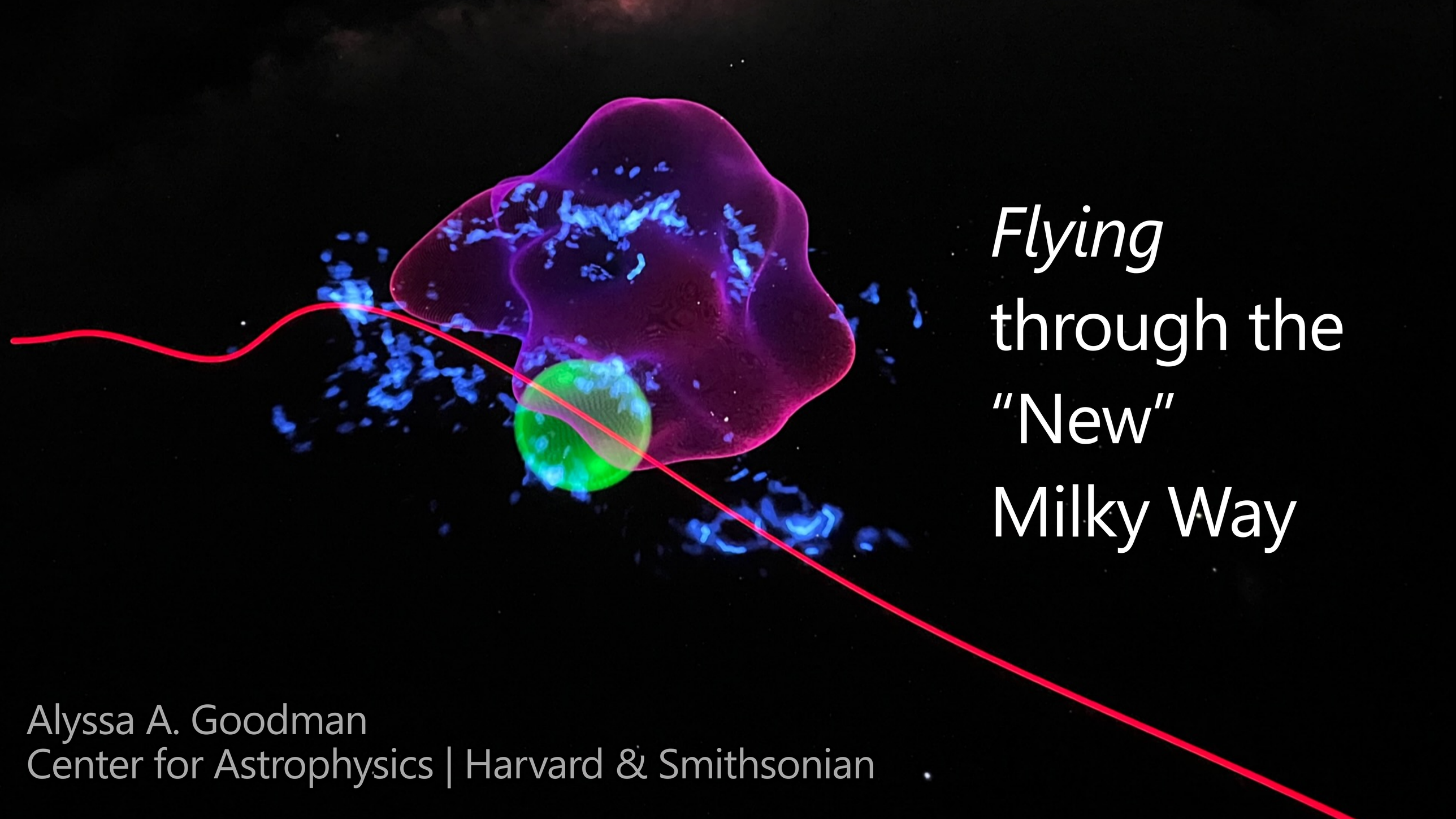


Flying through the "New" Milky Way

Alyssa A. Goodman
Center for Astrophysics | Harvard & Smithsonian

OpenSpace

glue

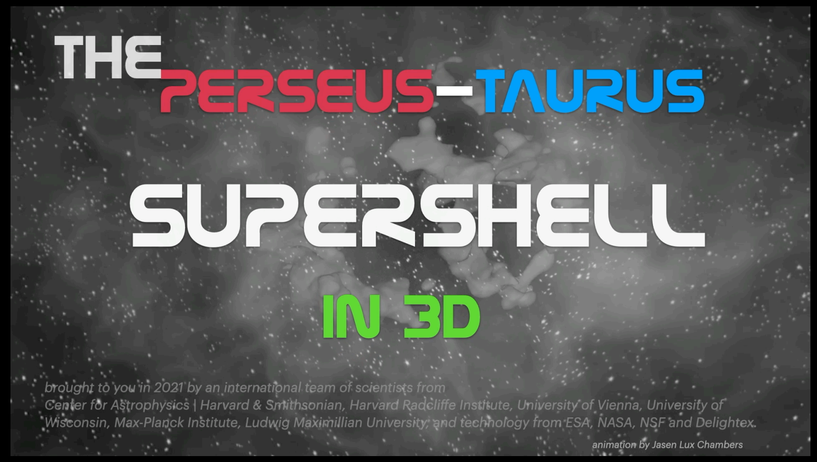
AMERICAN ASTRONOMICAL SOCIETY
WORLDWIDE TELESCOPE

Flying through the "New" Milky Way

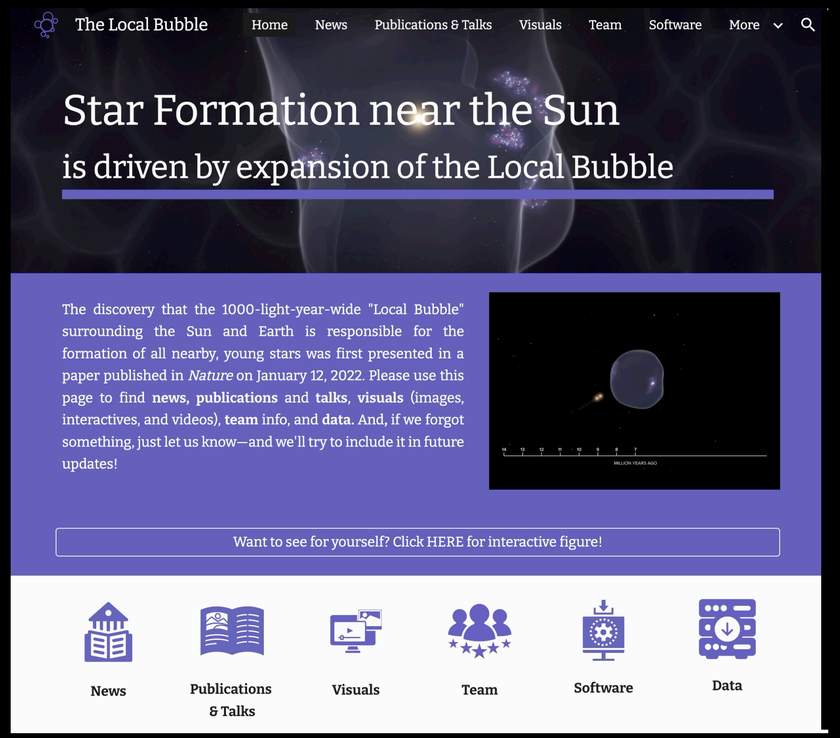
more information about our collaboration at milkyway3D.org

What's the "New" Milky Way?

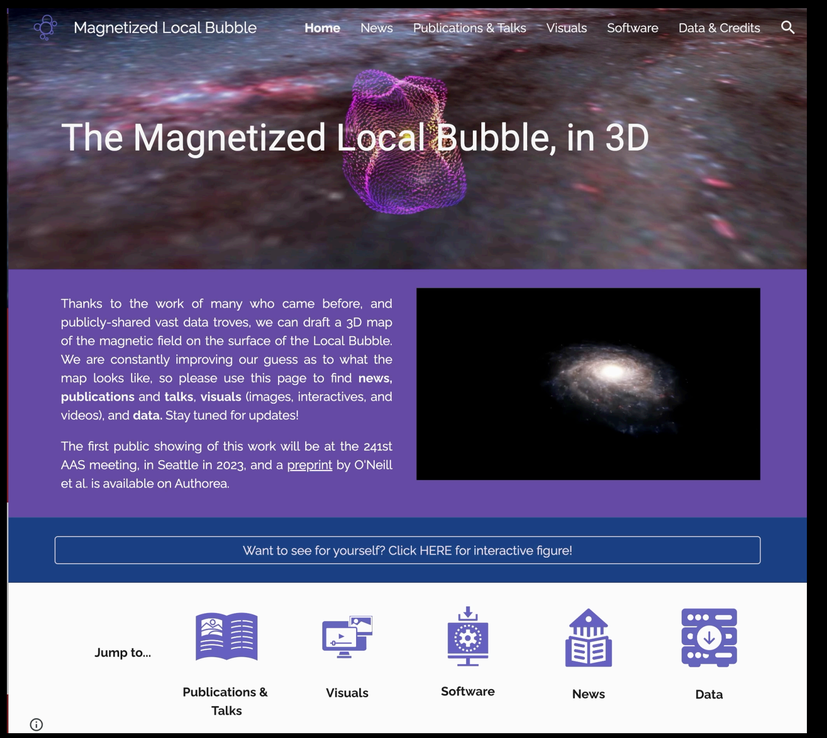
2021



2020

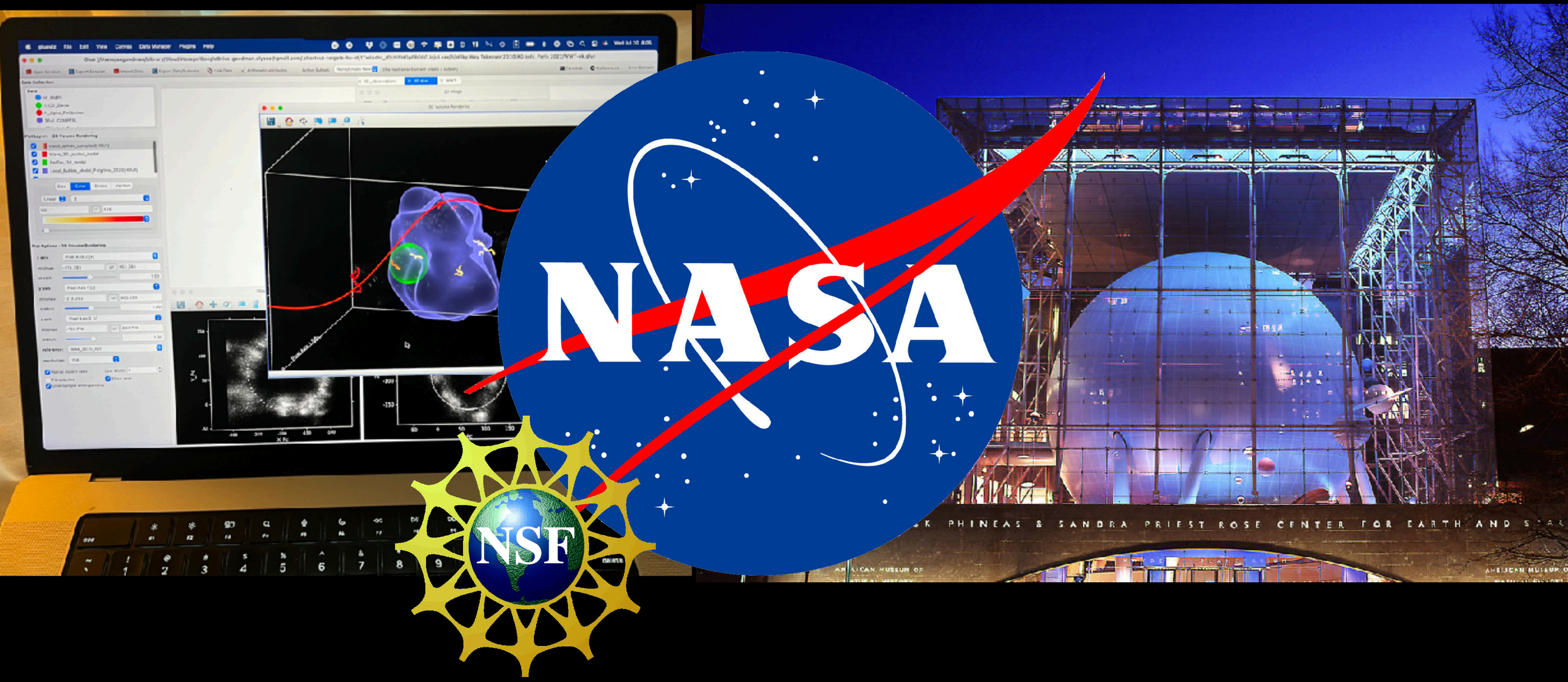


2022



2023 (today!)

Main Sequence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multidimensional data exploration
OpenSpace
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NASA
NSF
PHINEAS & SANDRA PRIEST ROSE CENTER FOR EARTH AND

Welcome to a new view of the Milky Way... in 3D!

Soon, milkyway3d.org will serve as a hub for the interconnected set of outreach, education, and research resources that will result from the interconnections we're in the process of making.

Our project includes new software development; approaches to data sharing; and scientific research questions propelling our collaboration forward.

milkyway3D.org

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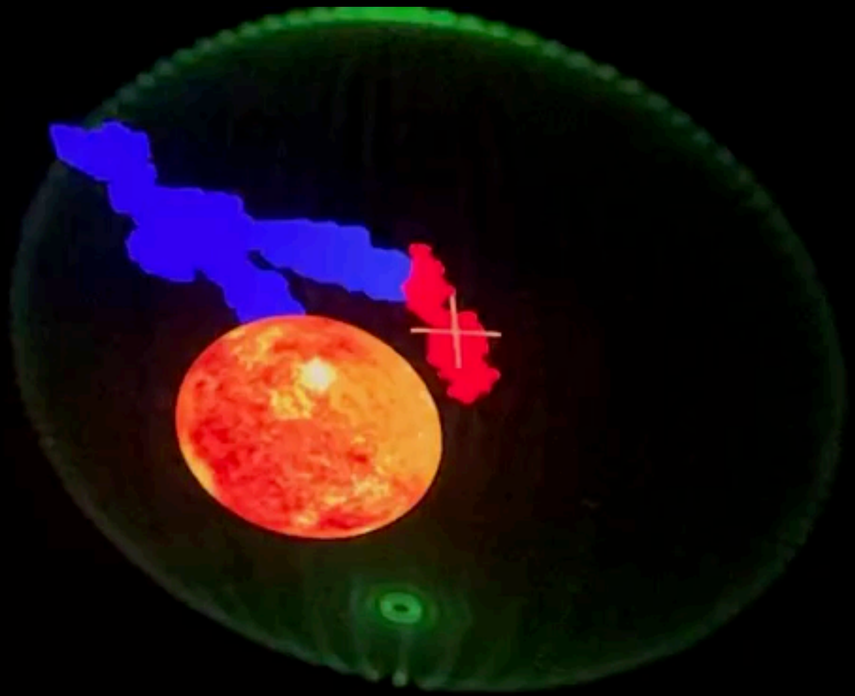

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Multidimensional data exploration

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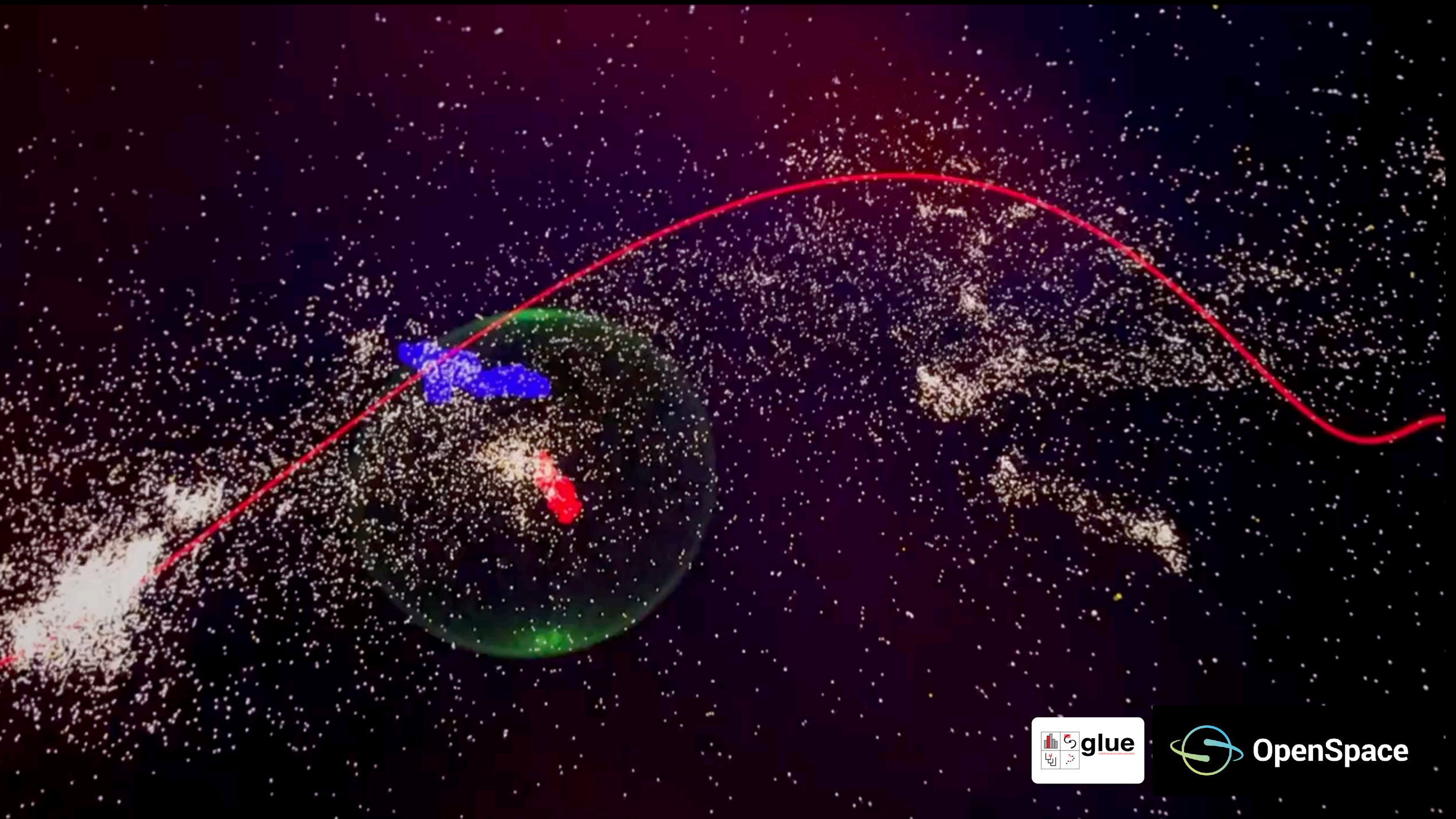
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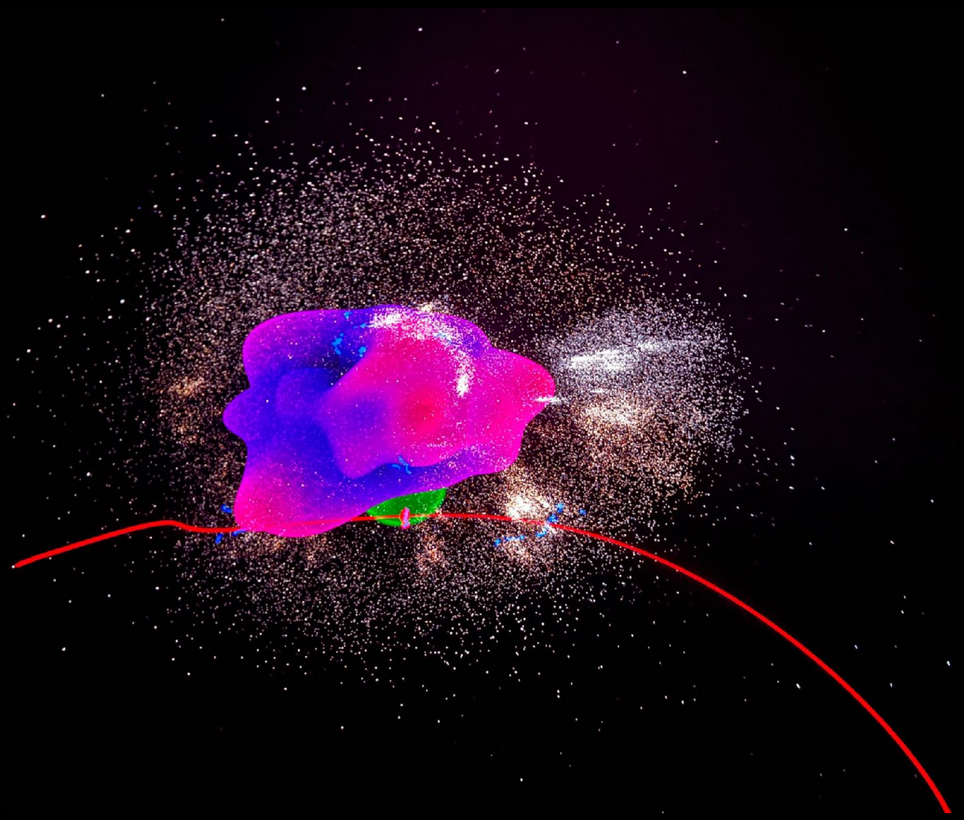

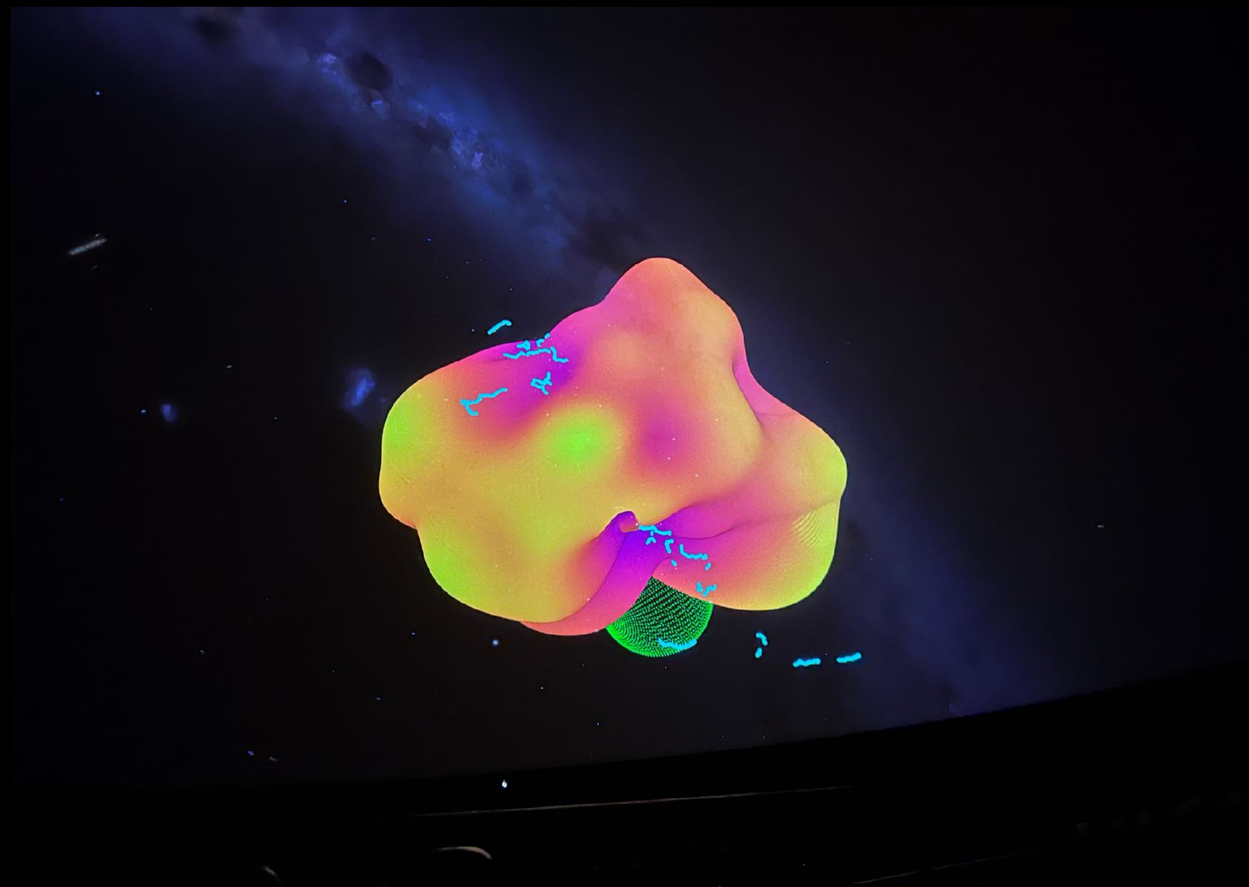

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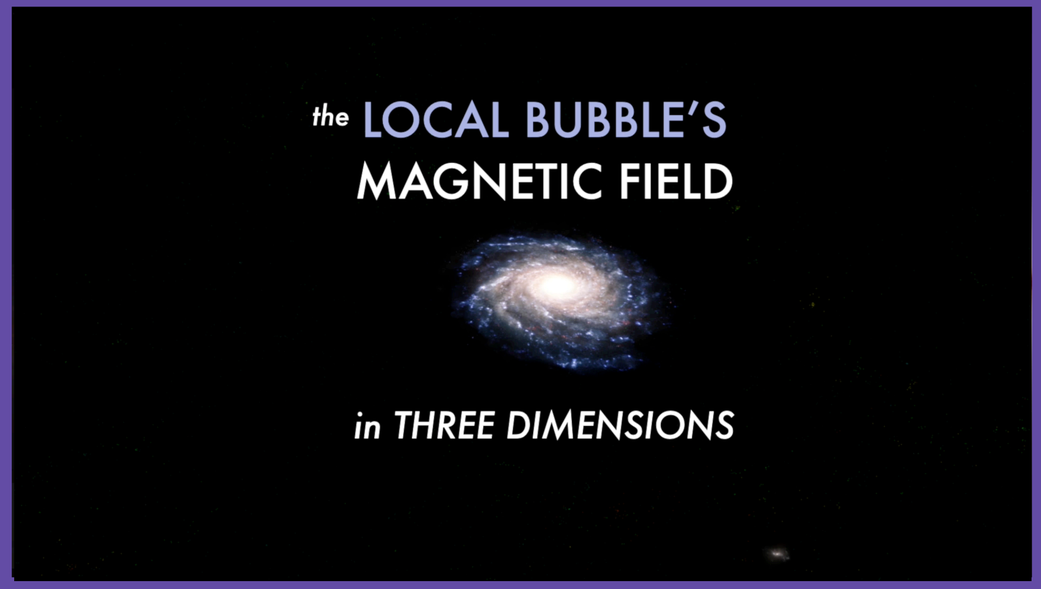
The Magnetized Local Bubble, in 3D

visit *tinyurl.com/local-bubble-b* for interactive figures, videos, and much more

Thanks to the work of many who came before, and publicly-shared vast data troves, we can draft a 3D map of the magnetic field on the surface of the Local Bubble. We are constantly improving our guess as to what the map looks like, so please use this page to find **news, publications** and **talks**, **visuals** (images, interactives, and videos), and **data.** Stay tuned for updates!

The first public showing of this work will be at the 241st AAS meeting, in Seattle in 2023, and a preprint by O'Neill et al. is available on Authorea.



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CosmicDS

Hide Images

X

Want to see in the
INFRARED
like JWST can?

Watch the demo read the
or X me to start playing right now!

This mini data story is brought to you by
NASA's SciAct CosmicDS program
and AAS WorldWide Telescope.

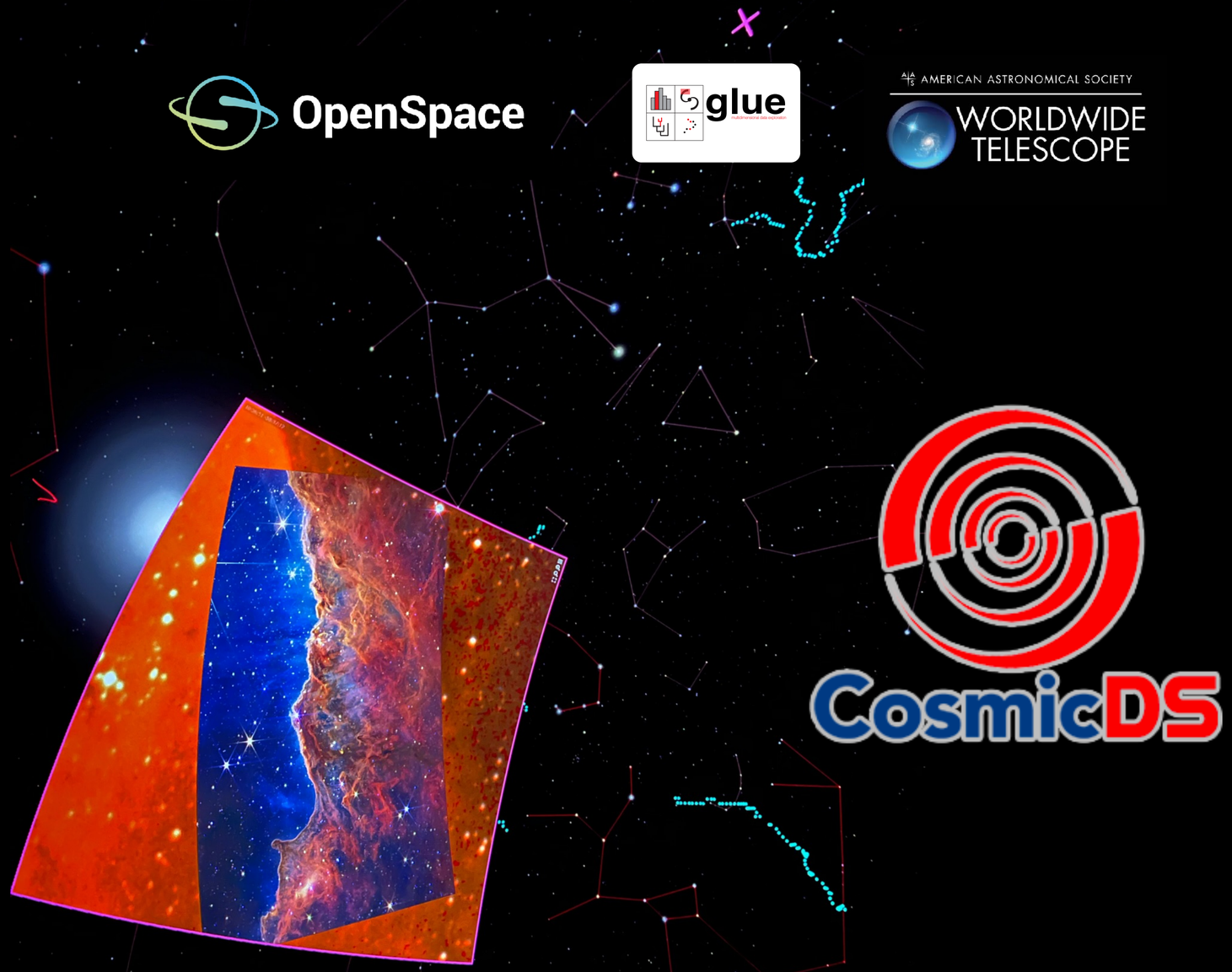
WEBB SPACE TELESCOPE
AMERICAN ASTRONOMICAL SOCIETY WORLDWIDE TELESCOPE
CosmicDS

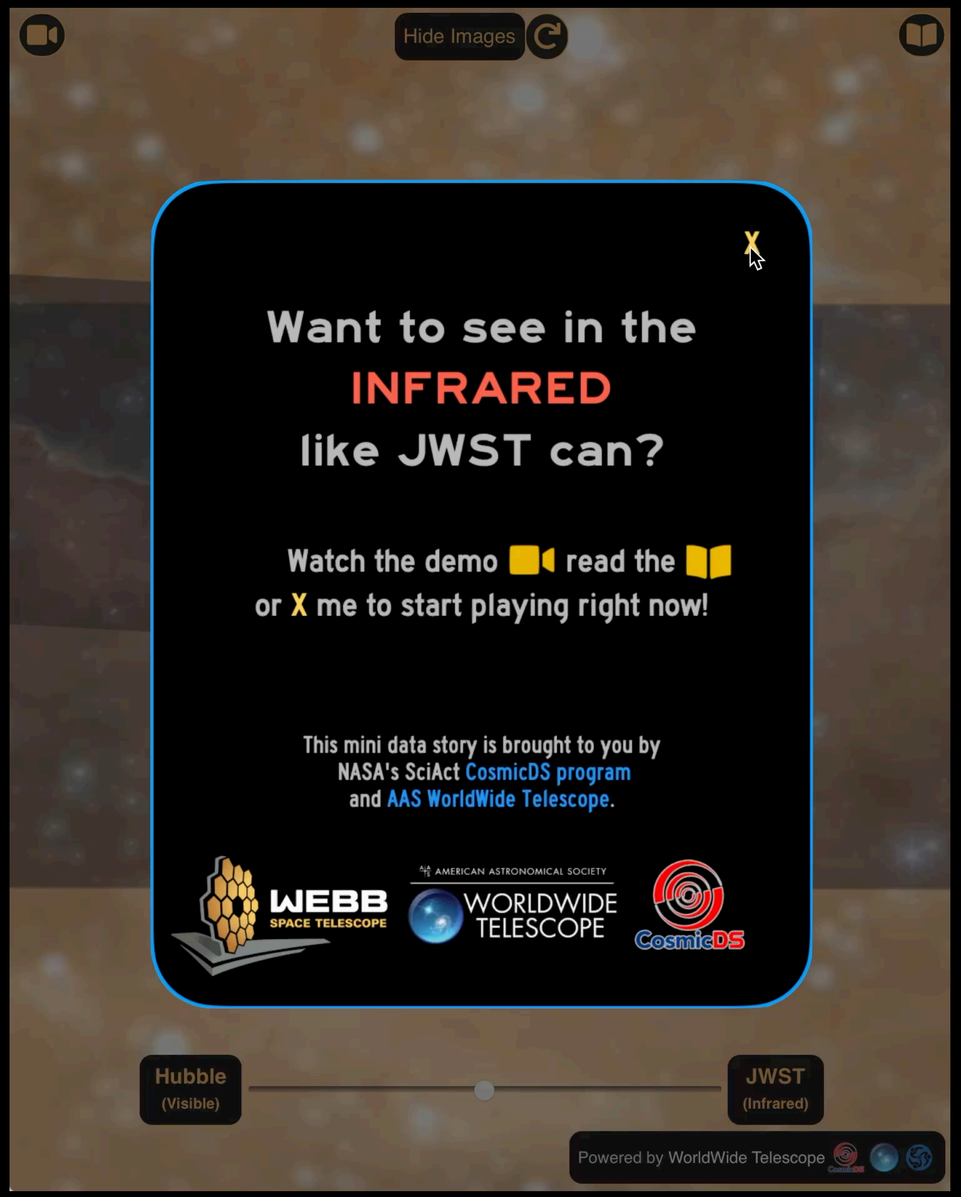
Hubble (Visible)

JWST (Infrared)

Powered by WorldWide Telescope

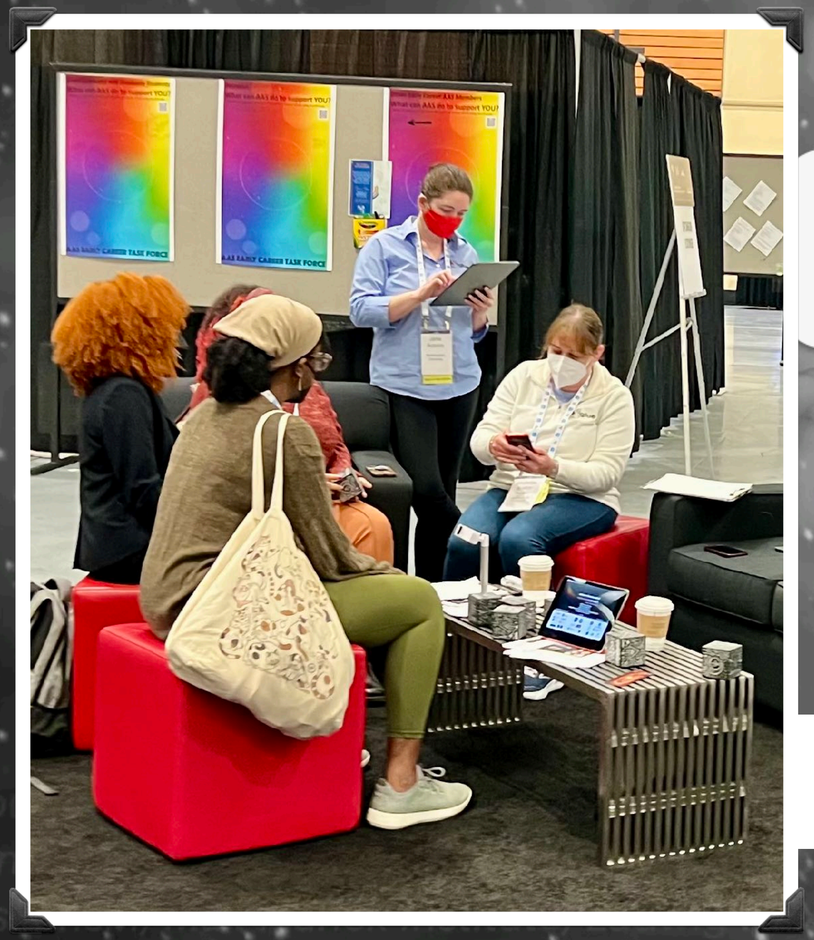
tinyurl.com/minids-carina





tinyurl.com/minids-carina

THE PERSEUS-TAURUS ERSHELL IN 3D



Try out the augmented reality at the AAS Booth!

animation by Jasen Lux Chambers

***great* 1D, 2D** and **3D** data manipulation, flexible architecture facilitating plug-ins, data transfer, and interactive data exploration; "glupyter" flavor runs in web pages

glue
multidimensional data exploration

CosmicDS

plug-in in-use on Hayden Planetarium dome

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plug-in shows WWT images in context in 3.

OpenSpace

***great* 2D** object and all-sky images
limited 3D functionality

limited 2D all-sky images
***great* 3D** functionality

The "Perseus-Taurus Superbubble"
a demo of the need for 2D-3D contextualization functionality

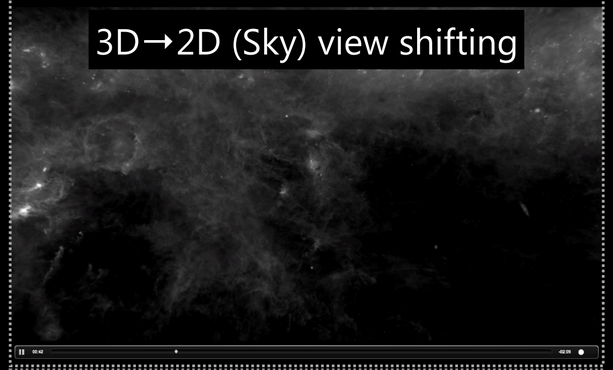
This video was composited using the WWT and OpenSpace, making some use of prototype plug-ins, but 2D and 3D imagery was aligned manually by experts. As a generalizable STEM concept, it explains the deceptive "forced perspective" made possible in when objects at very different distances, in 3D, appear to touch in 2D.

VISUALIZATION FEATURES

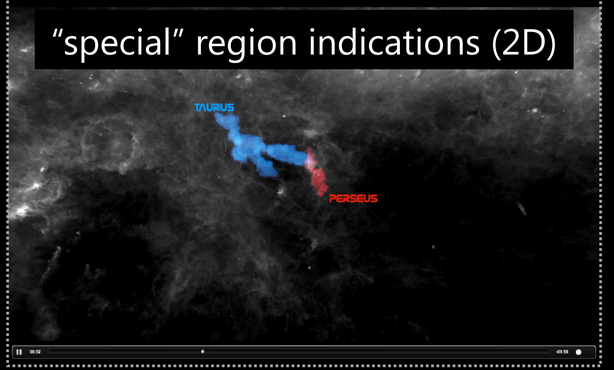
OVERVIEW CARTOON

STARS IN 3D

3D→2D (Sky) view shifting

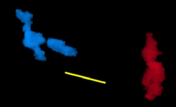


"special" region indications (2D)

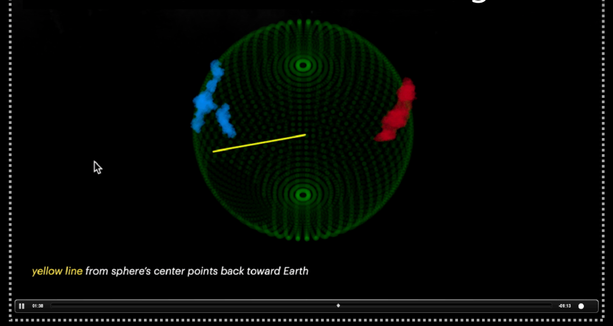


pop-outs

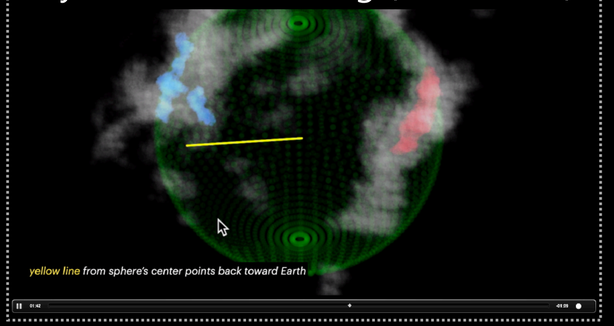
interaction, with user data added



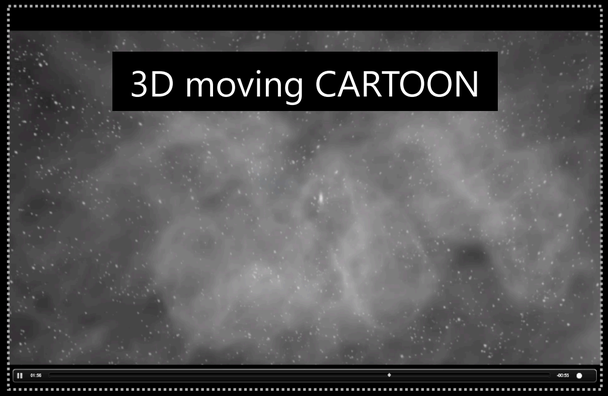
models, direction, scales, grids



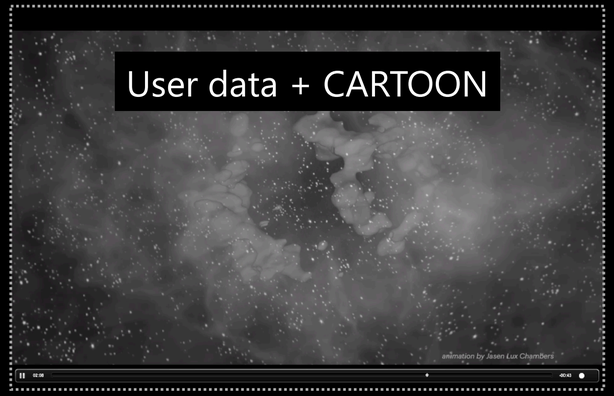
layer control + slicing (not shown)



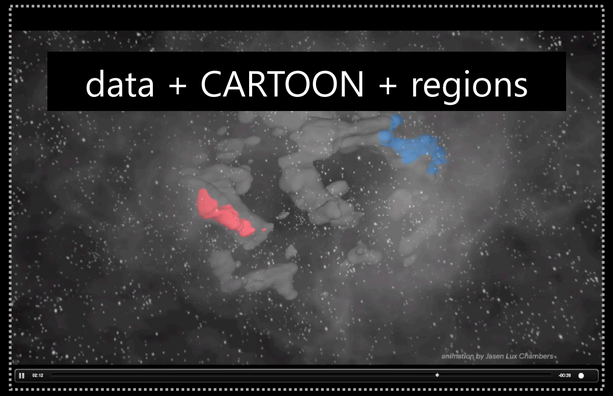
3D moving CARTOON



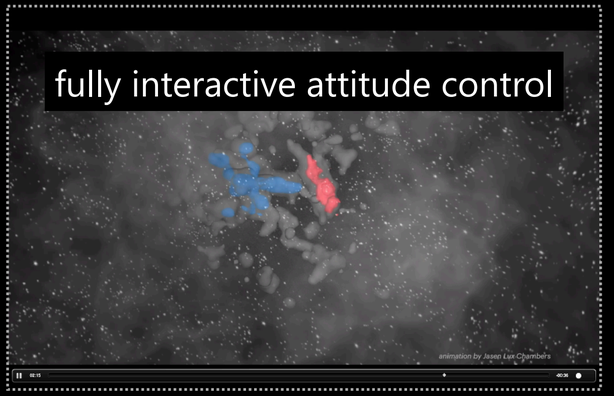
User data + CARTOON



data + CARTOON + regions



fully interactive attitude control



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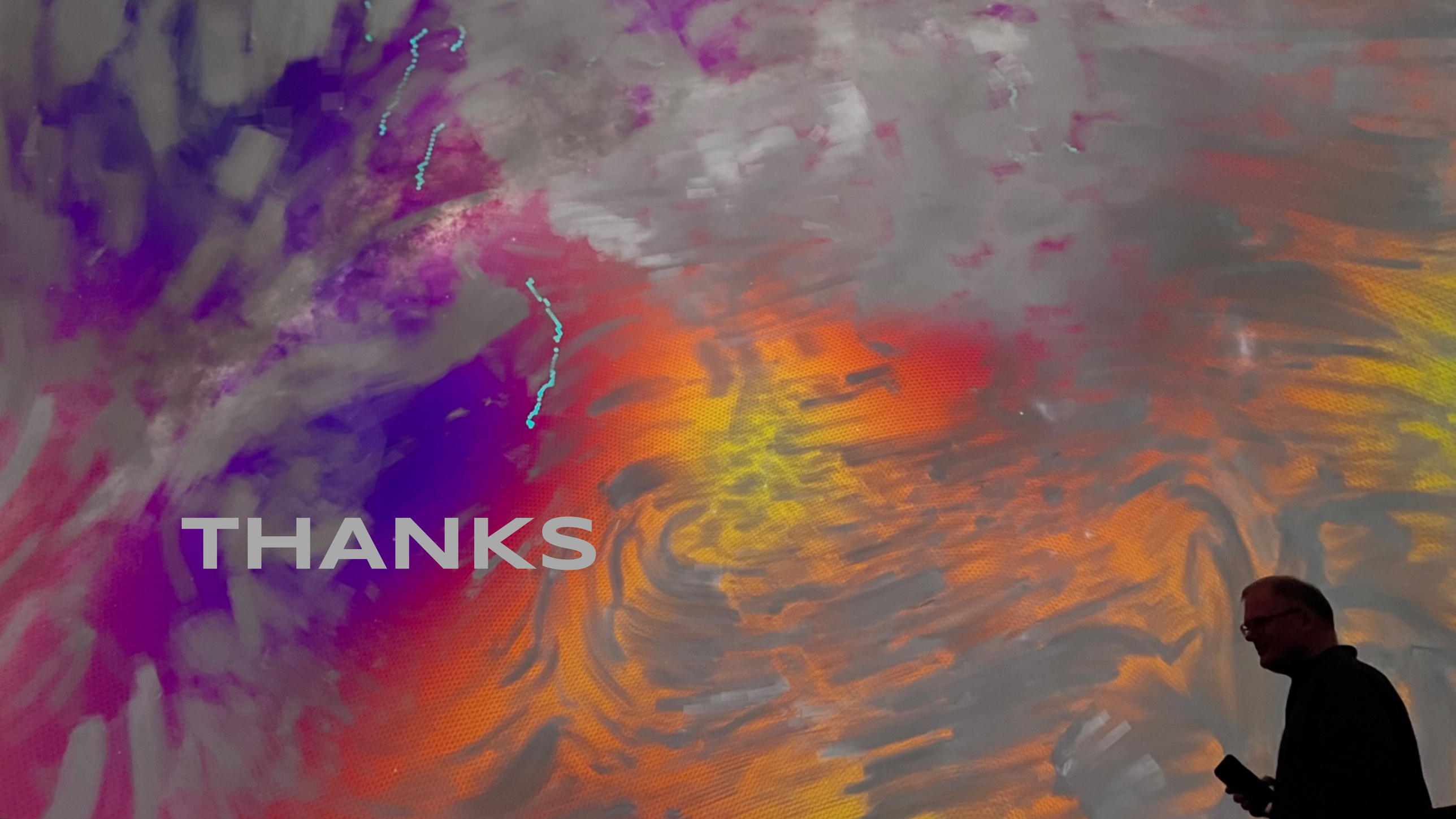

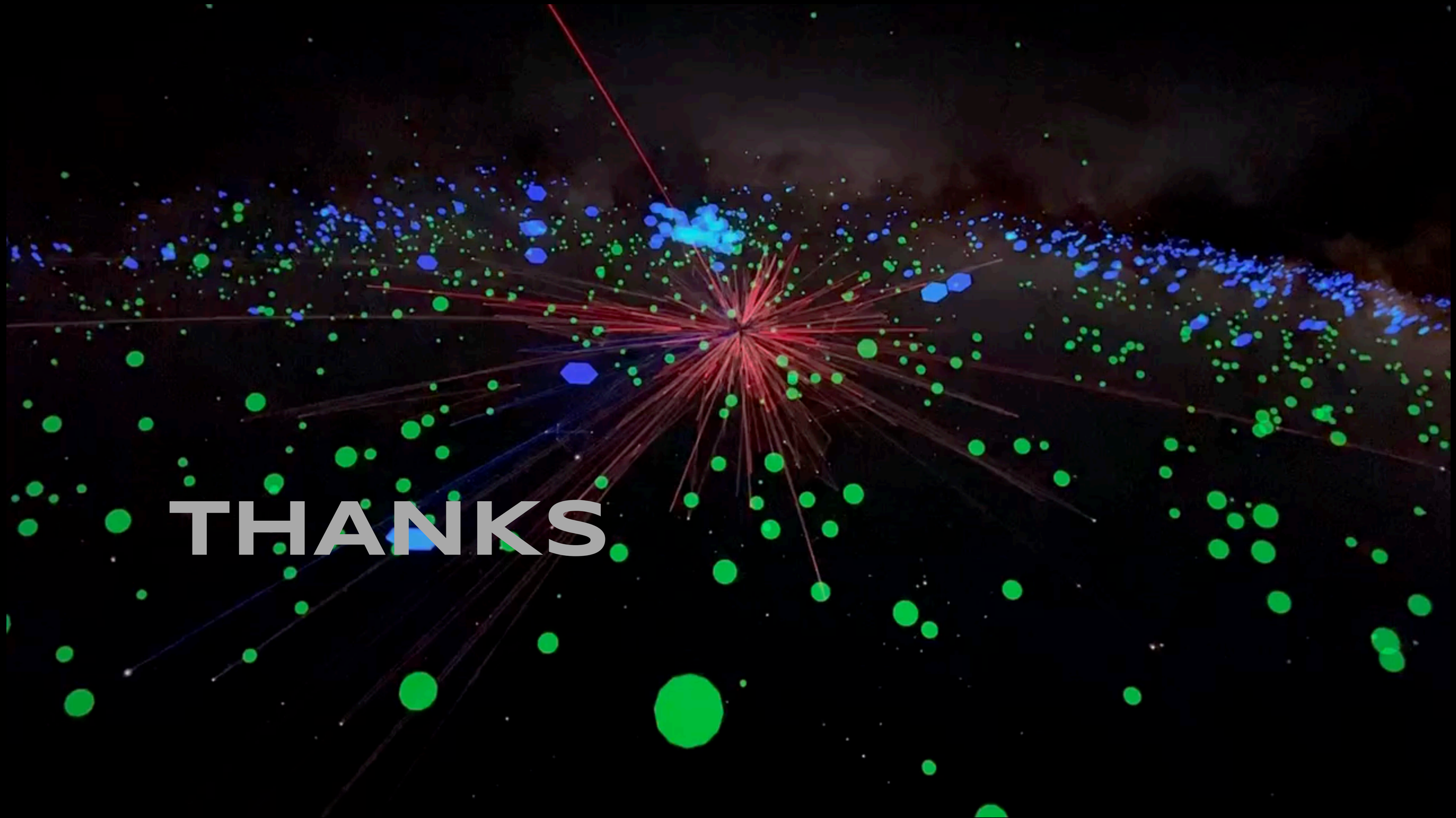
THANKS