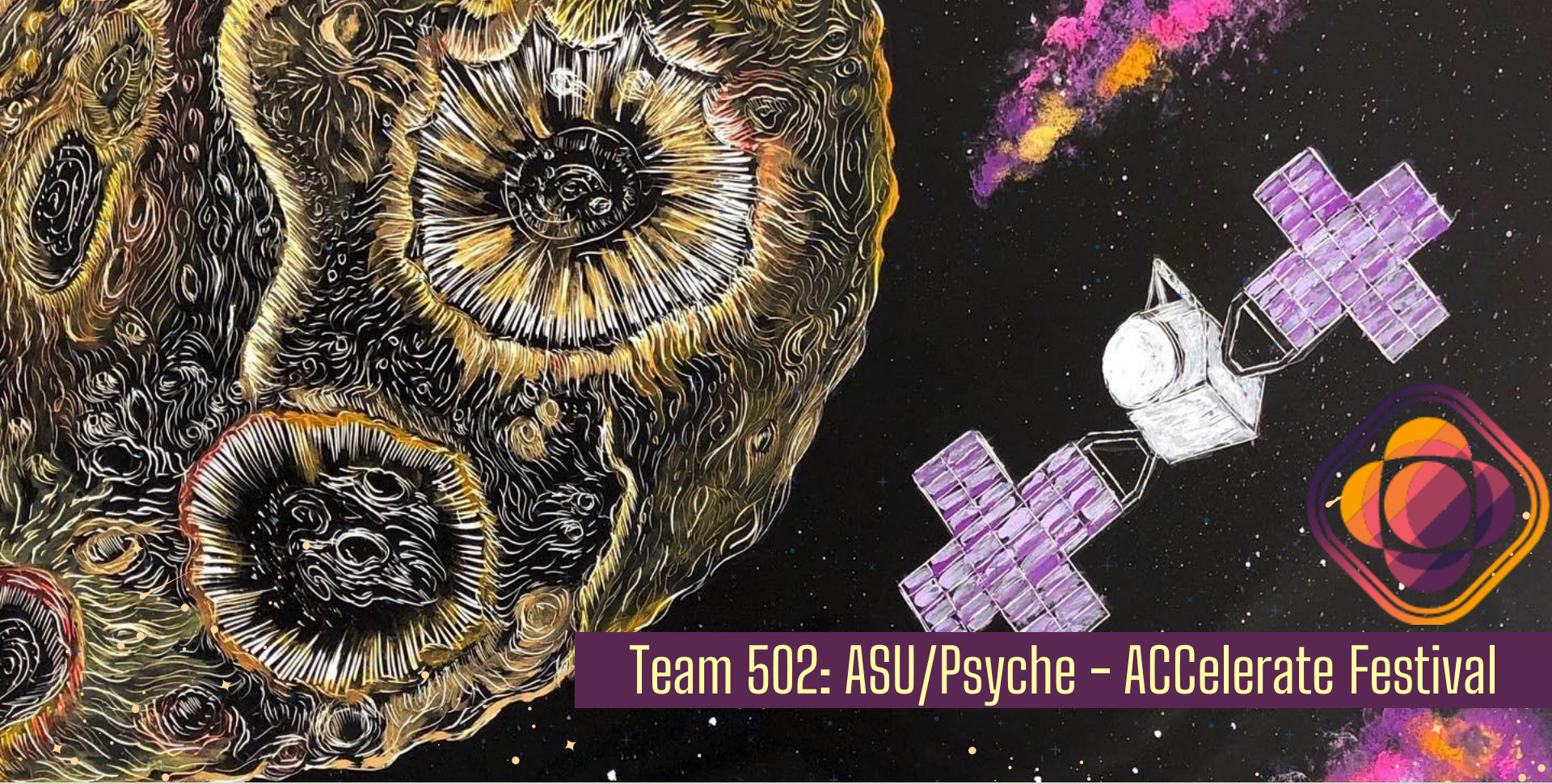

Team 502: ASU/Psyche - ACCelerate Festival

TEAM MEMBERS

Sara Bradley
Mechatronics Engineer

Connor Bishop
Electrical Engineer

Spencer Martin
Electrical Engineer

Mariam Medina
Systems Engineer

Garett Southerland
Fluids Engineer

Kenneth Zhou
Mechanical Engineer

Sara Bradley

SPONSOR AND ADVISOR

Sponsor

Cassie Bowman, Ed.D. Associate Research Professor, ASU

Academic Advisor

Shayne McConomy, Ph.D. ME Teaching Faculty

Sara Bradley

OBJECTIVE

The objective of this project is to create interest in the Psyche Mission with an interactive exhibit.

Sara Bradley

PROBLEM

The problem is ensuring a lasting interest in the Psyche Mission and STEAM.

Sara Bradley

PSYCHE STORY

Figure 1

What is Psyche?

A large asteroid the size of Massachusetts!

The leading hypothesis of the formation of the Psyche asteroid:

The remains of a Planetesimal with an iron core that experienced many violent collisions.

Sara Bradley

PSYCHE STORY

Sara Bradley

PSYCHE STORY

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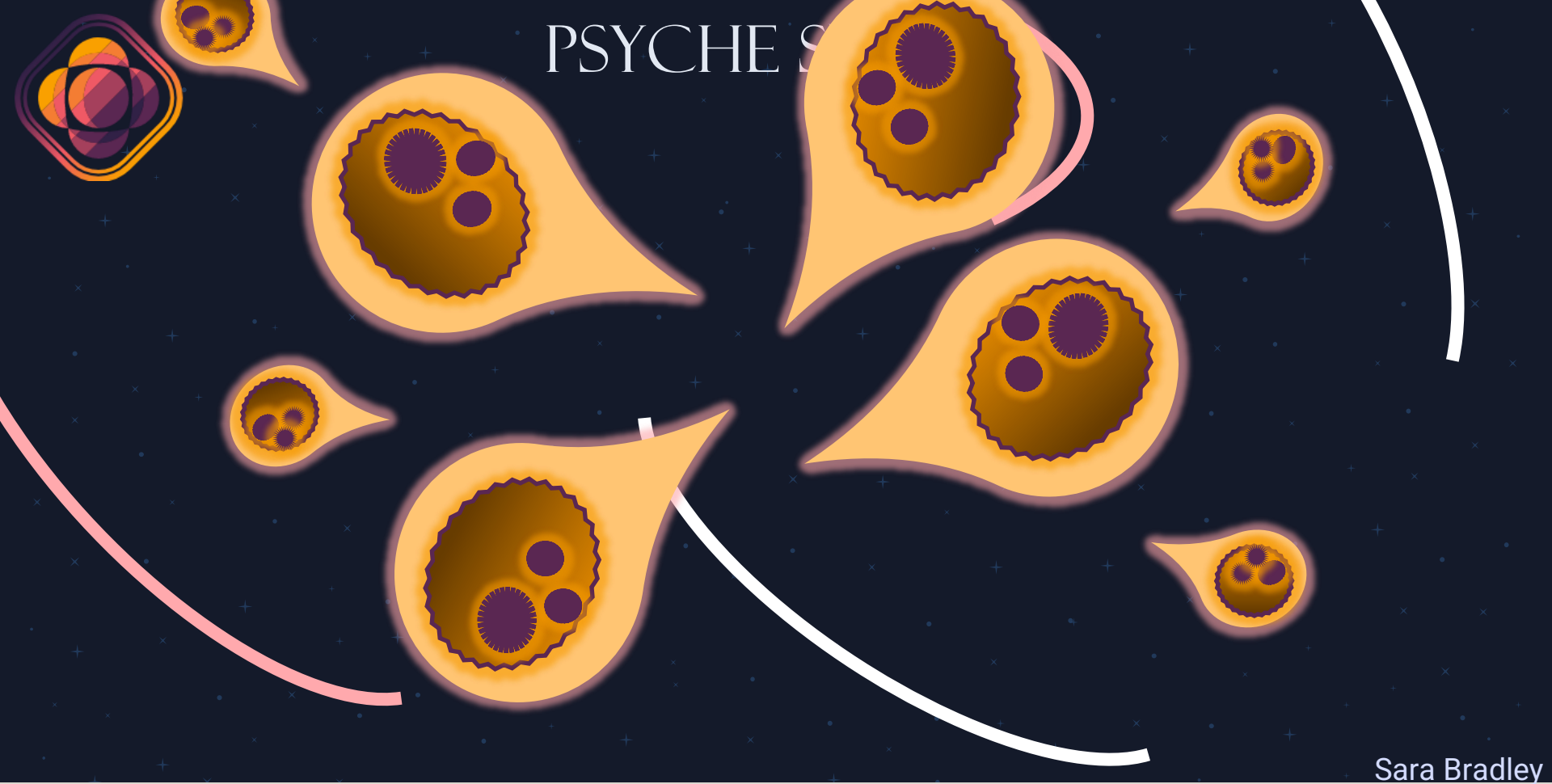

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PSYCHE STORY

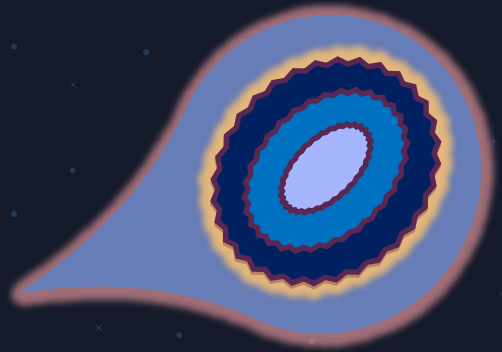


Figure 3: inside of the rocky layer as it cools

Sara Bradley

PSYCHE STORY

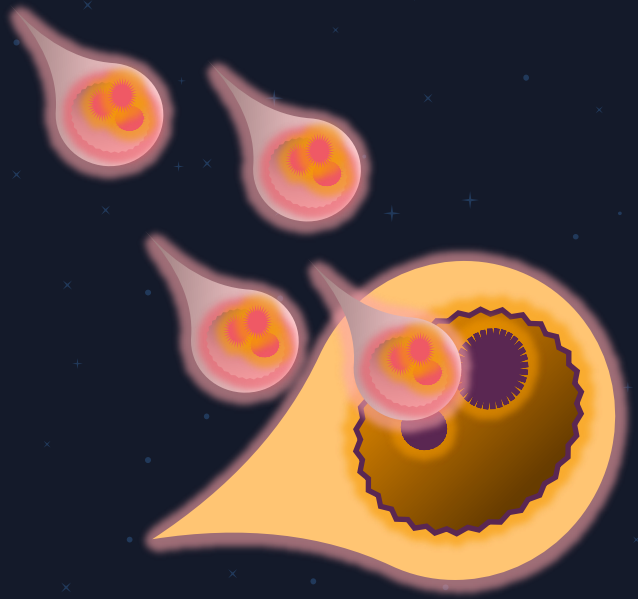
Figure 2

Current mission?

The mission is to study the surface using a spacecraft named *Psyche.* Psyche is the only metallic core-like body we have discovered.

Sara Bradley

PSYCHE STORY



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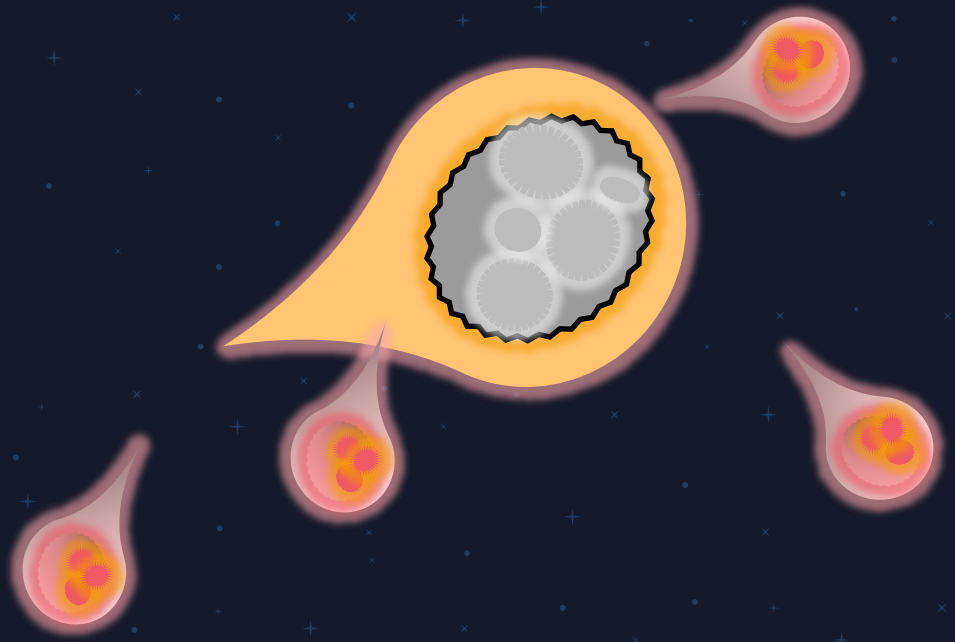
PSYCHE STORY



Sara Bradley

PSYCHE STORY

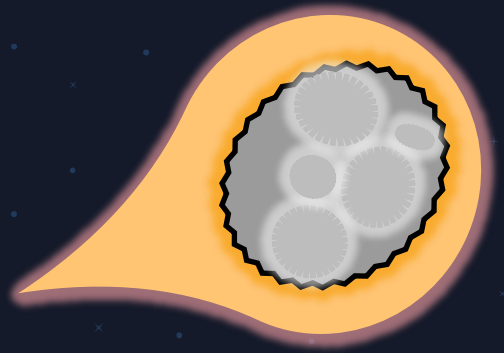


Figure 4: Psyche without a rocky outer layer

A Metal World?

By observing Psyche from a distance, it is currently believed that Psyche is made of mostly metal because it gives off many reflections.

Sara Bradley

WHERE IS PSYCHE

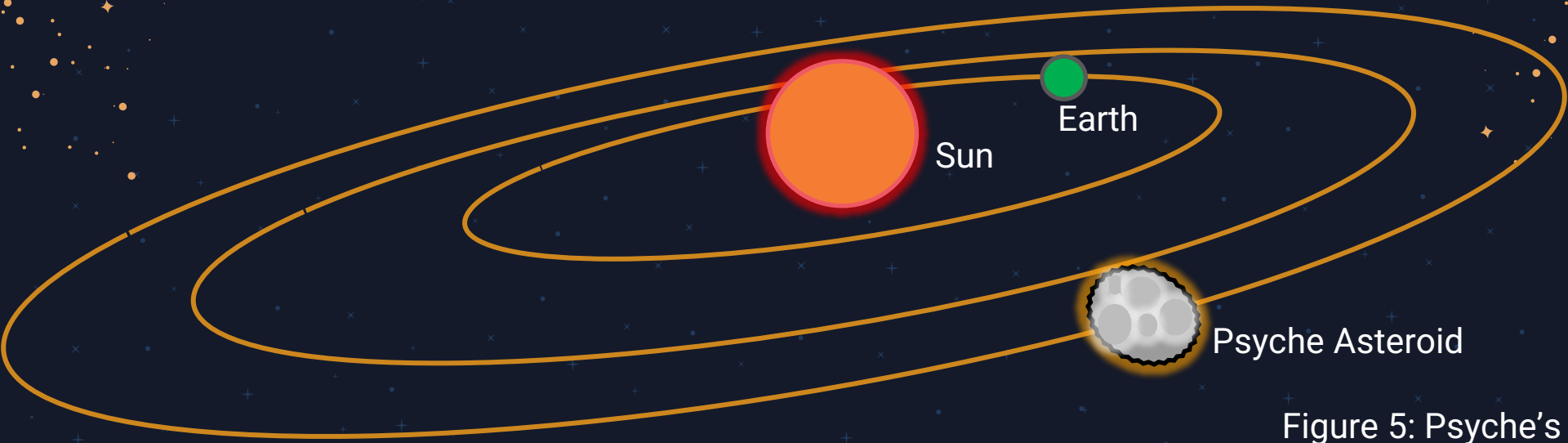


Figure 5: Psyche's location

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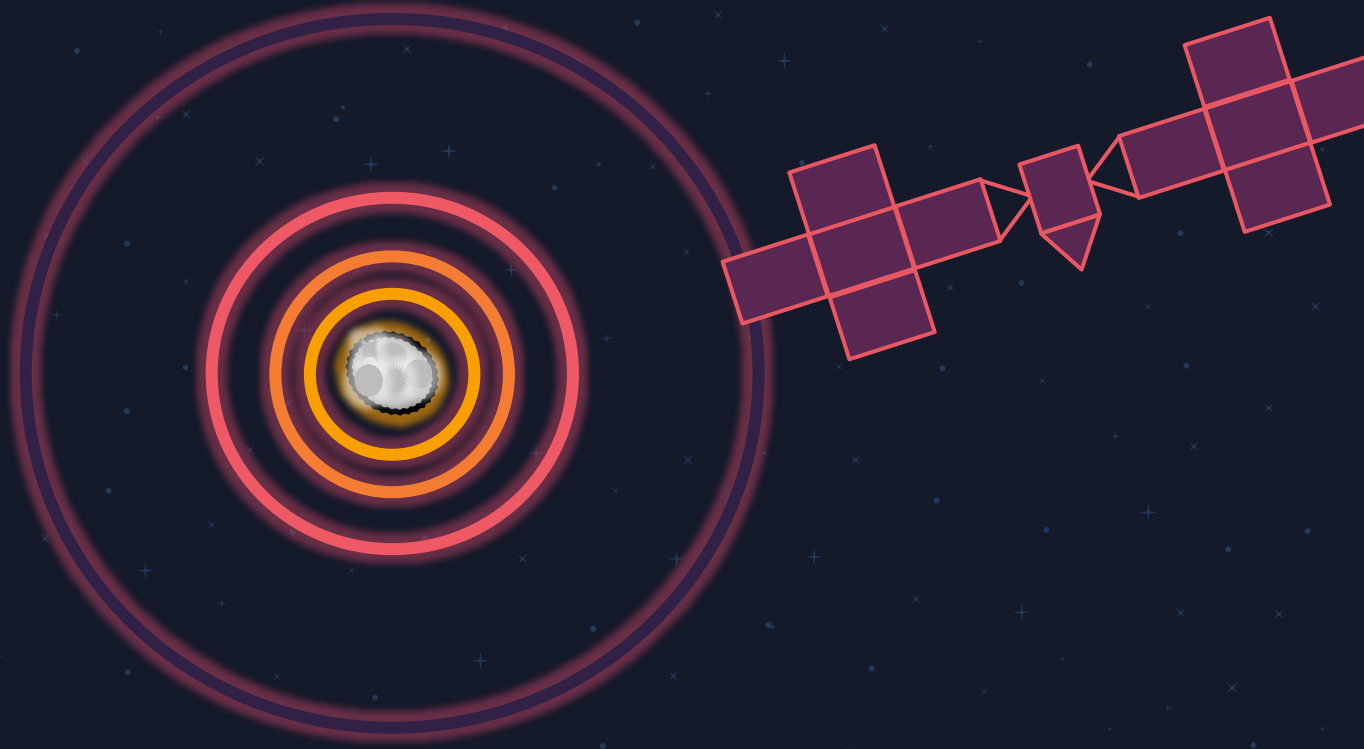
REACHING PSYCHE

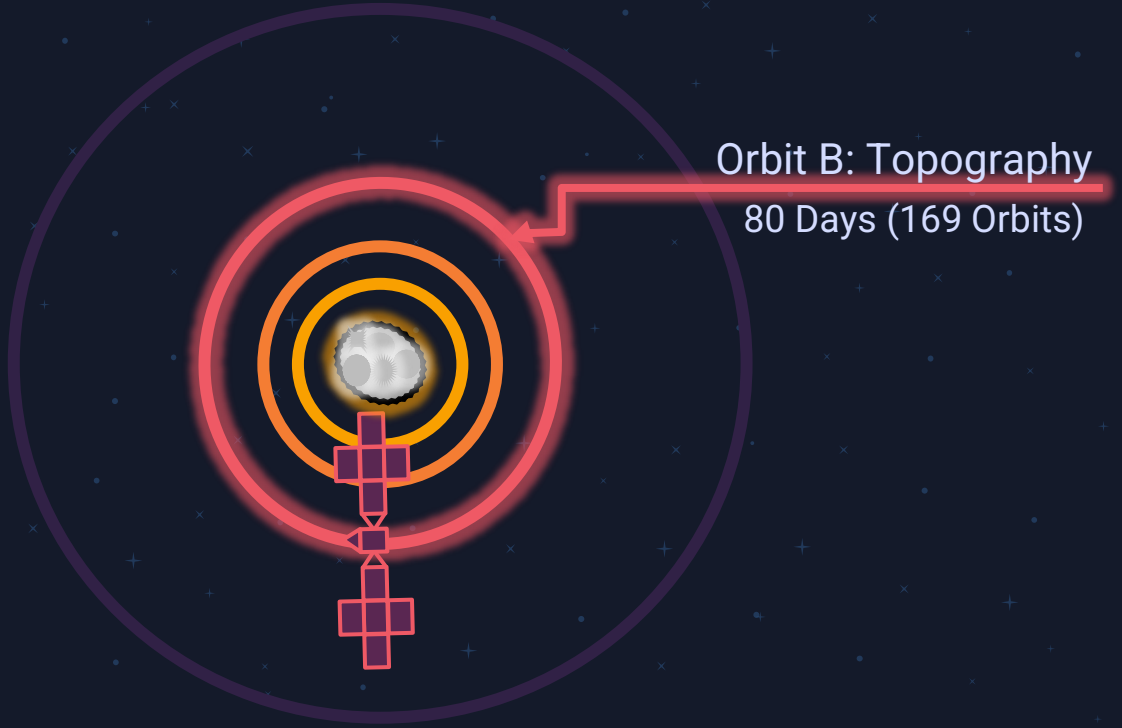


Sara Bradley

REACHING PSYCHE

Sara Bradley

REACHING PSYCHE



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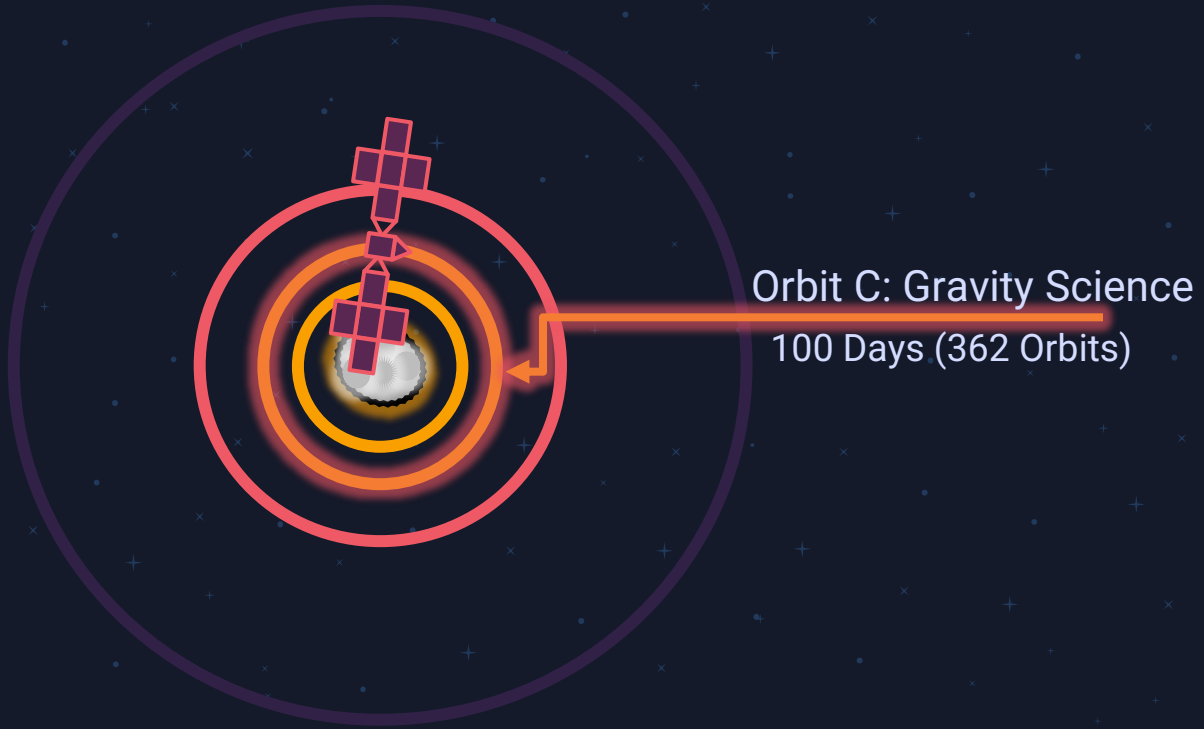
REACHING PSYCHE



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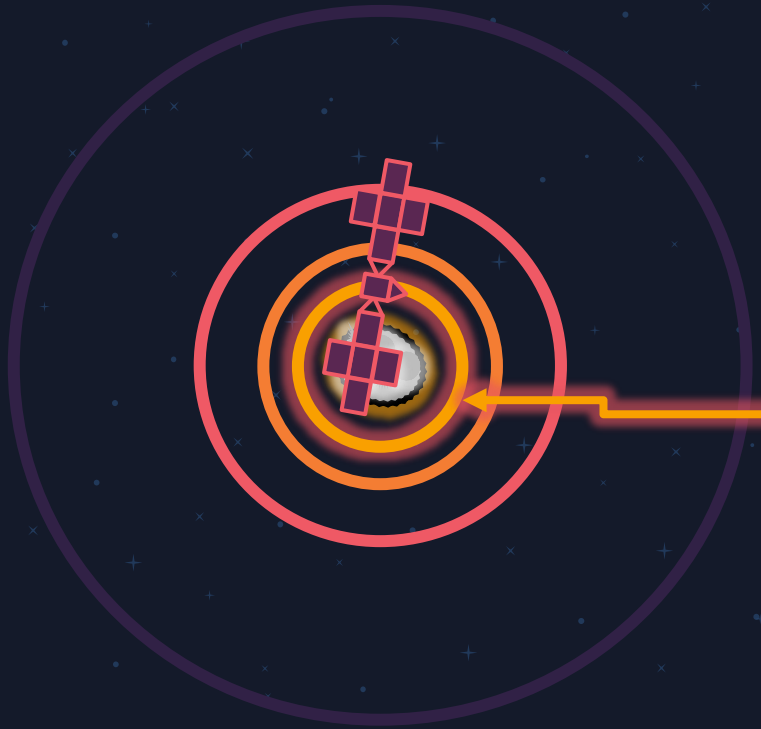
REACHING PSYCHE



Orbit D: Elemental Mapping

100 Days (684 Orbits)

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Future
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PRELIMINARY RESEARCH

Accessible Exhibition Design

Museum Visitor Experience

Previous ACCelerate Submissions

Garett Southerland

PRELIMINARY RESEARCH

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PRELIMINARY RESEARCH

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ACCESIBLE EXHIBITION DESIGN

Mount small items no higher than 40 in (1015 mm) above the floor

Include closed captioning for audio aspects and alternative text for visual aspects of the design

Construct the top of a case no higher than 36 in (915 mm) above the ground

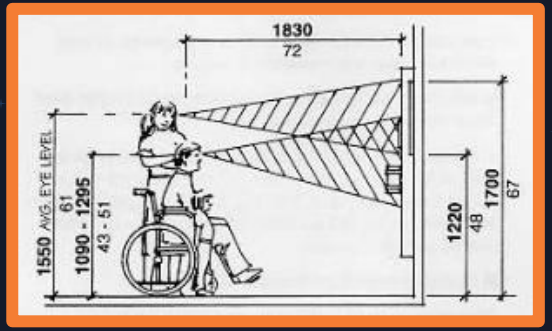

Figure 6 : Wall mounting

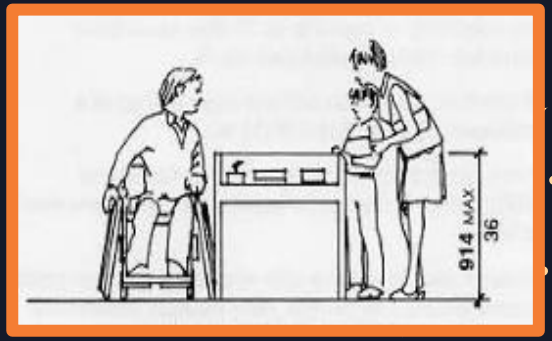

Figure 7: Table display

Garett Southerland

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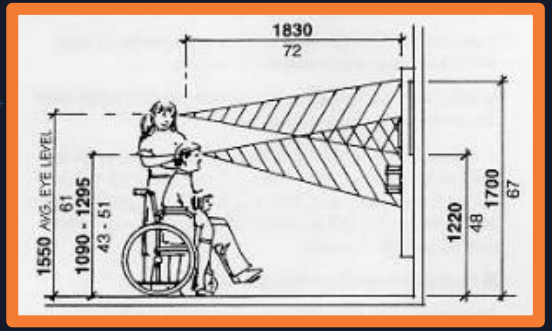

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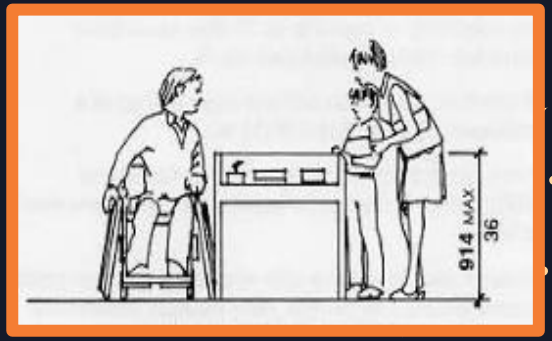

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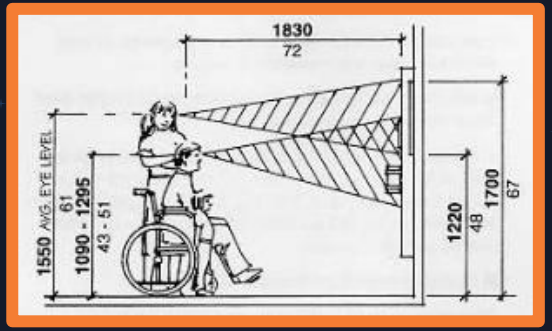

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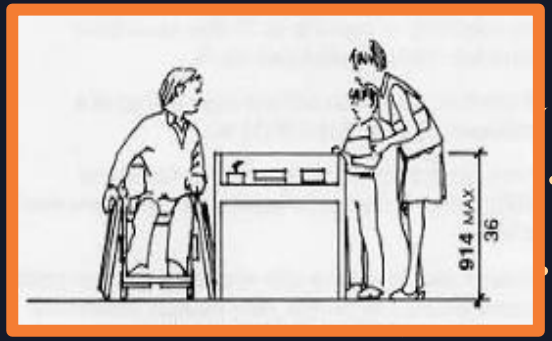

Figure 7: Table display

Garett Southerland

MUSEUM VISITOR EXPERIENCE

On average, families spend 1.6 minutes on an individual exhibit and non-families spend 1.1 minutes.

Mean Time per Exhibit

	Family	Nonfamily	Average
Weekday	1.9[a]	0.9[a]	1.4
Weekend	1.3	1.2	1.3
Average	1.6	1.1	1.4

Note. All times are in minutes. Values are averaged over both exhibitions.
[a]These values are statistically different from one another.

Figure 8: Time spent at each interactive exhibit

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PREVIOUS ACCELERATE SUBMISSIONS

Shared Space, Shared History

Figure 9: Shared Space cover photo

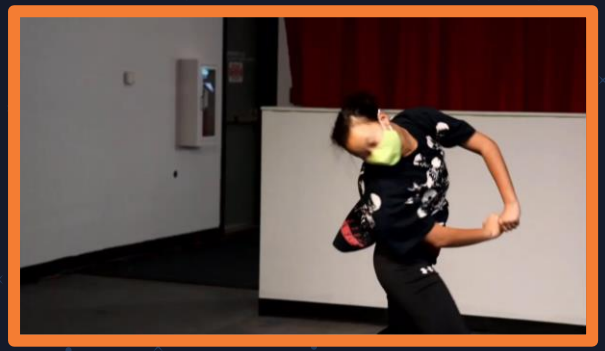

Figure 10: Shared Space video demonstration

Penguineering Robotics

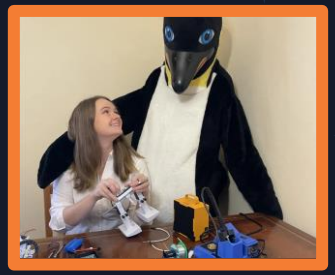

Figure 11: Penguineering cover photo

Figure 12: Penguin robots at exhibition

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CURRENT RESEARCH

Survey on Target Audience

Social Media Interaction

Garett Southerland

CURRENT RESEARCH

Survey on Target Audience

Social Media Interaction

Garett Southerland

ASSUMPTIONS

Power Source Access

Eighth Grade Level Concepts

Low-Cost Fabrication

Garett Southerland

ASSUMPTIONS

Power Source Access

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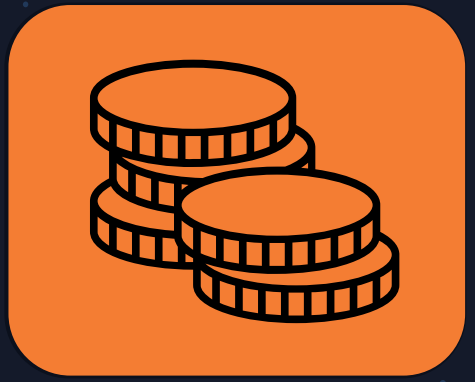
KEY GOALS



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MARKETS

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CUSTOMER NEEDS

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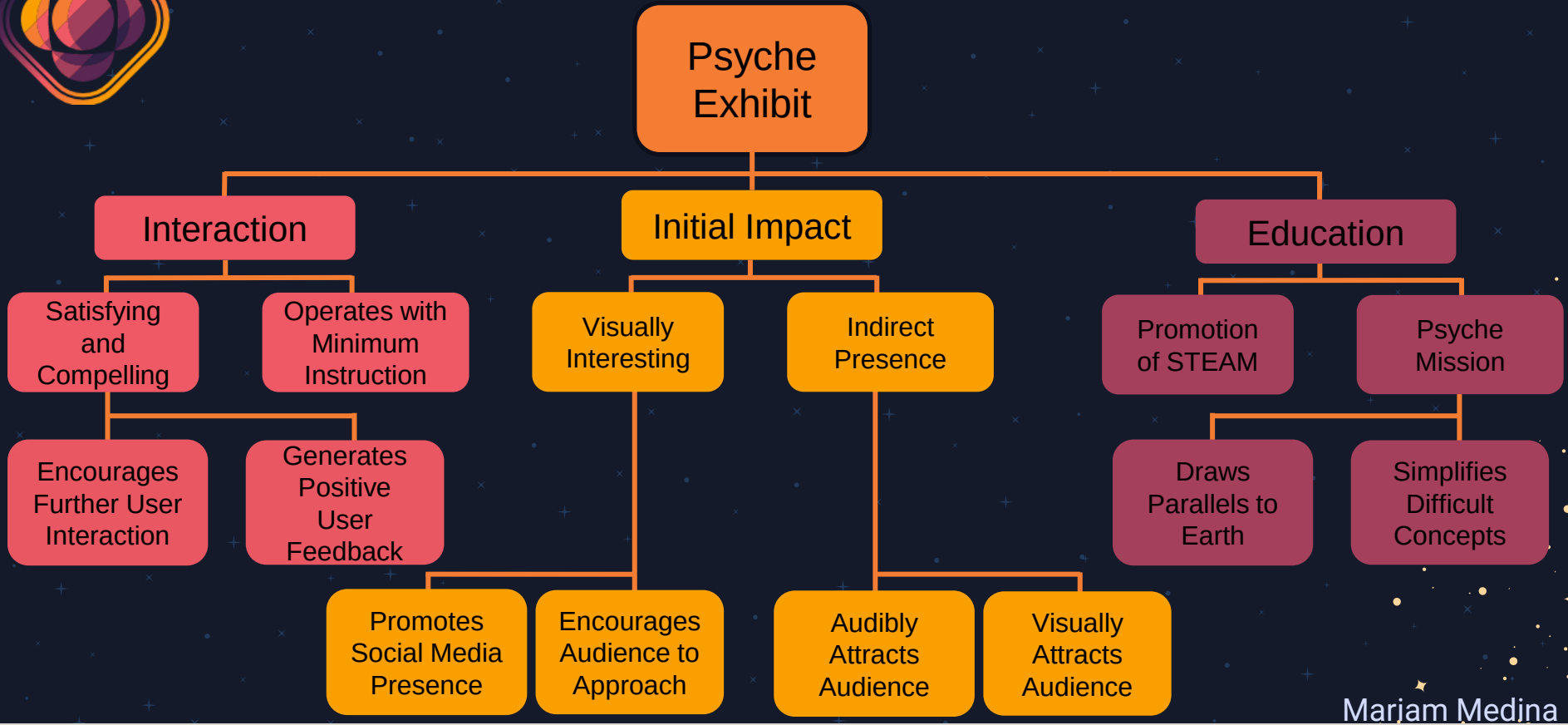
FUNCTIONAL DECOMPOSITION



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FD MATRIX

Minor Functions	System Functions		
	Interaction	Initial Impact	Education
Visually Interesting	●		
Operates w/Minimum Instruction	●		
Satisfying and Compelling	●	●	
Indirect Presence		●	
Promotion of STEAM	●		●
Psyche Mission			●

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FUTURE WORK

Research, Survey, Targets and Metrics

Generation and Evaluation of Concepts

Rapid Prototyping, Concept Selection, Material Selection

Finalize BOM, Better Prototype, Crowd Testing

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"Access smithsonian," *Access Smithsonian | Access Smithsonian*. [Online]. Available: https://access.si.edu/. [Accessed: 06-Oct-2022].

E. Asphaug, J. F. Bell, C. J. Bierson, B. G. Bills, W. F. Bottke, S. W. Courville, S. D. Dibb, I. Jun, D. J. Lawrence, S. Marchi, T. J. McCoy, J. M. G. Merayo, R. Oran, J. G. O'Rourke, R. S. Park, P. N. Peplowski, T. H. Prettyman, C. A. Raymond, B. P. Weiss, M. A. Wieczorek, and M. T. Zuber, "Distinguishing the origin of asteroid (16) psyche - space science reviews," *SpringerLink*, 12-Apr-2022. [Online]. Available: https://link.springer.com/article/10.1007/s11214-022-00880-9. [Accessed: 06-Oct-2022].

SUMMARY

We are creating an accessible museum exhibit to spark interest in Psyche

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ADDITIONAL SLIDES

Marjam Medina

PUT EXTRA STUFF IN THE SLIDES AFTER THIS

Marjam Medina

PSYCHE STORY

How did Psyche get there?
There are three theories, but one leading formation of Psyche:
Psyche believe to be part of a differentiated body, meaning it is what remains of a once larger planet, and experienced iron volcanism.

Current mission?
Psyche is the only metallic core-like body we have discovered and can teach us a lot. The mission is to study using a spacecraft also named *Psyche.*

Future of the mission?
The most recent major update on the Psyche mission was in Feb 2020 when NASA awarded SpaceX the $117 million contract launch *Psyche. Psyche* is scheduled to launch no earlier than 2024.

Our role
Our objective is to raise awareness and interest in Psyche and to get the public excited about the future of the mission.

ABOUT THE MISSION

Present
Launch a spacecraft to travel to Psyche to further study

Future
Launch a lander to do research on the asteroid

Sara Bradley

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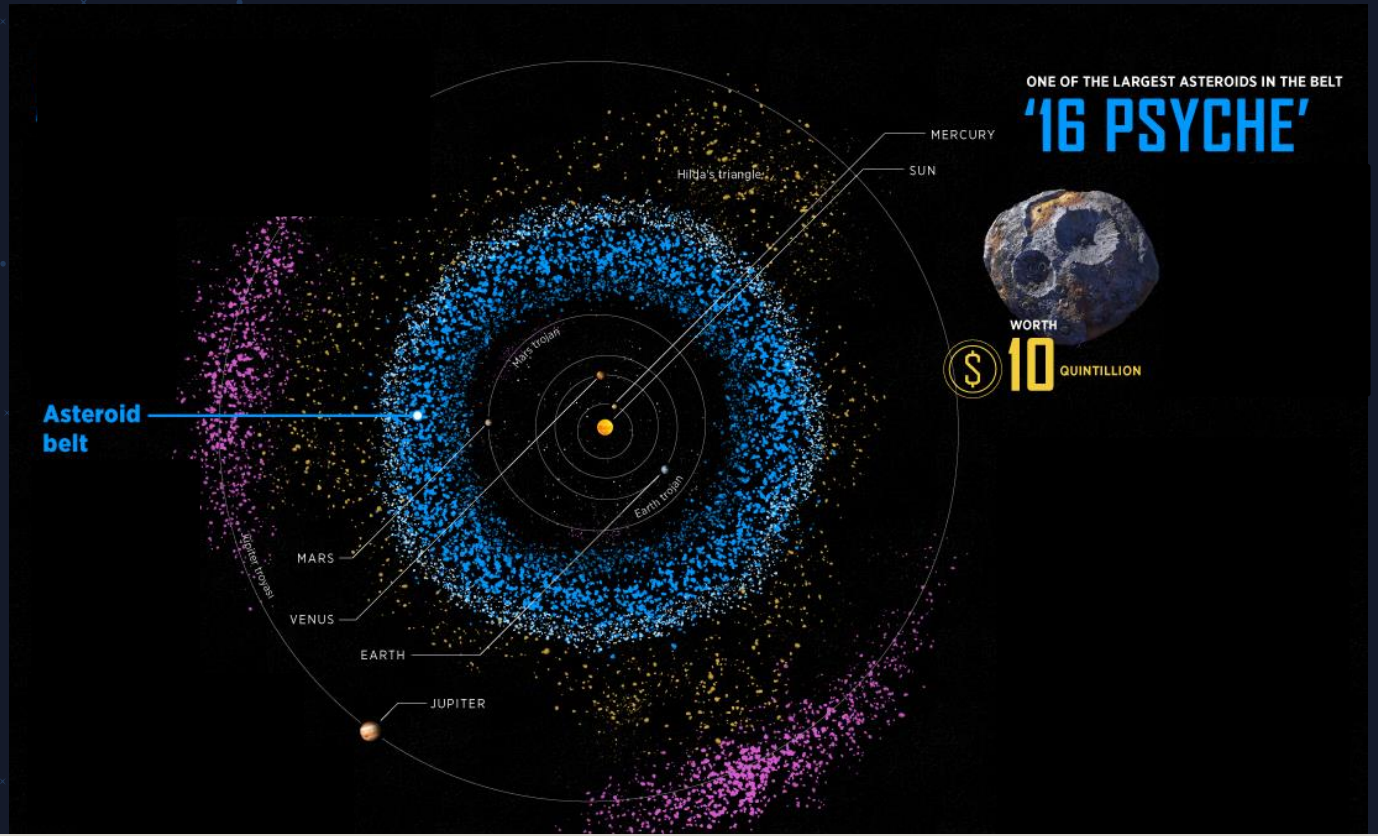
ABOUT PSYCHE



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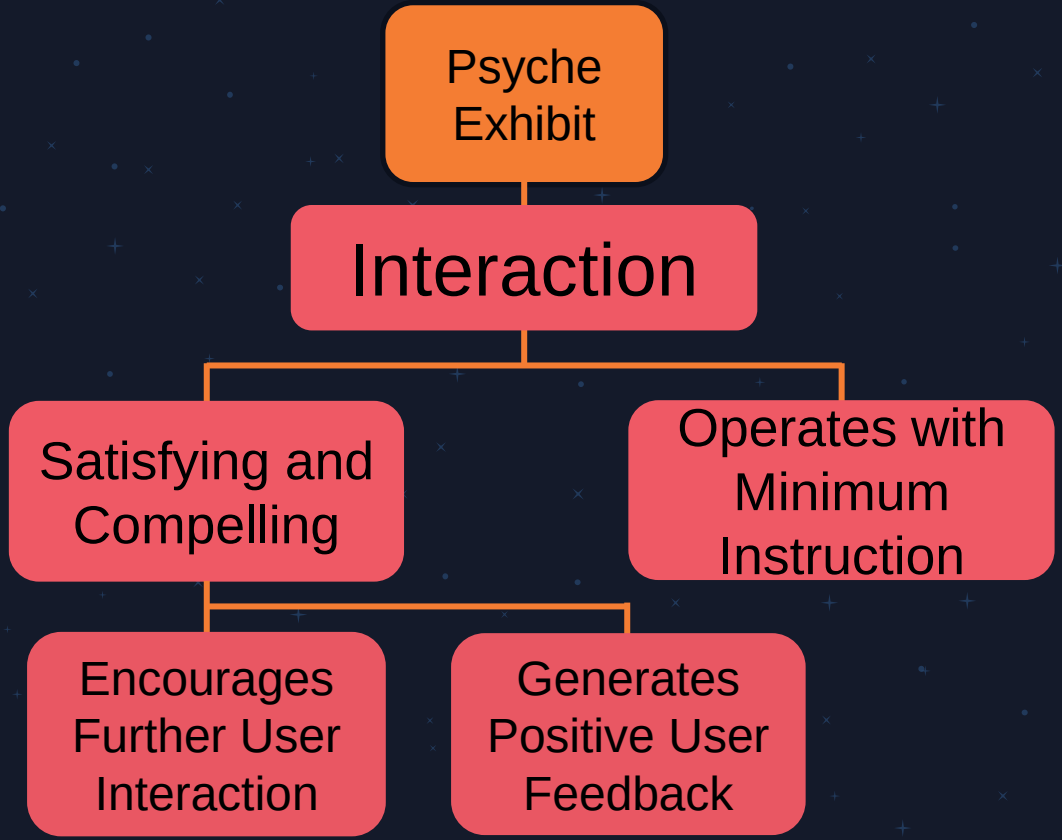

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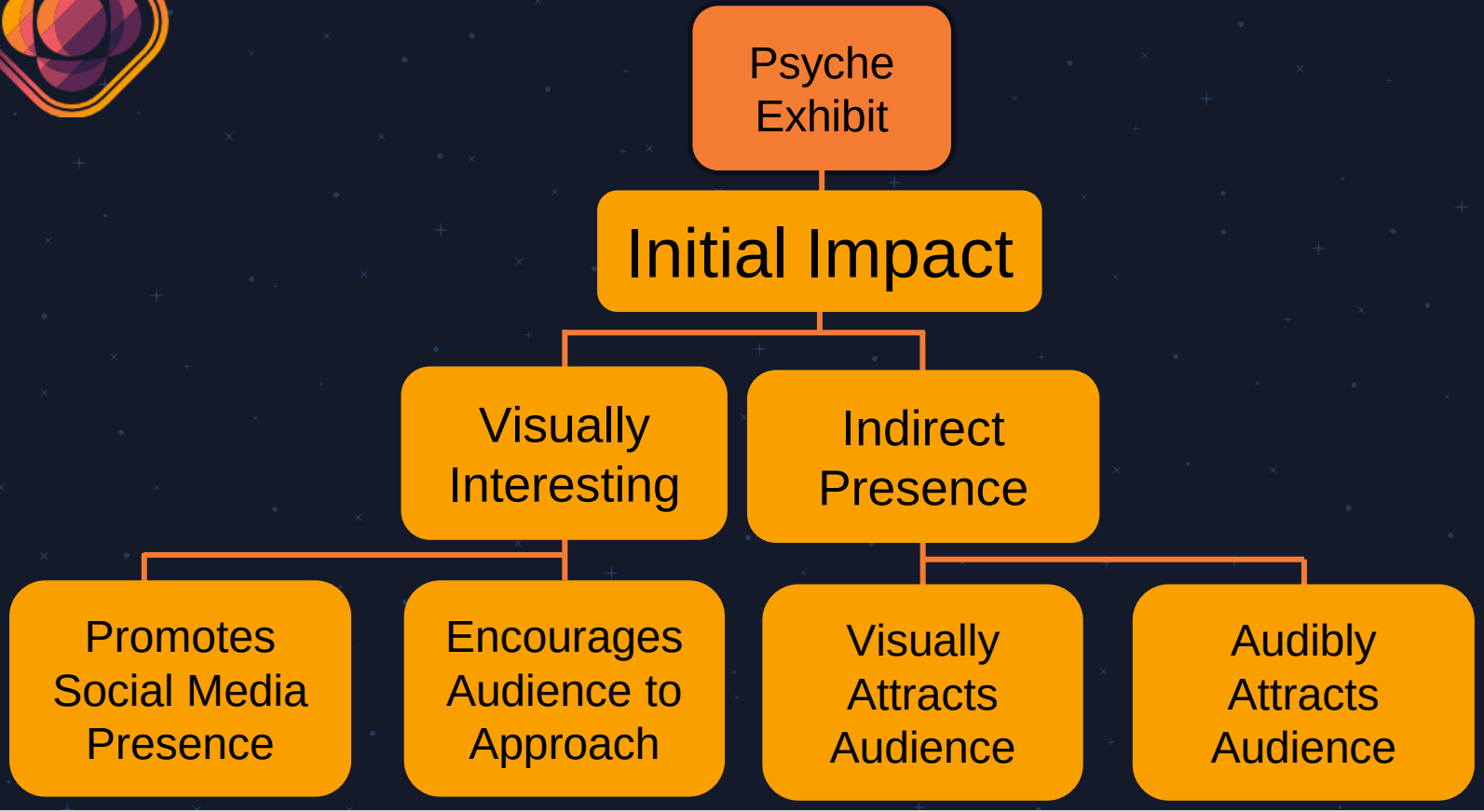

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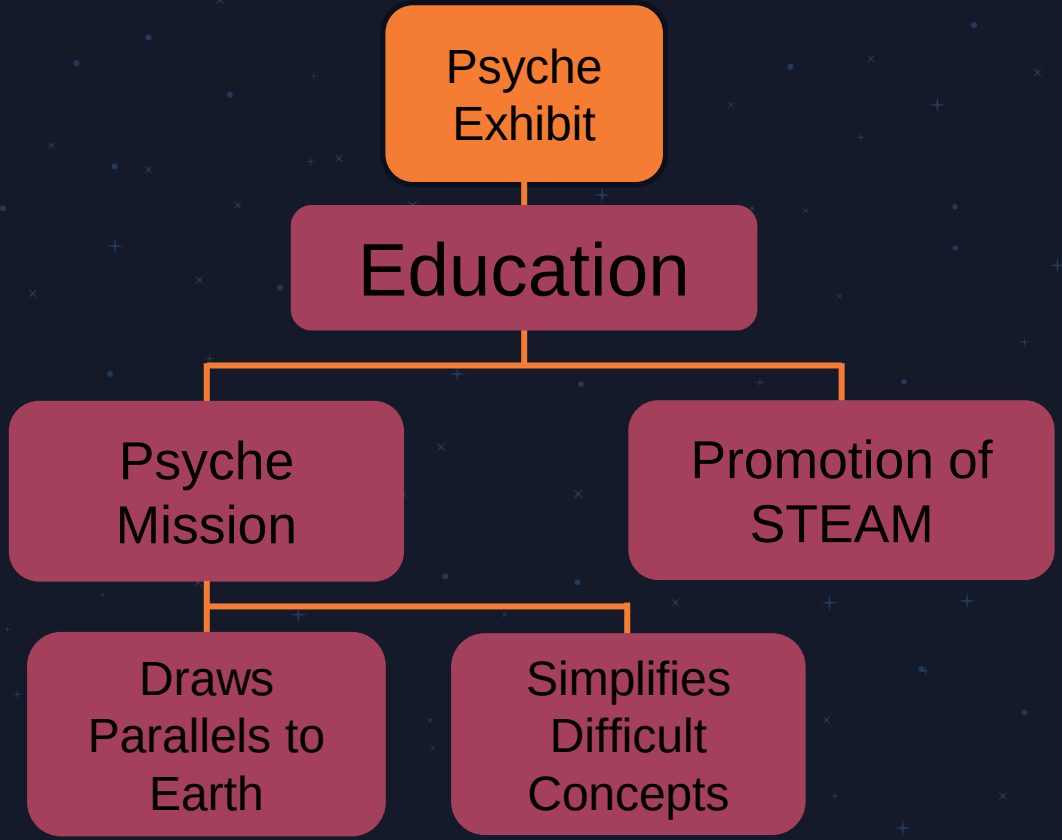

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