



ART AND MUSIC AS A MEANS OF CONVEYING INFORMATION ABOUT THE STATE OF THE PLANET

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OVERVIEW

- ★ Defining science communication
- ★ Models of science communication
 - ★ The cultural cognition thesis
- ★ Accepting decision-relevant science
 - ★ The Art of Planetary Science
 - ★ Artist interviews
 - ★ Conclusions

The background is a dark blue and purple space scene. In the top left, there's a large planet with horizontal stripes. Below it is a smaller planet with a ring. In the top right, an astronaut in a white suit is floating, holding a long, thin, looping tether. The bottom right corner shows a cratered moon. The entire scene is filled with small white stars and larger, four-pointed starburst patterns.

WHAT IS SCIENCE COMMUNICATION?

- Scientific literacy: competence or knowledge about scientific topics
- Public awareness of science: is the public informed on scientific issues?
 - Science communication is the whole process
- Doing research > spreading awareness > inspiring the public to engage

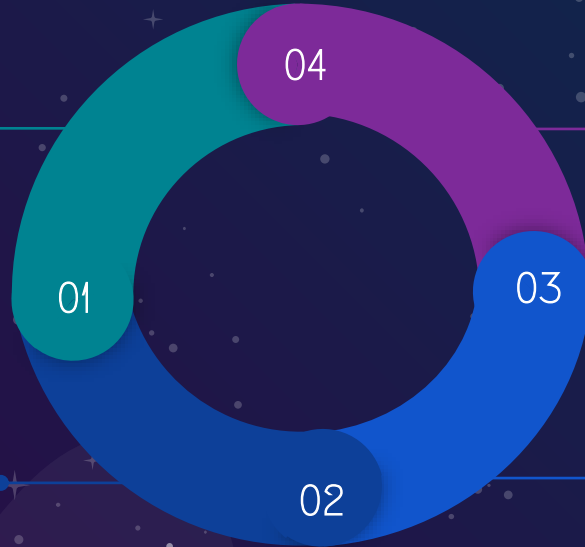
THE STAKEHOLDERS

Scientists

In academia, industry and governmental positions.

Mediators

Middle-man communicators, like journalists and educators, science illustrators/artists.



Policy Influencers

People who make policy, like advocate/lobbying groups and government officials.

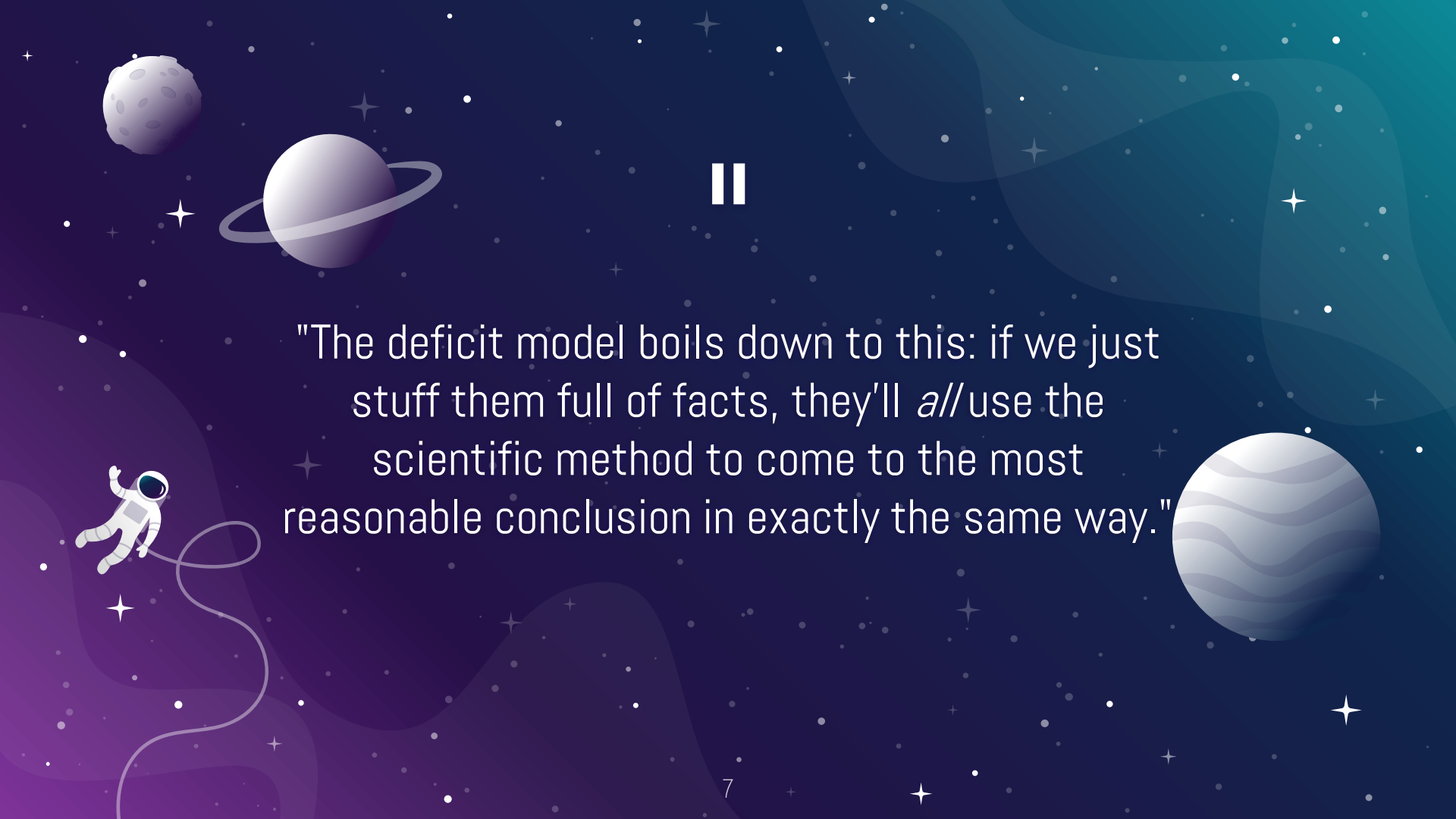
The Public

Members of the general population who evolve in response to issues.

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THE DEFICIT MODEL

- AKA the dissemination model
- One-way monologue from scientists to mediators, mediators to public .
- Public lacks facts and education = can't see the whole picture = controversy
- Educating the public will result in judgement of issues 'like a scientist'
- Mediator maintains flow of information between scientists and the public

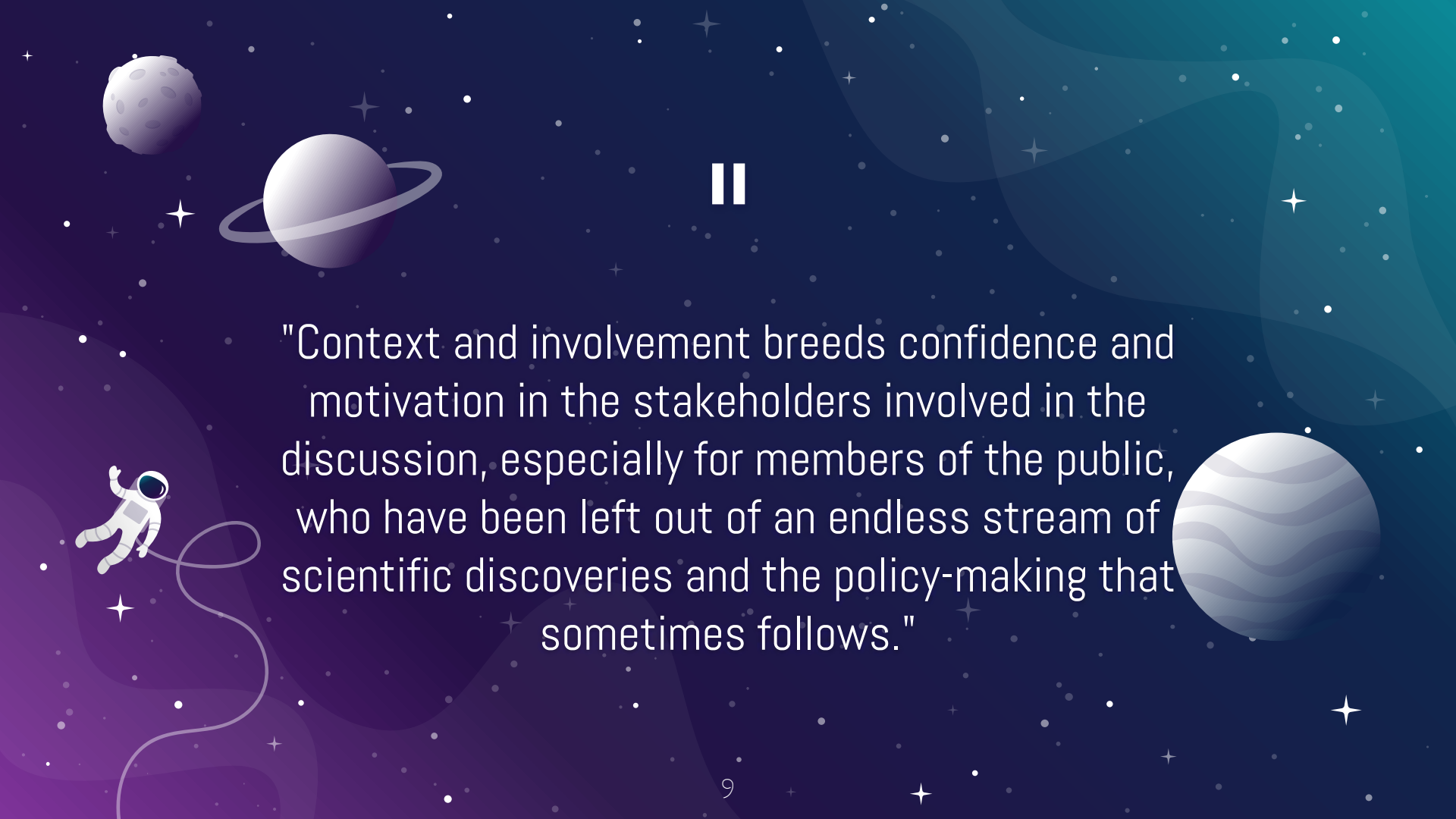
The background is a dark purple and blue space scene. It features several celestial bodies: a cratered moon in the top left, a ringed planet (like Saturn) in the upper middle, and a striped planet (like Jupiter) in the bottom right. Numerous white stars of varying sizes are scattered throughout. In the bottom left, a white astronaut is shown floating, with a white line trailing behind them. In the center, there is a white pause symbol (two vertical bars).

"The deficit model boils down to this: if we just stuff them full of facts, they'll *all* use the scientific method to come to the most reasonable conclusion in exactly the same way."

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THE DIALOGUE MODEL

- Introduces emphasis on context about research
- Allows for two-way discussion among stakeholders, namely as feedback
- Criticism on research validity, quality of translation, opinion on topics
 - Two heads are better than one

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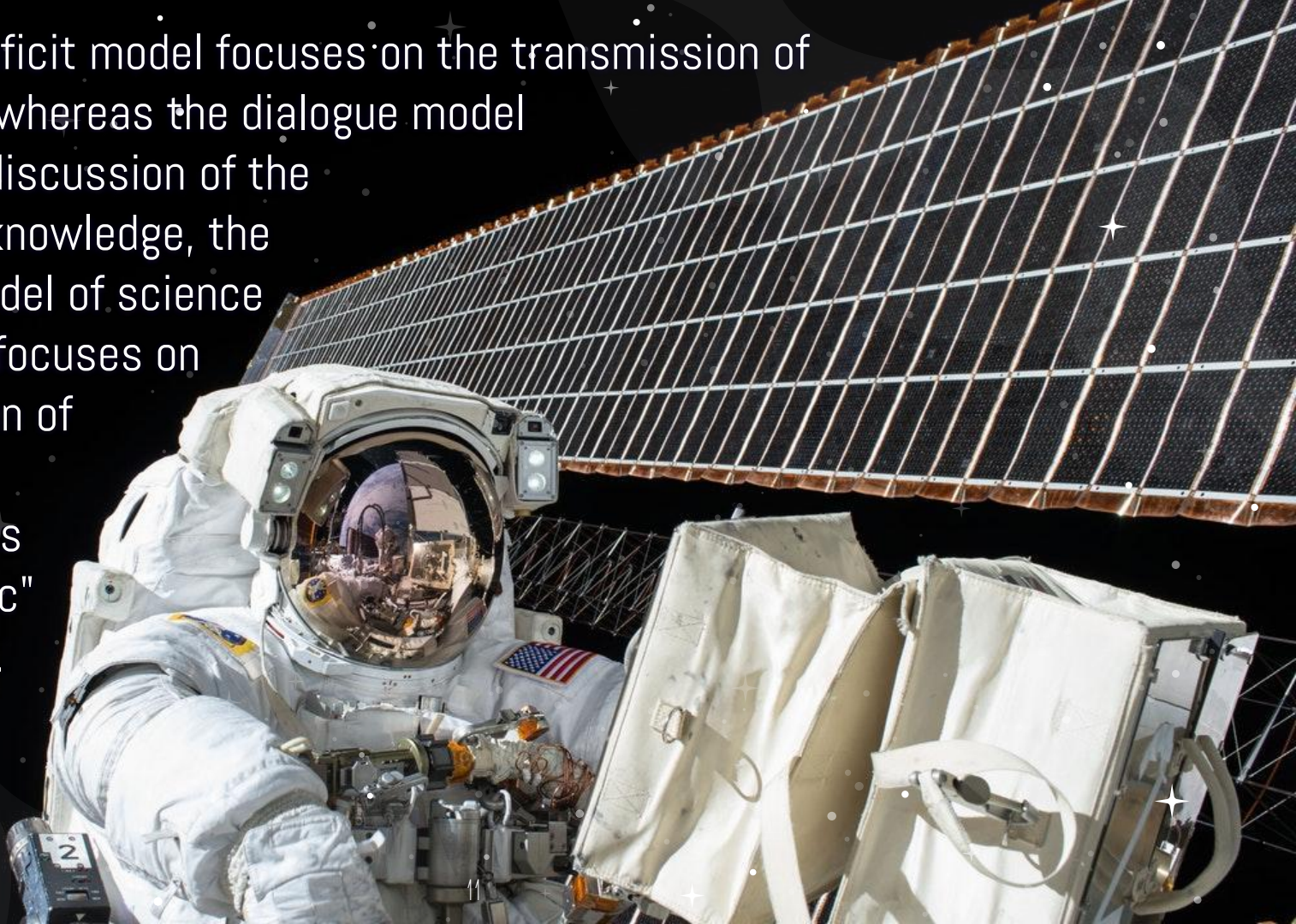
"Context and involvement breeds confidence and motivation in the stakeholders involved in the discussion, especially for members of the public, who have been left out of an endless stream of scientific discoveries and the policy-making that sometimes follows."

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THE PARTICIPATION MODEL

- Allows public to actively participate in generating science
 - Assist in every stage of scientific process
 - Ex: citizen science projects
 - Shared identity, shared equality, unifying character
- Democratization of science = more open-minded public

"Whereas the deficit model focuses on the transmission of knowledge, and whereas the dialogue model focuses on the discussion of the implications of knowledge, the participation model of science communication focuses on the co-production of knowledge by scientific experts and the lay public" (Bartock, 2015).



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THE CULTURAL COGNITION THESIS

- Humans don't always make decisions rationally
- People will gravitate toward beliefs they already agree with
- Public will question credibility of experts and their conclusions
 - Need solutions that don't threaten values of any group

KAHAN ON DECISION-RELEVANT SCIENCE



Why does the public struggle to accept 'decision-relevant' (D-R) science?

1. The public must accept there's too much D-R science to verify themselves
 2. They must recognize D-R science in order to use it
3. Struggle due to inability to recognize, not failure to comprehend science
4. Cultural cognition—tendency to align with values already agree with

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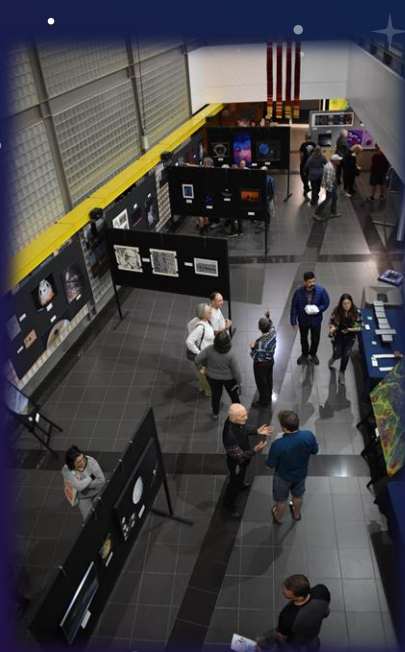
PENNYCOOK & RAND

- "Mentally lazy" = we don't use critical thinking to make decisions
 - Motivates people to "go with their gut"
- Prior exposure and repetition increase likelihood of accepting statements as true
 - Scientific experts and humanities scholars have difficulty communicating



THE ART OF PLANETARY SCIENCE.

"How can we visualize our science for the public, and then on the same note, invite members of the public to express what they see about space and the solar system and the universe?" -Allison McGraw, LPL graduate student & show organizer



ABOUT THE EXHIBITION

- ★ Lunar & Planetary Laboratory (LPL)
- ★ Began in 2013
- ★ Entirely graduate student run
- ★ 3-day event during fall semester
- ★ Bonus activities

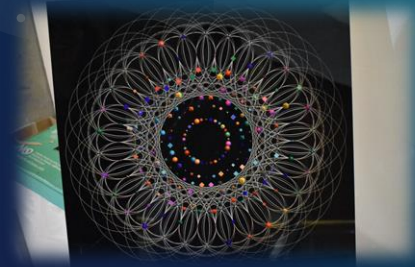


TAPS SUBMISSION CATEGORIES



Fine Art

Data Art



paintings, digital illustration, sculptures, photographs, etc.

other art influenced by planetary topics

scientists presenting research data/models as art

art inspired by scientific data/models

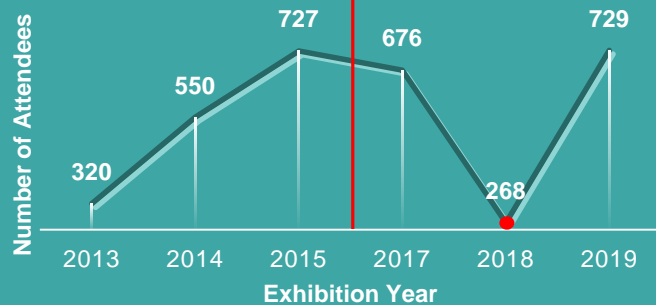
ARTISTS REPRESENTED AT TAPS



ART PIECES SUBMITTED TO TAPS



TAPS ATTENDANCE ACROSS TIME



2016: there was no TAPS
2018: attendance was only collected on one of three event nights

INTERVIEWEES SEE THEMSELVES AS PRIMARILY...

5

artists 

2

scientists 

3

both 

1

neither 



VAN GOGH'S REALITY ON JUPITER

"The mystery of space, the relativity of time gives us different perspectives and makes our lives more meaningful by expanding our imagination and increasing our admiration for the universe. We make sense of our existence in the world with science and art."



Müzeyyen Abika
Antalya, Turkey



JUNO'S VAN GOGH

"I just love how nature presents itself as art. When we explore space, that's what we're finding... That was the whole idea, to attract a different kind of people—people that would be more interested in art than science, that see the art AS science or representing scientific things."



Ron Cottrell
Tucson, AZ



LOOKING TO THE FUTURE

- "I think it's really important to be able to promote science in a different way, because it can be really unappealing to some people...If we can get it on a relatable level, if someone can see something that evokes an emotional response in them as opposed to just 'here's a bunch of graphs'—that is how you get more people on board with your message."



Christi Cummings
Phoenix, AZ





TEMPERATURE SCARFS

- "Science touches our lives in every single way, you know, there's chemistry in cooking and there's physics in riding a bike and all these things are not separate. I think The Art of Planetary Science is trying to show that it's not just a cup of tea or your bicycle, it's the planet and the whole solar system. The larger universe, it has a beauty to it as well. Let's celebrate that."



Brenda Huettner
Tucson, AZ



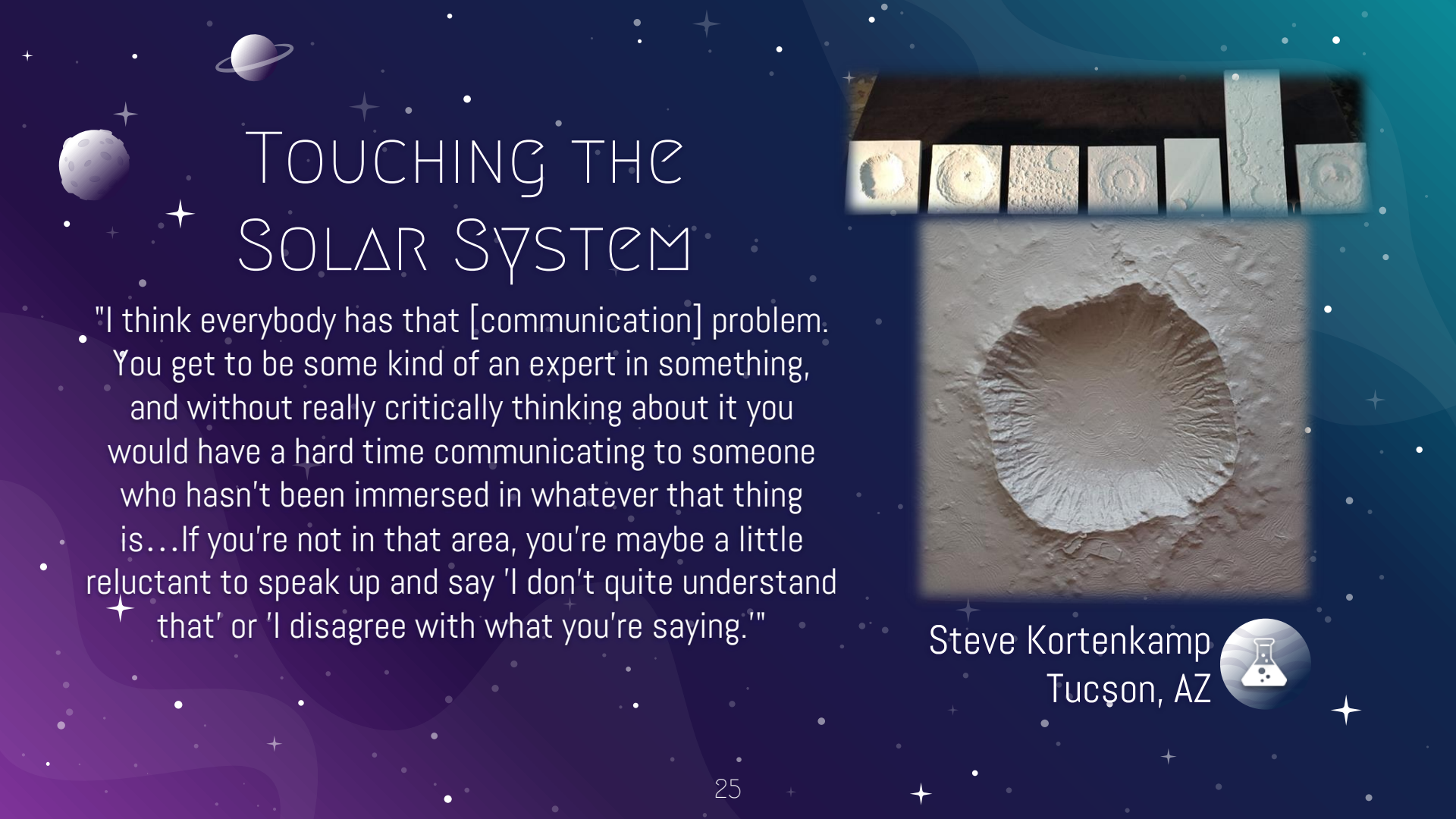
★ TACTILE MOON

• "I think to help people that don't understand science or are afraid of science, I think it's really up to the professor to be open to bringing in visuals. Even if it's an illustration, it doesn't have to be, like, fine art. It can be illustrations and color. It really helps, because someone is going to stare at that, and they're going to look at it and they'll be intrigued by it."



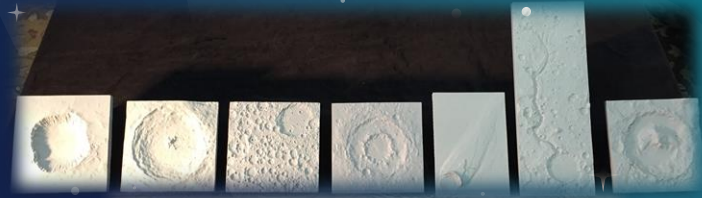
Chrysanthe Kapuranis
Tucson, AZ





TOUCHING THE SOLAR SYSTEM

"I think everybody has that [communication] problem. You get to be some kind of an expert in something, and without really critically thinking about it you would have a hard time communicating to someone who hasn't been immersed in whatever that thing is...If you're not in that area, you're maybe a little reluctant to speak up and say 'I don't quite understand that' or 'I disagree with what you're saying.'"



Steve Kortenkamp
Tucson, AZ





IN THE BEGINNING

"Everybody comes to art with their own background. So, when they look at the artwork, they're bringing their experiences and stories to create what they're going to want to see. Because a lot of people, when they look at abstract art, they want to see something.

- That's why when I title things, I used to just title things Untitled A, Untitled B, Untitled C—well, that's not helpful. I think people need a point of departure, as far as when they're looking at something so abstract, so that they can ground themselves and create their stories from their experiences:"

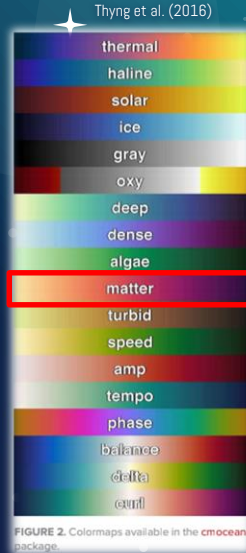
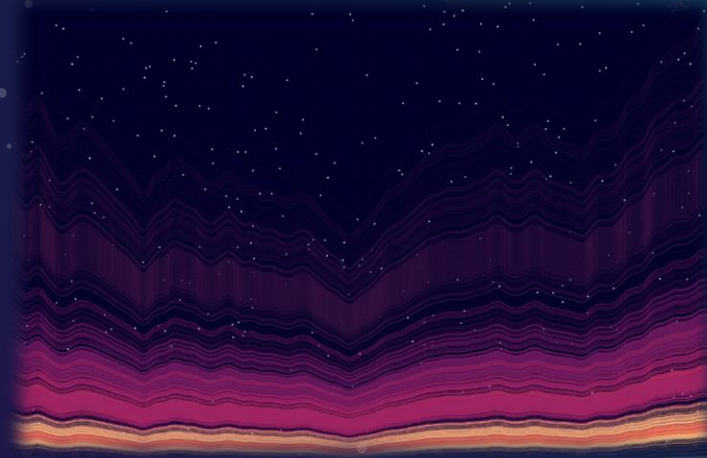


Ann Marcus Lapidus
Tucson, AZ



BEAUTY & THE BASAL REFLECTION

"If it's just numbers it's not always super interesting... Different audiences, I think, that's something that's important to consider. But yeah, data visualization in a peer-reviewed article is still really important to efficiently compliment the text in your paper. It's important to have those visuals too."



Tyler Meng
Tucson AZ



GENESIS

"I think that you can show so much more with an illustration or art, or something...I think that once you've done something for so long and you've worked around people who have also done the same thing for so long, you kind of have a completely different language and it's really hard to communicate with people who, you know, have never done anything in the field or really know the language of that field."



Mica Post
Ames, IA





THE PAST WILL SHOW US OUR FUTURES

"Science is intimidating to a great number of people; it often seems far away and difficult to understand. Having the opportunity to see so many different representations and ideas, having the opportunity to talk to scientists, artists and aficionados in that venue is a great way to spread the word of why it's all so important."



Janice Wallace
Tucson, AZ





SAMPLE SITES/ RECONNAISSANCE BIRDS

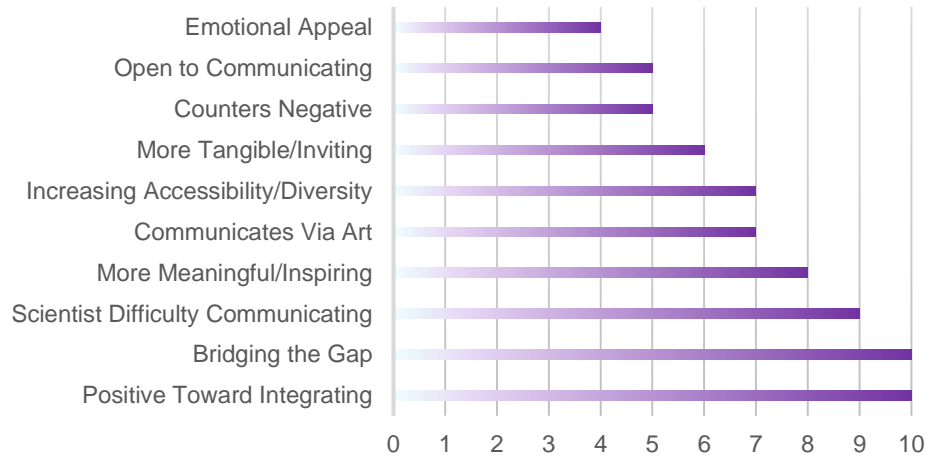
"Just, things about our process that the general public—or anybody that doesn't work on the mission—wouldn't be aware of. They can sort of see how we do things, and I think that's cool, and it might inspire other people to get into science and say 'Oh, that looks like interesting work. That might be something I would want to do.'"



Zoe Zeszut
Tucson, AZ



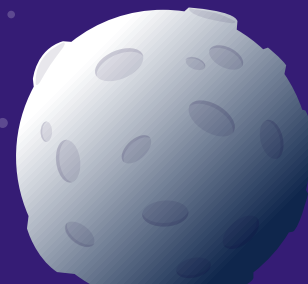
INTERVIEW FOCUS





THANKS!

ANY QUESTIONS?



REFERENCES

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 - ★ Photographs by <http://unsplash.com/>
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