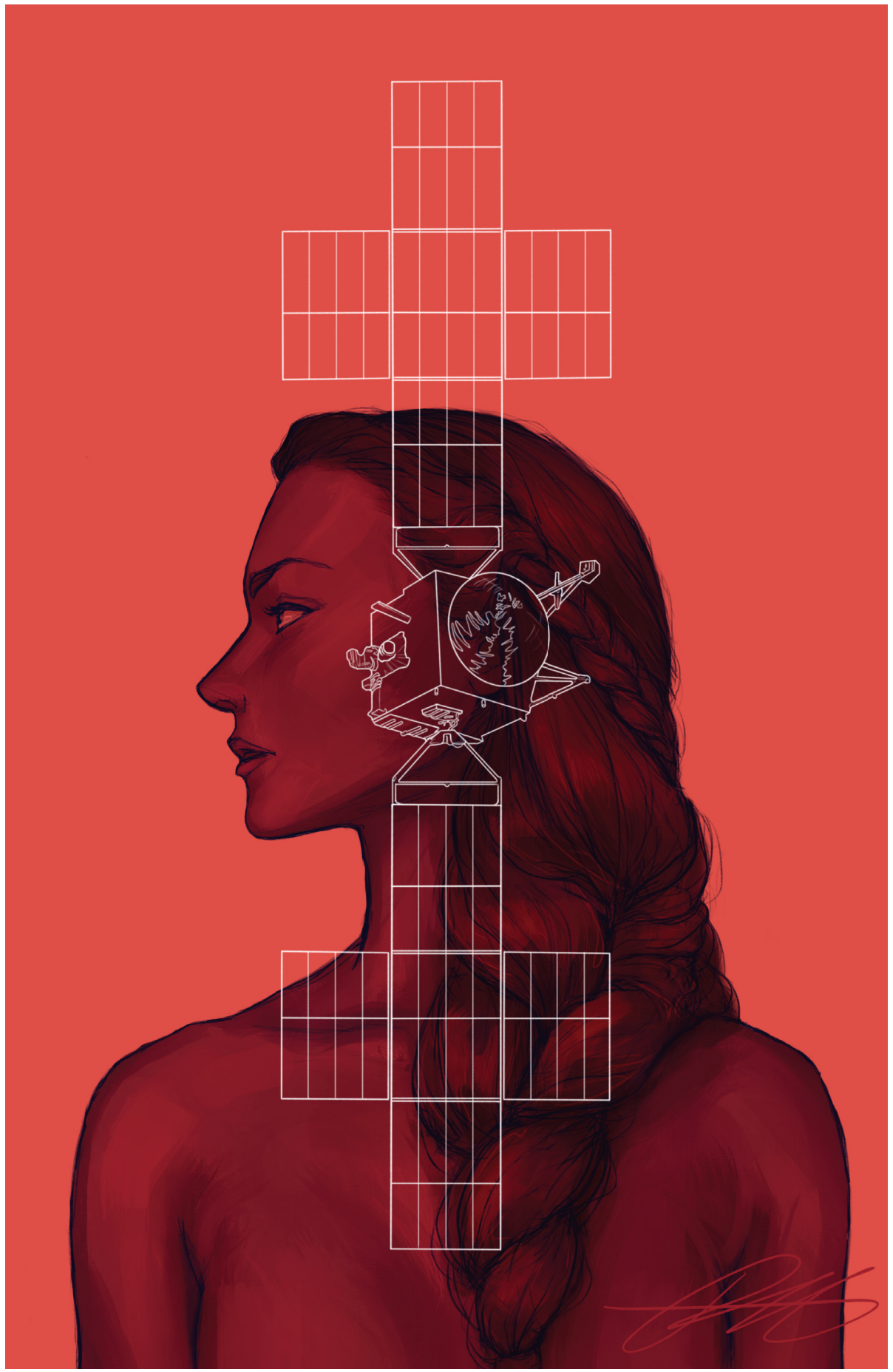
Where Art Meets Science: My inspiration for joining Psyche Inspired. Art and science are often seen as opposite fields, however, they often take inspiration from each other. The engineering behind the Psyche Mission can be seen as its own art piece, while famous artists often pulled from science to showcase astronomy and anatomy. This poster features two paintings: one of Psyche, The Goddess, in the style of Pablo Picasso and one of Psyche, The Asteroid, in the style of Vincent van Gogh's Starry Night.

Psyche and Eros and Psyche

Chris Kim
Digital art using Procreate

I decided to tie in the Psyche and Eros mythology with the Psyche mission and re-emphasize the heart of the mission. There's inherent beauty in traveling to space to discover more about ourselves and the world we live on, so it feels fitting that the mission is based on the goddess of the soul.

SCAN ME



Innovation

Phoebe Murphy
Digital Illustration

Psyche is the Greek goddess of the soul. Her namesake, the Psyche asteroid, is of course the soul of the mission. However, spirit alone is not enough to achieve our lofty goals. As humans, we have used our intellect to forge a path of innovation. I wanted to create an image that captured the marriage of soul and mind, represented by the goddess Psyche and the Psyche spacecraft respectively.

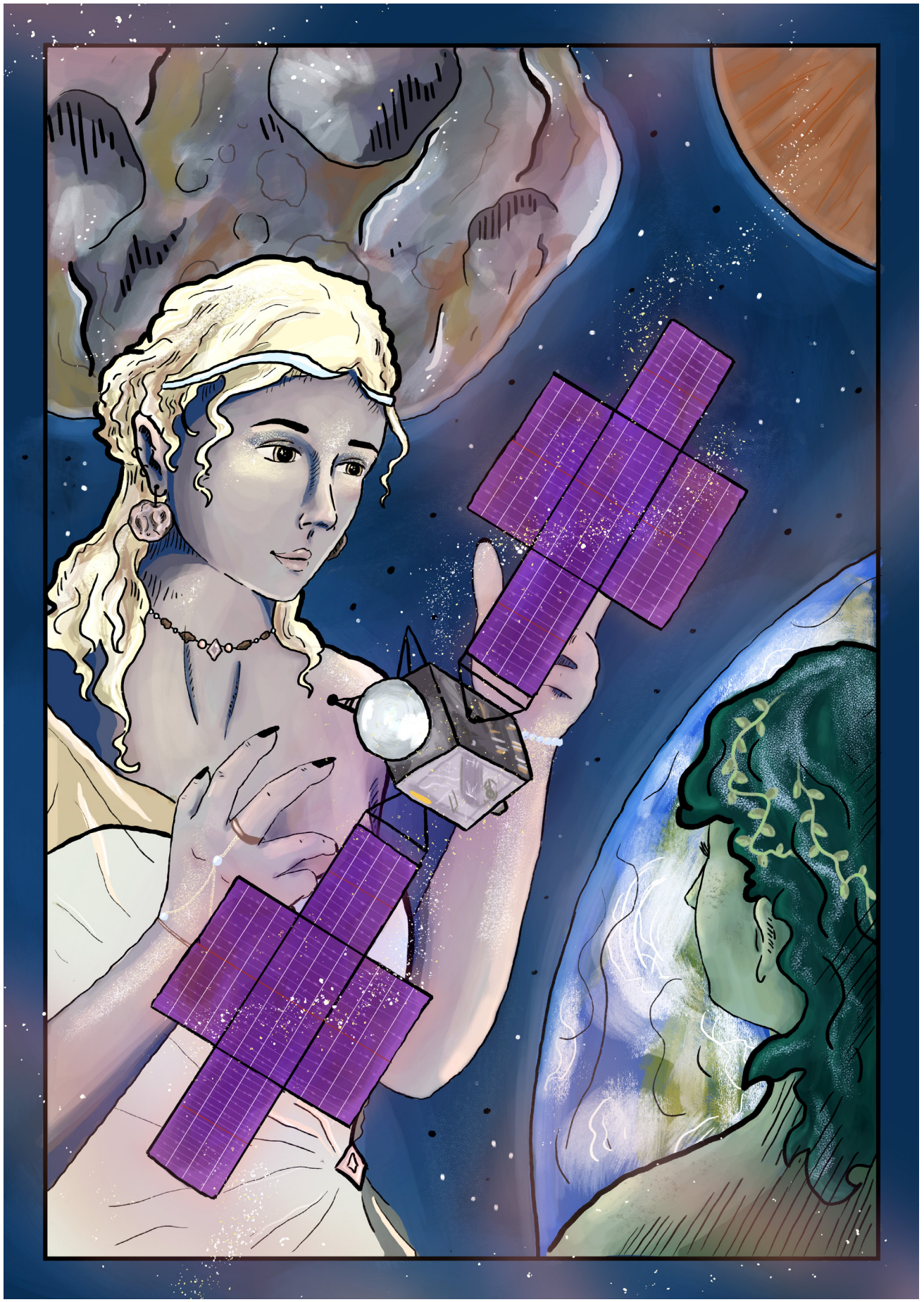
Psyche Engraved

Britney Hill
Wood, Laser Engraving

See the different symbols of Psyche while sipping your coffee or brewing your tea! In this set of three, you see Psyche: the asteroid, the goddess, and the mission. Each of these pieces were hand cut, sanded, laser engraved, and sealed with a clear coat. Engraved designs were manipulated in Adobe Photoshop (logo piece features the official Psyche mission logo and was not changed for this project)

JOURNEY TO A METAL WORLD • PSYCHE •

JOURNEY TO A METAL WORLD • PSYCHE • JOURNEY TO A METAL WORLD • PSYCHE •



Soul Searching

Caillyn Jeffery
Digital Illustration

“Do you want to see inside yourself?” Psyche, both as the Goddess of the soul and the asteroid, asks Earth. Psyche stands before the Psyche asteroid wearing metallic jewelry and clothing. She presents the Psyche spacecraft between her hands as the key to Earth learning more about herself.
My artwork interprets Psyche as both the asteroid and the goddess it is named after.
I chose to explore the idea of “soul-searching”, both metaphorically through these characters discovering themselves, and literally through the Psyche mission potentially allowing us to learn more about Earth’s core.

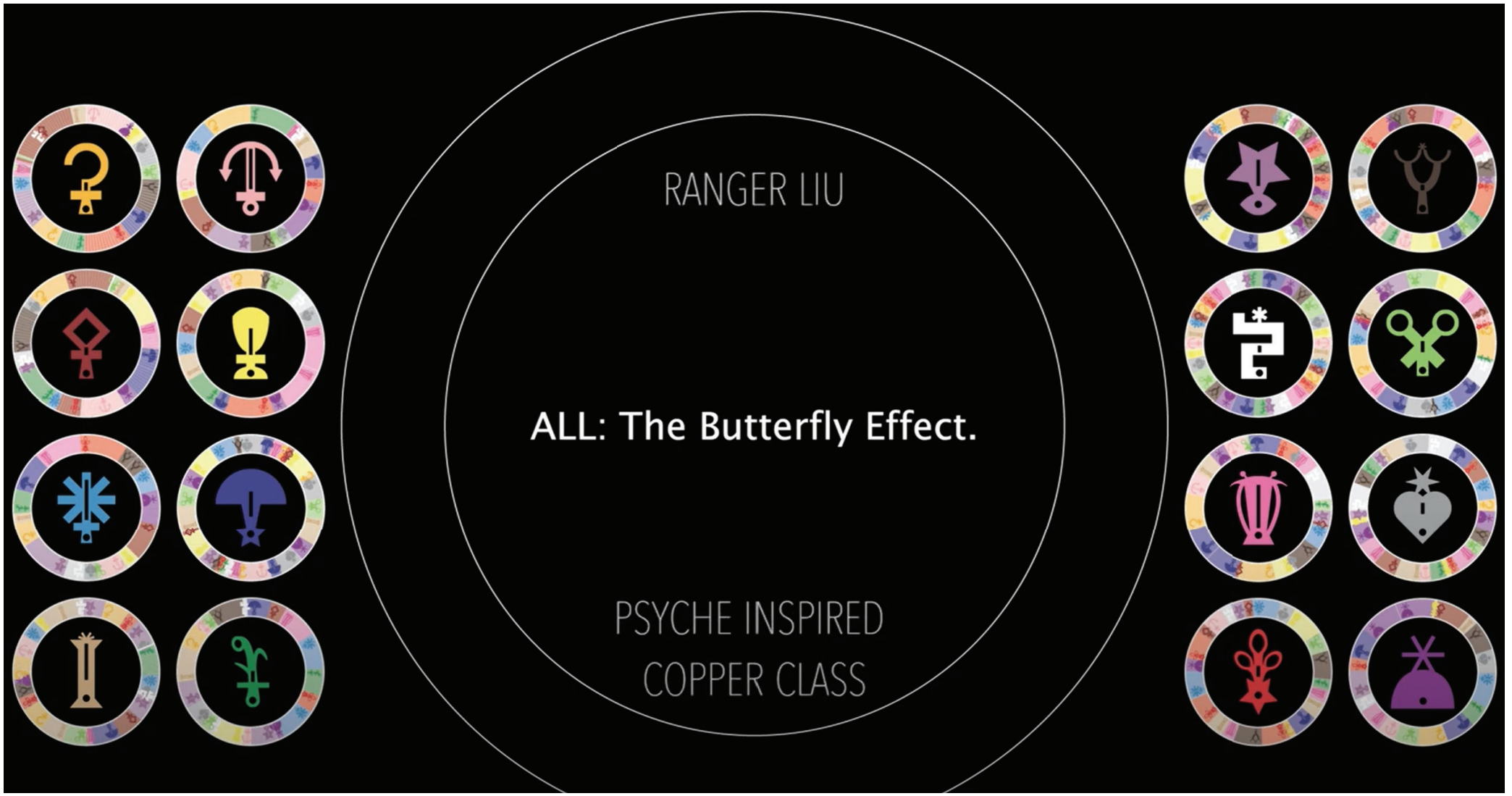
From beginning to end, my piece was drawn and composited digitally using Photoshop. Although I originally intended to composite hand-painted elements, I instead used effects within Photoshop to add lighting and texture around the spacecraft and the entire piece. Color choices within the two figures were intended to mimic the asteroid and Earth and to show these characters as not just individuals, but embodiments of the celestial bodies they represent. Additionally, colors for the lighting effects were pulled from the Psyche mission logo.

The Butterfly Effect

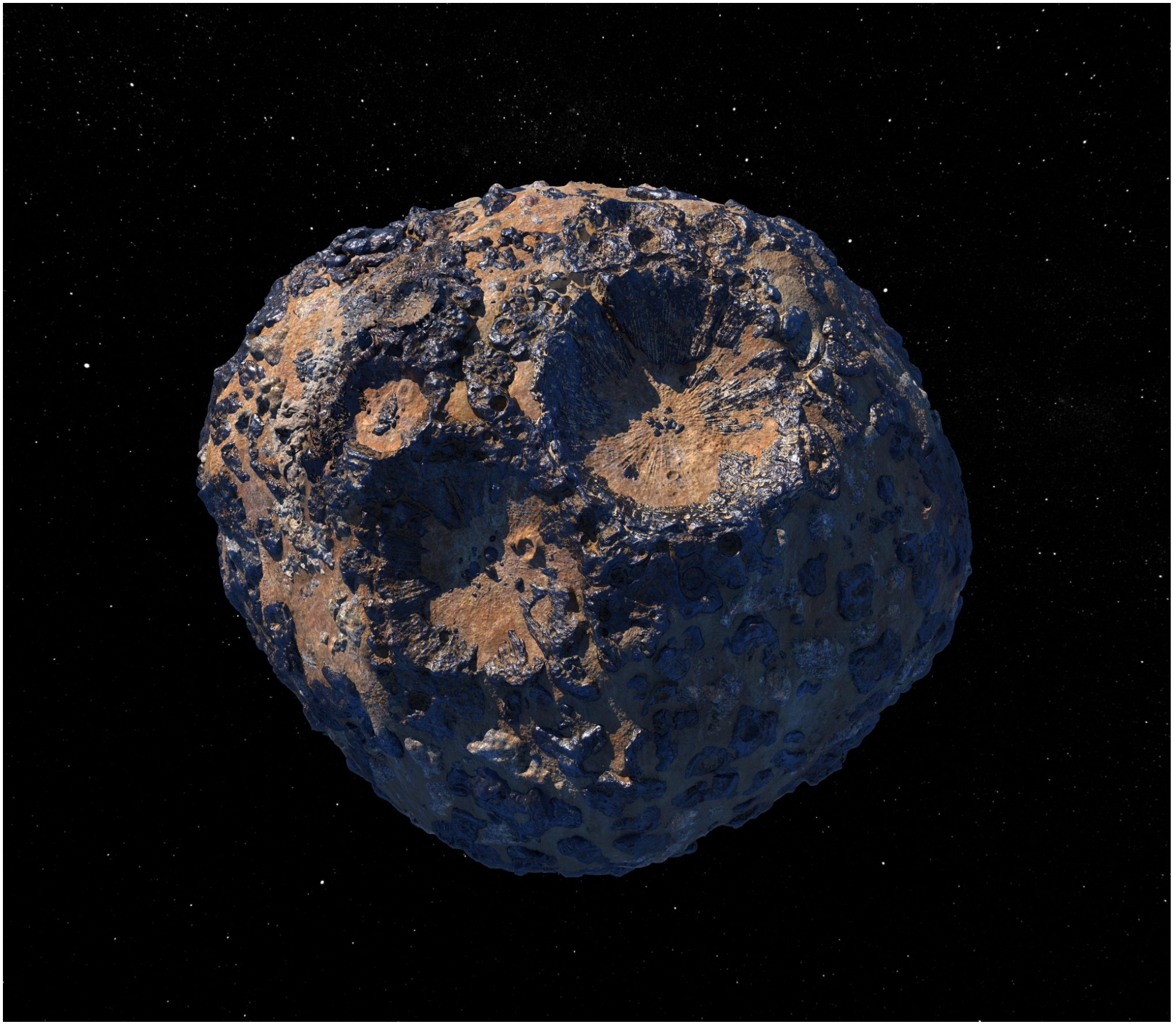
Ranger Liu

Collaborative sculpture + composition; posterboard, cardstock, dowels; Logic/ Premiere/Photoshop/After Effects/Illustrator

THE BUTTERFLY EFFECT is a collaborative sculpture that functions both as a composition device (to generate musical notation) and as a musical instrument (to interpret the notation). This dual-nature is inspired by the overloaded meaning of the name “Psyche” , which refers to the asteroid, the mission, the spacecraft, and the goddess simultaneously. The project is also inspired by the goddess Psyche’s connection to butterflies and the “butterfly effect”, which describes how tiny actions that seem inconsequential actually propagate through the world and have major effects. The project demonstrates this principle by having participants perform seemingly simple tasks to build up the sculpture, ultimately determining the physical structure of the sculpture, as well as the musical interpretation. The performative evolution of the project through three phases also reflects the three major phases of the Psyche mission: pre-launch preparation, actual spaceflight and in-orbit period, and data analysis.


RANGER LIU
ALL: The Butterfly Effect.
PSYCHE INSPIRED
COPPER CLASS

SCAN ME



The Asteroid

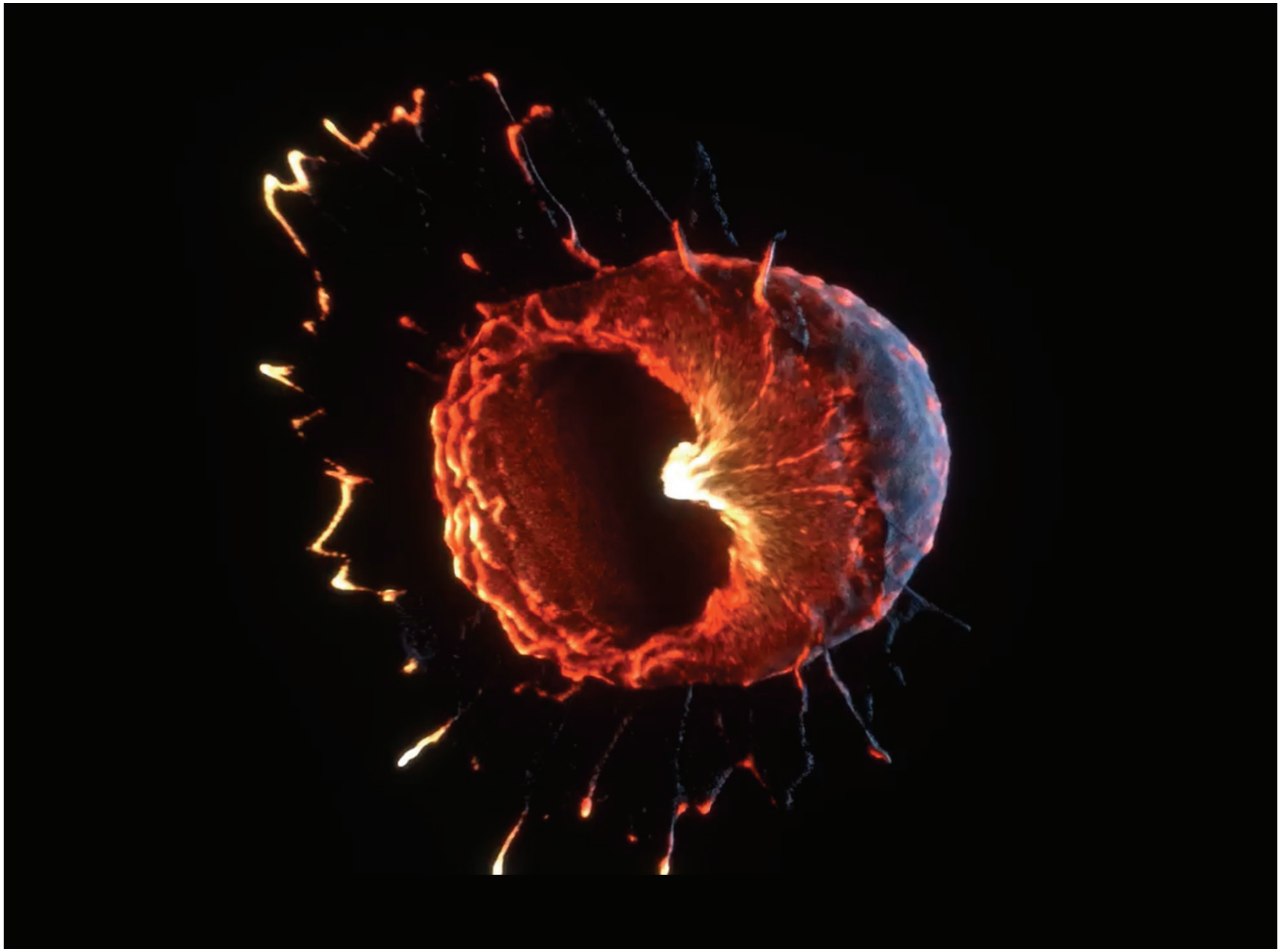
Asteroids themselves are thought to be leftover material from the formation of the solar system. Therefore, asteroids can be composed of a variety of elements, offering scientists unique opportunities to study our solar system's formation. One such unique asteroid is (16) Psyche.

If Psyche were a perfect sphere, it would have a diameter of 140 miles (226 km), or about the length of the state of Massachusetts (leaving out Cape Cod). It would also have a surface area of about 64,000 square miles, or about 165,800 square kilometers. However, its size isn't the reason for our fascination with this body. Rather, Psyche is unique because scientists believe that this asteroid may be the core of a planetesimal that was bombarded, stripping the mantle away and leaving exposed core material. No one has seen the Psyche asteroid yet, so we will not know what it looks like until the spacecraft arrives, but many of the student artists have drawn inspiration from several artist conceptions on the Psyche website.

Birth of Psyche

Josh Meister
Digital 3D Animation: SideFX Houdini

One of the mysteries of Psyche that I find most compelling is how it came to be in the first place. My personal favorite theory of Psyche's origin is that it is core material ejected from a planetary collision. After watching simulations of merging planetary bodies, I've become fascinated by their fluid-like behavior. This piece is an artistic animation inspired by scientific simulations I have seen.



SCAN ME

“What once was, what could’ve been”

Caillyn Jeffery
Acrylic paint

This painting explores what one was, and what could have been, of the Psyche asteroid. As the asteroid travels around the sun, different landscapes and textures project from the surface, showing a hint at what the asteroid might have looked like in its planetesimal phase, or what it could have looked like if it formed into a full planet. My piece was painted with a focus on movement, fantasy, and texture. Although acrylic is not my primary medium, it was fun using the material elements of paint to express gestures, textures, and forms in this abstract piece.

Faces of Psyche

Jennah Colborn
Makeup/SFX, Digital Photography

I was immediately captivated by Psyche's possible appearance: its asymmetry, metallicity, and texture. My goal was to bring some of these physical features to life through a series of portraits personifying the asteroid. Its characteristics could first be separated into the categories of external (surface) features and internal composition, and from there I selected four traits that I felt best encompassed Psyche's distinctive feel.

The first portrait illustrates the asteroid's asymmetry and unique shape. Using a bright color palette to mimic the look of topographical maps, I portrayed Psyche's two most distinctive craters in deep tones above and near the eyes, providing a clear contrast to the vivid light tones that represent the rest of its surface.

Psyche Impasto

Maia Huddleston
Acrylic on Canvas

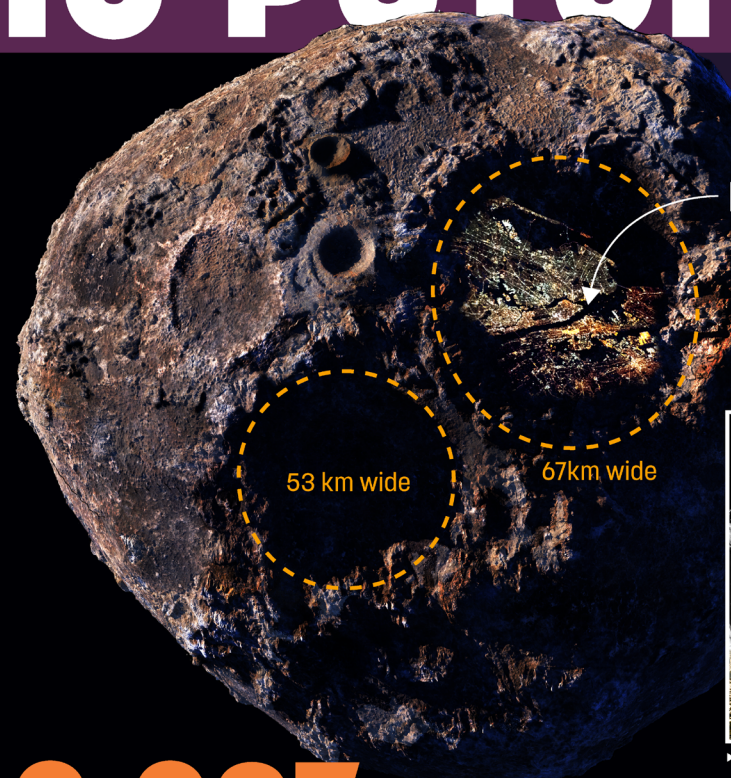
This piece is my first ever physical painting. Previously, my work was solely digital. Psyche truly INSPIRED me to try a new art medium, even though I had no experience or training in it. I used acrylic paints of various thicknesses and sponges to create a textured effect on the circular canvas.

How Big is 16 Psyche?

G. Marshall Wolff
Infographic/Digital/Illustrator and Photoshop

This project is meant to give a more vivid idea of how large the (16) Psyche asteroid is in comparison to things people actually have experience with. Although size comparisons on larger scales are useful, it can be difficult to grasp the size of something extremely large when comparing it to something else extremely large. However, we also had to ensure we didn't spread a misconception that the asteroid was going to hit Earth. So, although a view of the asteroid in a perspective from Earth was exciting, it was also terrifying. For this route, we decided to use the view of New York City and Hawaii from space, images that people are familiar with and can potentially relate to real-life experiences of seeing them from planes. The mass and density of the asteroid were also helpful in providing a more physical connection. Finally, adding in a portion that shows how we know the size of Psyche was included to help it feel more real and concrete.

HOW BIG IS 16 PSYCHE?



NEW YORK CITY

from Long Beach to Clifton, from the Bronx to Staten Island, the Big Apple could easily fit into one of the large depressions on the surface that could be a crater with rims towering above the horizon like mountains.

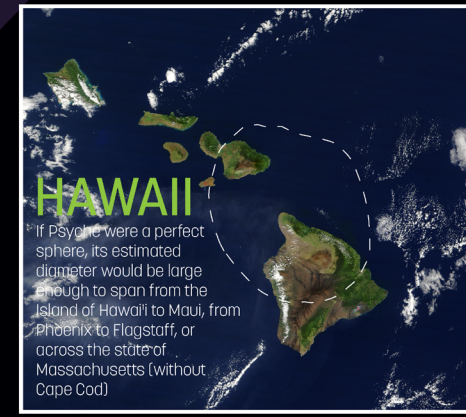
▶ An artist's impression of New York sitting inside what could be a large crater on Psyche.

2.287×10^{19} KILOGRAMS

THAT'S APPROXIMATELY

130,000+ MT. EVERESTS
4 BILLION PYRAMIDS OF GIZA
47 TRILLION BOEING 747 AIRLINERS

Additionally, this asteroid is dense. Our current estimates show it to be around 4000 kg/m^3, suggesting a mixture of rock and metal.



HAWAII

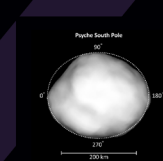
If Psyche were a perfect sphere, its estimated diameter would be large enough to span from the Island of Hawai'i to Maui, from Phoenix to Flagstaff, or across the state of Massachusetts (without Cape Cod)

ENORMOUS! BUT, SMALL:
(HOW CARS CAN FEEL LIKE DOGS)

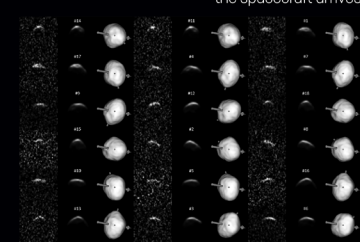
Psyche is large enough to have considerable gravity for an asteroid, but it is very weak compared to Earth's gravity. While we sit at a comfortable 9.8 m/s^2, we would feel a pull of 0.144 m/s^2 on Psyche's surface. On Psyche, lifting a car would feel as light as lifting a big dog on Earth!

MODELS AND PIXELS

Scientists have combined radar and optical observations to generate a 3D shape model of Psyche. This model shows evidence for two crater-like depressions. It suggests that there is significant variation in the metal content and color of the asteroid over the surface. But remember, no one has seen the Psyche asteroid yet, so we will not know what it looks like until the spacecraft arrives.



A recent shape model of the asteroid.



SPECIAL THANKS TO:
Peter Rubin NASA/JPL-Caltech/ASU for the original visualization of 16 Psyche
Visible Earth, EOS Project Science Office at NASA Goddard Space Flight Center for the image of Hawaii
Shepard, et. al. *Radar observations and shape model of asteroid 16 Psyche* for their scientific figures.

PIECE OF
PSYCHE
MINIATURE MODEL OF THE
ASTEROID 16 PSYCHE
PIECE OF
PSYCHE
MINIATURE MODEL OF THE
ASTEROID 16 PSYCHE
PIECE OF
PSYCHE
MINIATURE MODEL OF THE
ASTEROID 16 PSYCHE

PIECE OF
PSYCHE
WHY IS PSYCHE SO IMPORTANT?
Only the 16th asteroid to be discovered, Psyche was found in 1852 by Italian astronomer Annibale de Gasparis, who named it for the goddess of the soul in ancient Greek mythology.
What gives asteroid Psyche great scientific interest is that it is likely rich in metal. It may consist largely of metal from the core of a planetesimal, one of the building blocks of the Sun's planetary system. At Psyche scientists will explore, for the first time ever, a world made not of rock or ice, but rich in metal.
MINIATURE MODEL OF THE
ASTEROID 16 PSYCHE
THE MISSION TO PSYCHE
AUG 2022
MISSION LAUNCH
JAN 2026
ARRIVAL AT PSYCHE
173 x 144 x 117 miles
The real Psyche is over 2 million times larger than this model.
To learn more and stay up to date with Psyche, visit psyche.asu.edu

SCAN ME

Piece of Psyche

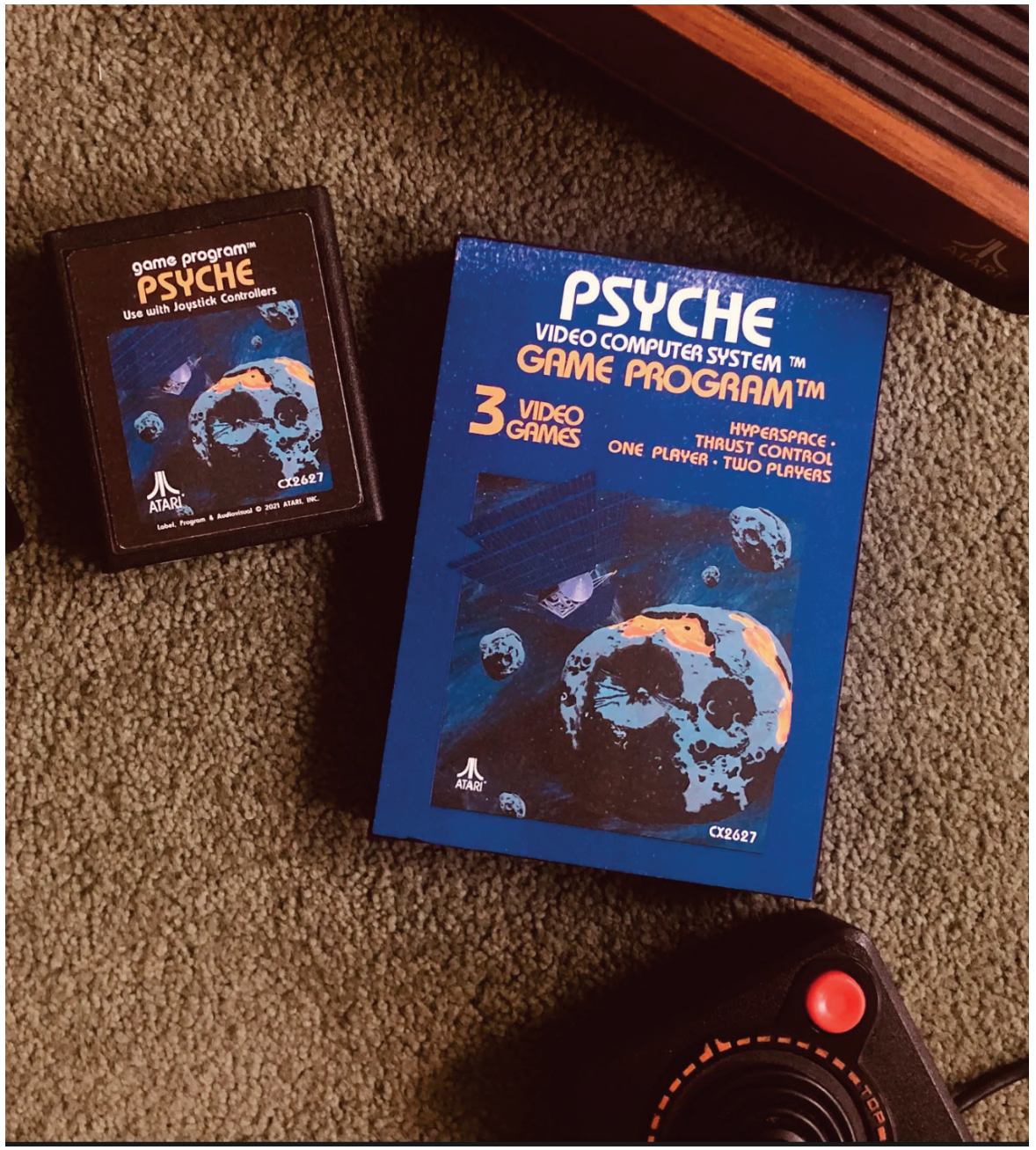
Zack Gibson
Graphic Design, 3D Rendering

With Piece of Psyche, I wanted to create packaging for a hypothetical miniature model of the Psyche asteroid that would be suitable for store shelves. My goal was to pack a lot of information about Psyche onto a small 5 inch box while retaining a modern, clean, and scientific aesthetic. The piece is digitally rendered to give viewers a sense of how the product would look in real life. I hoped to create something that could be seen in the educational toys and trinkets section of stores like Barnes and Noble that aim to educate both children and adults.

PSYCHE for Atari 2600

Mary Pyrdol
Graphic Design/Adobe Illustrator/ Procreate/Sticker Print

Whether it be by human or by machine, the concept of space exploration has always felt like a miraculous fantasy to me. Psyche's "Journey to a Metal World" slogan captures this feeling perfectly: venturing off into the unknown, anticipating groundbreaking discoveries. This fantastical concept reminds me of how entire worlds can be generated by video games, more specifically, Atari games. The intricately detailed art on Atari 2600 cartridges inspire the player to fantasize the computer graphics into dynamic, visual realities beyond the pixels. For my project, I aimed to capture this concept into my own version of an Atari game titled "PSYCHE". The visual on the cartridge box depicts Psyche bursting out of the frame, followed by an angular shot of the spacecraft on its orbital mission to study the asteroid. The cartridge label features this same visual, accompanied by an original Atari-style typeface describing how to play the game. Just as the original Star Wars movie posters of the 1970s and 80s, all Atari 2600 cartridge art was painted by hand. My cartridge label is designed in this motif, mimicking paint brush strokes in the background and utilizing realistic shading techniques on the spacecraft and in the asteroid's texture. The color palette I chose was inspired by bold tones found in 80s New Wave art, driving the idea of futurism into my interpretation of Psyche as an illusory experience.


game program™
PSYCHE
Use with Joystick Controllers
ATARI
CX2627
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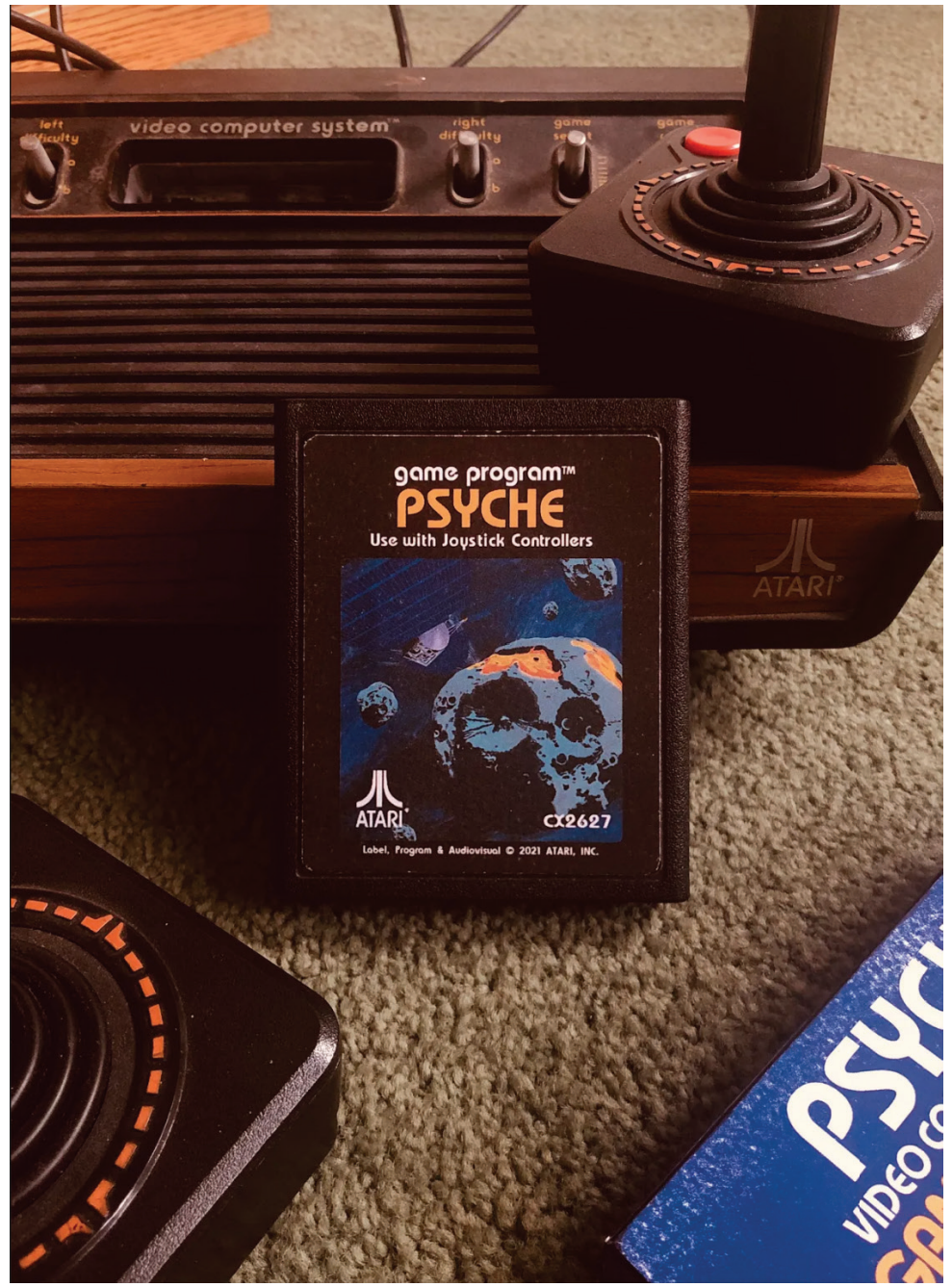
VIDEO COMPUTER SYSTEM ™
GAME PROGRAM™
3 VIDEO GAMES
HYPERSPACE · THRUST CONTROL
ONE PLAYER · TWO PLAYERS
ATARI
CX2627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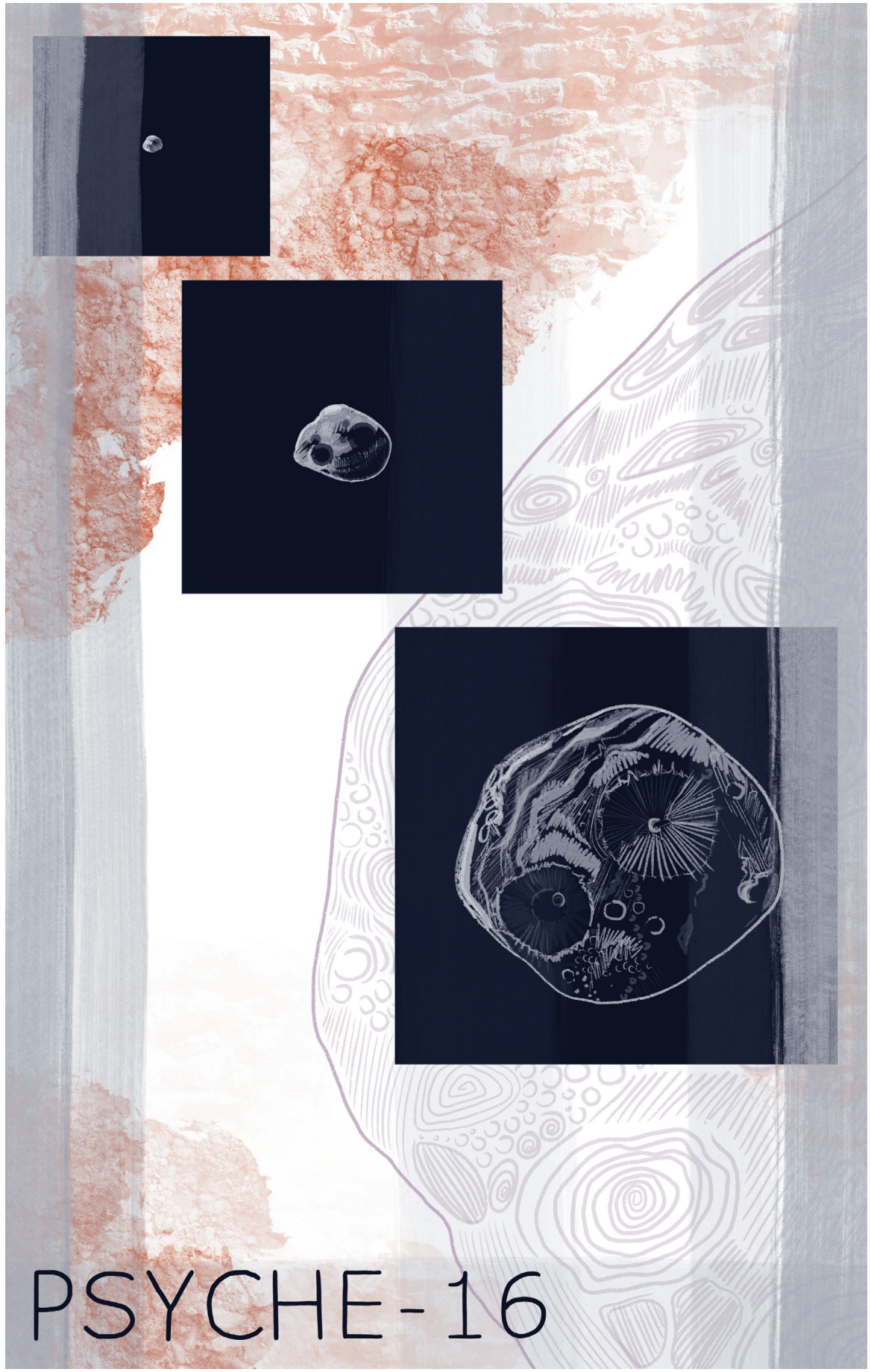

PSYCHE-16

Psyche, Simplified

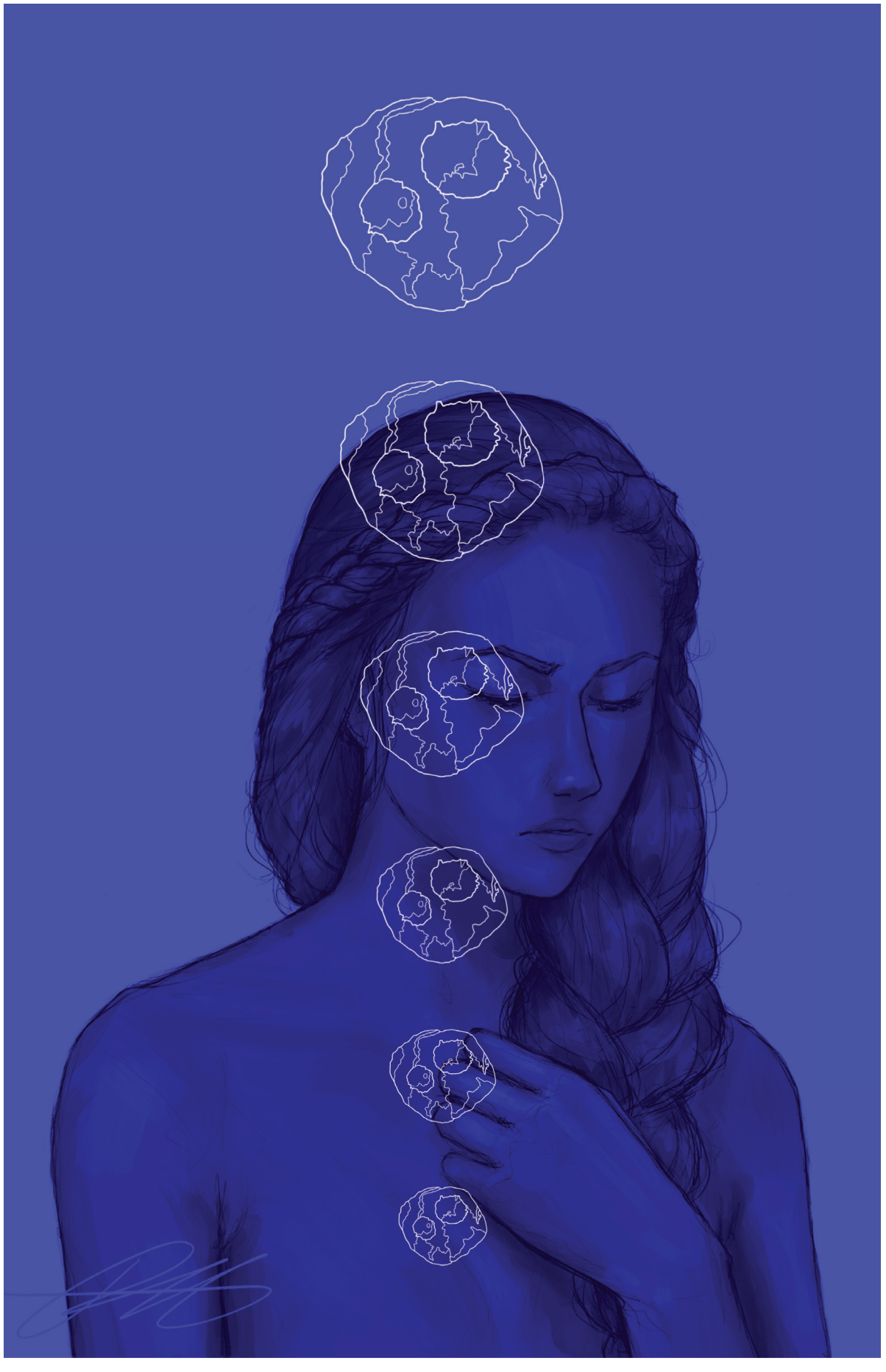
Jennah Colborn
Digital Illustration

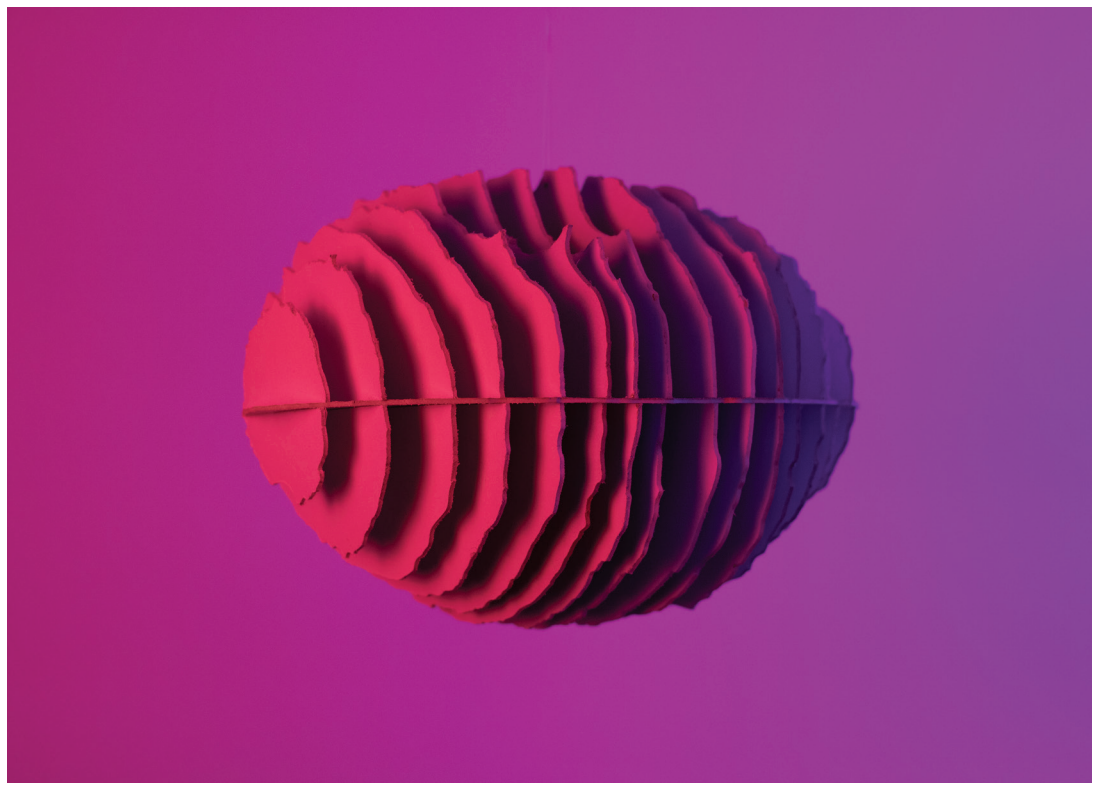
I wanted to take a step back from some of the more abstract representations of Psyche I've done, and return to the fundamental aspects of the asteroid. For this project I digitally illustrated Psyche-16 from different angles and perspectives in space: I created some concrete, simple black-and-white images of the asteroid from varying distances for the foreground, and some more playful ornate line drawings and rocky textures for the background. The background is composed of purple and orange, the designated Psyche mission colors, and are meant to give depth and diversity to the composition of the illustration as a whole. Finally, I incorporated handwritten text at the bottom of the image to frame it by its official name: "PSYCHE-16".

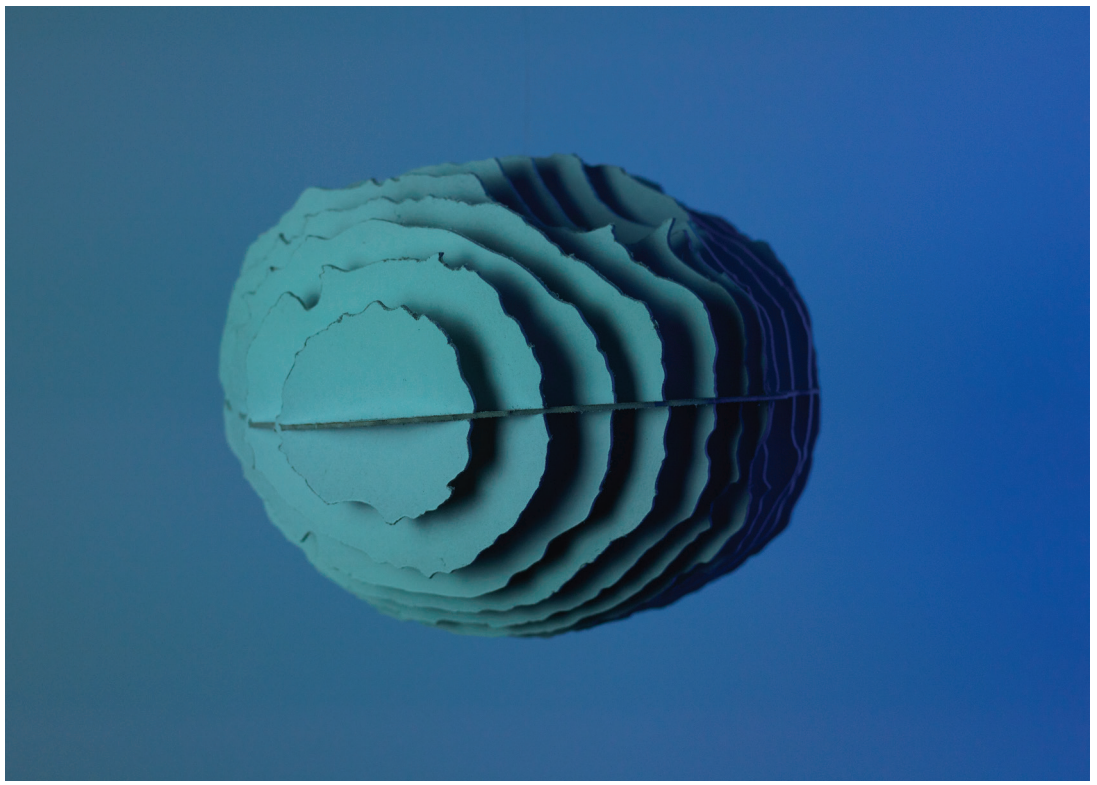
Soul

Phoebe Murphy
Digital Illustration

Soul is a companion piece to my first project: Innovation. While Innovation celebrates the technological advancements of the Psyche mission, Soul takes us back to the heart of the mission: the asteroid itself. Therefore, I wanted to create a more mellow and introspective piece to counter the vivacity and determination of Innovation. Together, all aspects of Psyche work in harmony.







SCAN ME

Layers of Psyche

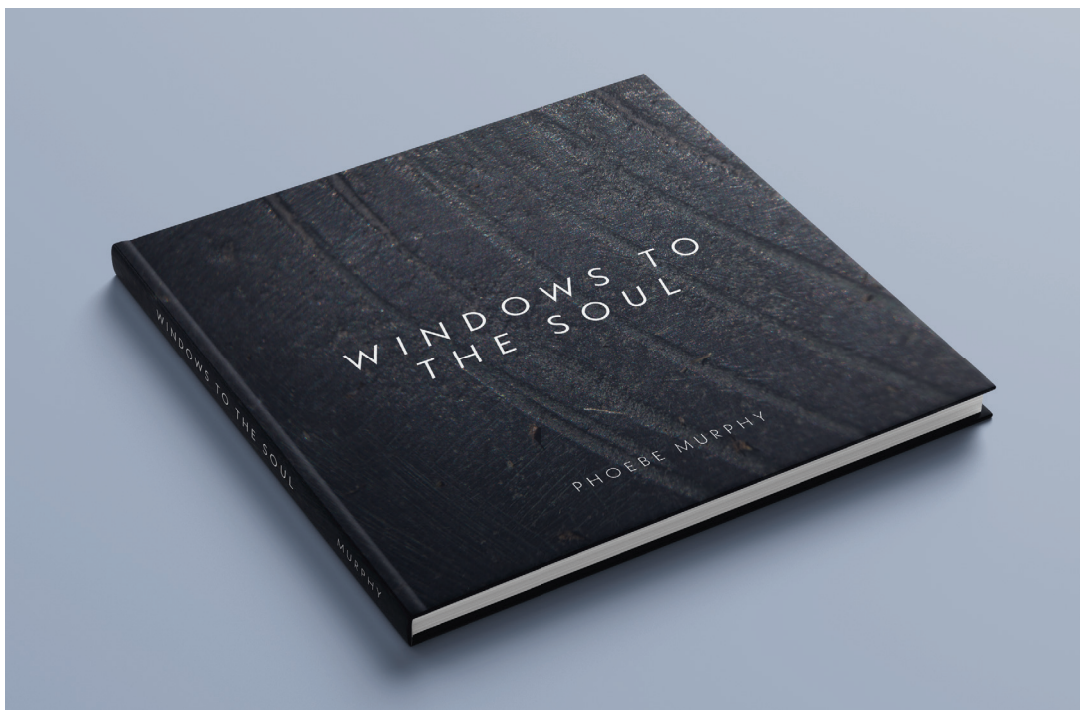
Zack Gibson
Sculpture, Chipboard, Spray paint

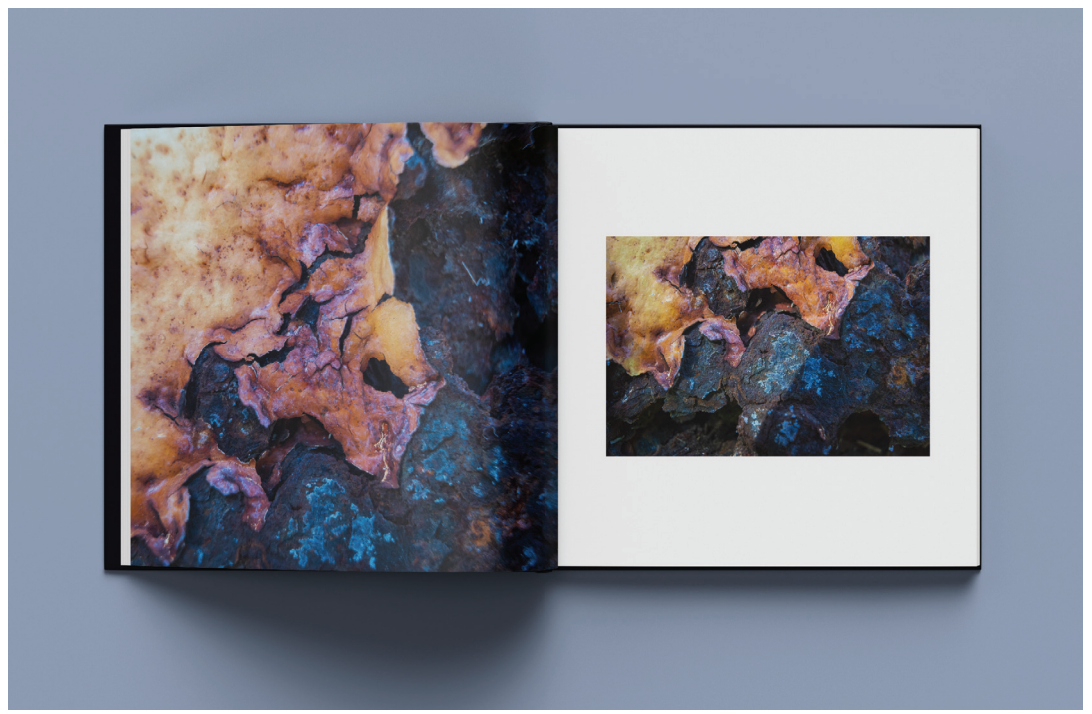
Layers of Psyche is a sculpture of the asteroid 16 Psyche. It breaks the asteroid down into 16 individual layers that are cut out from chipboard and spray painted white. The pieces were assembled like a puzzle, similar to how teams must come together for the mission to Psyche. The finished sculpture is hung with clear string and illuminated with different colored lights to add liveliness and represent an array of emotions felt by everyone involved and spectating with the mission. In an ideal exhibition space, the color of the lights would be ever-changing.

A Child's Psyche

Jennah Colborn
Acrylic Paint, Mixed Materials

While reflecting on what inspired me about Psyche and NASA's many other iconic missions, I found my thoughts frequently returning to childhood memories: visiting the local aerospace museum with my dad, looking through telescopes, & watching Star Trek late at night. These activities sparked a natural curiosity in me which, when coupled with a vivid imagination, ignited a lifetime passion for space exploration. I wanted to pay homage to that curious child in this project. I collaborated with a brilliant 8-year old space enthusiast, Zachary Fleck, to visualize what the surface of Psyche might look like from a first-person point of view. I cemented his drawing in the center of my painting to illustrate our central motivation for exploration: learning more about our universe for the simple pursuit of knowledge for knowledge's sake. I then applied mixed materials of aluminum foil, silver paper, & gemstones in layers across the canvas to illustrate the creativity and abstract thinking that goes into successful space missions. Creating this collage was very fun for me; I purposely used only materials I could find around my house, and tried to create something "imperfect" as I channeled my inner child. I believe that the end piece is playful yet inspiring, and that it reflects the pure heart of the Psyche mission.


WINDOWS TO
THE SOUL
PHOEBE MURPHY
WINDOWS TO THE SOUL
MURPHY



Windows to the Soul

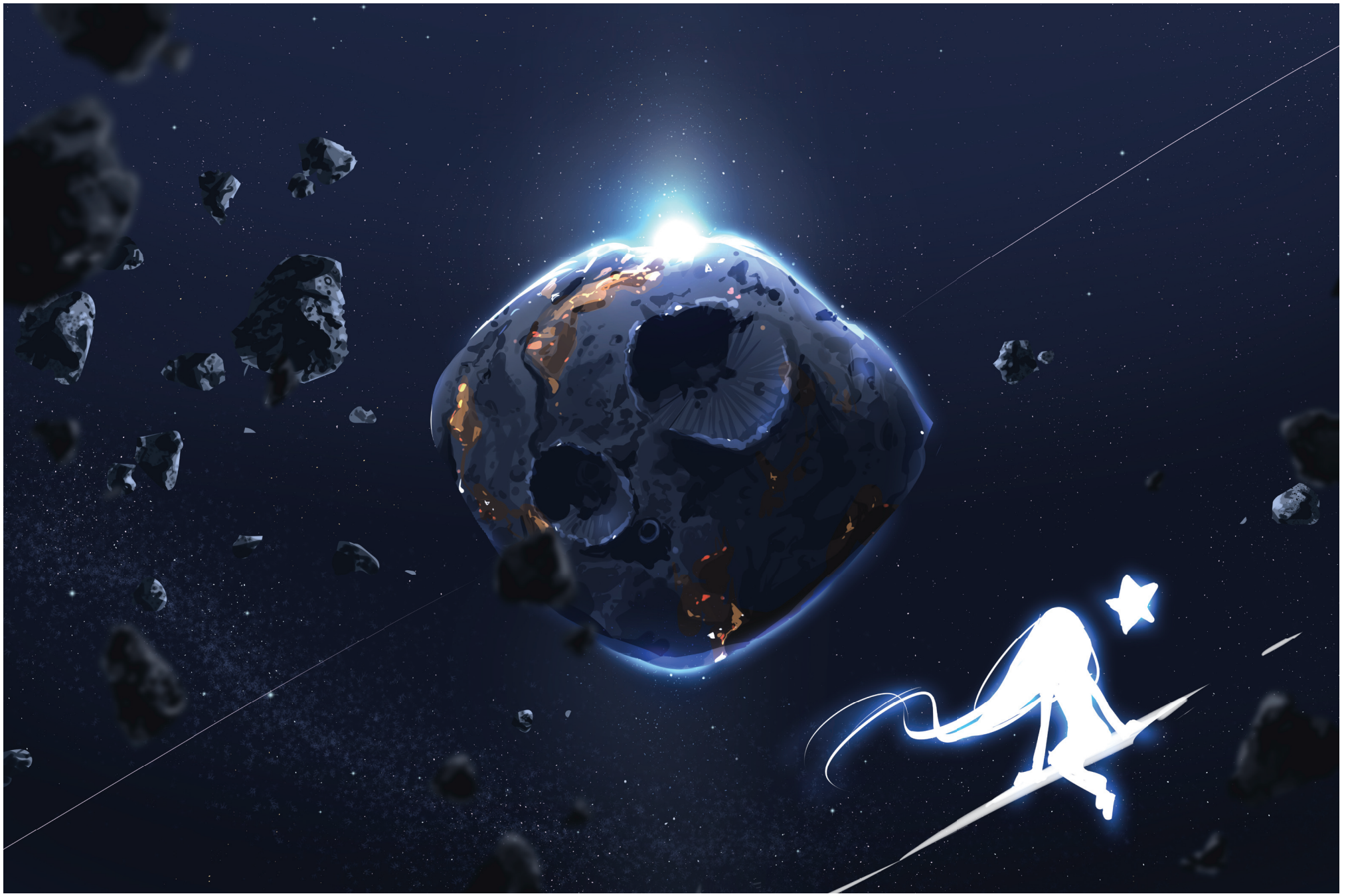
Phoebe Murphy
Photography/Book Design

Windows to the Soul is a photographic love letter to the unexplored metal world that is Psyche. With this collection, my goal was to immerse the viewer in a land of rich rocky and metal textures. There is also a theme of “looking closer,” as I took many of the images in pairs—one with my normal lens and another at macro distance. I wanted to invoke a sense of wonder, curiosity, and slight disorientation—feelings one might get while exploring Psyche for the first time.

Curiosity

Emily Ku
Digital Art: Clip Studio Paint

“Curiosity” is a piece that marks the beginning of one’s journey to find one’s soul. The figure is colorless and blank because they have not found their soul yet. The Psyche asteroid represents their soul, and the figure discovers it on its journey through the universe. It’s meant to symbolize the initial discovery of the soul: in unfamiliar terrain and a little out of reach, but it’s there. The curiosity behind what lies inside will beckon the figure forth and begin their journey to find their soul.



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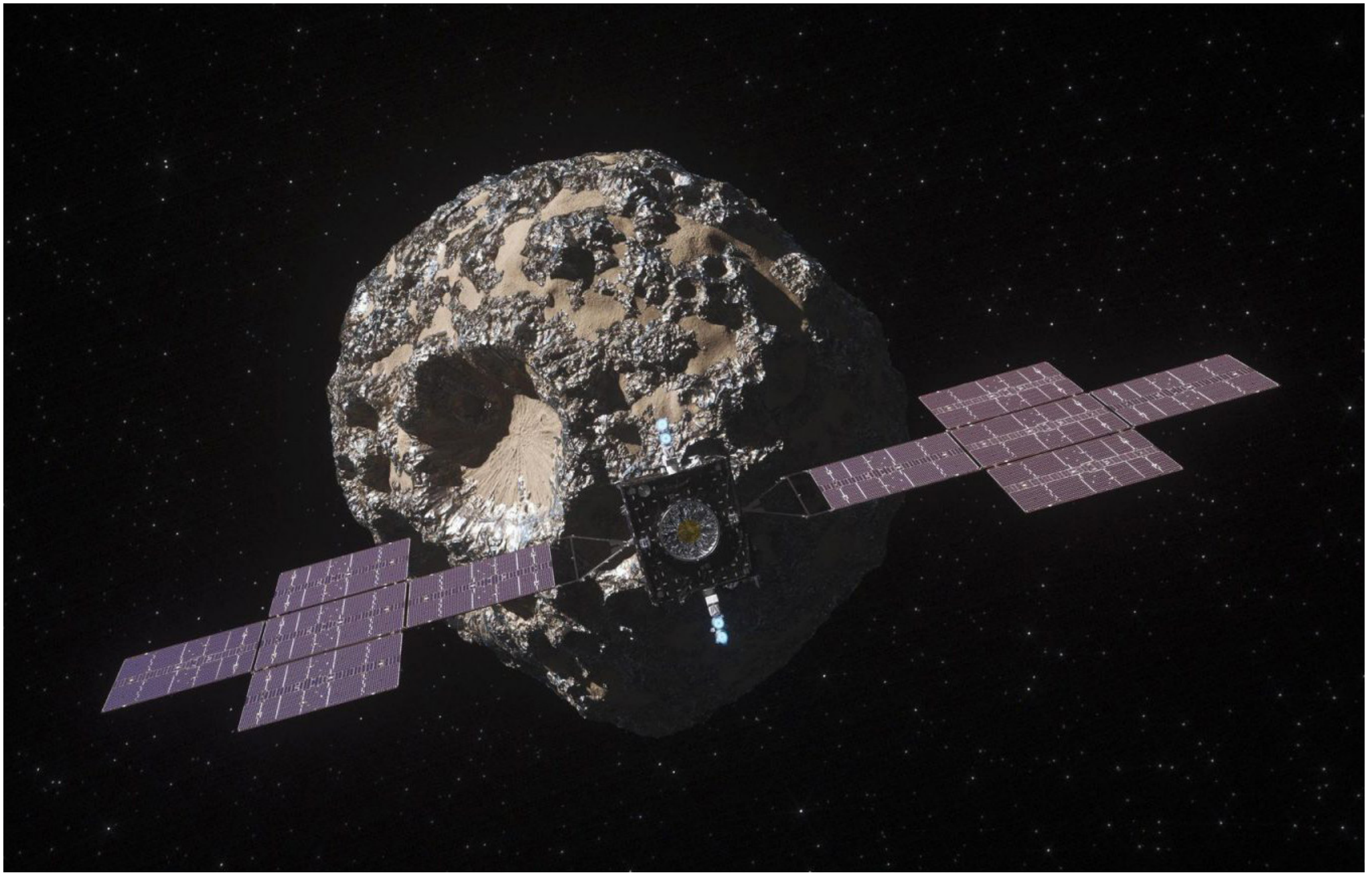


The Mission

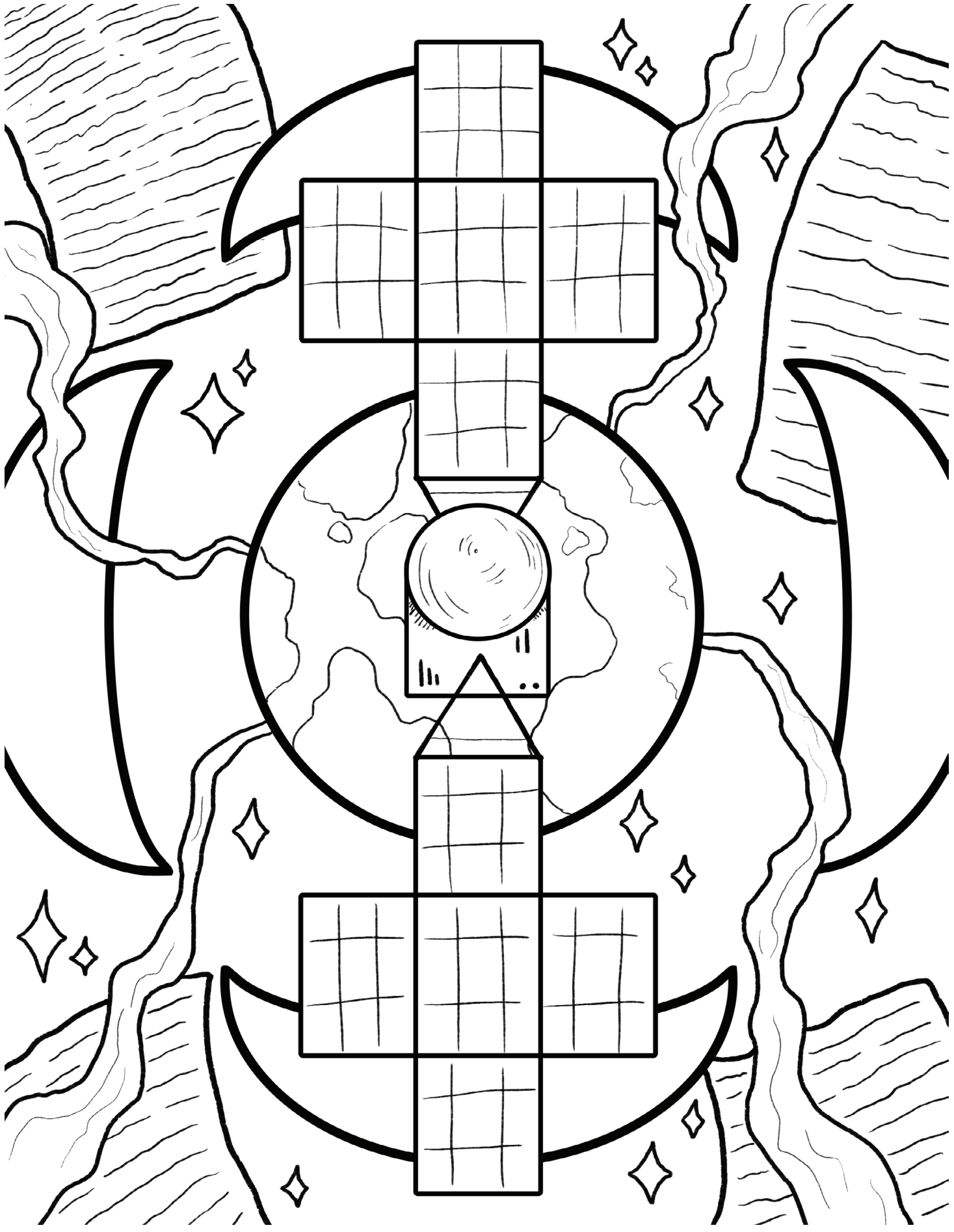
The Psyche mission was chosen by NASA on January 4, 2017 as one of two missions for the agency's Discovery Program, a series of relatively low-cost missions to solar system targets. The Psyche spacecraft will be used to study the Psyche asteroid after a period of cruising through the solar system using solar-electric (low thrust) propulsion.

Psyche Timeline Coloring-Book Zine

Caillyn Jeffery
Digital Illustration

This piece, an interactive coloring book zine, celebrates the six main phases of the Psyche Mission timeline. Each coloring page visually represents the goals or purpose of the phase, utilizing both abstract and literal forms. However, this piece is only partially finished... the final artwork is created by those engaging with the coloring pages, adding their own color and artistic vision to each!
The pages are purposefully left imperfect, with wobbly lines, overlapping lines, and more... this is to enhance the collaborative experience between myself and those who wish to participate in the coloring book.

Visual elements are pulled both from information displayed on the Psyche website, as well as my own interpretation of the events and purposes of each phase. Viewers are encouraged to print out the pages and add their own color! These images, if they wish to be shared, can be emailed to cajeffery@vt.edu.



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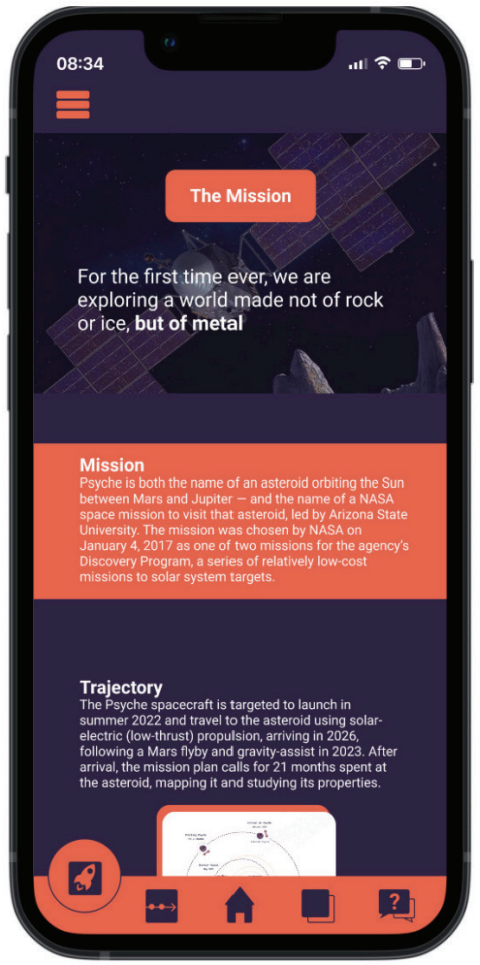
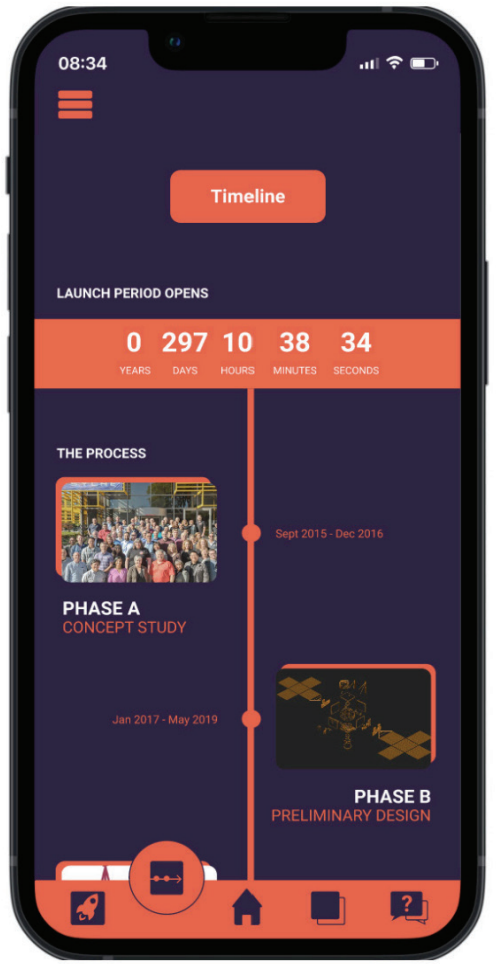
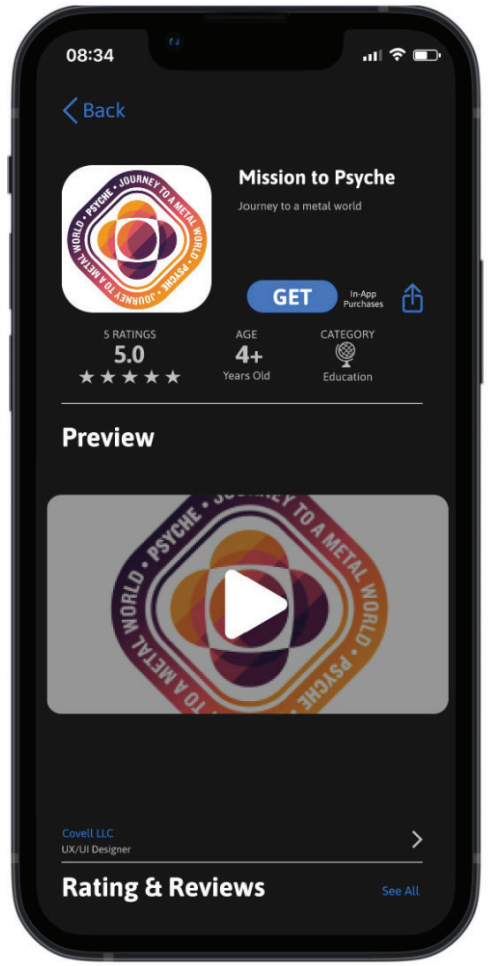

08:34
The Mission
For the first time ever, we are exploring a world made not of rock or ice, but of metal
Mission
Psyche is both the name of an asteroid orbiting the Sun between Mars and Jupiter — and the name of a NASA space mission to visit that asteroid, led by Arizona State University. The mission was chosen by NASA on January 4, 2017 as one of two missions for the agency's Discovery Program, a series of relatively low-cost missions to solar system targets.
Trajectory
The Psyche spacecraft is targeted to launch in summer 2022 and travel to the asteroid using solar-electric (low-thrust) propulsion, arriving in 2026, following a Mars flyby and gravity-assist in 2023. After arrival, the mission plan calls for 21 months spent at the asteroid, mapping it and studying its properties.


08:34
Timeline
LAUNCH PERIOD OPENS
0 297 10 38 34
YEARS DAYS HOURS MINUTES SECONDS
THE PROCESS
Sept 2015 - Dec 2016
PHASE A
CONCEPT STUDY
Jan 2017 - May 2019
PHASE B
PRELIMINARY DESIGN

08:34
PSYCHE-TEE
Sarah Rankin
May 12, 2021
Major: Physics
Genre/Medium: Embroidery, Ragian T-Shirt
About the work: I wanted to have a design on the shirt that was eye-catching enough to have people ask me where it was from, so I could get to tell them all about the Psyche mission! The front design is the asteroid with the satellite's panels branching off of it, and the back design is a borderless satellite taking off. I left an outline off of the solar panels and the back design because it made the shirt seem more welcoming and open. I also added the satellite's dimensions in kilometers on the sleeve. I hope that when people see the numbers, or the unfamiliar logo, it will invite them to strike up a conversation about the shirt and the Psyche mission as a whole.


08:34
Back
Mission to Psyche
Journey to a metal world
GET
In-App Purchases
5 RATINGS
5.0
AGE
4+
Years Old
CATEGORY
Education
Preview
Covell LLC
UX/UI Designer
Rating & Reviews
See All

SCAN ME

Redesigning Mission to Psyche App

Tori Covell
UX/UI and Figma

The Psyche mission app was already created by a group of Seniors at Arizona State University for their capstone project. I decided to redesign the app because it is extremely important to have information communicated clearly and be easy to use. I conducted a survey and asked people to download the current app and give me feedback what they wished to see more of and what improvements were needed. Based on those surveyed, I was able to create an up-to-date version of this app that was easier to navigate and anyone could use. I noticed in the current app it was missing all of the incredible information that the Psyche mission website provided, or it was only providing links to the website. So, I decided to replace the links to the website and include as much information as I could directly into the app, making it more compatible and equal to the website.

Using Figma, a vector graphics editor and prototype program, I created a prototype with layouts, colors, text, and navigation choices. In regards to design choices, I was inspired by the Psyche mission logo. I used the curves of the logo and applied them to all of the buttons and picture frames. This makes it more consistent throughout the entire app, which makes it easier for people to navigate and more intuitive. As for color choices, I, again, was inspired by the logo, but I wanted to add my own twist. So, I replaced the white with the purple from the logo, which I felt would feel more like Psyche's journey through space.

Collage of Psyche

Britney Hill
Digital Art / Collage

The Famous Psyche!

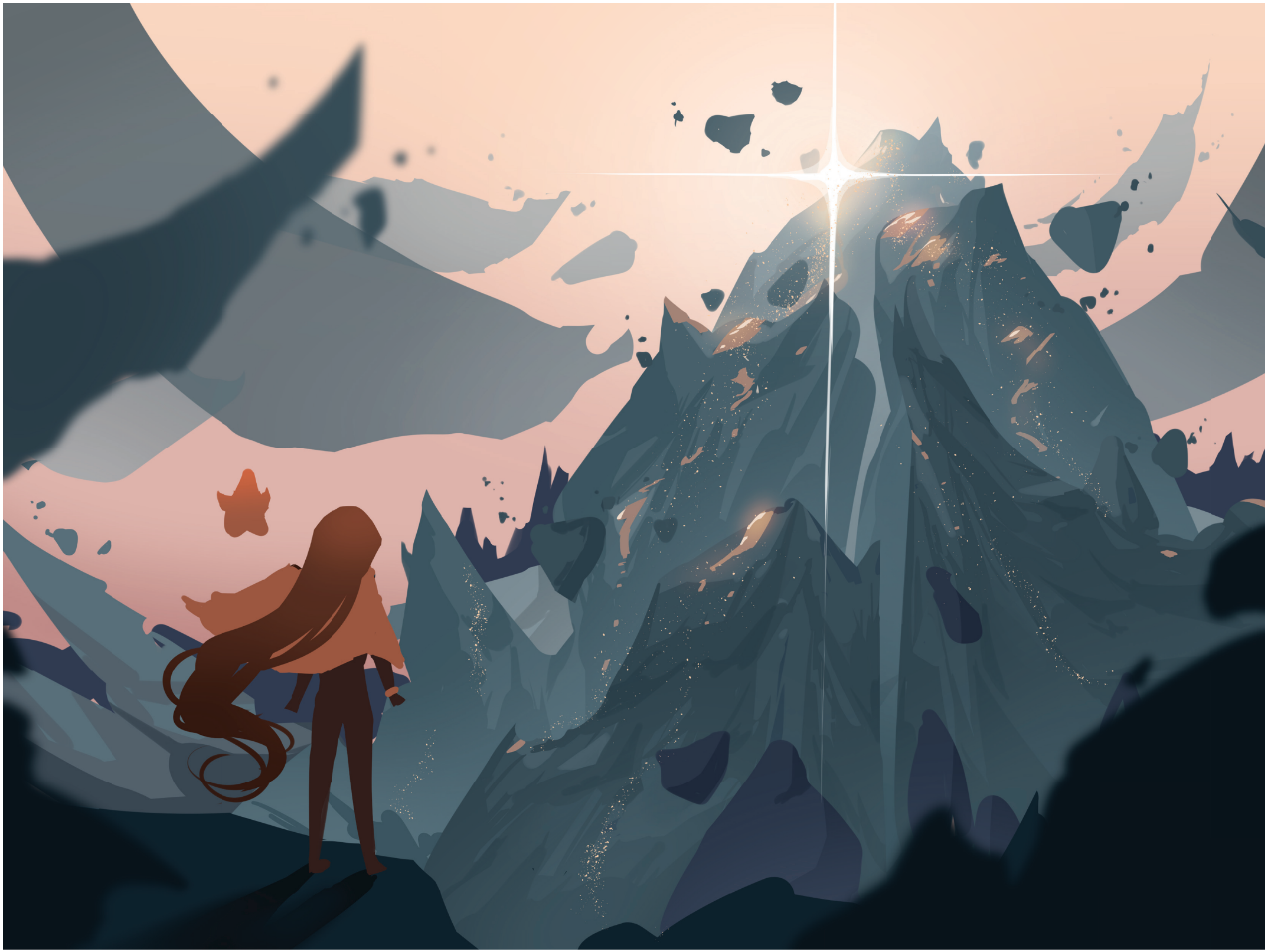
Inspired by celebrity fan art, this digitally created poster tells the story of the Psyche mission through a magazine collage. On the right, we have the goddess of the soul (namesake of the Psyche asteroid) posed between digitally manipulated depictions of Mars and Jupiter — similar to the orbital position of the Psyche asteroid in real-life. We also see four circular rings that represent the different orbit distances the mission instruments will collect data from. On the top is a “magazine” snippet from the mission website (psyche.asu.edu) explaining the significance of Psyche. Get your fan art ready, because the Psyche mission launch is set for the summer of 2022!

16 PSYCHE

Psyche was found in 1852 by Italian astronomer Annibale de Gasparis, who named it for the goddess of the soul in ancient Greek mythology.

What gives asteroid Psyche great scientific interest is that it is likely rich in metal. It may consist largely of metal from the core of a planetesimal, one of the building blocks of the Sun's planetary system. At Psyche, scientists will explore the history of the asteroid.

— psyche.asu.edu



Arrival

Emily Ku
Digital - Clip Studio Paint

Arrival is part 2 of this figure's journey to the Psyche asteroid and to finding their soul. The figure arrives on the surface of the asteroid and gazes at the metal world, full of shining mountains, unusual rock formations, and floating structures. Although it looks like a long and challenging journey, they may find what they are looking for at its peak.

Psyche Building Blocks

Katherine Page
Basswood, wood carving tools, acrylic paint

"Psyche Building Blocks" is a set of six basswood forms carved and painted by hand to mimic the nostalgic style of classic children's building blocks. Each block face is a different color of the rainbow and boldly depicts a letter, number or symbol pertaining to the Psyche mission. Letters spell out "PSYCHE" and "WONDER" to represent the value of wonder and curiosity in the mission, and the blocks can be arranged like puzzle pieces to form a picture of the spacecraft orbiting the asteroid, with the phrase "Journey to a metal world" floating inside the image. These blocks are designed to promote hands-on learning; they have to be held, shuffled and arranged to reveal each word or pattern. To invoke the colorful chaos of elementary school art sessions, the blocks are strewn about with spilled glitter, rubber bands, Legos, and a paint palette.

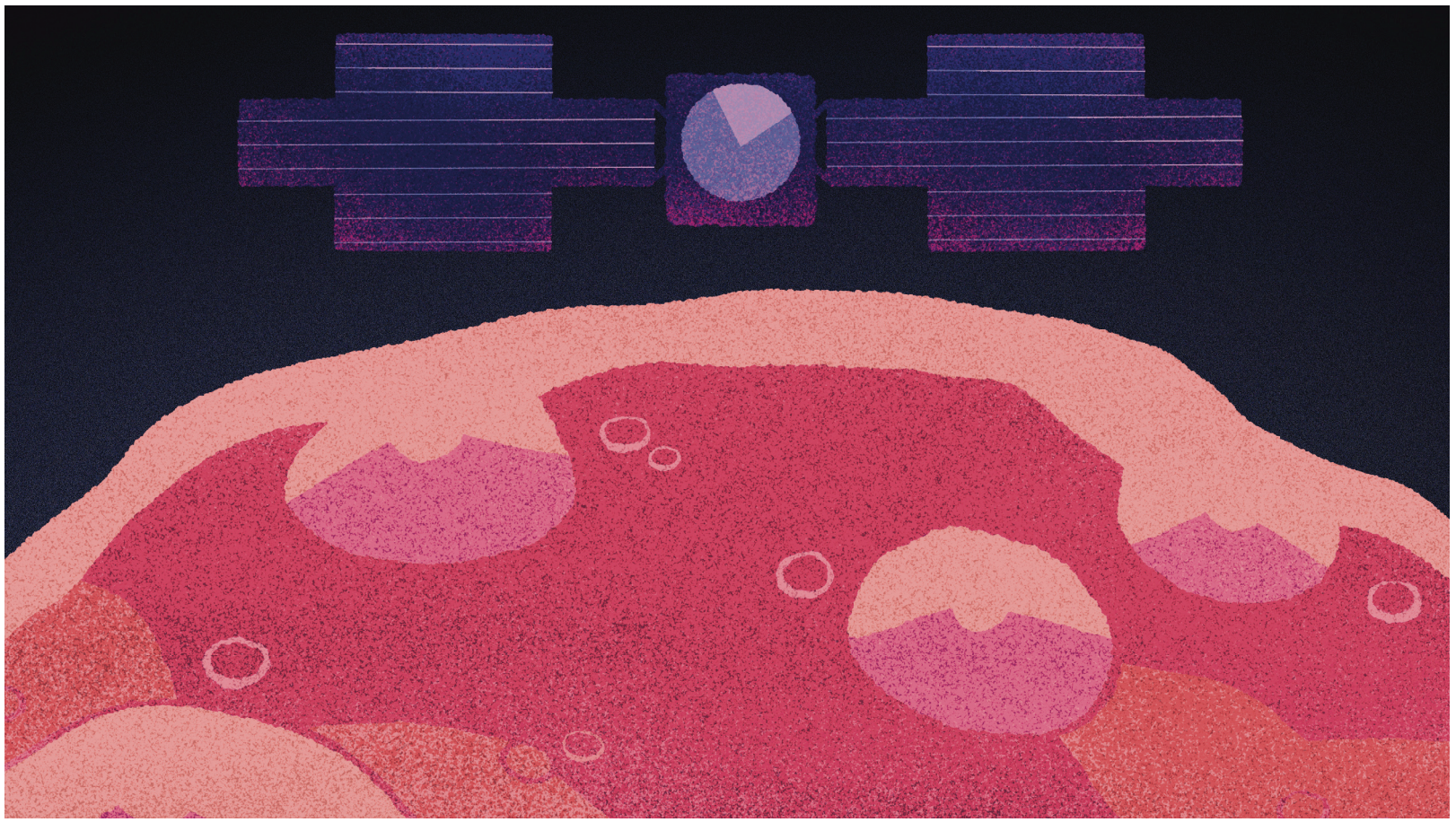
PSYCHE

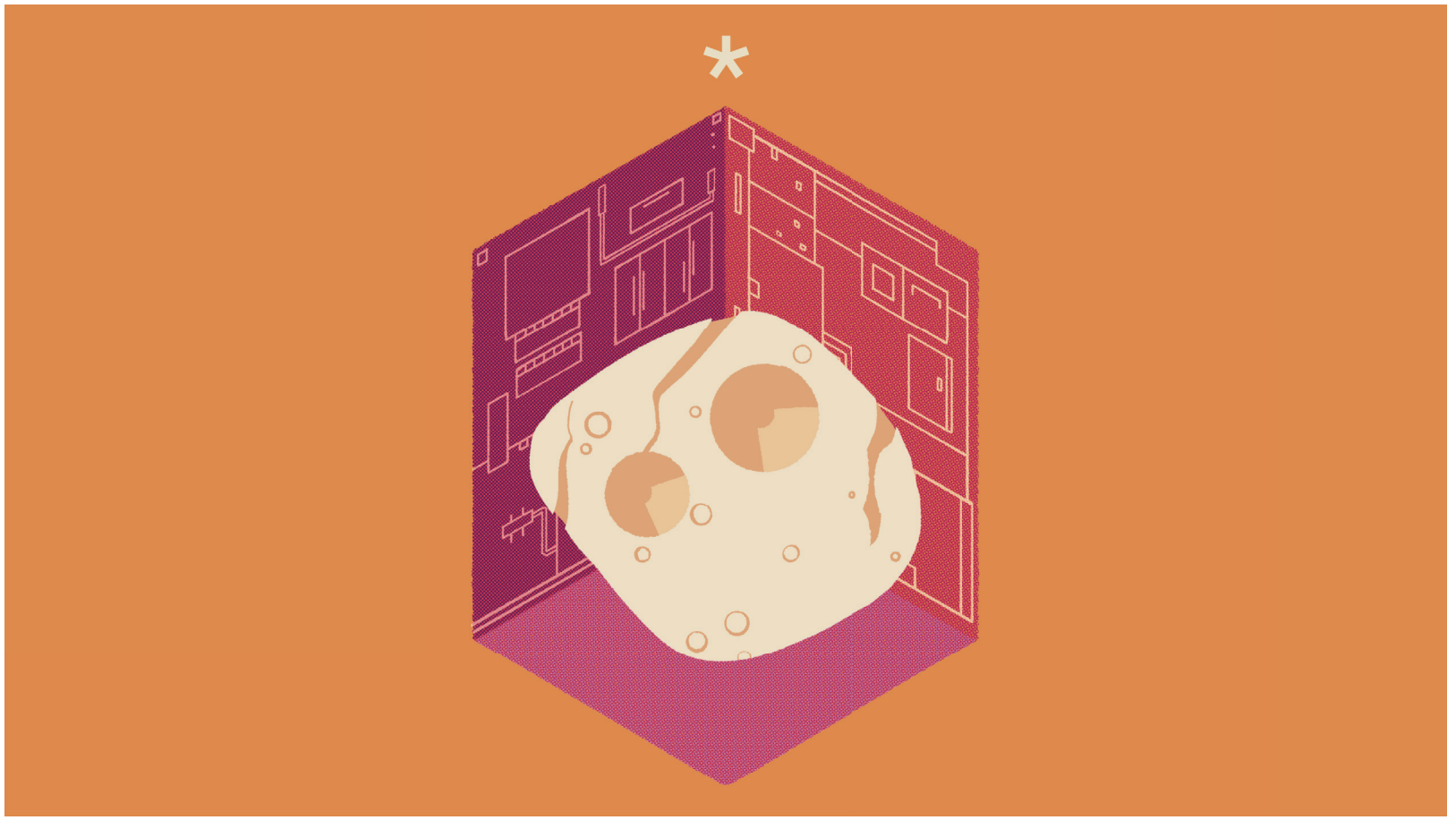
WONDER

16

A day
on Psyche:
4 hours
12 minutes!

PSYCHE
Journey
TO
A
METAL
WORLD





Psyche Wallpapers

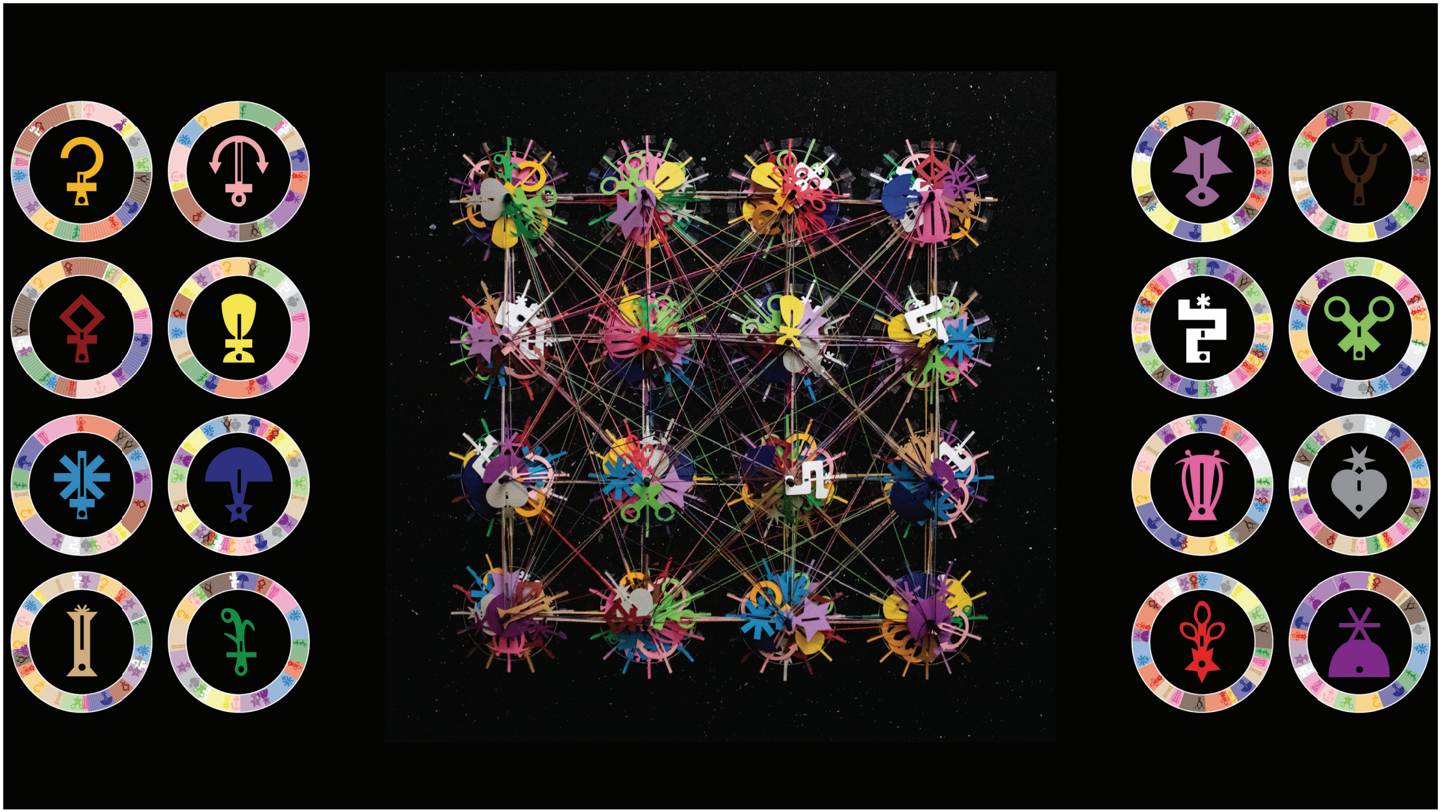
Chris Kim
Digital

I wanted to create desktop backgrounds showcasing the Psyche spacecraft and asteroid as an easy way to support for the mission while garnering interest from anyone else who may see it. I aimed to use a more graphic style in order to fit the modern look of most technology these days, but used grain on one of them to create a more organic feel to match the uncertainty of Psyche's surface. The primarily orange background is purposely more flat and inorganic as the focus shifts from the ragged surface to the precise build of the spacecraft body. I referenced the Psyche patch colors for both illustrations, but contrasted the two by shifting from one end of the palette (darker purples) to the other end (lighter oranges).

Psyche Calendar

Ranger Liu
Graphic Design, Adobe Illustrator

Psyche Calendar is a timekeeping system inspired by asteroids and based around the number 16 instead of 12. There are 16 months to the year, each named for one of the first 16 discovered asteroids. Weeks are 16 days long and are split into two 8-day periods, with weekdays also named after the first 16 discovered asteroids. Psyche Calendar New Year's falls on Psyche's discovery day, Gregorian Calendar March 17. Similarly, the "current era" for Psyche Calendar starts with the year of Psyche's discovery, 1852. This epoch is denoted as "M.P.", which stands for "metapsyche", meaning "after psyche". Previous years are denoted as "P.P.", which stands for "propsyche", meaning "before psyche".



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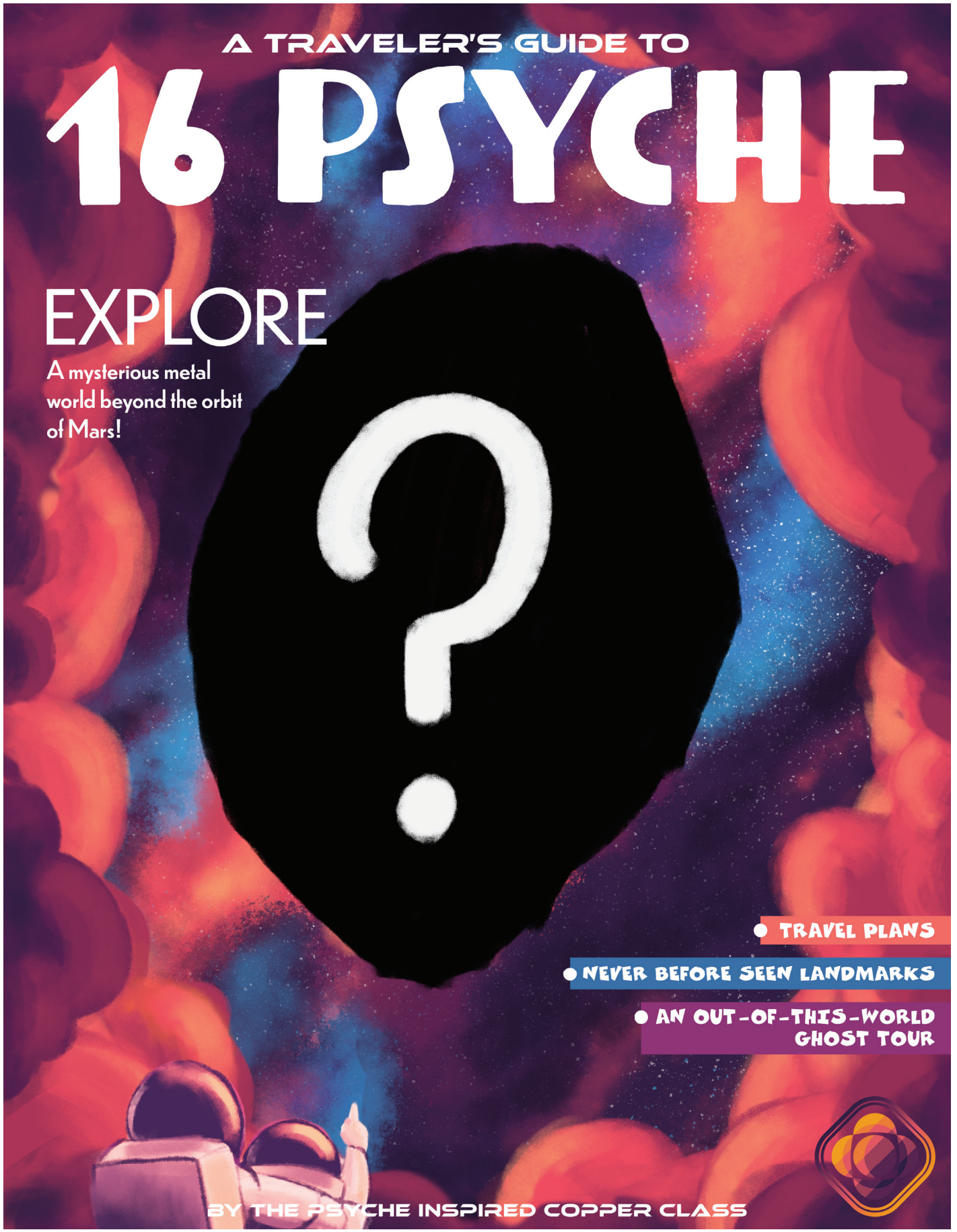

A TRAVELER'S GUIDE TO
16 PSYCHE
EXPLORE
A mysterious metal world beyond the orbit of Mars!
TRAVEL PLANS
NEVER BEFORE SEEN LANDMARKS
AN OUT-OF-THIS-WORLD GHOST TOUR
BY THE PSYCHE INSPIRED COPPER CLASS

SCAN ME

A Traveler's Guide to 16 Psyche

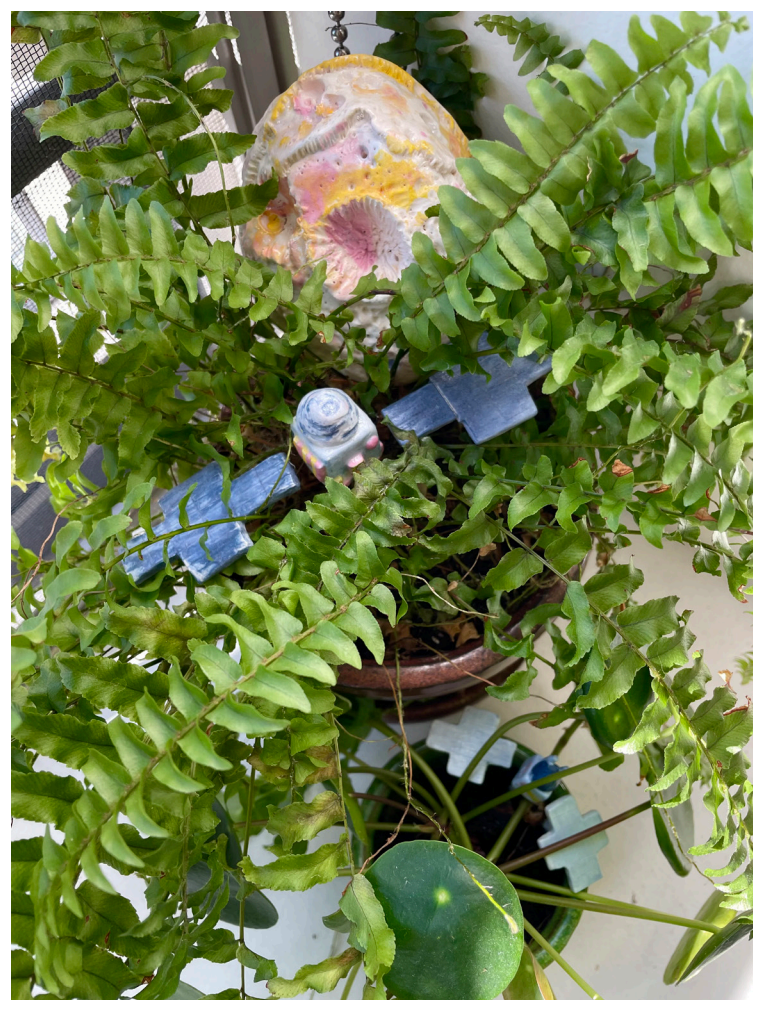
G. Marshall Wolff
Illustrated Book, Procreate, Photoshop

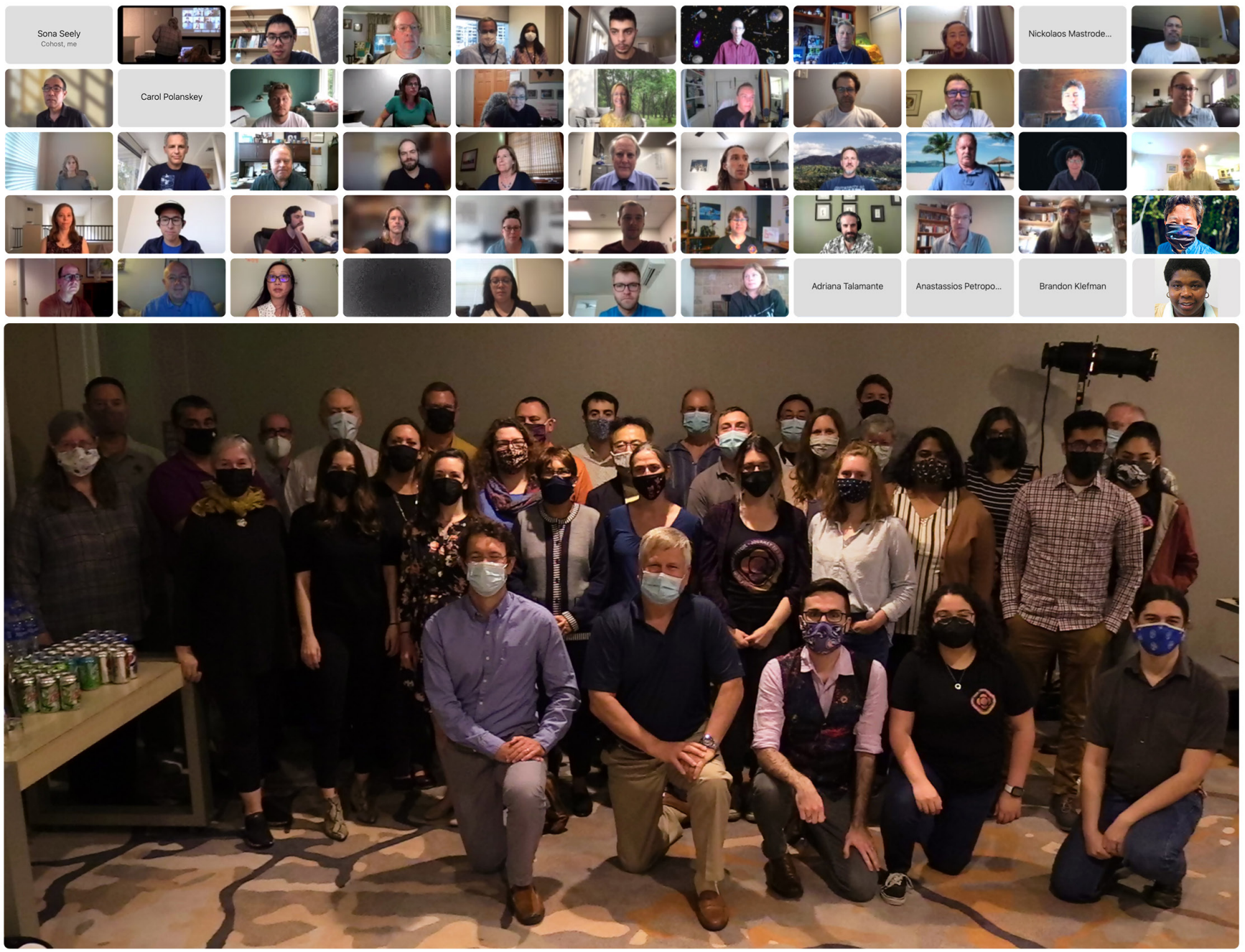
This is a short illustrated book meant to provoke interest and provide information about the mission. I focused on creating visually appealing illustrations that are more decorative than informative to help make the subject more interesting and lead the audience to read the paragraphs. The illustrations are also meant to provide a layered 3D effect for the associated augmented reality experiences that will be made for each of the pages.

Psyche Stoneware

Katherine Page
Stoneware clay sculpture with underglaze, hot glue, Mod Podge, cotton swabs

My ceramic plant decorations incorporate a combination of elements that bring me joy: excitement for the Psyche mission, the greenness of Earth's nature, and the therapy of clay hand-building. The larger spacecraft was designed to mimic the form of the real-life structure and the smaller spacecraft is a simplified version meant for smaller potted plants. Though the texture, contents, and exact shape of the asteroid is yet to be understood, I mimicked the form that is portrayed by the mission's website. An essence of my personality was left on each form through splotches of my favorite colors, and they are completed by their green plant habitat that beautifully connects science and art.




Sona Seely
Cohost, me
Carol Polanskey
Nickolaos Mastrode...
Adriana Talamante
Anastassios Petropo...
Brandon Klefman

The Team

Initially, the Psyche team was composed of five individuals, which grew to about 140 by the time of the site visit from NASA in 2016. The site visit is an intense, highly technical in-person review done by a select group of science, technical, and industry experts. They review every detail of the proposed mission, from concept and design, to execution and science application, as well as how the mission personnel from different institutions work together as a team.

As the mission continues to progress, more team members are added as needed. Currently, the Psyche team is comprised of many hundreds of individuals and seventeen different partners with a variety of specialties, including science, engineering, management, business, outreach, and education. Each member of the Psyche team plays an important role in the mission, ensuring that the mission proceeds on schedule and achieves its mission goals and objectives.

Cyclical

Chris Kim
Digital

For this piece, I wanted to try something more abstract with the intent of piquing interest about the mission. The camera starts from the middle as it focuses on the "core," then pulls out to reveal the larger picture. The shape and colors are also taken from the patch.

SCAN ME

Copper Quilt

Caillyn Jeffery
Fabric, Woodblock print

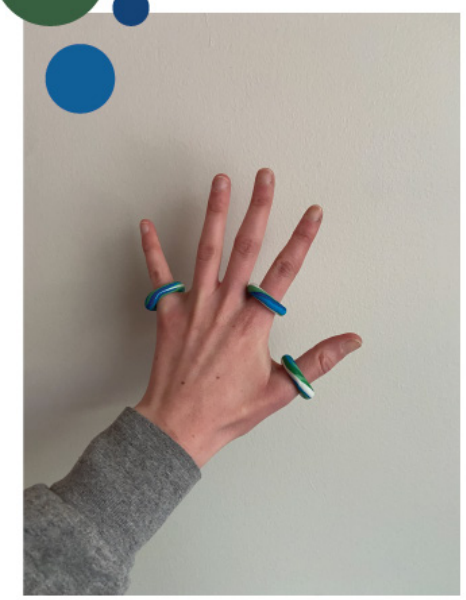
This piece represents an exploration of material, method, and meaning. For this piece, I decided to practice woodblock printmaking on fabric. As I printed each individual square, each piece became unique from the others. I became enchanted by the idea that despite the material and method being the same, each individual piece can stand alone as a unique image. Yet together, the pieces come together to form something beautiful. This art piece represents the many individuals, organizations, and entities that are coming together to make the Psyche mission happen.

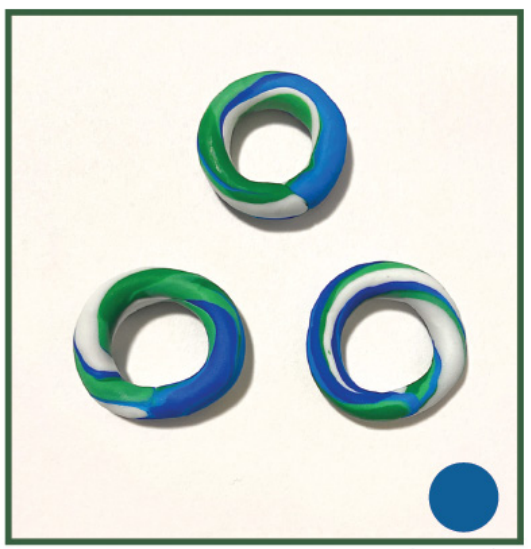
Journey to Psyche Rings

Tori Covell
Polymer Clay

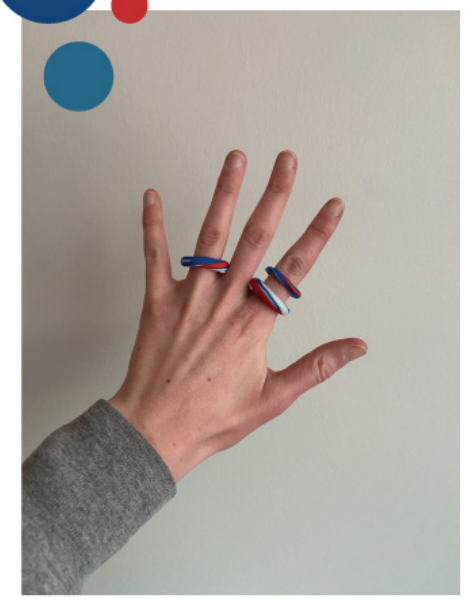
As a Graphic Designer, I mostly work in the digital realm. So for this project I wanted to challenge myself and work with a hands on project such as using polymer clays! There are different ways to work with polymer clay but I wanted to create something that was more trendy and unique that is related to “Journey to Psyche!” I decided to create six different themes with a total of 18 rings. I chose 18 because Psyche was discovered in 1852.

Earth

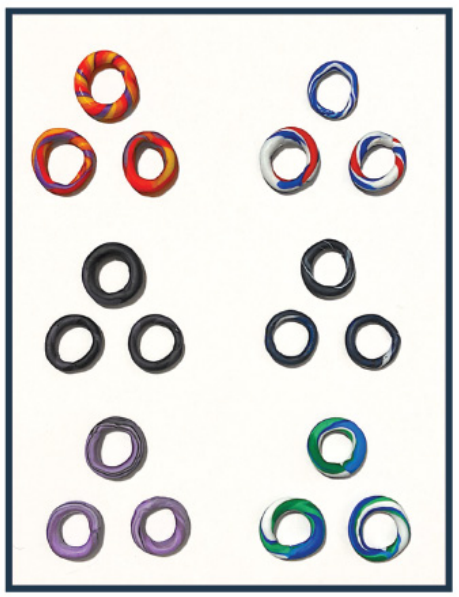




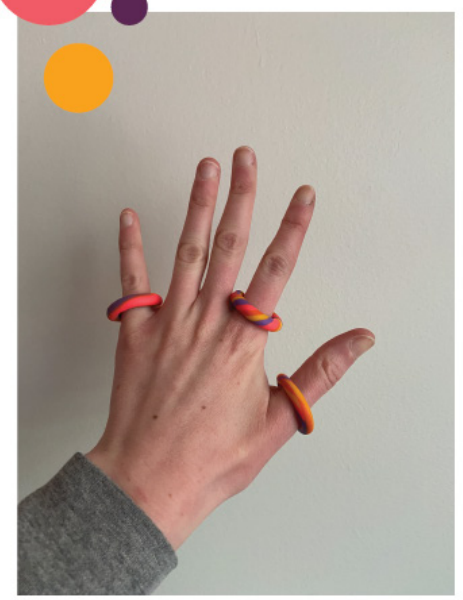
NASA



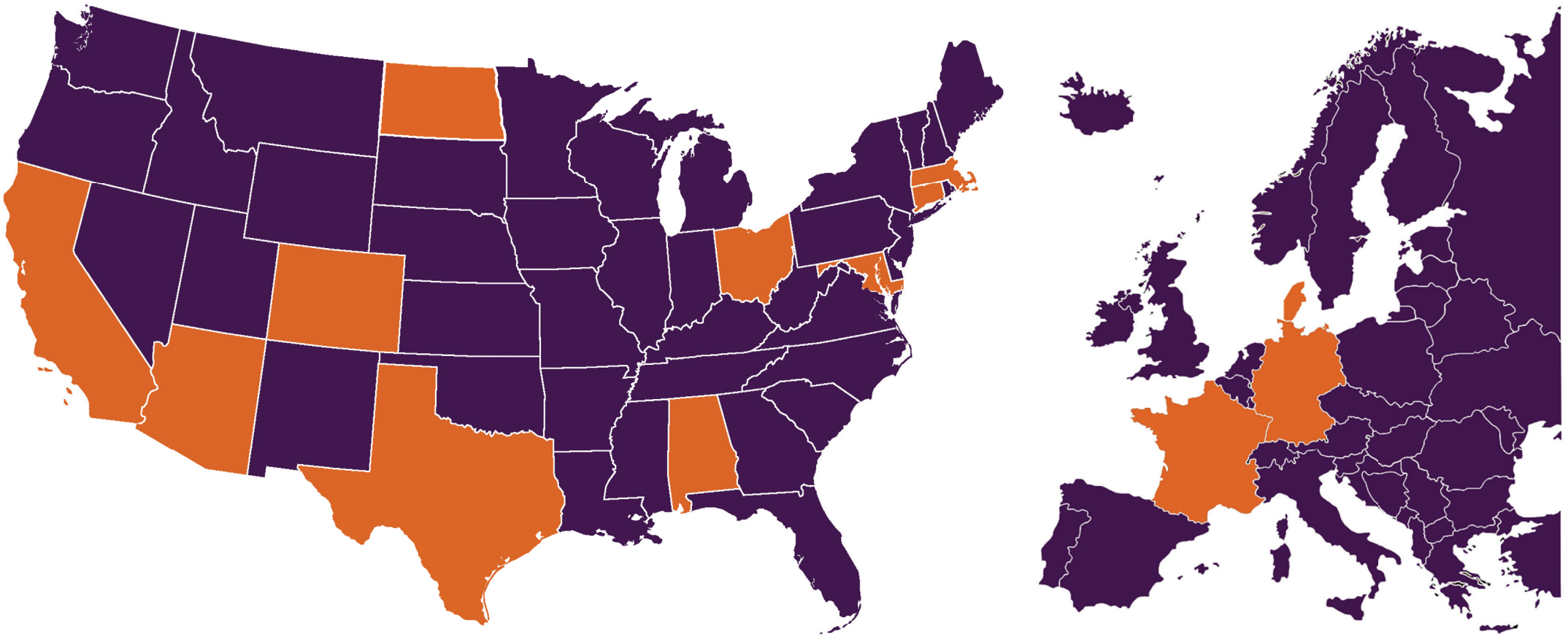
Journey to Psyche Rings



Psyche Inspired Logo



Psyche Map by Hannah Sweis



Please hover over a state to view the details

SCAN ME

A Map of the Psyche Mission

Hannah Sweis
Digital art & html/CSS coding

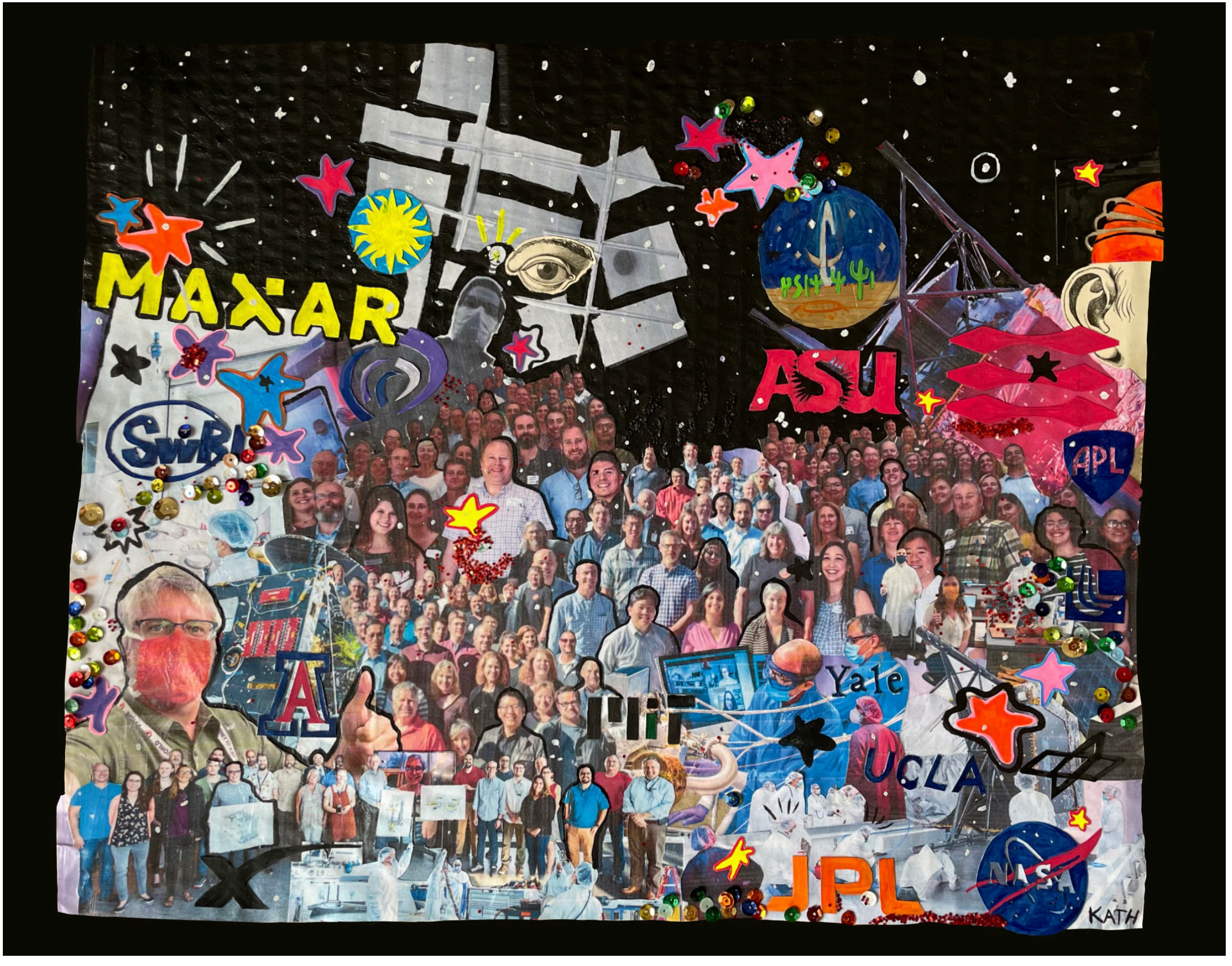
This map serves as a visual representation for the names and faces of the people around the country and around the world who are involved in the Psyche mission. Rather than reading a list of names, this informational graphic shows where all of the Psyche mission contributors are located to demonstrate how widespread the impact and teamwork of the Psyche mission is, and it puts a face to their names. While the photo graphic shows all of the involvement at once, the coded file provides an interactive element of the project – where hovering over a highlighted region reveals who is involved at each site, as well as their role in the Psyche mission.

Team

Katherine Page
Multi-media collage on cardboard (paper cutouts, paint, sequins, glitter and Mod Podge)

This collage is like a big thank-you card for each individual involved in the Psyche mission. The Psyche mission is made up of hundreds of people, organized into teams ranging from project system engineering to grad student collaborators. Though many are working in different spaces at different moments, they are all contributing time, knowledge and passion to a collective goal of uncovering the wonders of 16 Psyche.

My collage uses photographs, sequins, paint and handmade logo cut-outs to capture the beautiful chaos of the Psyche mission and represent the disciplines and backgrounds that work together. In this piece, focused engineers and ponderous researchers work amidst bright pink stars and splashes of sequins, because intellect and creativity go hand-in-hand. Many Psyche team members share other passions like music and art that stemmed from childhood and remained a creative outlet, and I wanted to emphasize this commonality of a science-arts balance in my work.


MAXAR
ASU
SwRI
APL
Yale
UCLA
JPL
NASA
KATH

AMERICAN
APPAREL

A New Psyche

Jennah Colborn

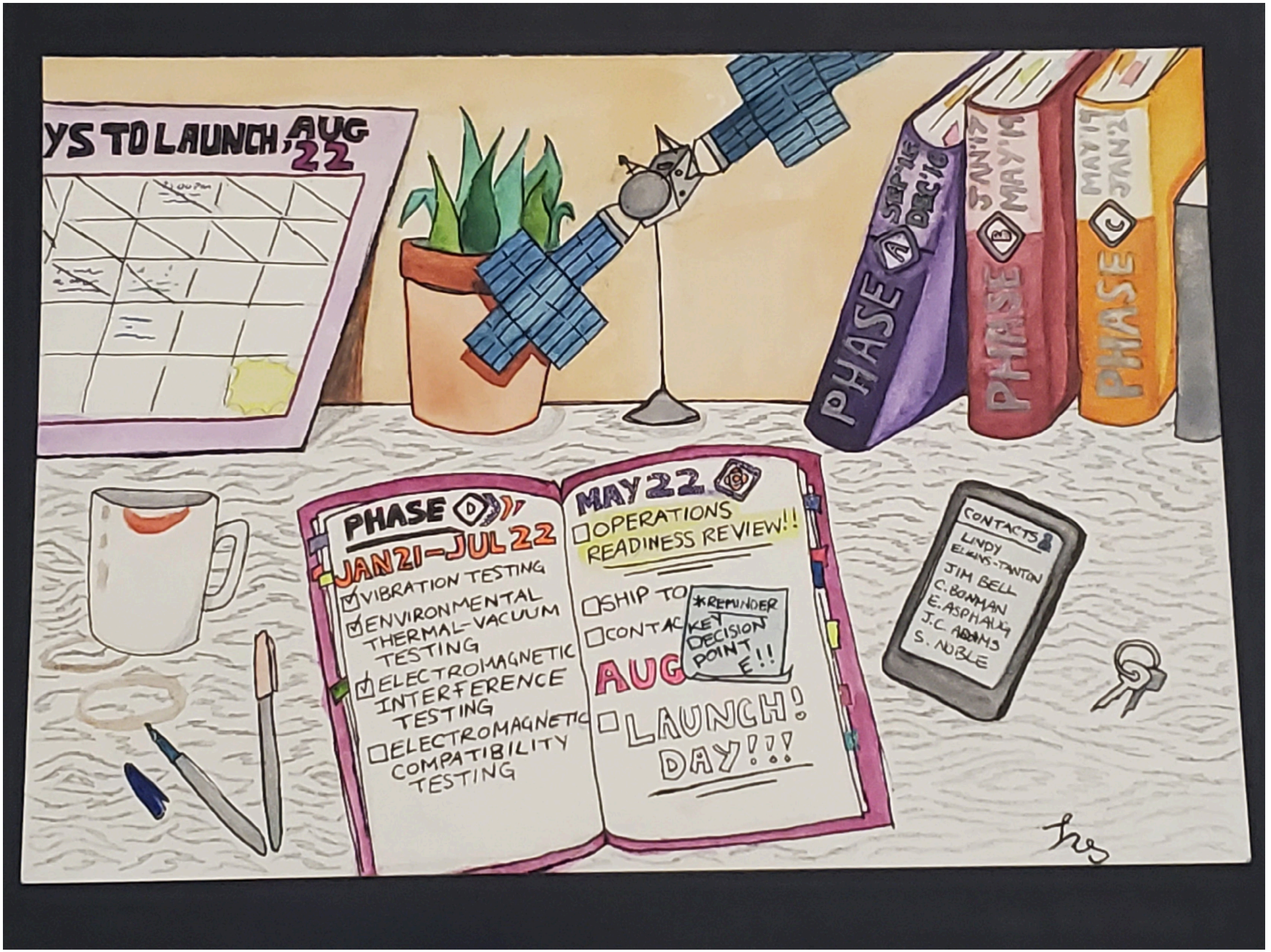
Acrylic paint, yarn, shoes

For my final piece, I wanted to break out of my comfort zone one last time and experiment with physical artwork, repurposing a pair of thrifted shoes into wearable art inspired by the Psyche mission and team. I felt that I hadn't yet examined the human spirit of the mission, and this is my attempt to do so by paying homage to one of the most iconic markers of humanity in space exploration: footprints. Our first steps into the cosmos are still imprinted on the Moon's dusty surface; this imagery led me to think about the relationship between the human body, mobility and exploration. So, I wanted to create some Psyche-inspired footwear. I incorporated elements from my past pieces into this one, playing with asteroidal texture and abstract soulful design to wrap everything up into one piece— and of course, utilizing the Psyche purple and orange!

A Day in the Life on the Psyche Mission

Hannah Sweis
Watercolor and Ink

This piece represents what someone working at the Psyche mission might see day-to-day – what their desk might look like – to provide an image of the mission for people unfamiliar with the project. The books represent the phases that the Psyche mission has gone through, and the open planner indicates the current phase with the necessary steps involved for the success of the mission.


YS TO LAUNCH, AUG 22
PHASE A SEP'16 DEC'16
PHASE B JAN'17 MAY'19
PHASE C JAN'21 MAY'21
PHASE D
JAN21–JUL 22
VIBRATION TESTING
ENVIRONMENTAL THERMAL-VACUUM TESTING
ELECTROMAGNETIC INTERFERENCE TESTING
ELECTROMAGNETIC COMPATIBILITY TESTING
MAY 22
OPERATIONS READINESS REVIEW!!
SHIP TO
CONTAC
*REMINDER KEY DECISION POINT E!!
AUG
LAUNCH! DAY!!!
CONTACTS
LINDY ELKINS-TANTON
JIM BELL
C. BONMAN
E. ASPHAUG
J.C ADAMS
S. NOBLE

Bill Klipstein

Serge Dubovitsky

Abi Biswas

Hernan Erlig

Greg Agnes

Maggie Scholtz

Chris Vorhees

Colin Bateson

SCAN ME

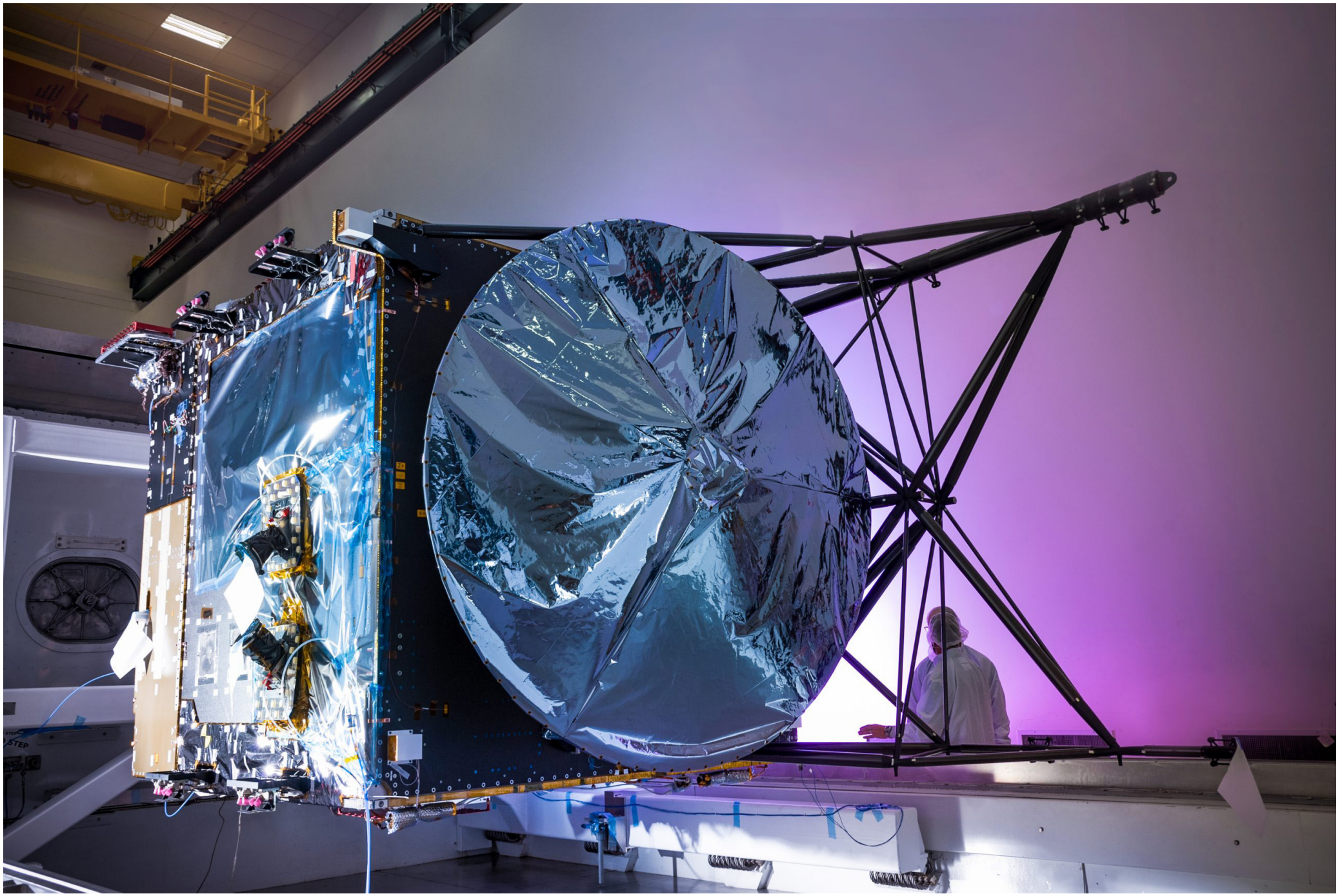
Psyche Credits

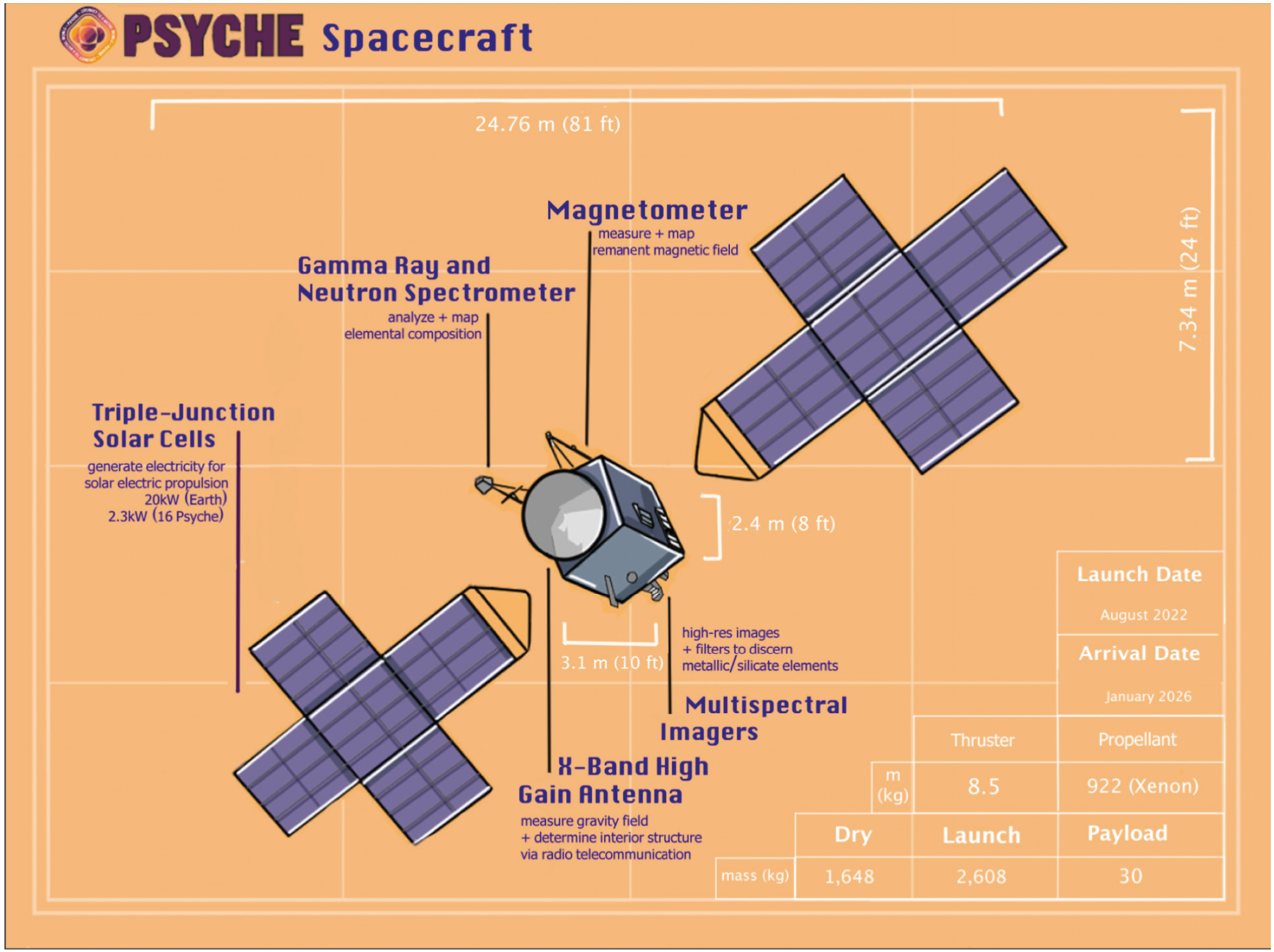
Maia Huddleston
Animated Sequence

This video shows each team and its members working on the Psyche mission. As someone brand new to animation, this took me over 30 hours to complete. Check out the current team list here! https://psyche.asu.edu/mission/the-team/full-psyche-team/

Instruments & Science Investigations

To study the Psyche asteroid up close, the Psyche spacecraft is equipped with multiple instruments and investigations. These include the multispectral imager, gamma ray and neutron spectrometer, magnetometer, a radio science experiment, and the Deep Space Optical Communications (DSOC) technology demonstration. With the aid of these instruments and investigations, the mission seeks to determine whether Psyche is a core, or if it is unmelted material, determine the relative ages of regions of Psyche's surface, determine whether metal bodies incorporate the same light elements as are expected in the Earth's high-pressure core, determine whether Psyche was formed under conditions more oxidizing or more reducing than Earth's core, and characterize Psyche's topography.




PSYCHE Spacecraft
24.76 m (81 ft)
7.34 m (24 ft)
Magnetometer
measure + map
remanent magnetic field
Gamma Ray and
Neutron Spectrometer
analyze + map
elemental composition
Triple-Junction
Solar Cells
generate electricity for
solar electric propulsion
20kW (Earth)
2.3kW (16 Psyche)
2.4 m (8 ft)
3.1 m (10 ft)
high-res images
+ filters to discern
metallic/silicate elements
Multispectral
Imagers
X-Band High
Gain Antenna
measure gravity field
+ determine interior structure
via radio telecommunication
Launch Date
August 2022
Arrival Date
January 2026
Thruster
Propellant
m (kg)
8.5
922 (Xenon)
Dry
Launch
Payload
mass (kg)
1,648
2,608
30

Psyche Spacecraft Blueprints

Hannah Sweis
Digital

As an Engineering Major, the idea of creating an artistic rendition of Psyche Spacecraft blueprints was intriguing. While this piece might not look like traditional blueprints, the intention was to create a simple infographic with information about the different components of the Psyche spacecraft and their functions, and to combine science and art by displaying technical drawings in an artistic and easy to understand format.

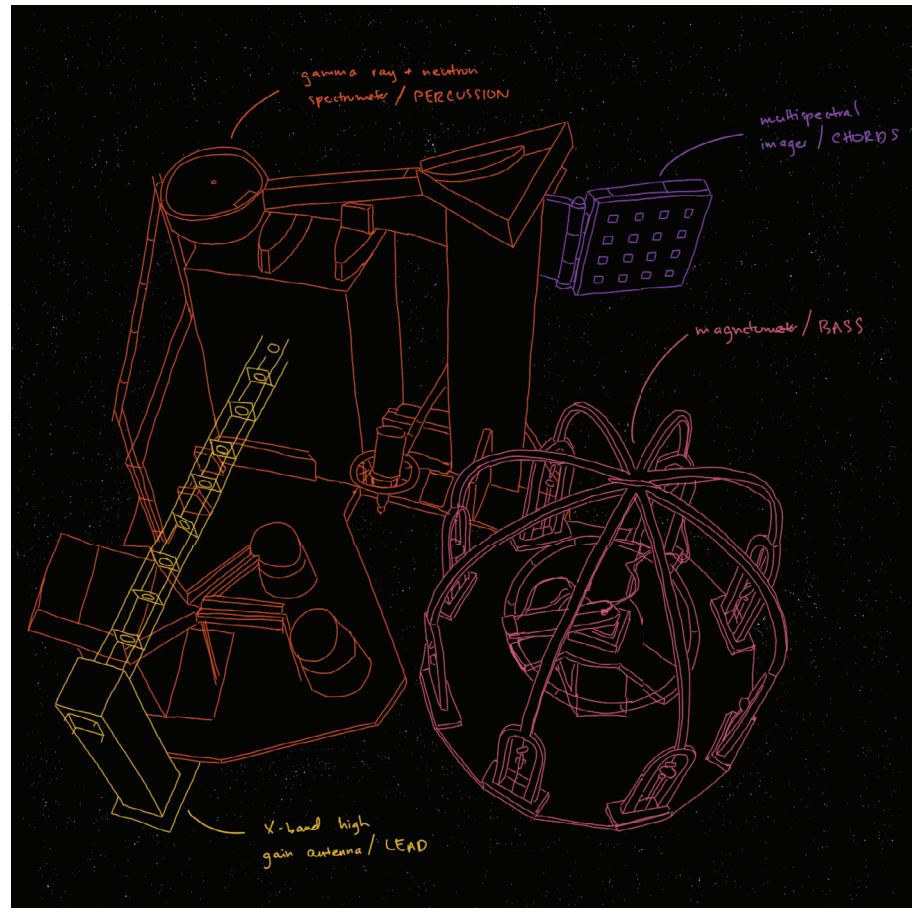
Guess That Instrument: A Psyche Game Show

Chris Kim
Animation: Paper cutouts with pen and crayon

I wanted to create something engaging and lighthearted for my first piece. I love the idea of personified spacecrafts and instruments, so I decided to make them as contestants of a gameshow. It's a mix of a trivia and dating show, as the audience learns more about the contestants the more they watch. While sticking to a more child-like presentation with the doodled faces and crayon coloring, I still wanted the information to be catered to older audiences. I took the explanations on the official website and made adjustments to make the language a bit more understandable and easier to digest in a short amount of time.

SCAN ME

SPACEROCK
RANGER
LIU
MUSIC FROM A
METAL
WORLD


gamma ray + neutron spectrometer / PERCUSSION
multispectral imager / CHORDS
magnetometer / BASS
X-band high gain antenna / LEAD

SCAN ME

SPACEROCK: Music From a Metal World

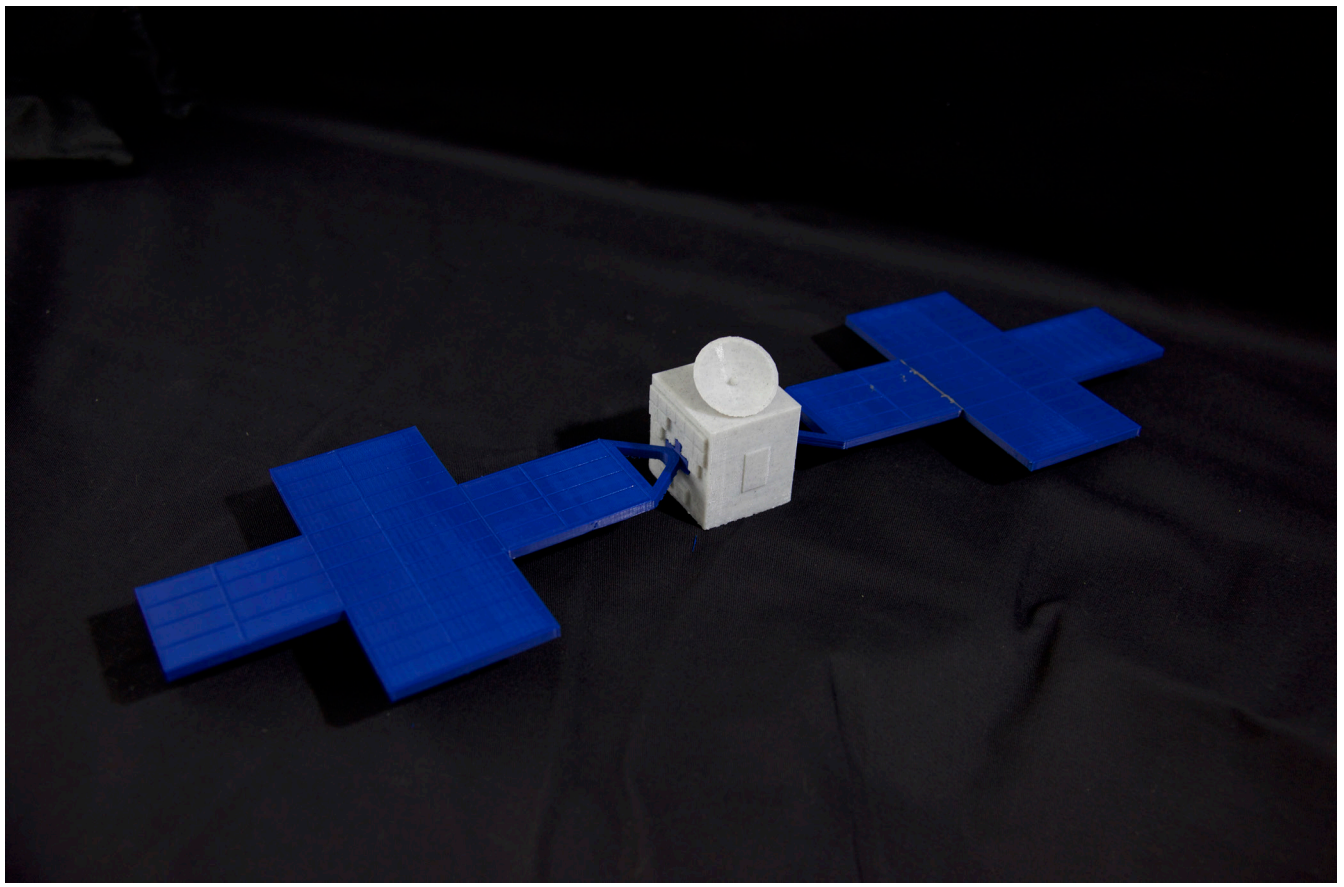
Ranger Liu
Experimental instruments and computer music

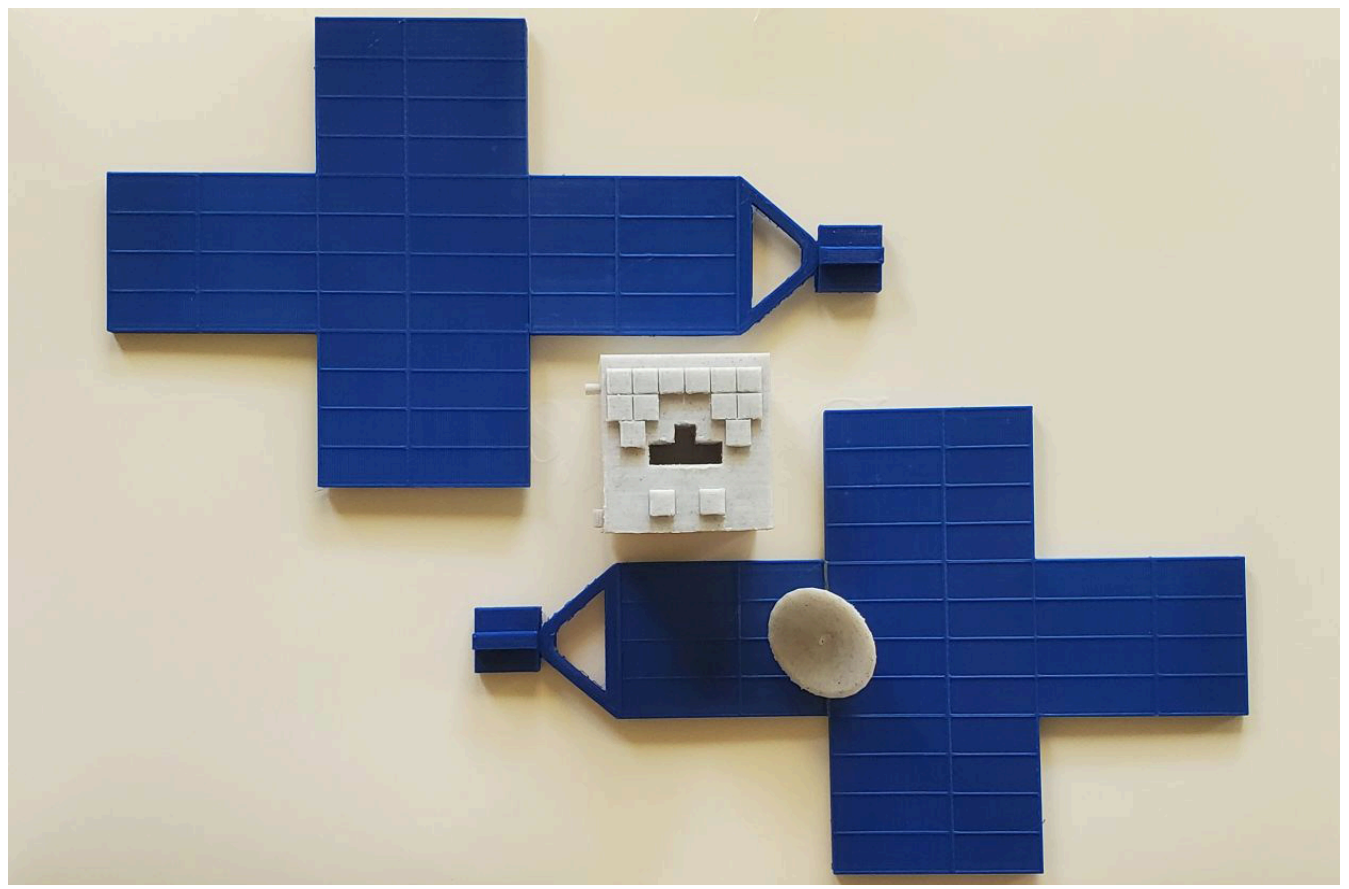
“SPACEROCK: Music from a Metal World” is an ensemble of four experimental computer music instruments, each inspired by one of the science instruments on the Psyche spacecraft: gamma ray and neutron spectrometer –> PERCUSSION; magnetometer –> BASS; X-band high gain antenna -> LEAD; and multispectral imager -> CHORDS. It plays music according to composition information extracted from an image, and it uses its own custom 16-note scale!

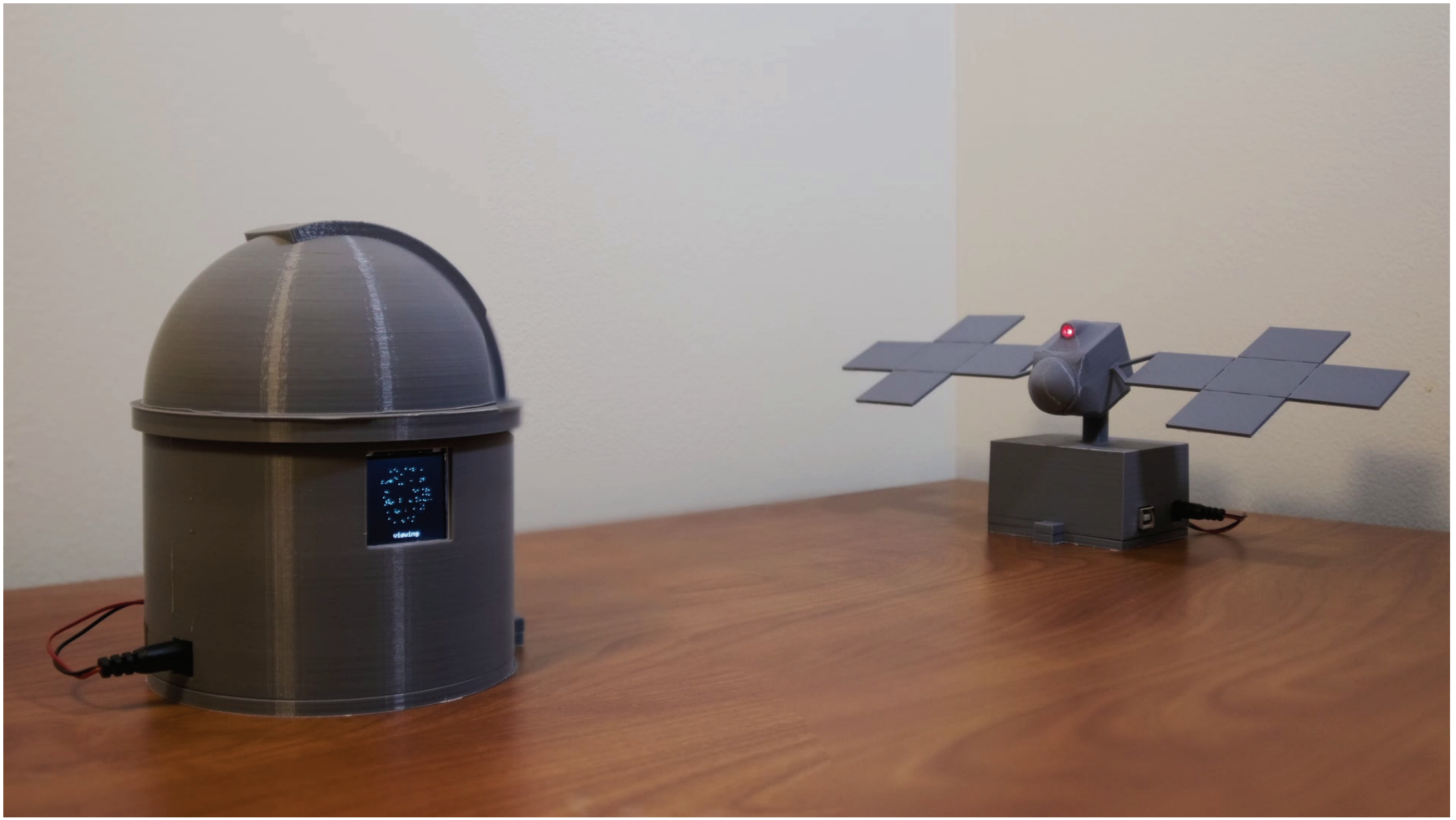
DIY Psyche Spacecraft

Hannah Sweis
PLA 3D Printing

The goal of this project is to demonstrate how easy it is to be creative and be inspired by something. The pieces of this project easily come together to make a miniature model of the Psyche Orbiter, kind of like assembling furniture with an instruction manual. The idea of “building your own orbiter” shows that anyone can be inspired by something like the Psyche Spacecraft, and represents how easy it is to get involved in the project on a smaller scale even if you don’t work at NASA, and aren’t building a giant spacecraft. You can even find 3D print files, and other ways of getting creative, on the Psyche website!







SCAN ME

SDOC (Small Desktop Optical Communication)

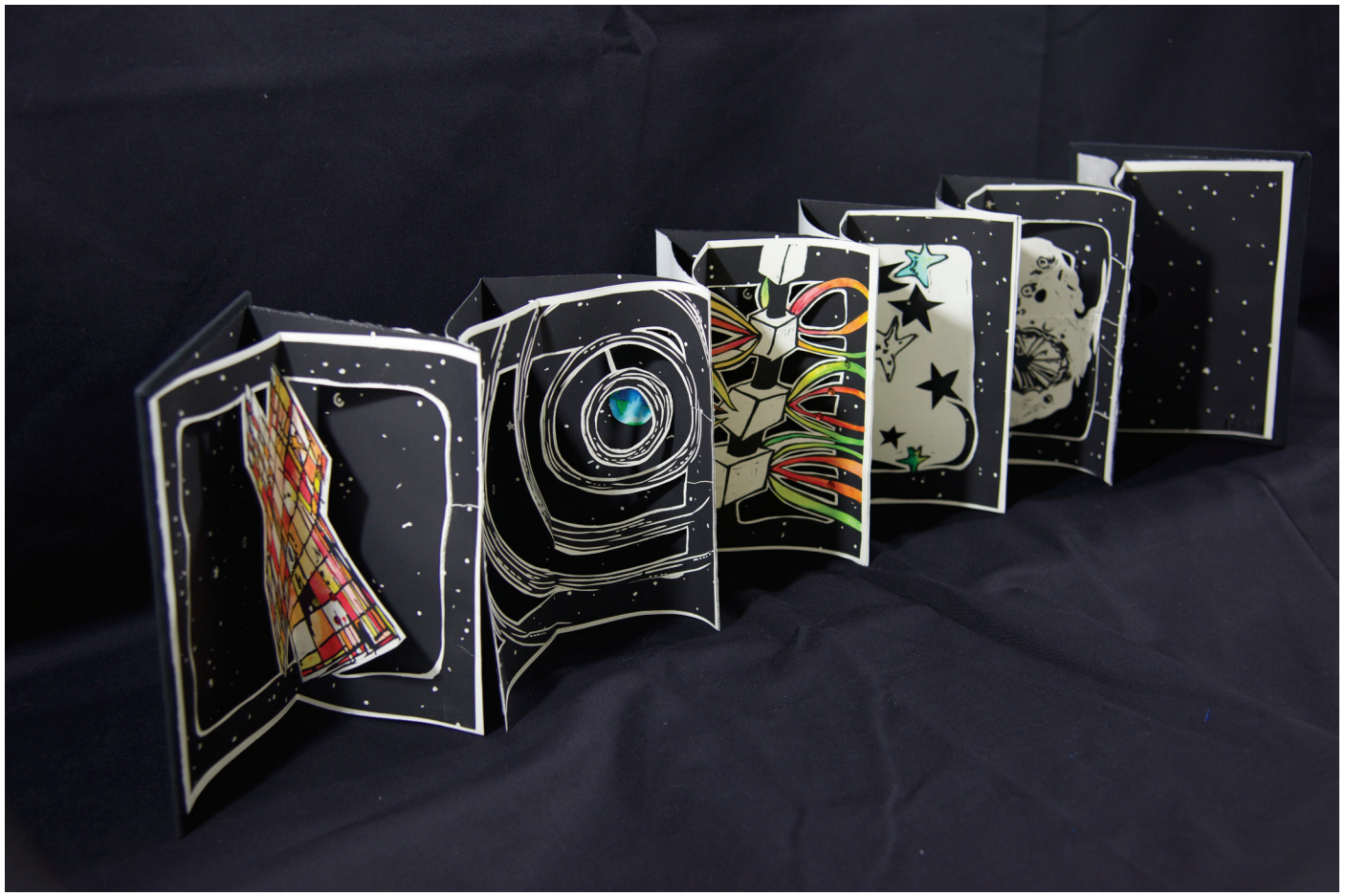
Josh Meister
Arduino, 3D Printing

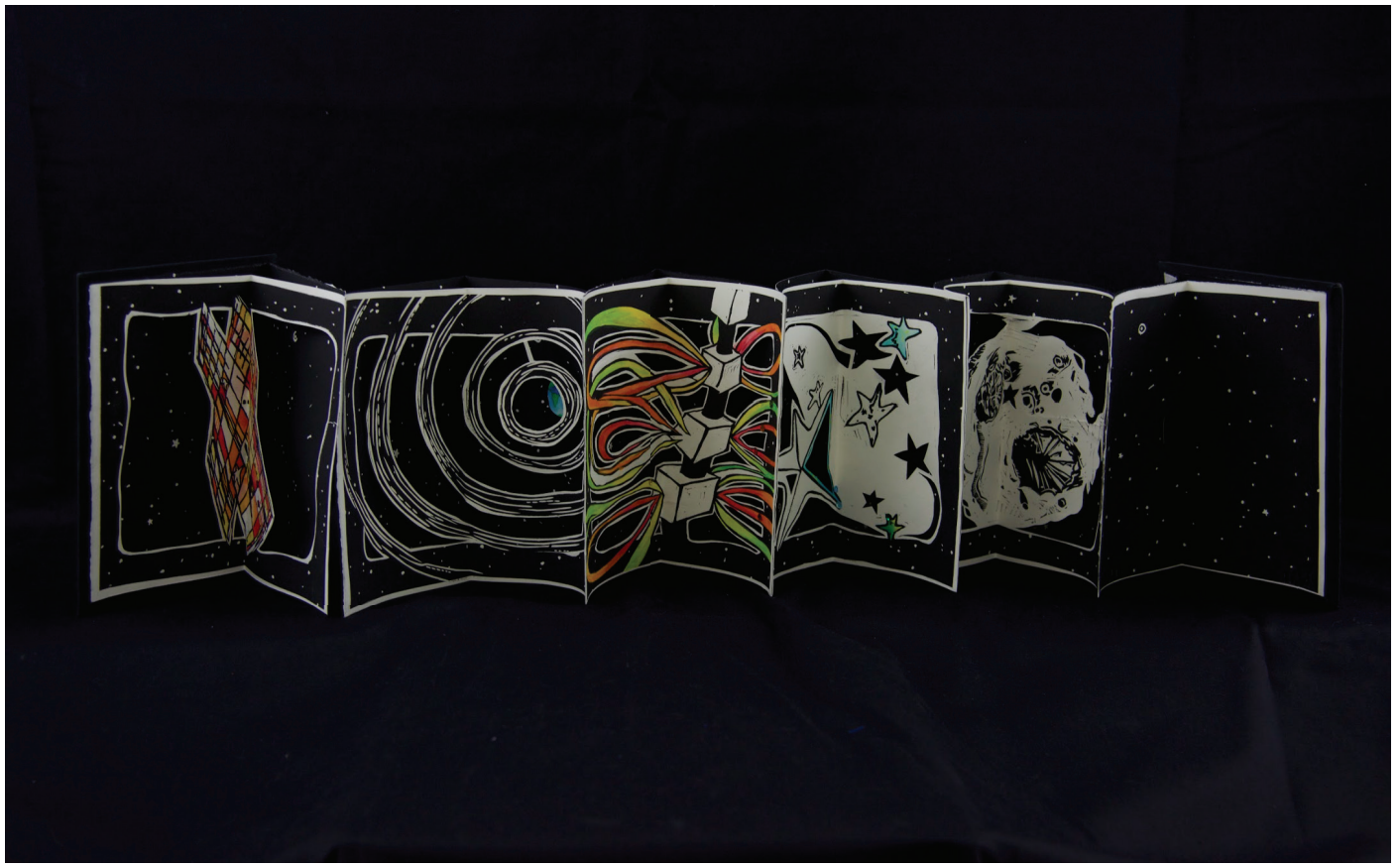
One of my favorite aspects of the Psyche mission is its use of the DSOC (Deep Space Optical Communication) system, which uses a laser transmitter to communicate with us on Earth. To show my appreciation for this technology, I have created a small desktop demonstration in which a pulsing laser transmits a 3D model of (16) Psyche to a receiver, which then displays the model as it is received.

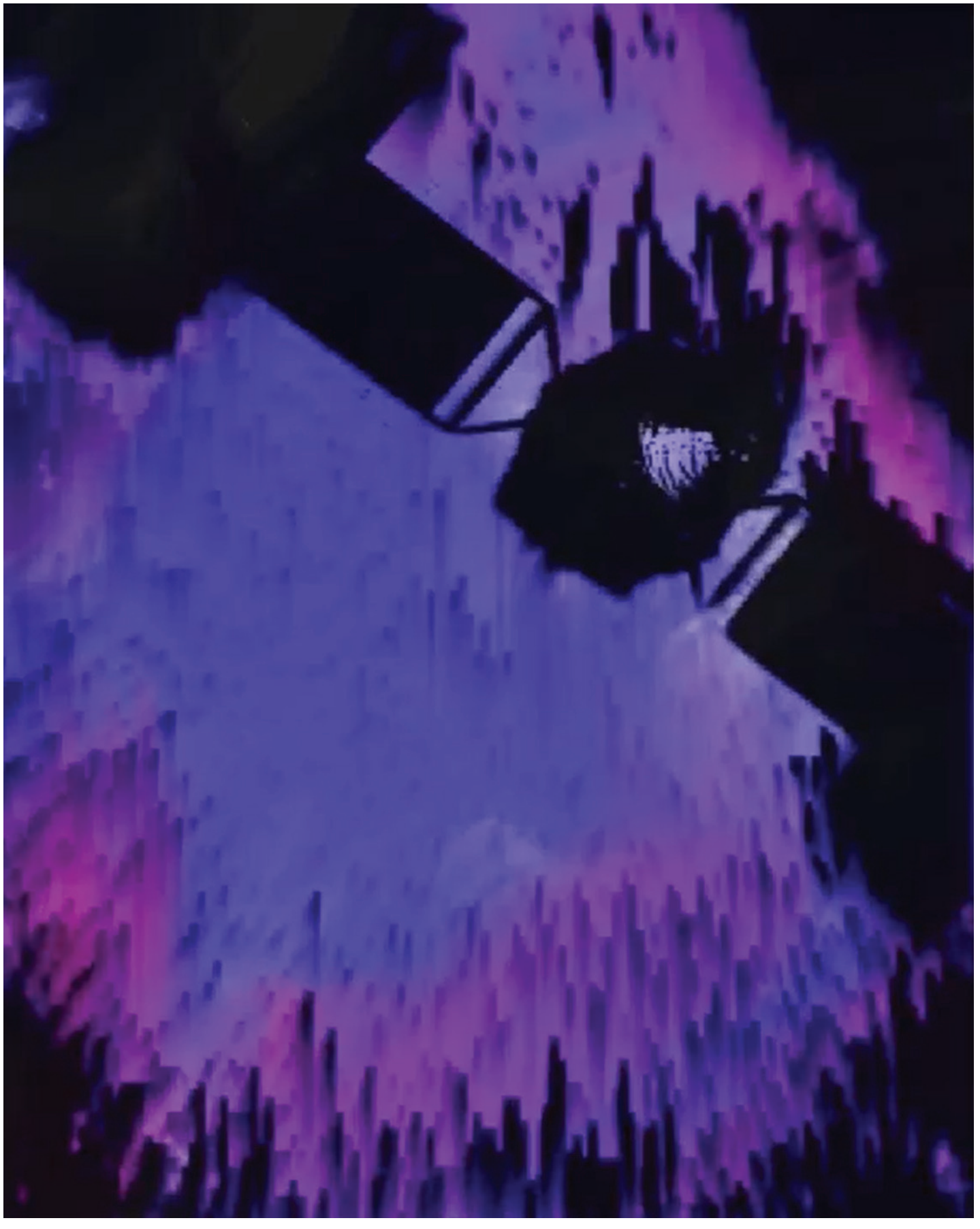
Psyche Spacecraft Artist Book

Katherine Page
Linocut prints, watercolor, sequins

This linocut pop-up artist book is a symbolic interpretation of the Psyche spacecraft and its instruments. Each page represents an instrument and its functions using abstract linocut relief printing, watercolor, sequins and cut-out forms, and each design is shadowed by a starry background to solidify a sense of infinite space. The Psyche mission's actual spacecraft is magnificent in its complexities but difficult to be understood by the average onlooker, so I made this book to invite accessible, up-to-your-interpretation views of the spacecraft and its significance. In order from left to right, the pages represent the spacecraft's solar arrays, laser communication technology (Deep Space Optical Communication), magnetometer, and star trackers, as well as the (16) Psyche asteroid and Psyche mission badge. The asteroid depiction is simple and lacking in color to represent the many unknown elements of (16) Psyche that are yet to be explored—only time will tell the true story of (16) Psyche!







SCAN ME

Psyche Spacecraft Reveal

Maia Huddleston
Digital illustration, Pixel sort, and animation

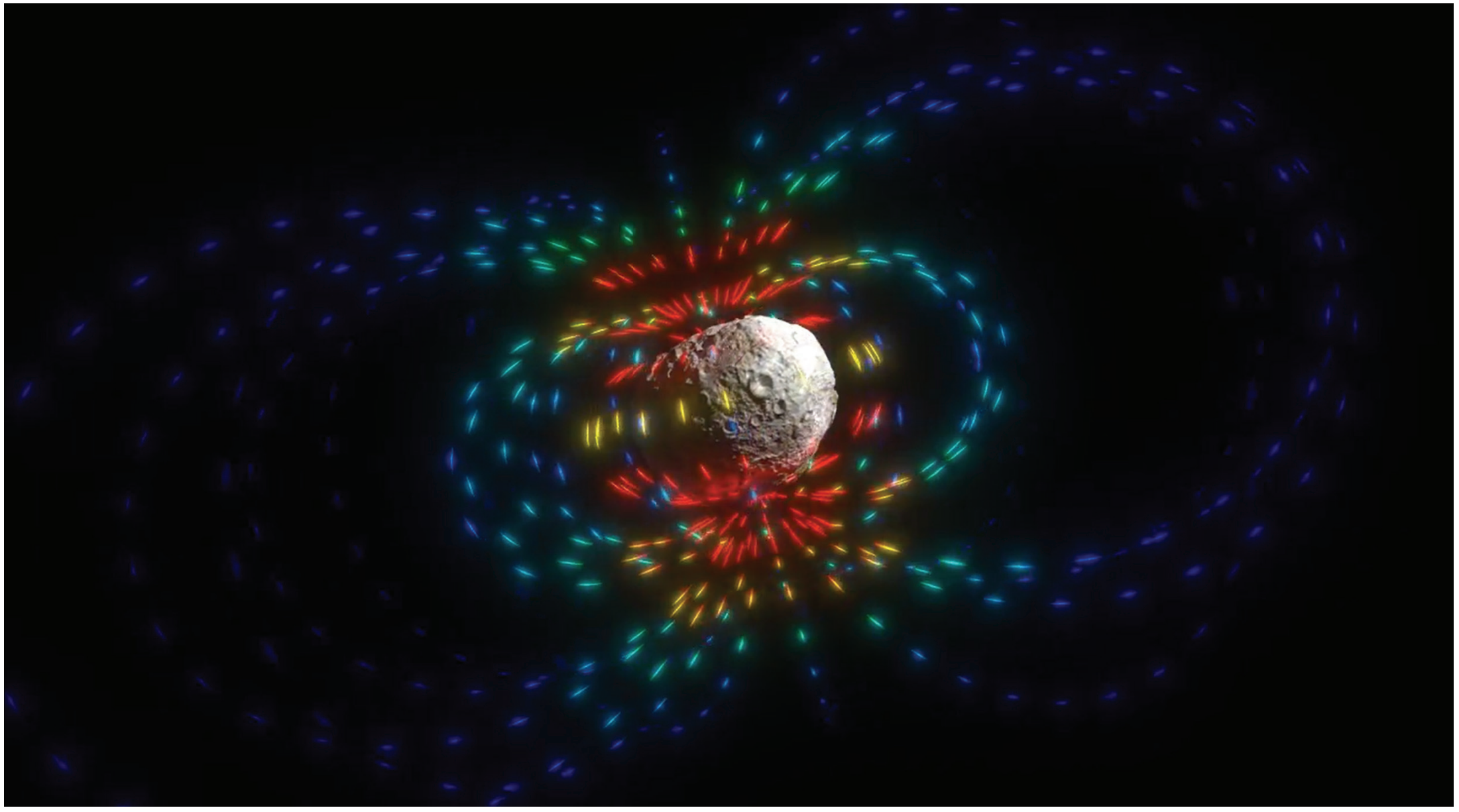
This piece began as a digital rendering of the Psyche spacecraft. It soon evolved into a digital illustration with a galaxy-inspired background. I wanted the piece to feel interactive, so I applied a random algorithmic pixel sort to the background. This created the waterfall effect around the spacecraft. To finish off the project, I animated the piece to unveil itself from an initial blurred assortment of large pixels.

A Magnetic World

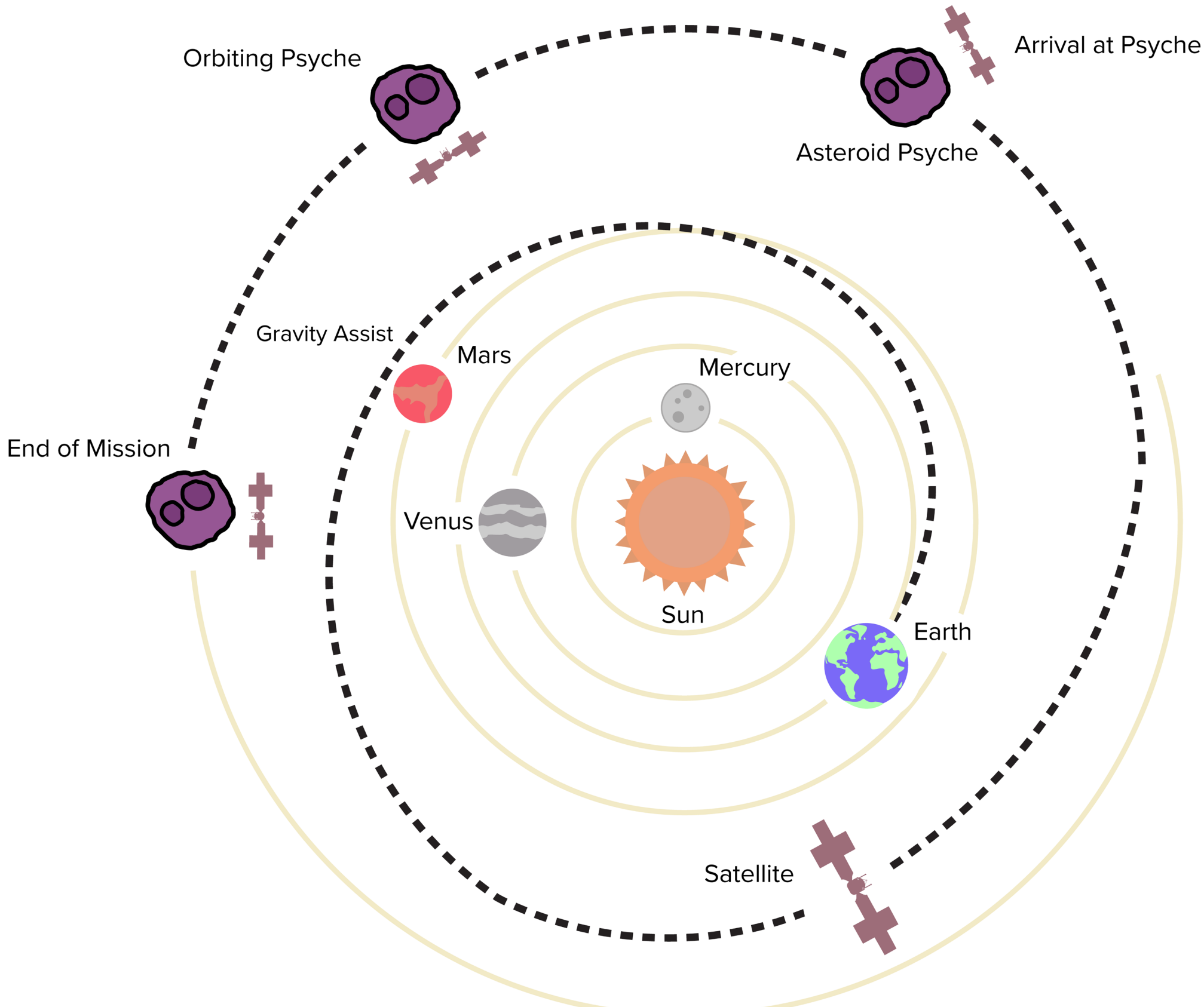
Josh Meister
Digital 3D Animation: SideFX Houdini

The idea that (16) Psyche may have a measurable magnetic field is a very exciting prospect to me. Not only can magnetic fields tell fascinating stories about a body's history, but I find them to have their own inherent beauty as well, both artistically and mathematically. For this piece I created an animation of magnetic field lines flowing around (16) Psyche, using Peter Rubin's Psyche model for the asteroid itself. I hope this piece might inspire others about the Psyche mission's magnetometry objectives as much as the team has inspired me.

Peter Rubin's 3D-printable asteroid model can be found here:
https://www.thingiverse.com/thing:2373526



SCAN ME


Orbiting Psyche
Arrival at Psyche
Asteroid Psyche
Gravity Assist
Mars
Mercury
End of Mission
Venus
Sun
Earth
Satellite

Journey

After separating from its launch vehicle, the Psyche spacecraft will undergo a 90-day operations checkout before traveling to the asteroid using solar-electric (low-thrust) propulsion. On its journey, the spacecraft will be heavily monitored, communicate with Earth, undergo operational readiness tests, have its instruments calibrated, and undergo navigation and trajectory calibration as needed. The spacecraft is projected to complete a Mars flyby and gravity assist prior to arriving at the asteroid.

Mission to Psyche Timeline

Tori Covell
Adobe Illustrator

I decided to create a timeline of Mission to Psyche. This timeline is found through psyche.asu.edu and the Mission to Psyche mobile app. I have converted this from digital into print media as if this was posted throughout a science museum, where young adults can look through the timeline of the journey of Mission to Psyche. Through this journey, the timeline would talk about how it was first started by proposing the idea and selected by NASA. It would also walk the audience through the process of creating the Psyche spacecraft and the end goal of this mission.

Mission to Psyche timeline

Phase A
Concept Study

In 2015, **Psyche Mission was selected by NASA** to develop a detailed concept study for consideration for NASA's Discovery Program.

A large team worked on the study, led by the Principal Investigator, Lindy elkins-Tanton, and consisting of an expansive team that include scientists, engineers, project managers, schedulers, financial modelers, graphic designers and marketing leads from ASU, JPL, SSL, as well as more than a dozen other universitites and research organizations.

Phase B
Preliminary Design

Science and engineering teams on the mission design the spacecraft and the instruments that will be used to analyze the asteroid.

Phase C
Critical Design & Build

Science and engineering teams begin to build their instruments.

The mission will use an X-band radio telecommunications systems to measure Psyche's gravity field to high precision. When combined with topography derived from onboard imagery, this will provide infomation on the interior structure of Psyche.

The bus or "body" of the spacecraft is completed by May 2020.

Phase D
Build, Assembly & Launch

During this phase, all the spacecraft subsystems are integrated onto the spacecraft bus. The spacecraft undergoes vibration testing, environmental thermal-vacuum testing, eletromagnetic interference, and eletromagnetic compatibility testing.

The Psyche spacecraft, now fully assembled, includes solar panels, which fold during transport and launch.

The space craft launches in Auguest of 2022. It arrives at the asteroid, located in the main asteroid belt between Mars and Jupiter in January of 2028.

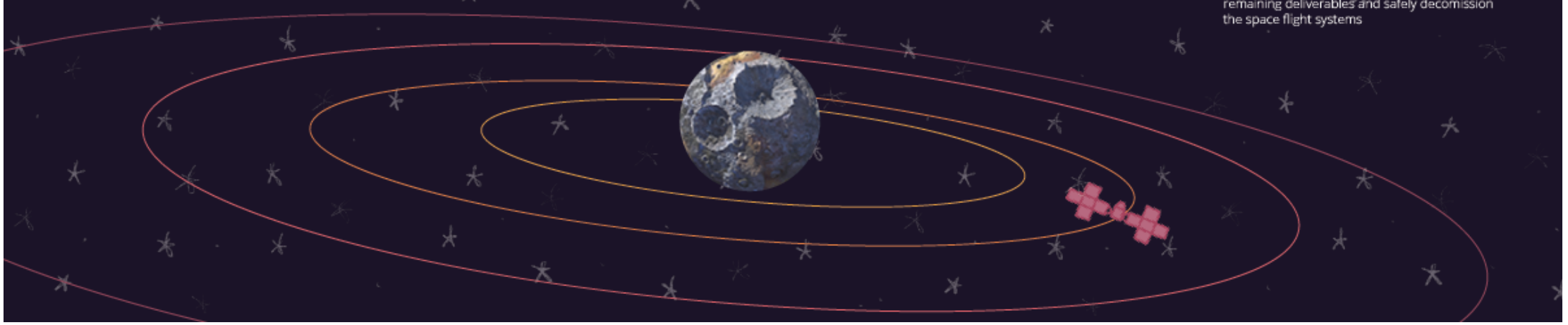
Phase E
Cruise, Arrival & Orbiting

Leading up to arrival at Psyche, the spacecraft spends 100 days in the approach phase. The spacecraft also measures the asteroid's spin axis and rotation.

The spacecraft orbits the asteroid for 21 months. It performs science operations from four different orbits, each successively closer to the asteroid. In each obit, the instruments on board send data back to Earth to be analyzed by the mission's science team.

Phase F
Mission Closeout

In this final phase, the mission team provides all remaining deliverables and safely decomission the space flight systems



Mission to Psyche
Flight: SPT-140
Departure Date: August 2022
Arrival Date: January 2026
Aircraft: SpaceX Falcon Heavy
Operated by: NASA Discovery Program
SEAT
39A
Origin:
Cape Canaveral
Air Force Station
Destination:
The Psyche Asteroid

Ticket to Psyche

Britney Hill
Digital Editing: Photoshop

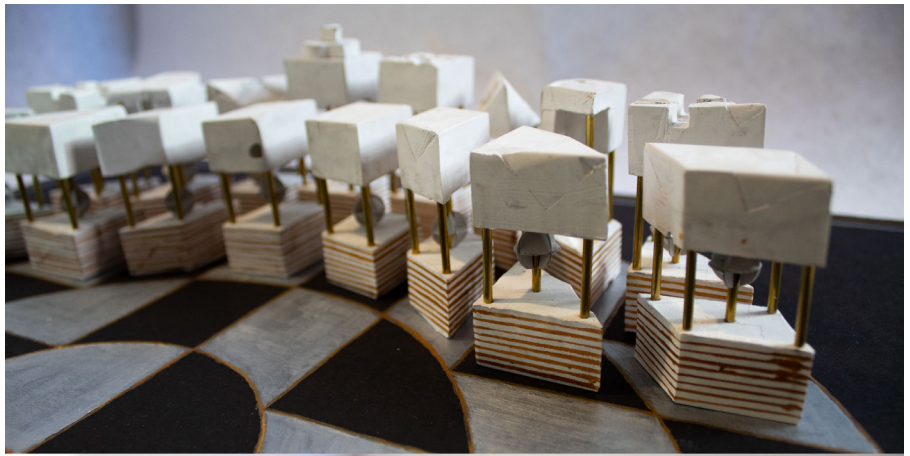
Let's go to Psyche!

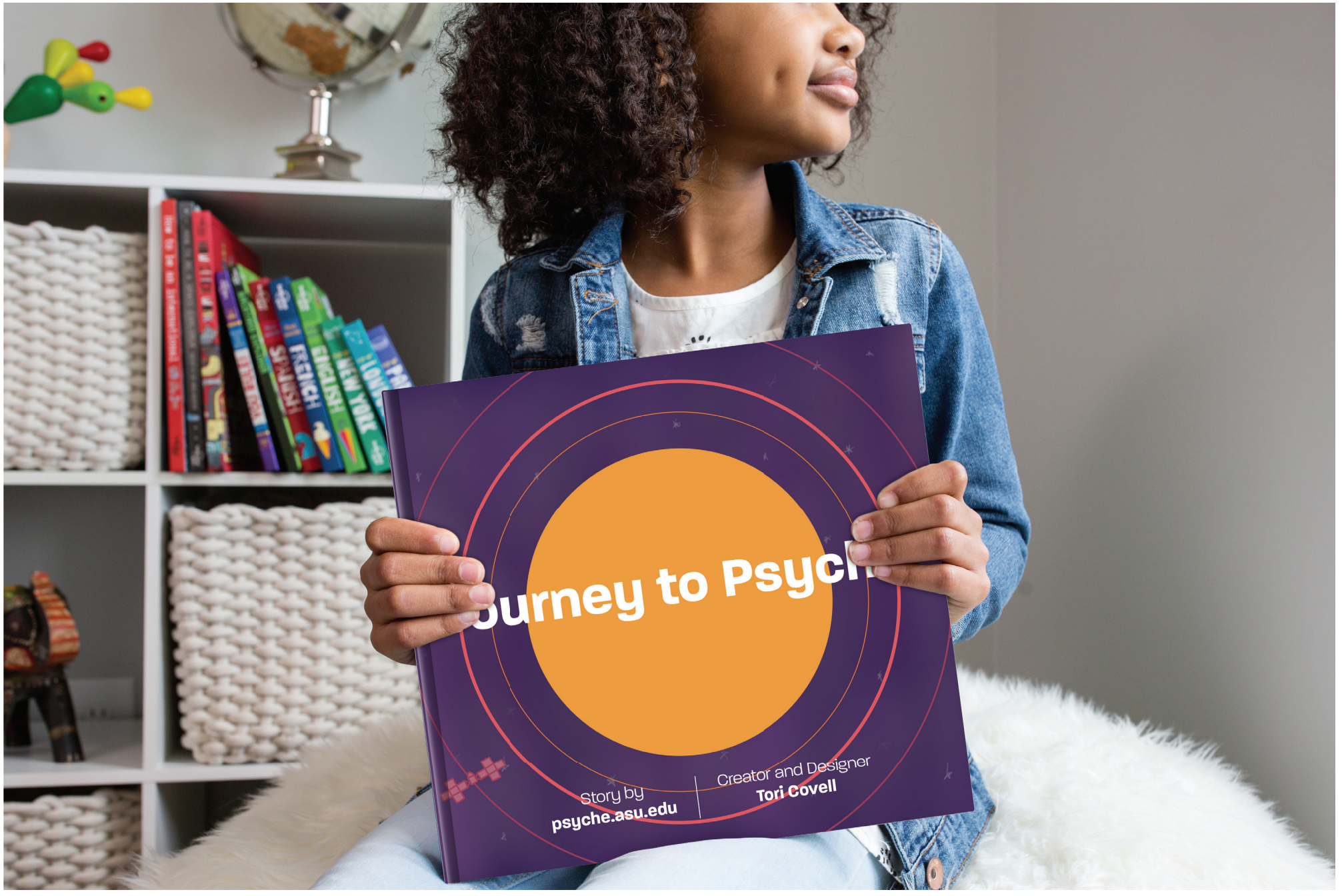
NASA isn't the only one going on a journey to a metal world—now you've got your own ticket to visit (16) Psyche! On this travel ticket sticker, you'll find the mission origin: Launch Complex 39A at Cape Canaveral Air Force Station in Florida, and its destination: the Psyche asteroid. The spacecraft housing the instruments, seen on the leftmost side of the ticket, will depart NEXT SUMMER and arrive in early 2026. Under the mission logo on the left, you'll find a QR code that takes you to psyche.asu.edu, so that you can learn more about the launch. Finally, on the right, you'll find a bar code that takes you to nasa.gov/psyche to learn more about the NASA Discovery Program and how the mission came to life. Enjoy your trip to a metal world!

Circle Chess

Ranger Liu
Rockite, iron oxide pigment,
aluminum/copper tubes,
cardstock, posterboard,
acrylic paint

This chess set and board are inspired by asteroids of the Asteroid Belt and Kuiper Belt. The concentric rings of the circular chess board evoke the idea of orbits. White pieces represent asteroids from the Kuiper Belt, with eight gold bands reflecting the Kuiper Belt's location outside the eight planets. Black pieces represent asteroids from the Asteroid Belt, with four silver bands on either side of the central sphere reflecting the Asteroid Belt's location between the eight planets. Each piece bears the astronomical symbol of its associated asteroid on its base. The shapes of the rooks, knights, bishops, queens, and kings are derived from their movement patterns on the circular chess board.
The chosen materials, concrete and metal, represent the rocky and/or metallic composition of asteroids. Subtle imperfections from the casting process also reflect the uniqueness of each asteroid.




Journey to Psych
Story by
psyche.asu.edu
Creator and Designer
Tori Covell

SCAN ME

Journey to Psyche

Tori Covell
InDesign, Procreate, Fliphtml5

I decided to create a book about the mission to Psyche. Through this journey, the book will teach children the hypotheses on how Psyche was formed, the spacecraft, and all the science! I was inspired by my little sister, as she loves to read, to learn new things, and to talk about them! I thought that as a current intern, I wanted to grab the opportunity to create books for children, so they can learn all about Psyche in a short/summarized version. A lot of the information is from psyche.asu.edu! I also used mission artwork and tried to sketch it in a children-friendly way. I used InDesign and Procreate to create this project. I created different layouts and designs to make it fun to look through.

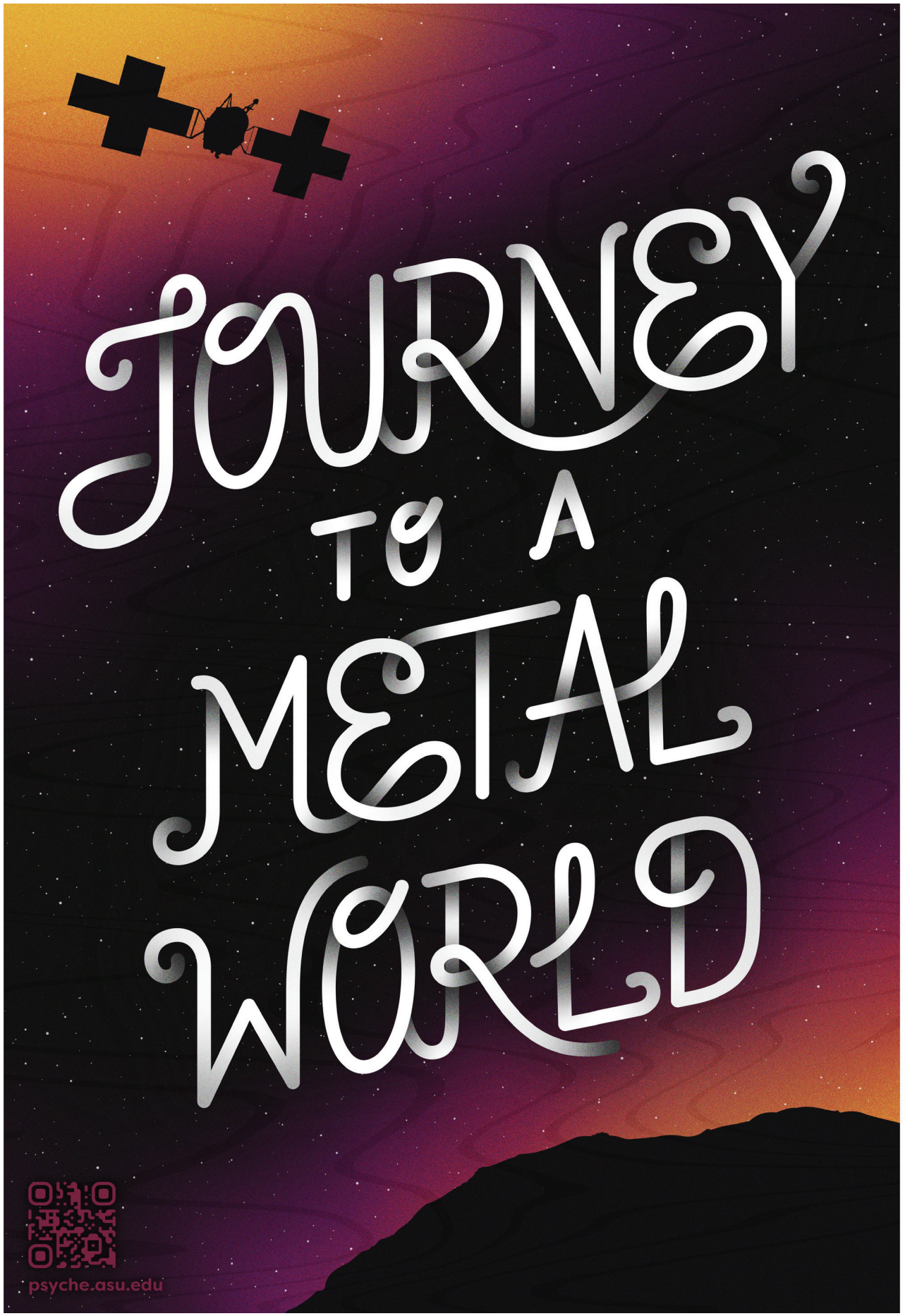
Journey To A Metal World: Typographic Exploration

Zack Gibson
Graphic Design, Motion Graphics

The phrase “Journey to a Metal World” grabbed my attention from the very moment I began learning about the Psyche mission. For this project, I wanted to create custom typography to go on a poster along with additional graphic elements to visually represent the phrase “Journey to a Metal World.”

Animating the poster brought extra life to the project, which I feel helps to reflect all of the time, energy, and emotion that goes into missions like these. The colors used in the background of this poster are bright and warm, which also help to create this sense of energy. I stuck with a white, silvery color on the letters to help them pop on the poster, be the main focus, and also represent Psyche’s metallic composition. The Psyche satellite and asteroid were included in silhouette form to give the viewer a peek into what the mission entails.

I hope that by bringing visual interest to an already captivating phrase, more people will be interested to learn about Psyche’s “Journey to a Metal World.”



SCAN ME

Psyche Metal Pins

Mary Pyrdol
Hand-Crafted Jewelry/Brooch/Recycled Metal

The phrase “Journey to a Metal World” excites me about what waits for us to discover on Psyche. One of those things being metal, I wanted this project to feature the material in all of its repurposable glory. Using recycled pieces of metal jewelry, I have handcrafted two brooches inspired by the asteroid and the spacecraft of the Psyche mission. The Asteroid brooch features the two prominent craters mimicked by radial bursts of metal scraps, along with rocky-textured metal plates to mimic the surface of Psyche. The spacecraft uses rectangular metal scraps with smaller, more detailed beads and rods to mimic the instruments on the actual spacecraft.

Trial

Emily Ku
Pencil/Digital

This is part 3 of the figure's journey to find their soul on the metal asteroid. It's a comic strip where the figure and their companion, Lu, encounter an obstacle at the peak of the mountain. They climb to the top, gaze at the view, only to find the goddess Psyche who morphs into the dark version of the figure.

Lu, how much longer do you think we have?

You're right, some of these are pretty steep.

If only you were stronger, then maybe you'd be able to help me.

angry noises

Chill out, I was only kiddin--

Ah!

clink

Guess you weren't kidding about the danger, huh Lu?

SCAN ME

SCAN ME

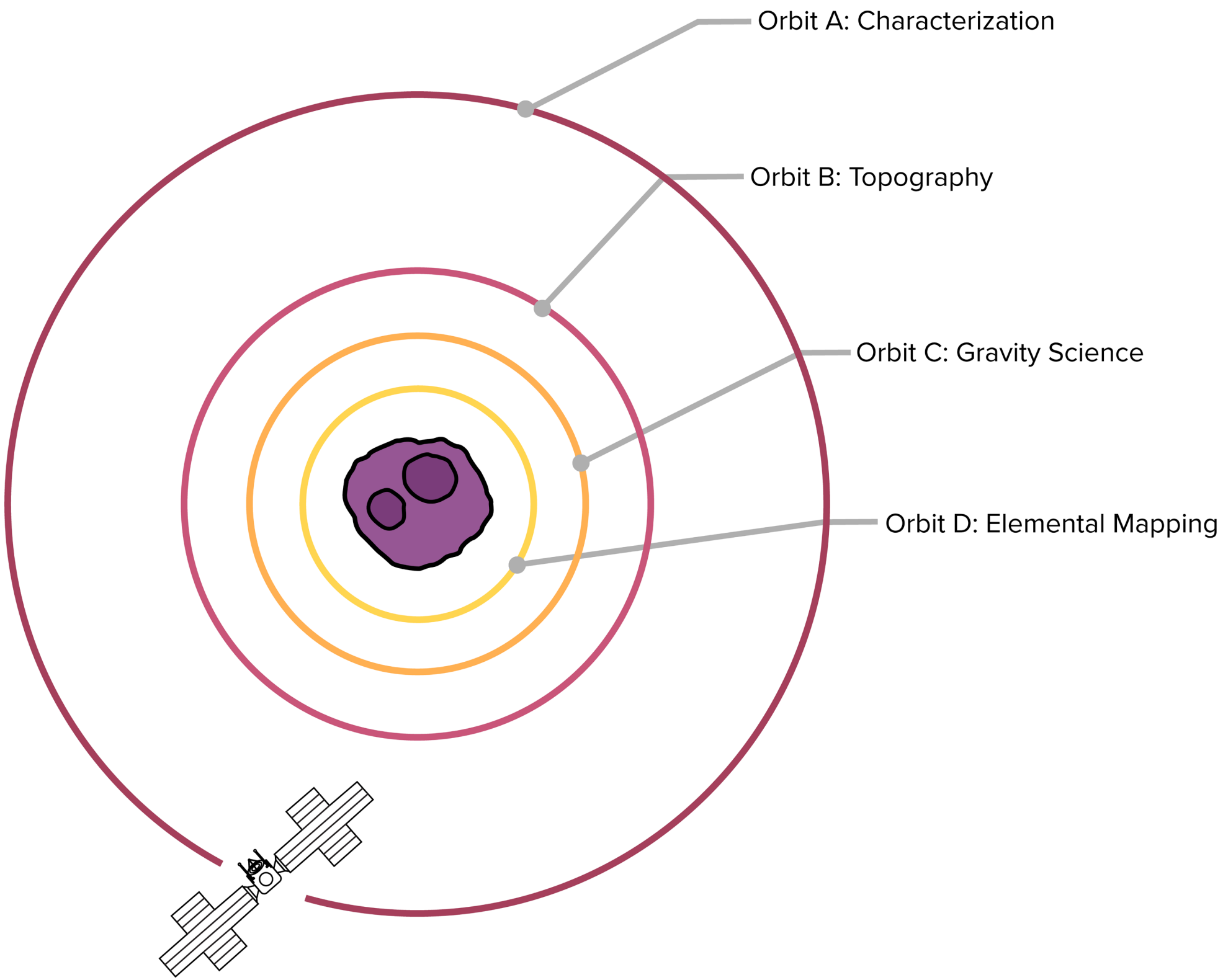
The Spacecraft's Journey to a Metal World

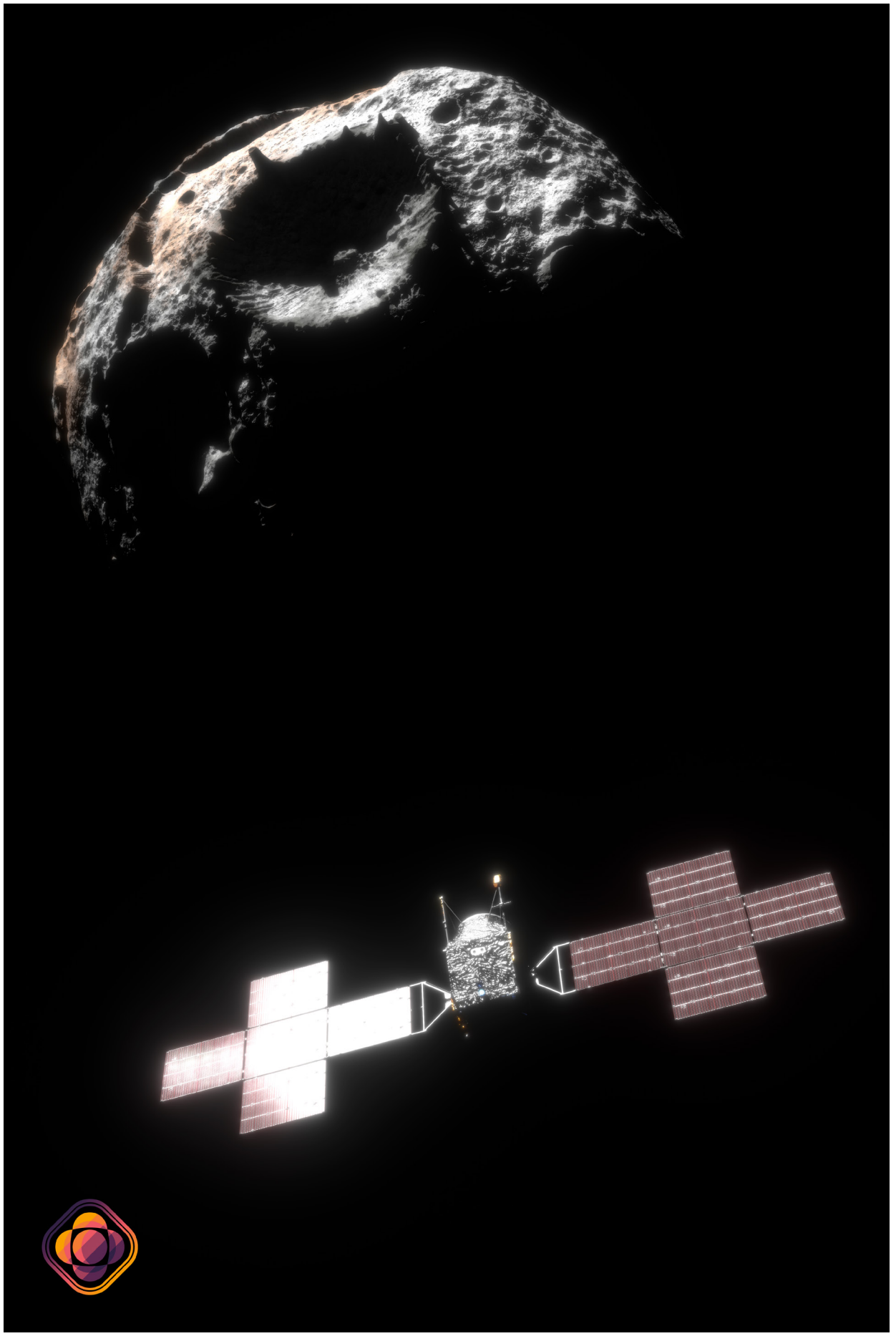
G. Marshall Wolff
3D Animation

It is easy to become so focused on the destination that we forget what it takes to get there. The Psyche spacecraft will have to travel for years before revealing the metal world's secrets, but this will be more than a long trip through the emptiness of space. The spacecraft and the team that built it will be busy making sure everything goes correctly, including a gravity assist around Mars, as well as preparing for all the data they will obtain once it arrives. The hope was to provide an accessible (and colorful) view of the spacecraft's path through space and show the excitement of a Mars gravity assist and the final approach to the asteroid. The gravity assist, although simplified, was actually modelled after the Mars Express's time lapse ("Looking at the Limb of Mars with UMC") for a more realistic sense of what the maneuver entails. Although sped up a great deal, I hope this animation provides some idea of the amount of work a NASA mission takes to plan and of the great distance and time the spacecraft will travel on its journey to (16) Psyche.

Arrival

After the Psyche spacecraft arrives at the asteroid it will spend 21 months orbiting Psyche. The spacecraft will begin with Orbit A, which will focus on characterizing the asteroid. It will then move on to Orbit B, which will focus on topography. Orbit C will be conducting gravity science on the asteroid. Finally, Orbit D will provide data on the elemental mapping of the asteroid. Through these four orbits, the Psyche spacecraft will move successively closer to the asteroid and be able to study it to collect information that will help accomplish the mission's science goals and unlock the mysteries of Psyche's formation and history.


Orbit A: Characterization
Orbit B: Topography
Orbit C: Gravity Science
Orbit D: Elemental Mapping



Arriving at (16) Psyche

Josh Meister
Digital Poster: SideFX Houdini, Adobe Substance, Adobe Photoshop, and Blender.

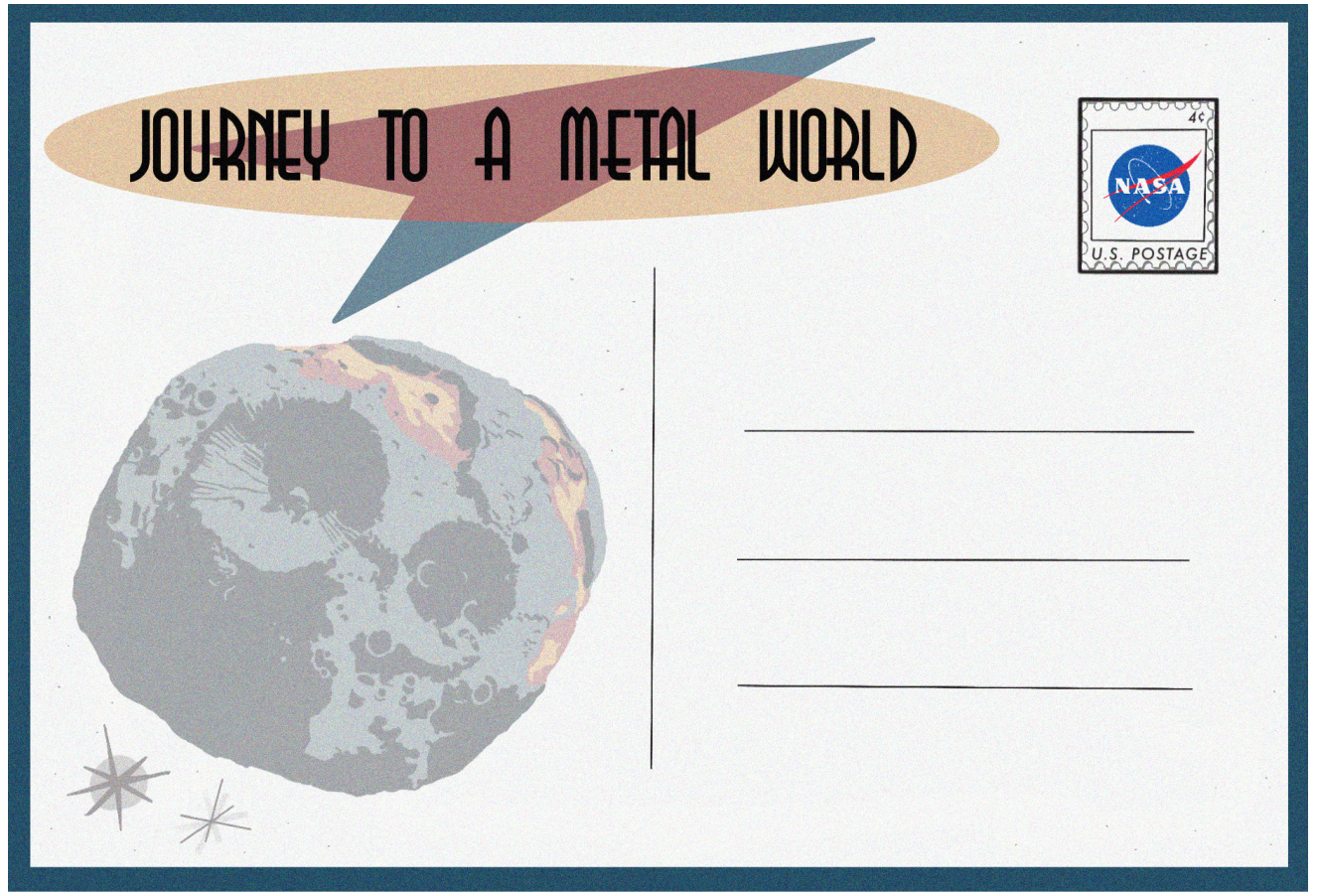
For this project, my goal was to provide my spin on a visually realistic display of the Psyche orbiter's first encounter with (16) Psyche, as if viewed by a nearby observer in space. To create this scene, I utilized 3D geometry from Peter Rubin and Maxar Technologies as bases for the asteroid and orbiter respectively. I then spent time detailing and texture-painting these models with my own take on visual realism before composing and lighting the final scene.

Greetings from PSYCHE

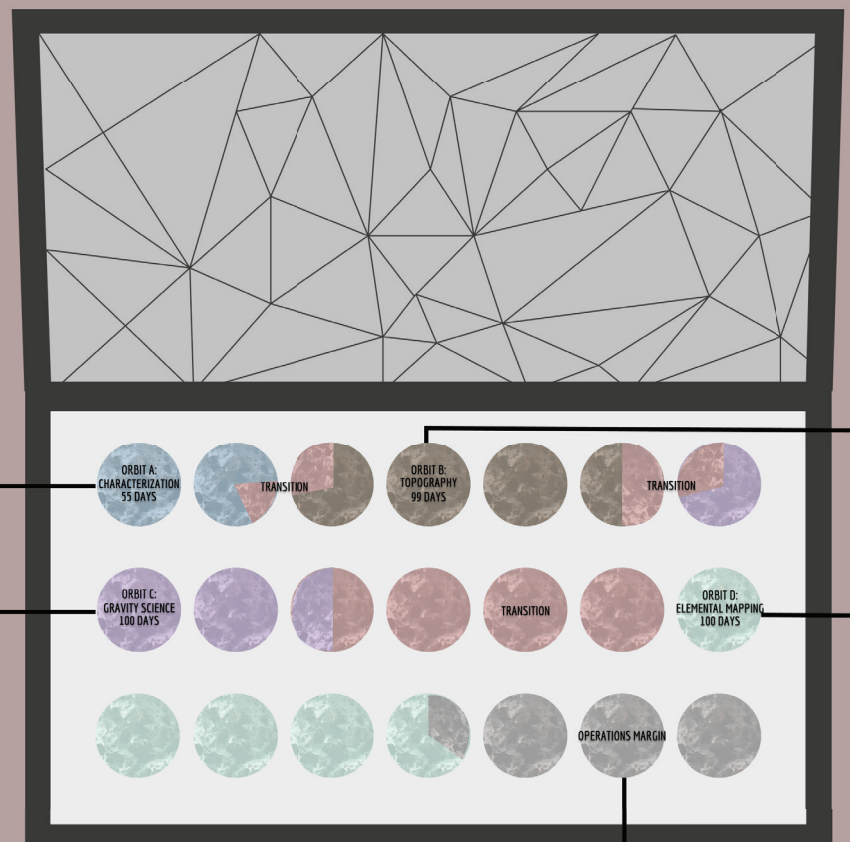
Mary Pyrdol
Postcard/Graphic Design/Procreate and Adobe Illustrator

When we leave home to explore a new or significant location far away, we often like to commemorate our journey or send a message home with a postcard. My project is a graphic design of a postcard that reads, “Greetings from PSYCHE,” and it is accompanied by a digital illustration of the asteroid and the spacecraft on its orbital mission. The backside features the quote, “JOURNEY TO A METAL WORLD”, along with an opaque illustration of the asteroid and some retro starburst decals. The concept behind the graphic style comes from the art movement Retro Futurism, a style originating from around the 1970s in depictions of 1950s America if it were heavily influenced by ambitious technologies of the future. Retro Futurism revolves around this idea of nostalgia within dreaming of what the world of tomorrow could be. Mostly inspired by Walt Disney’s Tomorrowland concept, I wanted to carry Retro Futurism into my graphic language to express NASA’s optimism and ambition for the Psyche mission while also being nostalgic of when space exploration was new to us.

Greetings from
PSYCHE


JOURNEY TO A METAL WORLD
4¢
NASA
U.S. POSTAGE

PSYCHE ORBIT TIMELINE



The duration of Orbit A (Characterization) is driven by the task of acquiring data to derive a gravity model and then using that model to design the orbit transfer and build the sequences to transfer to Orbit B (Topography).

A crucial component of determining the gravity field is updating Psyche's shape model. While images of Psyche will be obtained on approach, complete imaging of the surface in Orbit A with the clear filter at 35 m/pixel provides an improved shape model.

These images will also provide the data necessary to catalog the craters larger than 1 km in order to determine the relative ages of regions of the surface and to enable the initial global characterization of the asteroid's geology.

Orbit B is designed to provide the images necessary to derive shape, rotation, and a detailed topographic model of Psyche.

Orbit C is dedicated to producing the best global gravity field for the mission. While the gravity science team continues to collect Doppler and ranging data in each science orbit, Orbit C is the final polar orbit that will achieve full body coverage.

Imaging continues in Orbit C, although all requirements were met by the end of Orbit B.

The 100-day science phase supports seven complete mapping cycles so some of these cycles could be used to improve the topography model as well. If the geology of Psyche is discovered to be sufficiently complex to justify higher resolution geologic mapping, this will be undertaken using Orbit C data.

Orbit D is the only orbit low enough to explore Psyche's elemental composition. Psyche's irregular shape, potential for long eclipses, and currently unknown gravity field preclude maintaining a polar orbit at low altitudes.

Gravity science data is also improved during this orbit.

Imaging in this orbit is limited by data volume, lighting conditions and ground track range. With similar data budget to Orbit C but much smaller footprints on the surface, the imager is limited to about 40 images per orbit.

If the Psyche mission is extended, the goal is to transfer to an even lower altitude to improve the elemental composition measurements and obtain higher resolution data from the other investigations.

The Psyche team includes an operations margin to ensure mission completion if certain orbits exceed their predicted time allotment.

Psyche Orbit Timeline

Maia Huddleston
Graphic/Product Design

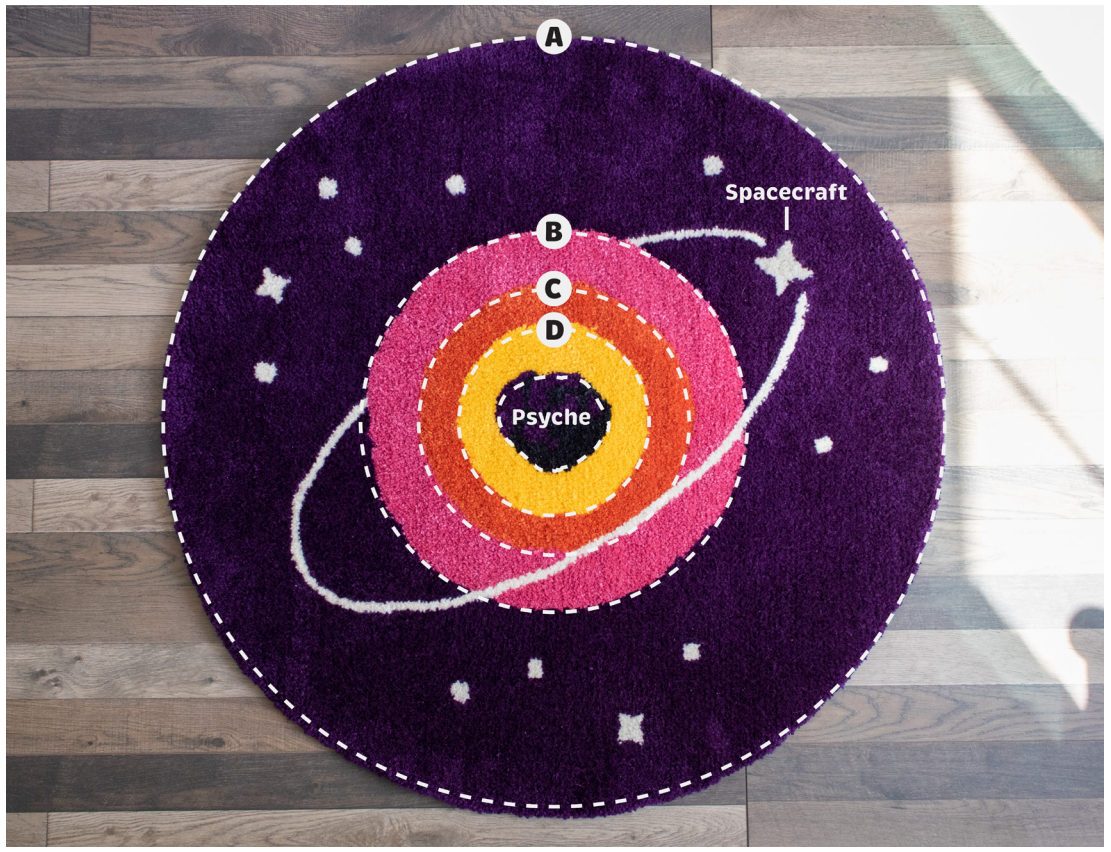
This piece originated as a series of pie charts representing the orbit lengths of the Psyche mission. Each circle represents one month on Earth. After I started designing, I noticed that my layout of the circles looked like a makeup palette. I chose to run with this idea and make the data visualization graphic a little more fun. The information represented in this graphic was extracted from the Psyche Science Operations Concept: Maximize Reuse to Minimize Risk paper presented at the 2018 SpaceOps Conference

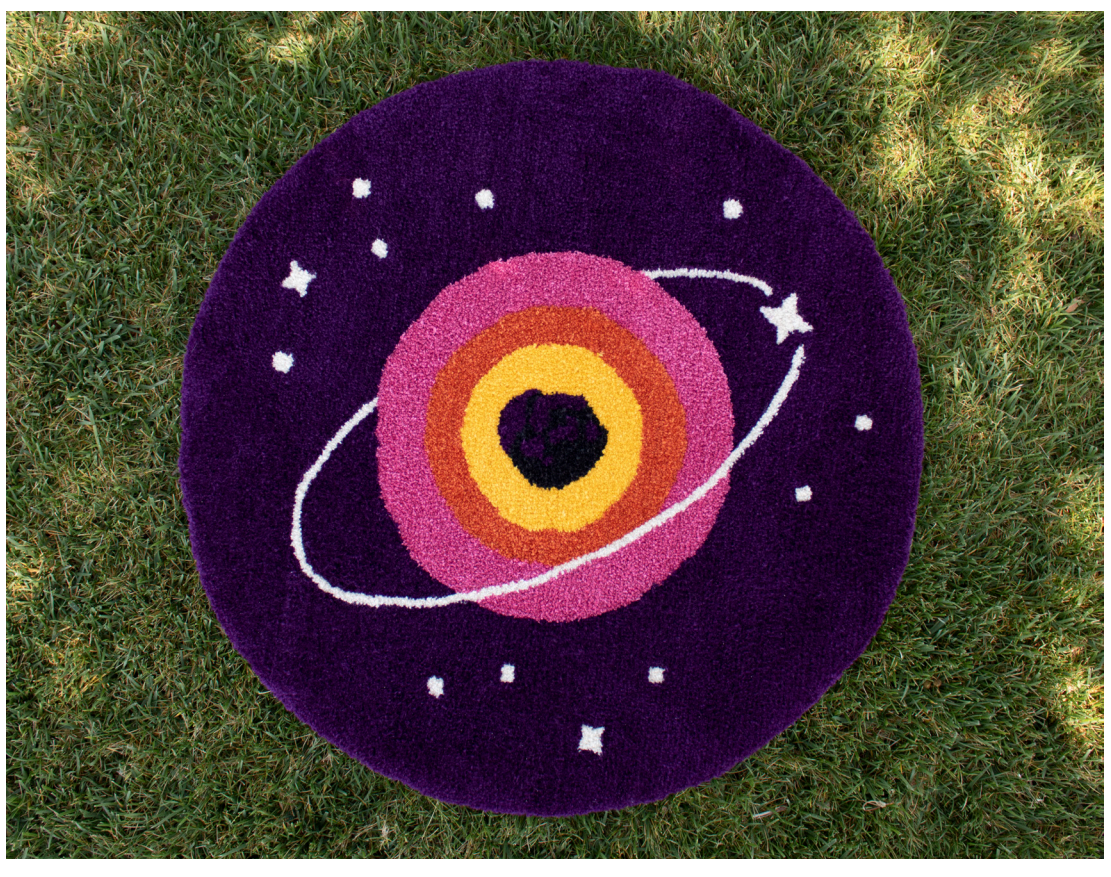
Orbits of Psyche

Phoebe Murphy
Graphic art/Shirt design

For my last project, I was inspired by the images of Psyche's orbits that we were shown, and I knew I wanted to do something related to that. Although I would have liked to create a physical object (like a sculpture), due to limitations on tools I decided the next best thing would be to design something that can become a physical object, i.e. a shirt design. I'm really into the modern kind of designs that are on graphic tees and sweatshirts nowadays, so I wanted to depict Psyche's four orbits in that style. I also thought it would be a nice souvenir to myself to remember the year.

PSY
CHE


A
B
C
D
Psyche
Spacecraft



Around Psyche Rug

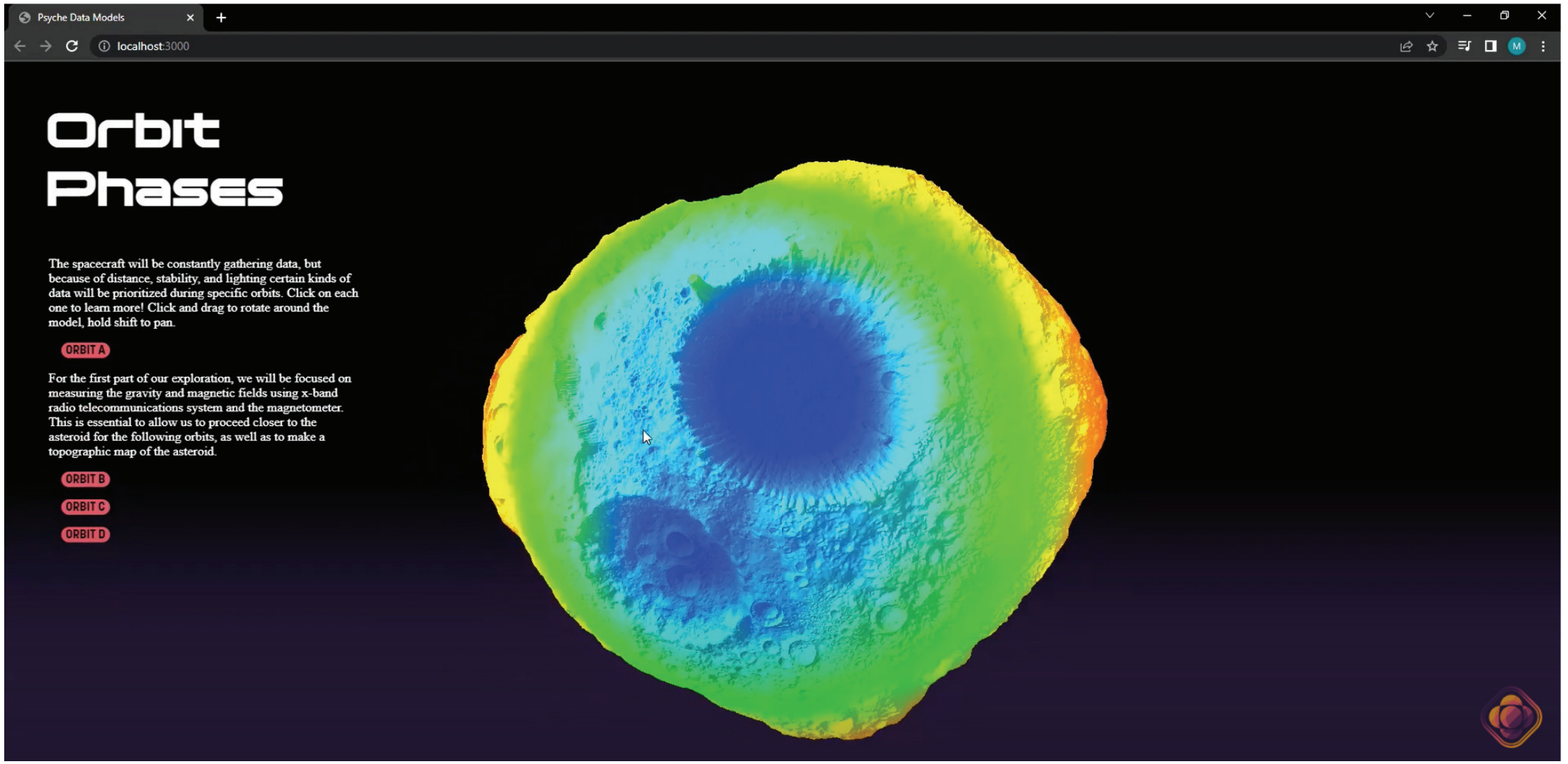
Zack Gibson
Tufted Rug, Yarn and Fabric

The creation of the Around Psyche rug was a multi-step process. First, I began by creating a design with four rings of differing color and a shape for Psyche at the center. The rings represent the different orbits of the Psyche spacecraft from Orbit D on the outer edge of the design to Orbit A at the center around Psyche. Once the design was finalized with some embellishing details, including a star shape that is symbolic of the spacecraft, I projected and traced it onto a large piece of loose-knit fabric. Using a tufting gun, I punched different colored yarn through the fabric until my design was complete. Using carpet glue on the back and adding a plush backing fabric helped seal in the yarn and finish the rug. While the rings of color are proportionally spaced apart to reflect the orbit distances, I think the rug composition also lends itself to being a visualization of Psyche as a planetary core.

Psyche Orbital Data Viewer

G. Marshall Wolff
Website

This website is meant to visualize the kinds of data we hope to obtain from the Psyche spacecraft once it arrives using 3D models of how the asteroid may look. Assuming all goes well, we hope to provide actual data from the Psyche mission, but for now we decided to go with more artistic renditions to make the experience compelling and encourage more interest in the mission.


Psyche Data Models
localhost:3000
Orbit Phases
The spacecraft will be constantly gathering data, but because of distance, stability, and lighting certain kinds of data will be prioritized during specific orbits. Click on each one to learn more! Click and drag to rotate around the model, hold shift to pan.
ORBIT A
For the first part of our exploration, we will be focused on measuring the gravity and magnetic fields using x-band radio telecommunications system and the magnetometer. This is essential to allow us to proceed closer to the asteroid for the following orbits, as well as to make a topographic map of the asteroid.
ORBIT B
ORBIT C
ORBIT D

SCAN ME

SCAN ME

Resolution

Emily Ku
Digital Animation

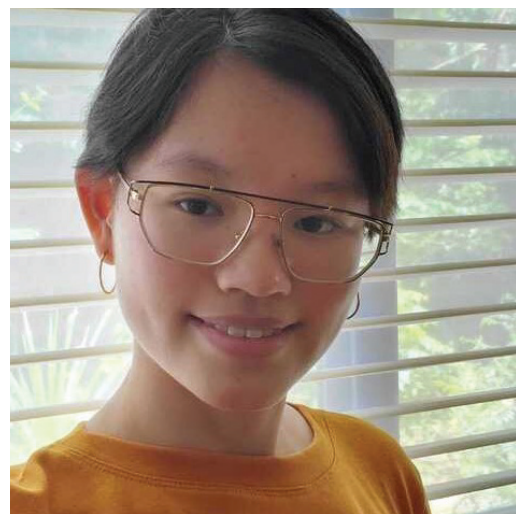
This is the resolution of the story behind the person on the journey to find their soul. They confront the dark parts of themselves, and once they decide to own their journey despite its imperfections, decides to embrace the dark parts of themselves rather than fight it. This is meant to represent how sometimes, in order to find ourselves and look within our souls, we need to confront the darkest parts of ourselves, parts that we may find shameful or disappointing. That is okay and a completely normal part of the process, and only when we embrace ourselves including our imperfections are we able to truly find ourselves and grow. At the end, the person's remembering of their name is meant to symbolize how they have embraced who they are, and the heart they received represents the part of their soul they have found from this journey. In the future, there are many more places to discover, and thus many more parts of themselves to find.

Meet The Interns

Mary Pyrdol
Boston University
Graphic Design

Britney Hill
Arizona State University
Biomedical Engineering

Chris Kim
University of Southern California
Animation



Phoebe Murphy
Trinity University
Communication

View all the interns' pages: https://psyche.asu.edu/get-involved/psyche-inspired-copper-class/

Meet The Interns

SCAN ME

Caillyn Jeffery
Virginia Tech
Creative Technologies

Ranger Liu
Columbia University
Astrophysics & Computer Science

SCAN ME

SCAN ME

Josh Meister
Indiana University - Purdue University Indianapolis
Computer Graphics Technology

Jennah Colborn
California Institute of Technology
Physics

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Meet The Interns

SCAN ME

Maia Huddleston
Illinois State University
Mass Media

G. Marshall Wolff
University of Colorado Colorado Springs
Physics

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Zack Gibson
Chaffey College
Graphic Design

Emily Ku
Georgia Tech
Aerospace Engineering

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Meet The Interns

SCAN ME

Tori Covell
Rochester Institute of Technology
Graphic Design

Katherine Page
Bowdoin College
Biology

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Hannah Sweis
Arizona State University
Mechanical Engineering

ArtSteps Virtual Gallery
Highlighting the work of the *Psyche Inspired Interns* through a virtual gallery

SCAN ME

SCAN ME

View all the interns' pages: https://psyche.asu.edu/get-involved/psyche-inspired-copper-class/

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