

Spawn as
Daniele De Luca

1 XP



Work
@CINECA

100 XP



Achievements

Something about me



Warping the Cosmos

An adaptable anamorphic video
for undefined immersive spaces

Warping the Cosmos

An adaptable anamorphic video for undefined immersive spaces

or

Zero budget, zero projection specs, zero cosmic knowledge:
a beginner's guide to single-shot anamorphic chaos



VISIT LAB
VISUAL INFORMATION
TECHNOLOGY LAB
CINECA



INAF
ISTITUTO NAZIONALE
DI ASTROFISICA

Aka

Destination Earth

A journey to discover the universe

Introductory video for
Genoa Science Festival's "Star-themed Code Hunting Game"

Aka
COSMOVIDEO

COSMOVIDEO



Repository-friendly
name

▶ **PLAY**

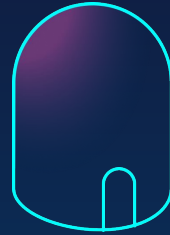
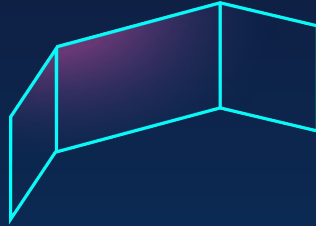
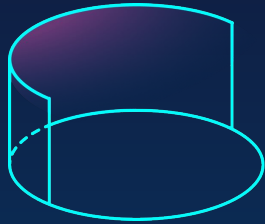
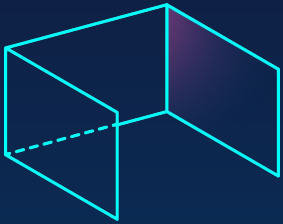
The request An immersive video for a yet unknown projection space



The request An immersive video for a **yet unknown** projection space

👍 Yeah!

The request An immersive video for a **yet unknown** projection space

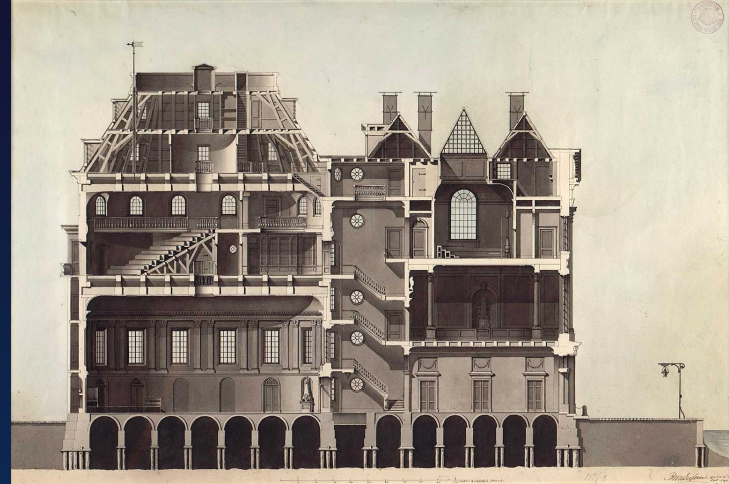


Jeremy Sealine

Real world scale



Bavelaar Music Hall in Felix Meritis, paper cut-out from 1781-1801 by J.S. d'Arnaud (Amsterdam Museum).



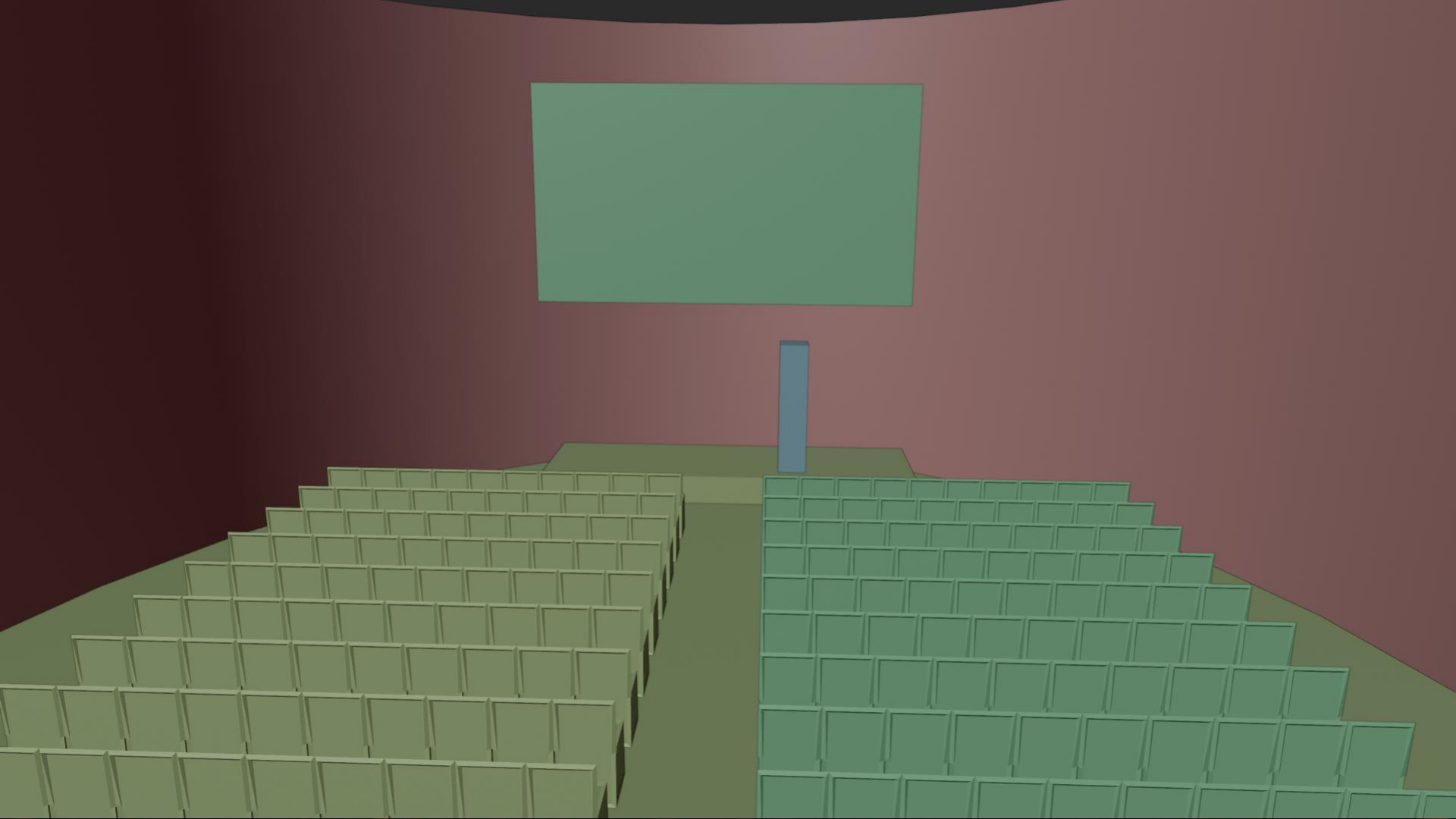
Side view cross section of Felix Meritis, drawing from around 1790 (Rijksmuseum).

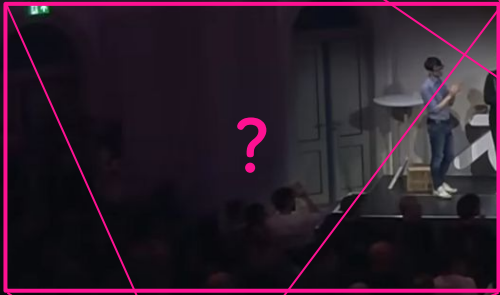
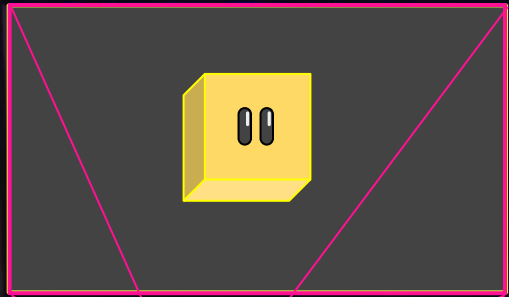
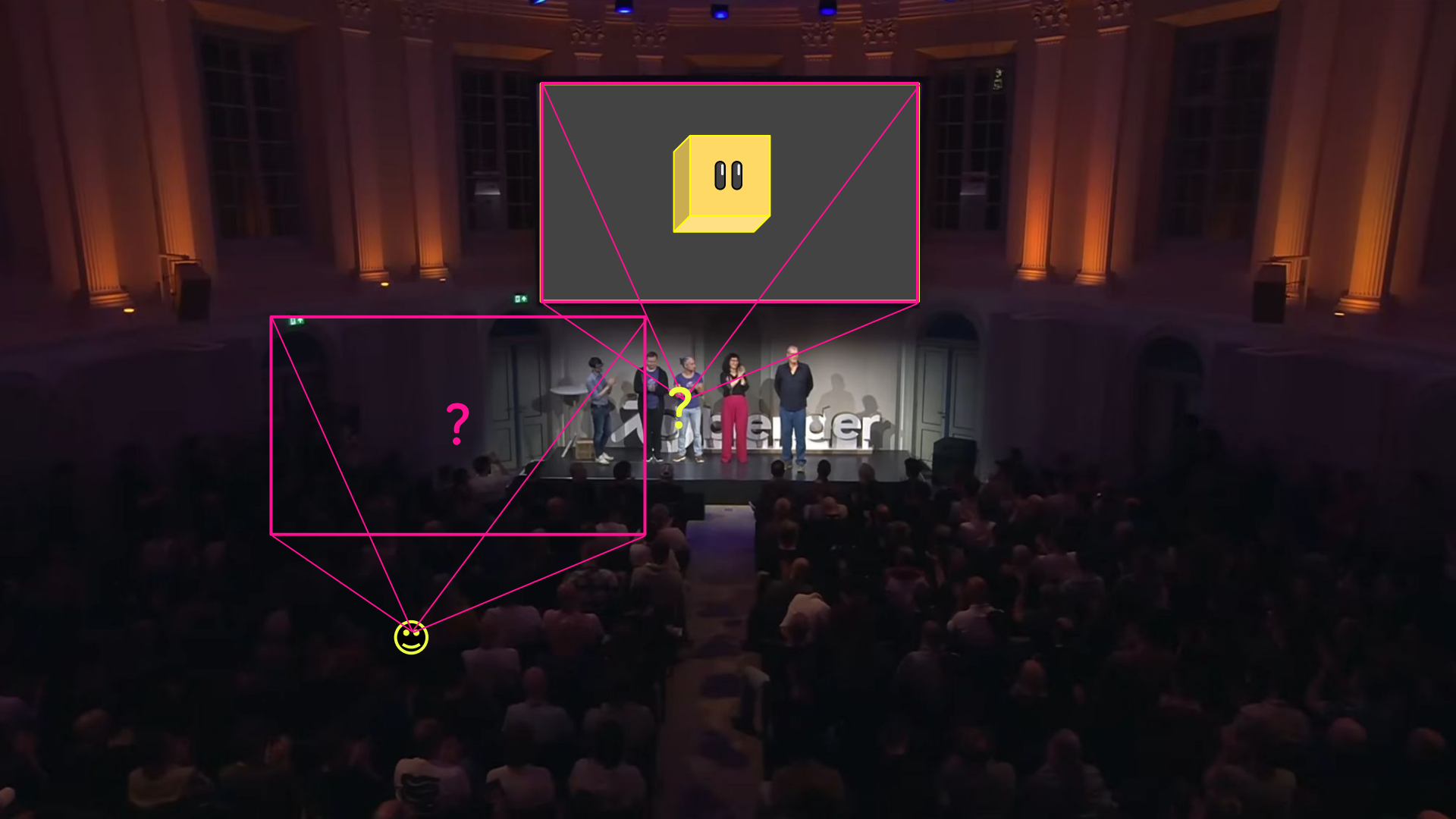
Real world scale

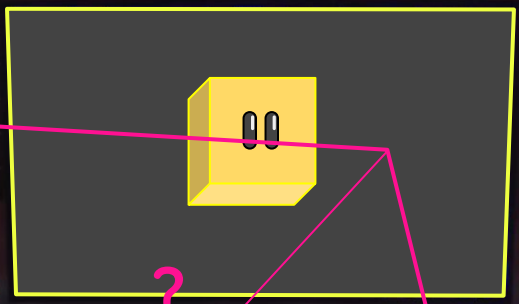
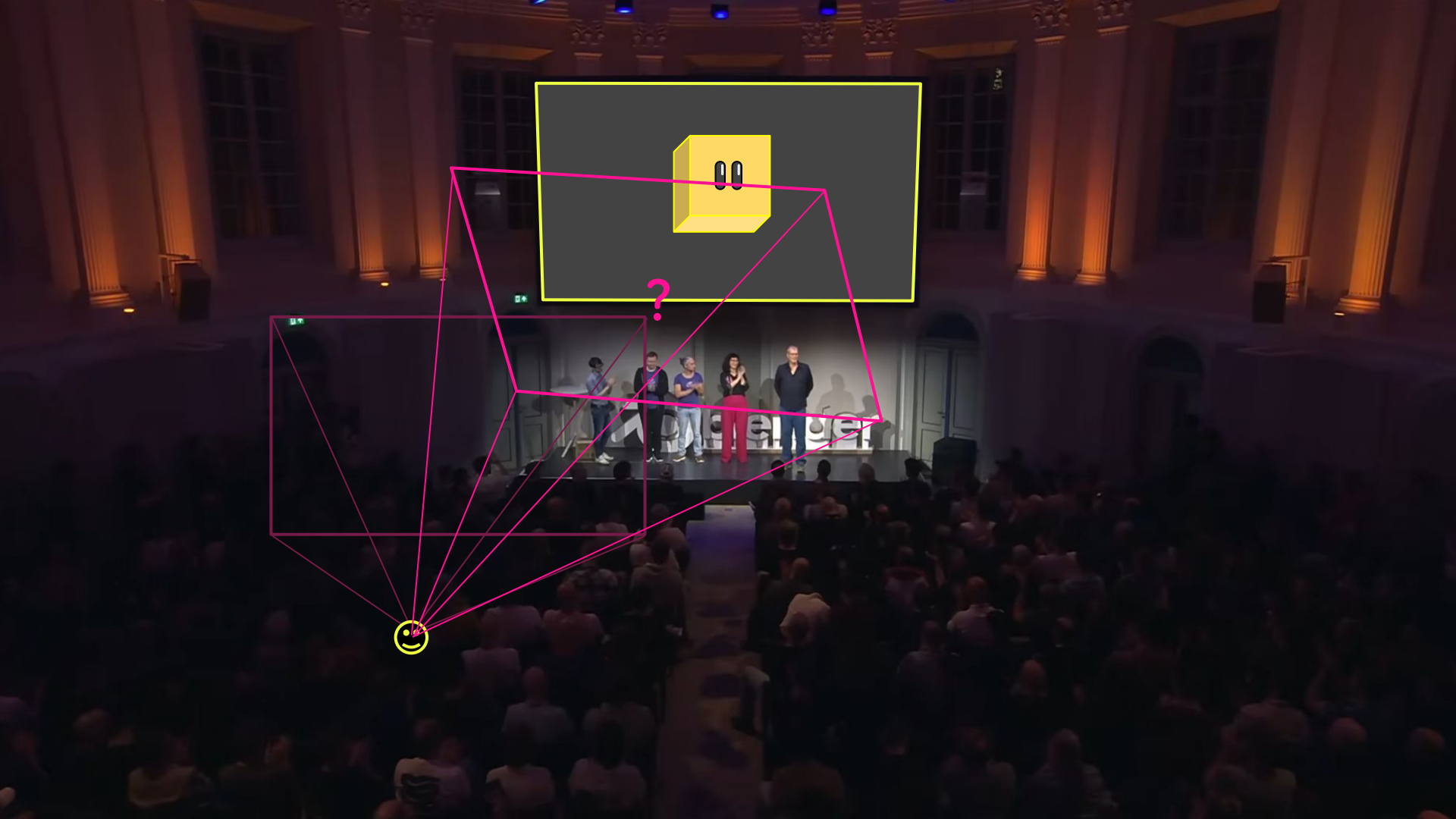


Real world scale





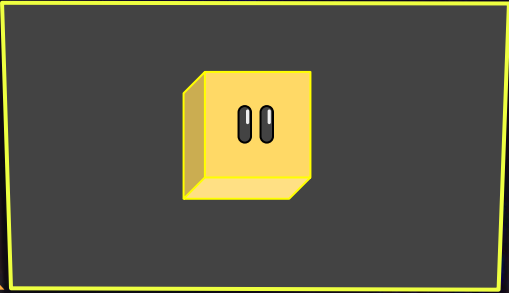
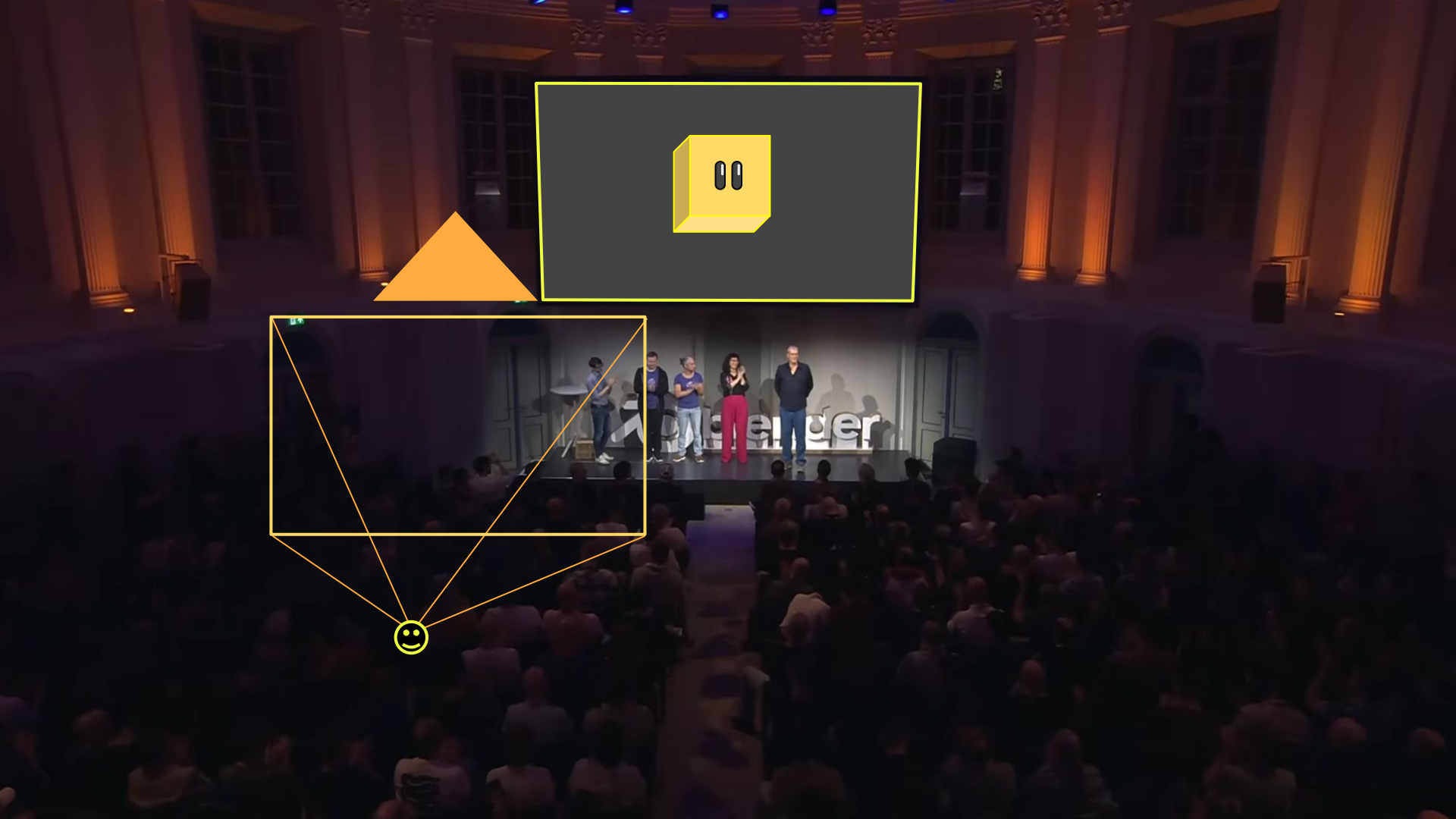


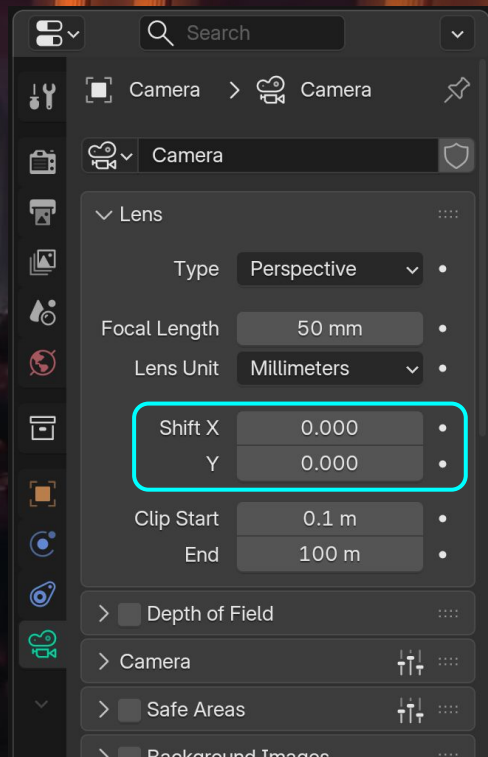
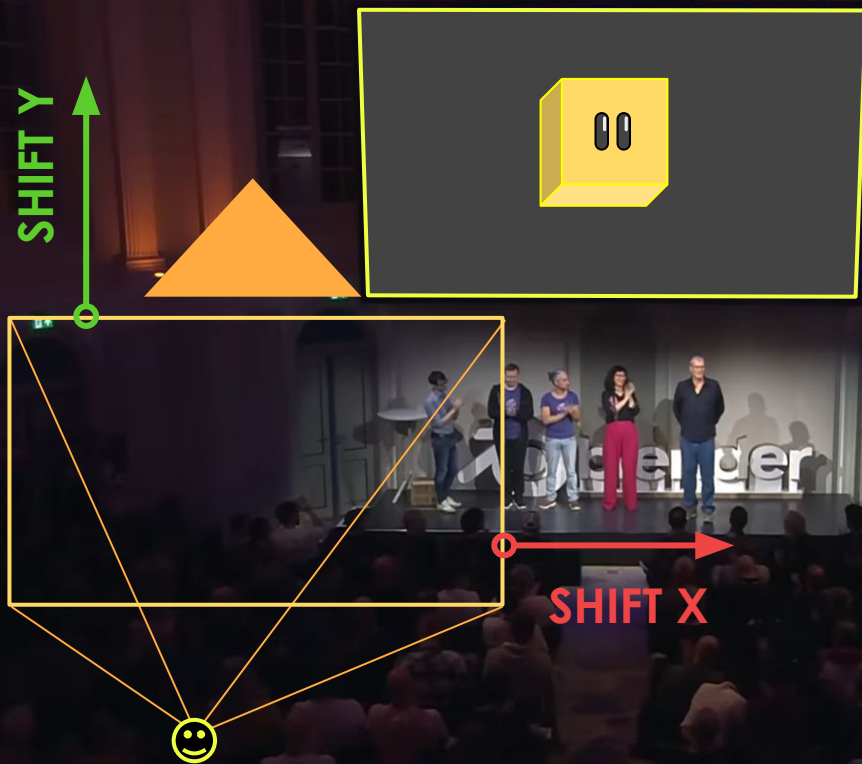


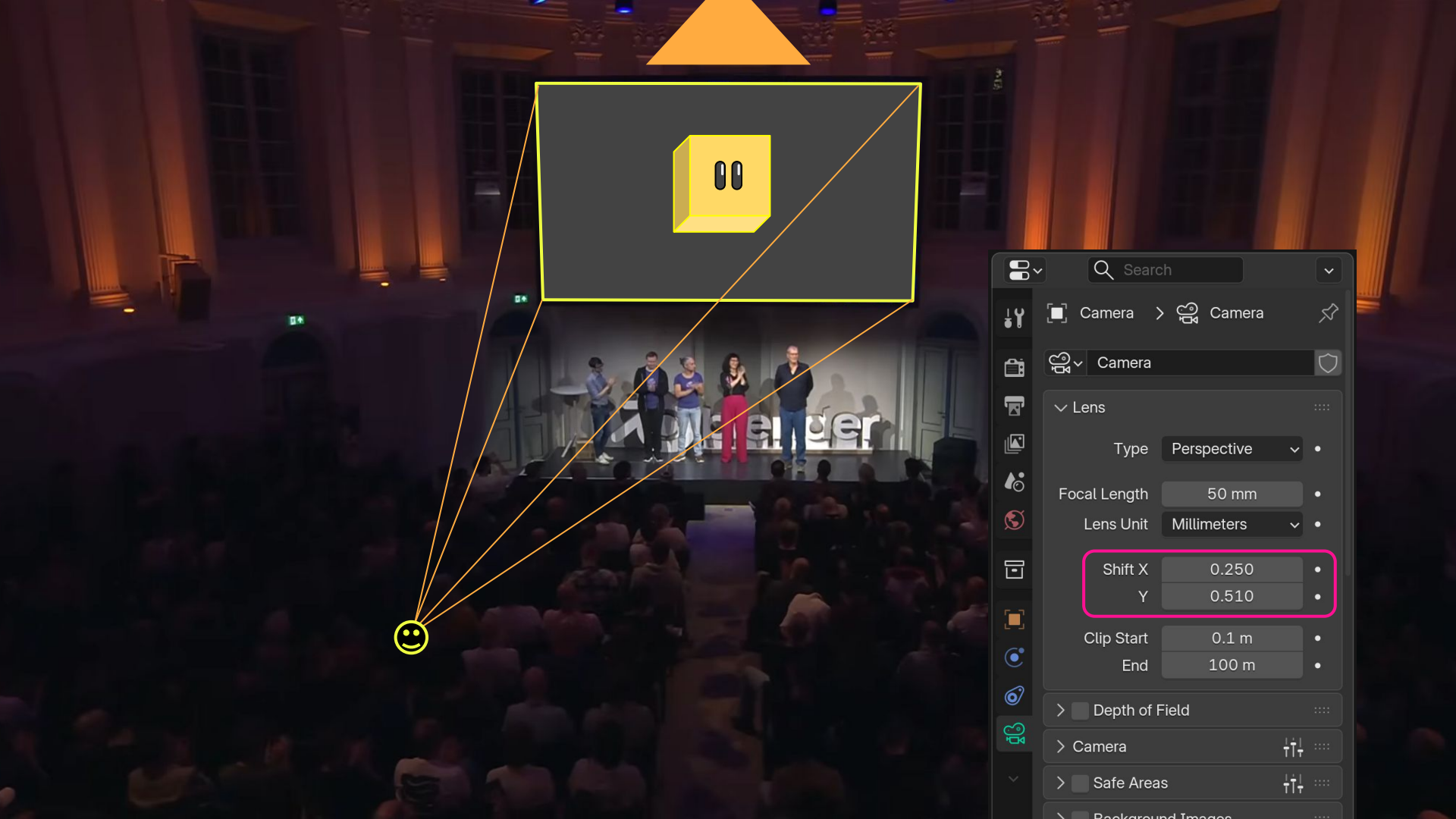
?











Search

Camera > Camera

Camera

▼ Lens

Type Perspective

Focal Length 50 mm

Lens Unit Millimeters

Shift X 0.250

Y 0.510

Clip Start 0.1 m

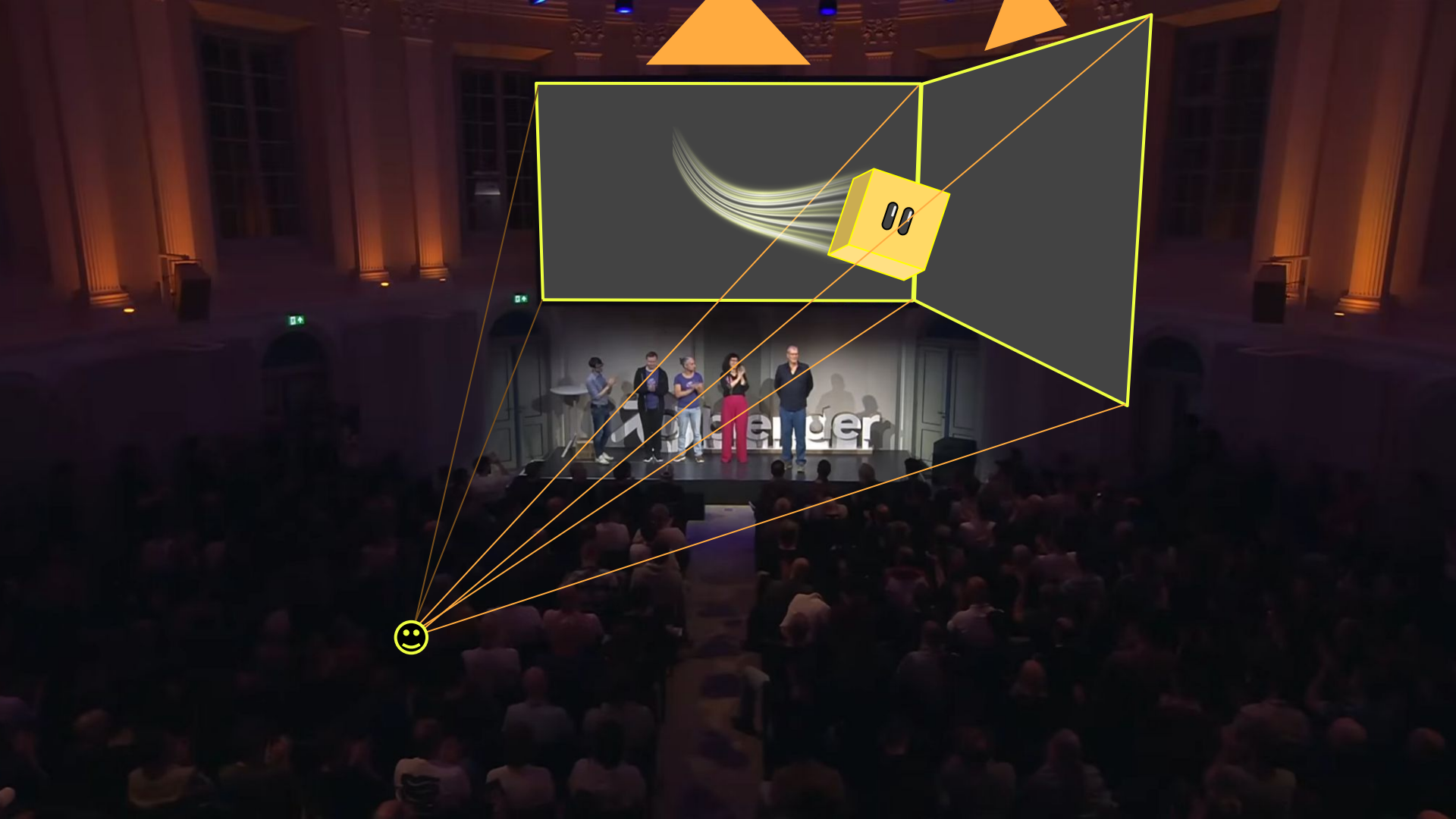
End 100 m

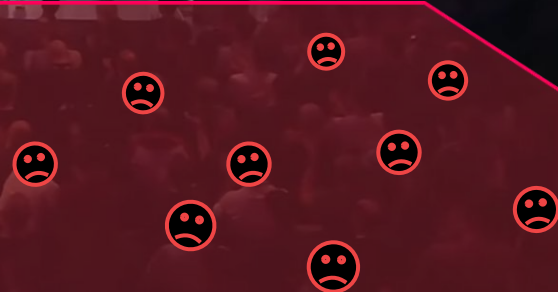
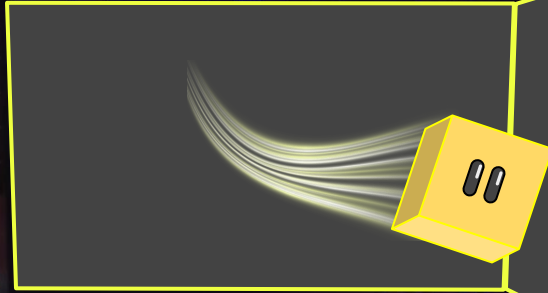
> Depth of Field

> Camera

> Safe Areas

> Background Images

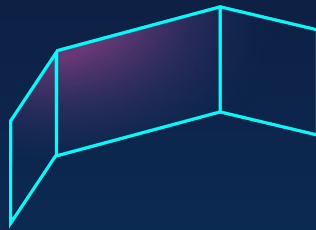
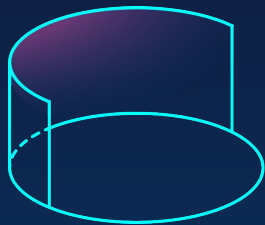
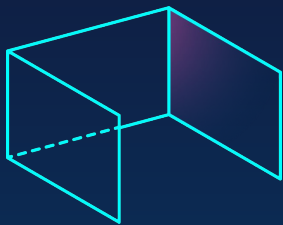




The bad place

👍 Yeah!

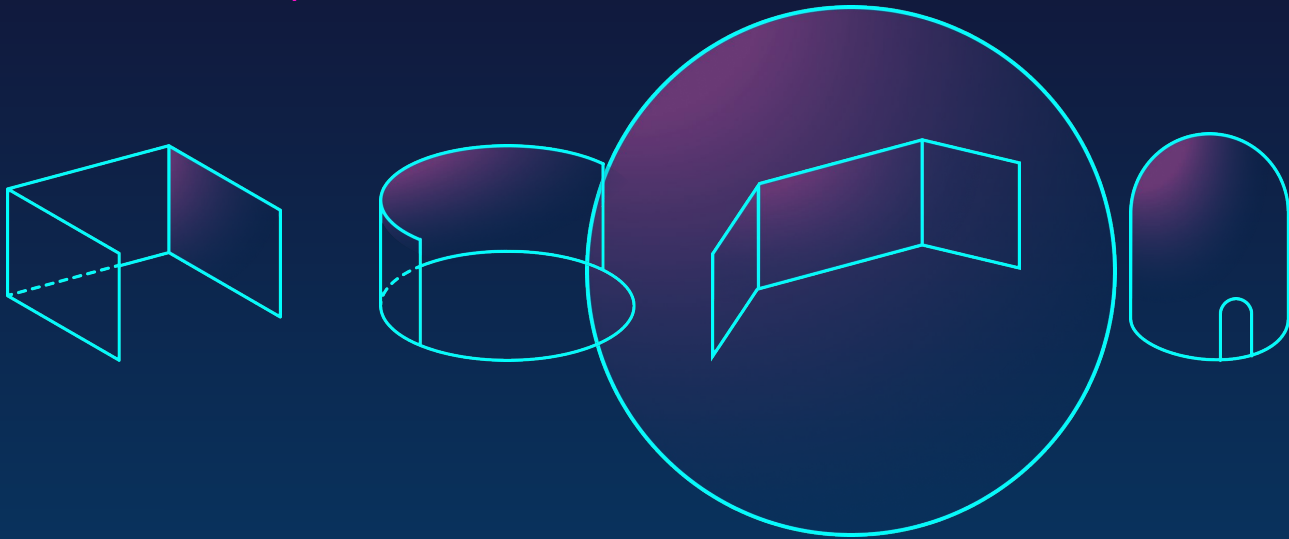
The request: An immersive video for a **yet unknown** projection space



Jeremy Sealine

👍 Yeah!

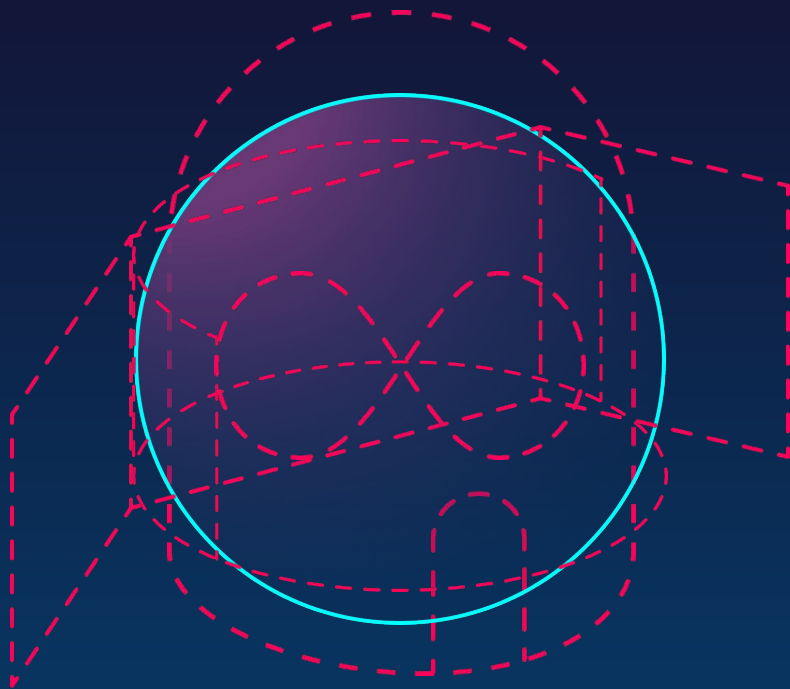
The request: An immersive video for a **yet unknown** projection space

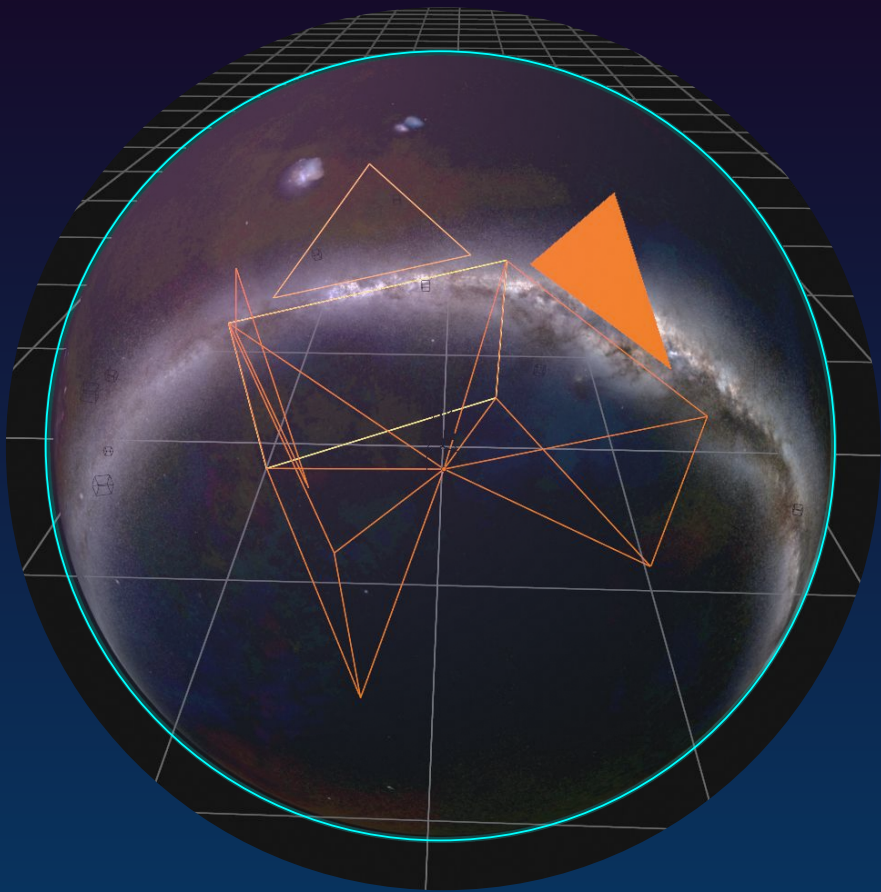


Jeremy Sealine

Our Answer

360° video with anamorphic cameras from the origin of the sphere





Anamorphic reprojection

Heterogeneous resources

blender  kit



ALMA MATER STUDIORUM
UNIVERSITA DI BOLOGNA



Poly Haven





Dark matter

★ Provider

Dept. of Physics & Astronomy, University
of Bologna

★ Dataset

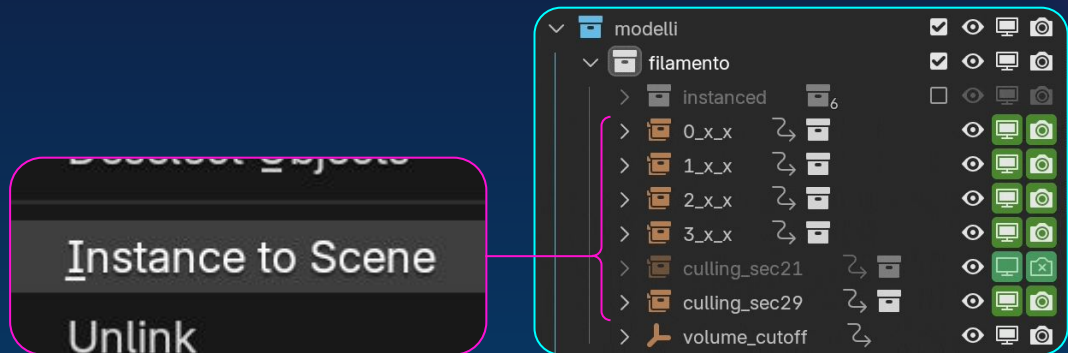
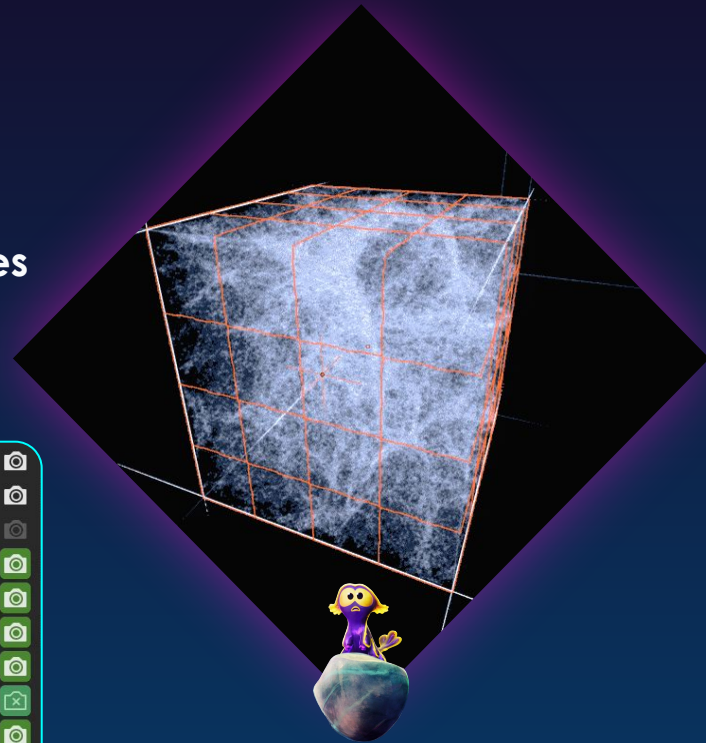
Cosmic web: dark matter density

★ Scale

1024^3 resolution covering **85^3 Mpc^3** of
cosmic volume

Dark matter - Blender Pipeline & Optimization

- ★ **Format Conversion**
HDF5 → OpenVDB via  ParaView
- ★ **Grid Splitting**
Divided into a 4x4x4 cubic matrix → **64 sub-volumes**
- ★ Memory optimization for viewport preview & volume rendering



8 Nov 2025 AD 13:17:24 UTC [Time off]
Name: Gaia Sky



Gaia Sky



Mouse pointer

• alt: 245.32° 41.20°
• lat/lon:
• alt: -0° 00°

Camera

Tracking:
Velocity: 2.608 au/yr
Distance: 91.473 pc





Gaia Sky - rendering 360

Camera

Mode
Free

Camera speed limit
No limit

Field of view 90.67°

Camera speed 100

Rotation speed 100

Turn speed 100

☐ Cinematic camera
☒ Lock camera to focus
☐ Lock orientation

Panoramic
rendering

Camera recorder - Keyframes

Open... Save... Export... Normalize Preferences

Keyframes list

000.00 (0)	1: Keyframe 3	→ I 📷 ⌂ + 🗑
040.00 (2400)	2: Keyframe 5	→ I 📷 ⌂ + 🗑
090.00 (5400)	3: Keyframe 4	→ I 📷 ⌂ + 🗑
170.00 (10200)	4: Keyframe 5	→ I 📷 ⌂ + 🗑
250.00 (15000)	5: Keyframe 4	→ I 📷 ⌂ + 🗑

Add keyframe at the end

Seconds after prev.: 1.0

Name (optional):

Keyframe visuals

Clear Hide Close



Gaia Sky - rendering 360

Settings - 3.6.9-2 - build c5c6600a5

⚡ Graphics settings

🎯 Scene settings

📄 Interface settings

🔊 Performance

🖱 Controls

🖼 Screenshots

📁 Frame output

📷 Camcorder

🌐 Panorama mode

🌌 Planetarium mode

📁 Data

🖱 System

Frame output configuration

- Use frame output to output each frame as an image
- Warning: It may be very slow!

Frame save location

Frame name prefix

Target FPS

Mode

Size of frames

Image format

Quality

Current sequence number

/home/ddeluca/visitlab/2024_cosmovideo/gaia_export/sce...

gaiasky_5_2

60.000

Advanced

10240

5120

JPG

90

0

Reset sequence number

Equirectangular 2:1
10k resolution

Mouse pointer

⬅️ alt: 245.3213 41.90°

⬅️ Lat/Lon:

⬅️ alt: -81°-80°

Camera

Tracking

Velocity: 2.608 m/s

Distance: 91.473 pc



Gaia Sky - rendering 360

Settings - 3.6.9-2 - build c5c6600a5

⚡ Graphics settings

🕒 Scene settings

📄 Interface settings

🔊 Performance

🖱 Controls

🖼 Screenshots

📺 Frame output

📷 Camcorder

🌐 **Panorama mode**

🌌 Planetarium mode

📁 Data

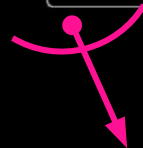
🖥 System

Panorama mode

The panorama mode renders 6 scenes (+X, -X, +Y, -Y, +Z, -Z) to a cubemap which is then projected on the screen.

The resolution of the cubemap is the resolution at which each side of the cubemap is rendered, in pixels.

Cubemap side resolution



Cubemap
face size

Mouse pointer

⬅ alt: 245.3213 41.90°

⬅ Lat/Lon

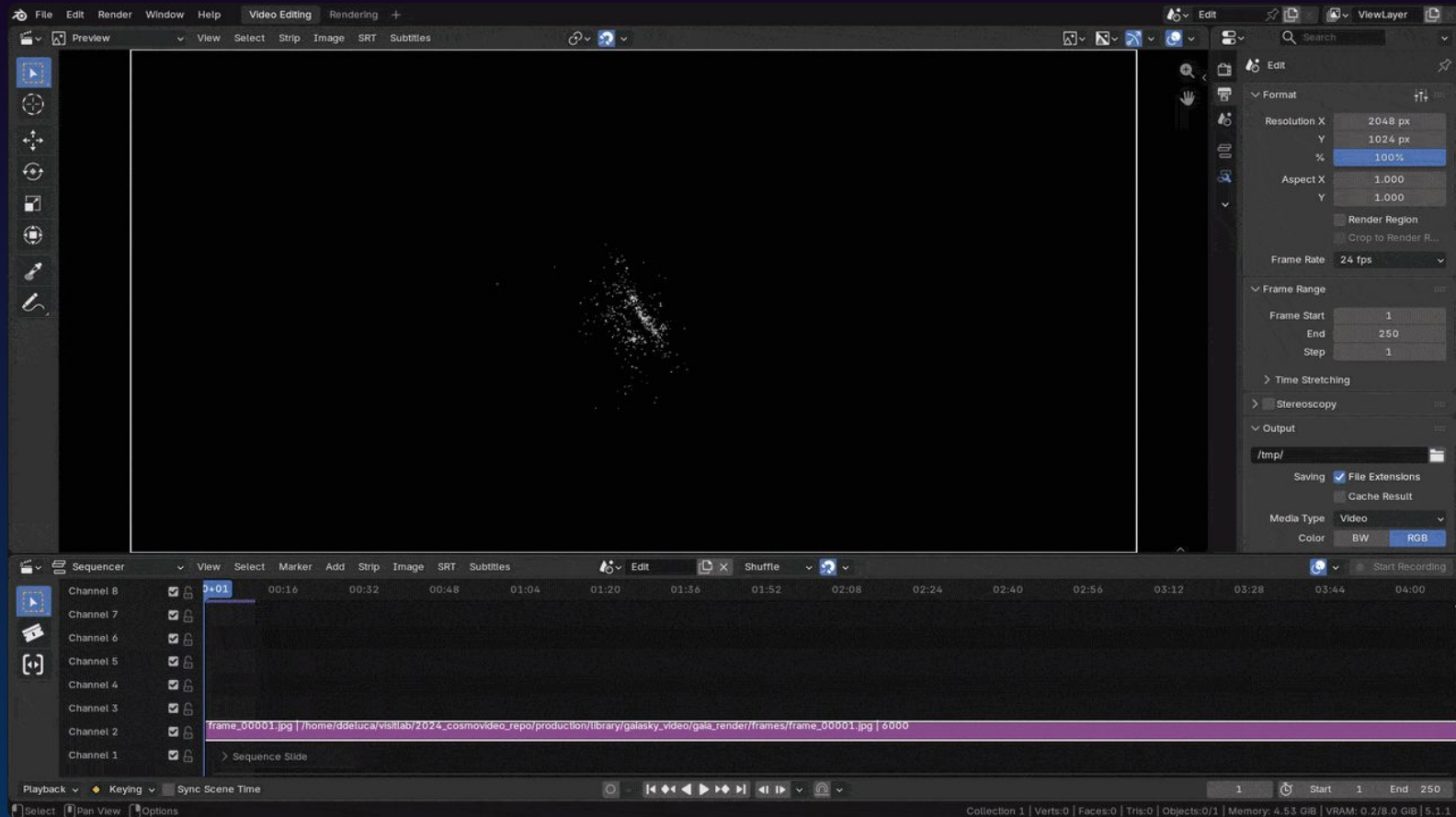
⬅ alt: -81°-80°

Camera

Tracking

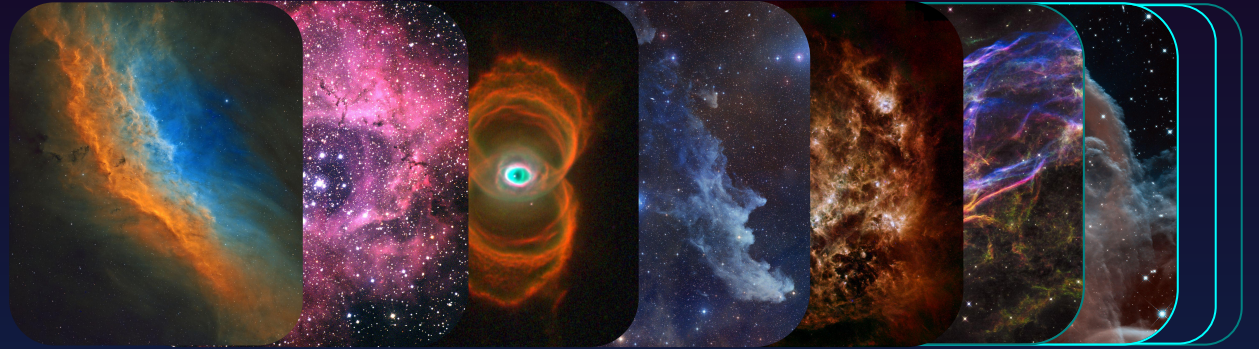
Velocity: 2.608 au/yr

Distance: 91.473 pc

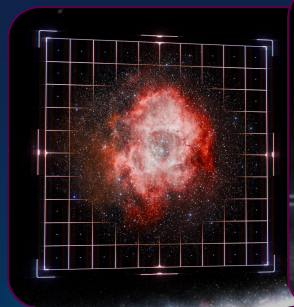
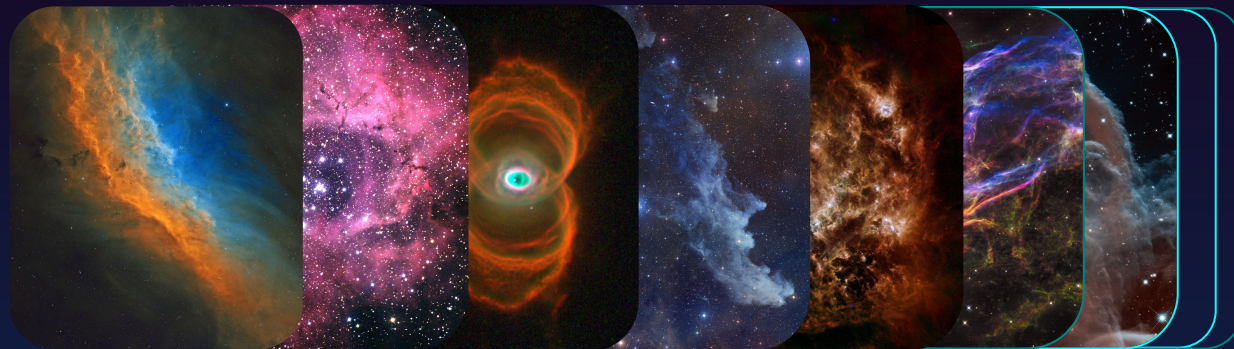


6000 frames 10k resolution 9GB .jpg sequence

 The
telescope



 The
telescope



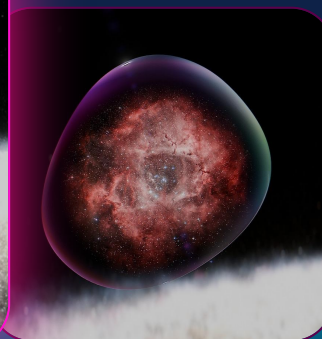
Hologram grid



Disk



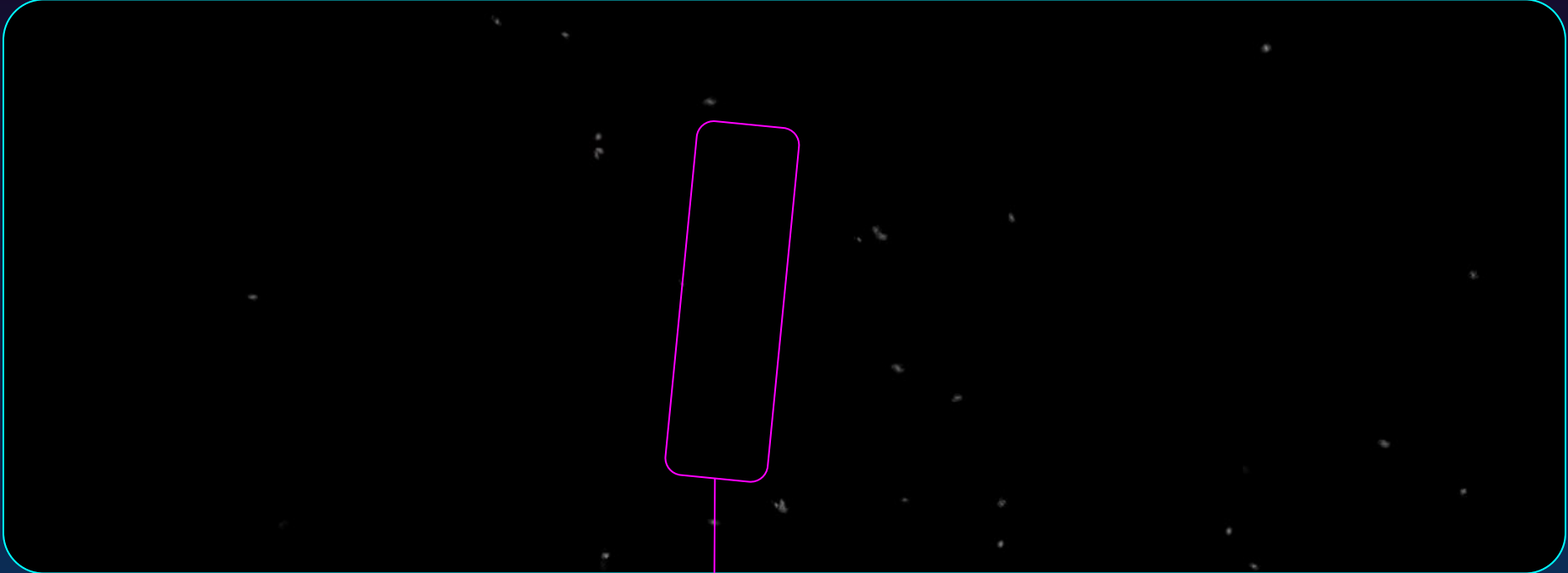
Marble



Bubble

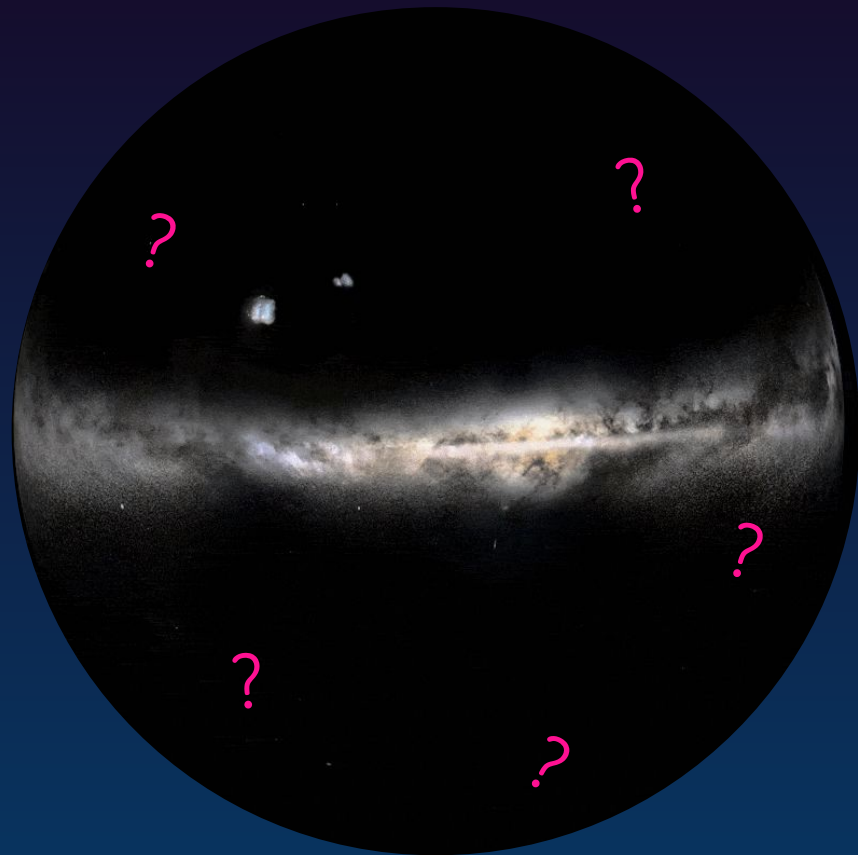


Hologram



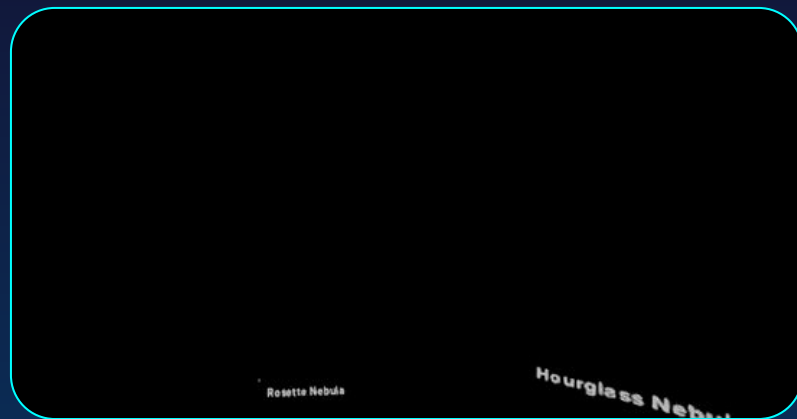
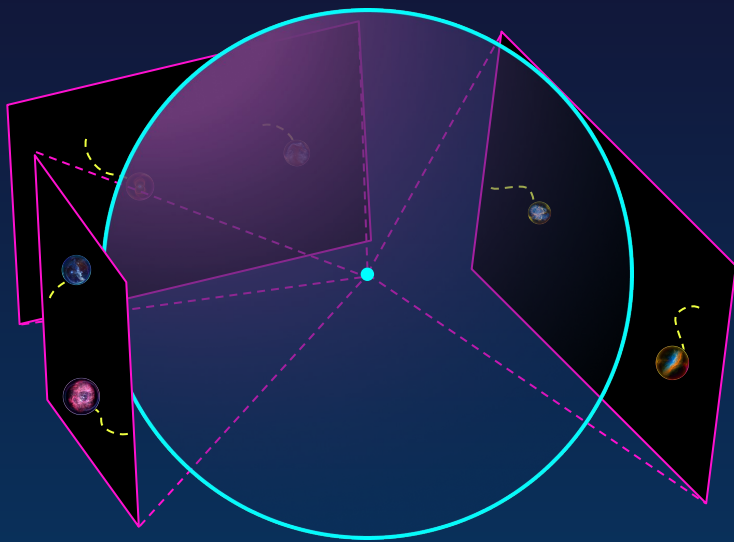
IN SPACE NO ONE CAN EAR YOU CRY

Mike Radjabov@Blenderkit



Tracking 2D

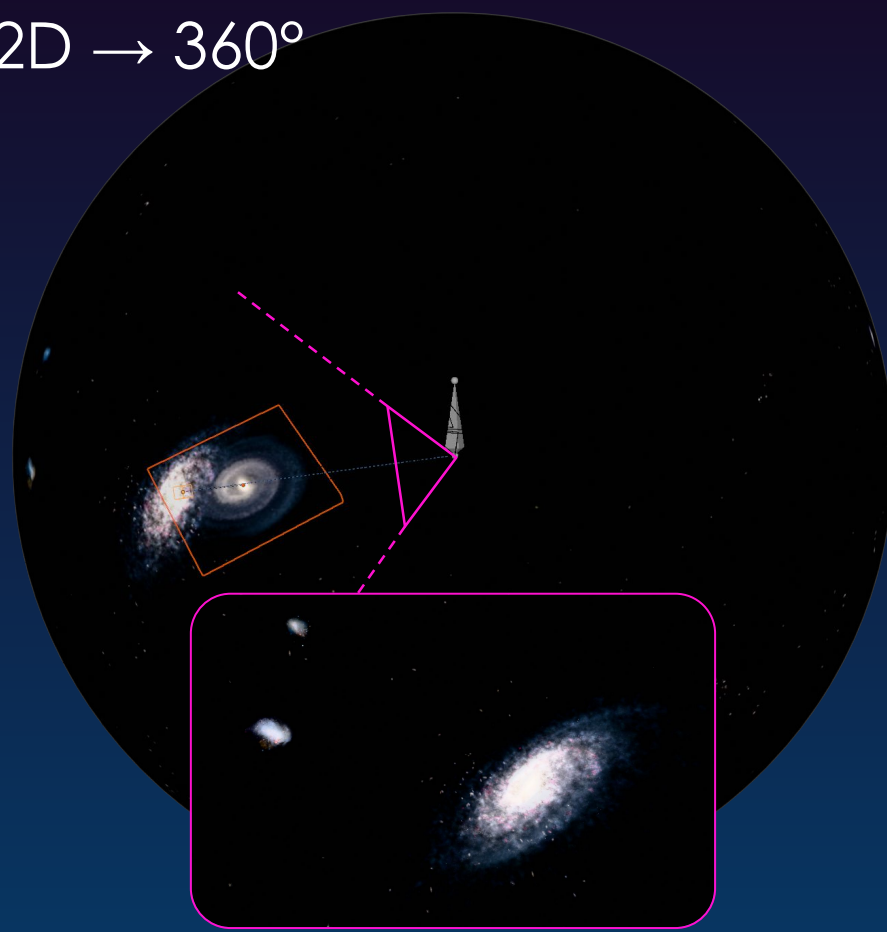
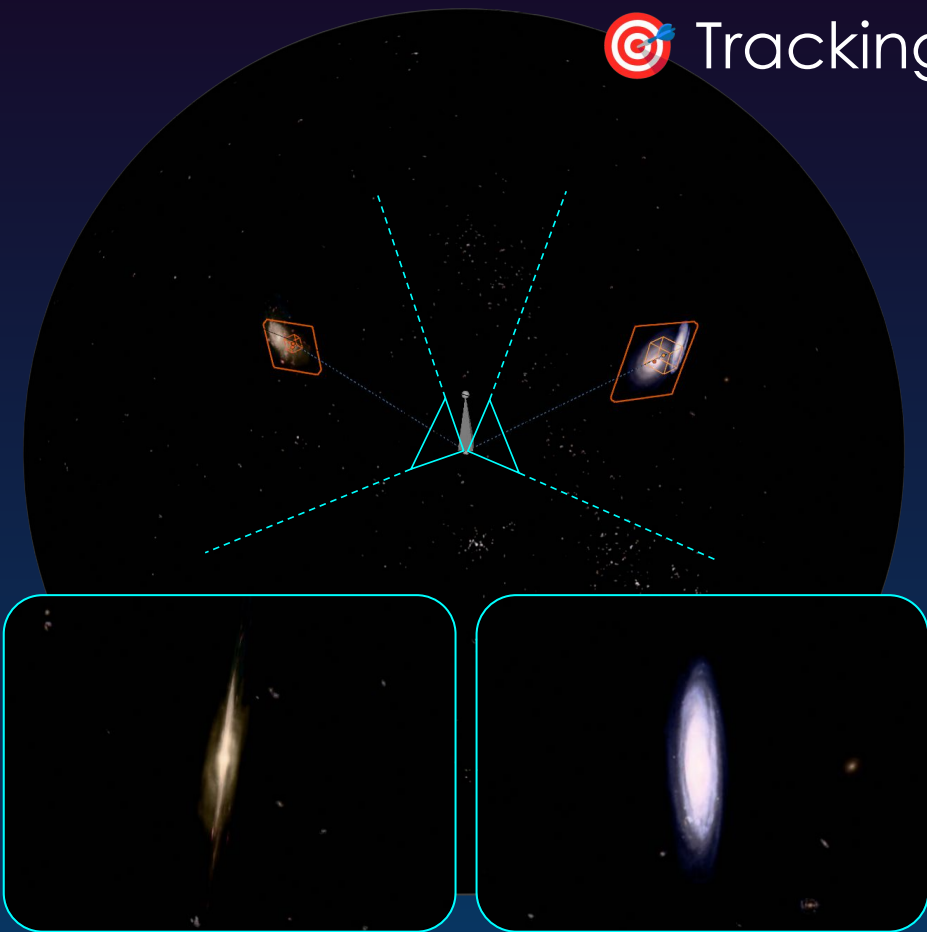
2D video tracking



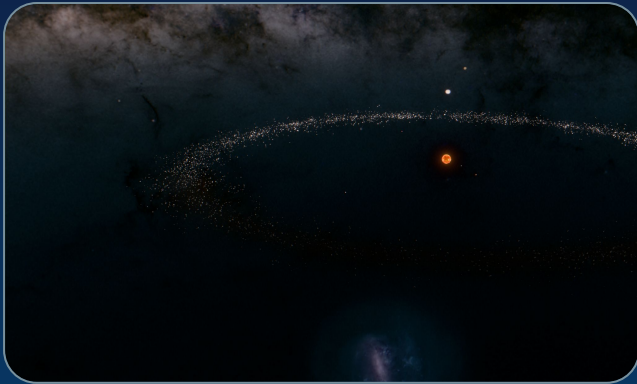
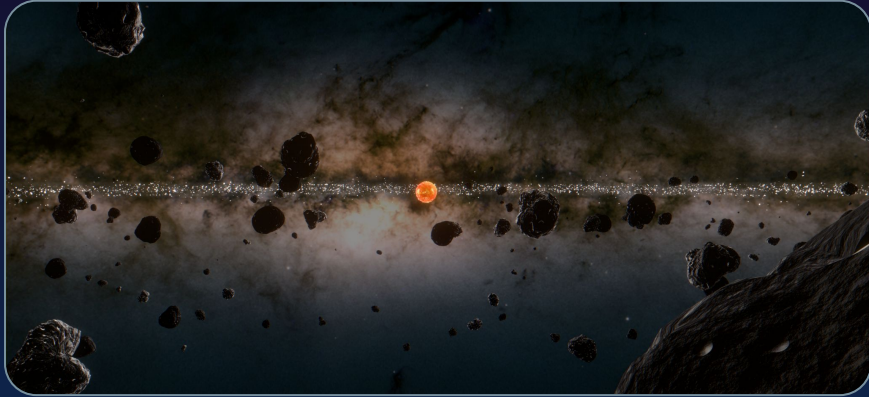


A circular diagram of the Milky Way galaxy, showing its spiral arms and central bulge. The diagram is labeled with various astronomical features and includes a pink arrow pointing towards the center. The labels include: "Sagittarius Arm", "Orion Arm", "Cygnus Arm", "Scutum Arm", "Sagittarius Arm", "Orion Arm", "Cygnus Arm", "Scutum Arm", "Sagittarius Arm", "Orion Arm", "Cygnus Arm", "Scutum Arm". The diagram is a circular map of the Milky Way, showing the spiral arms and the central bulge. The labels are in a circular arrangement around the galaxy. A pink arrow points from the bottom left towards the center of the galaxy.

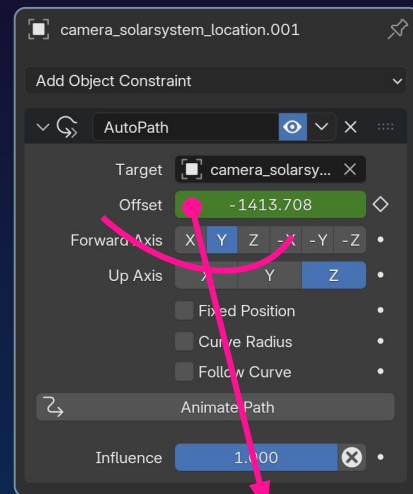
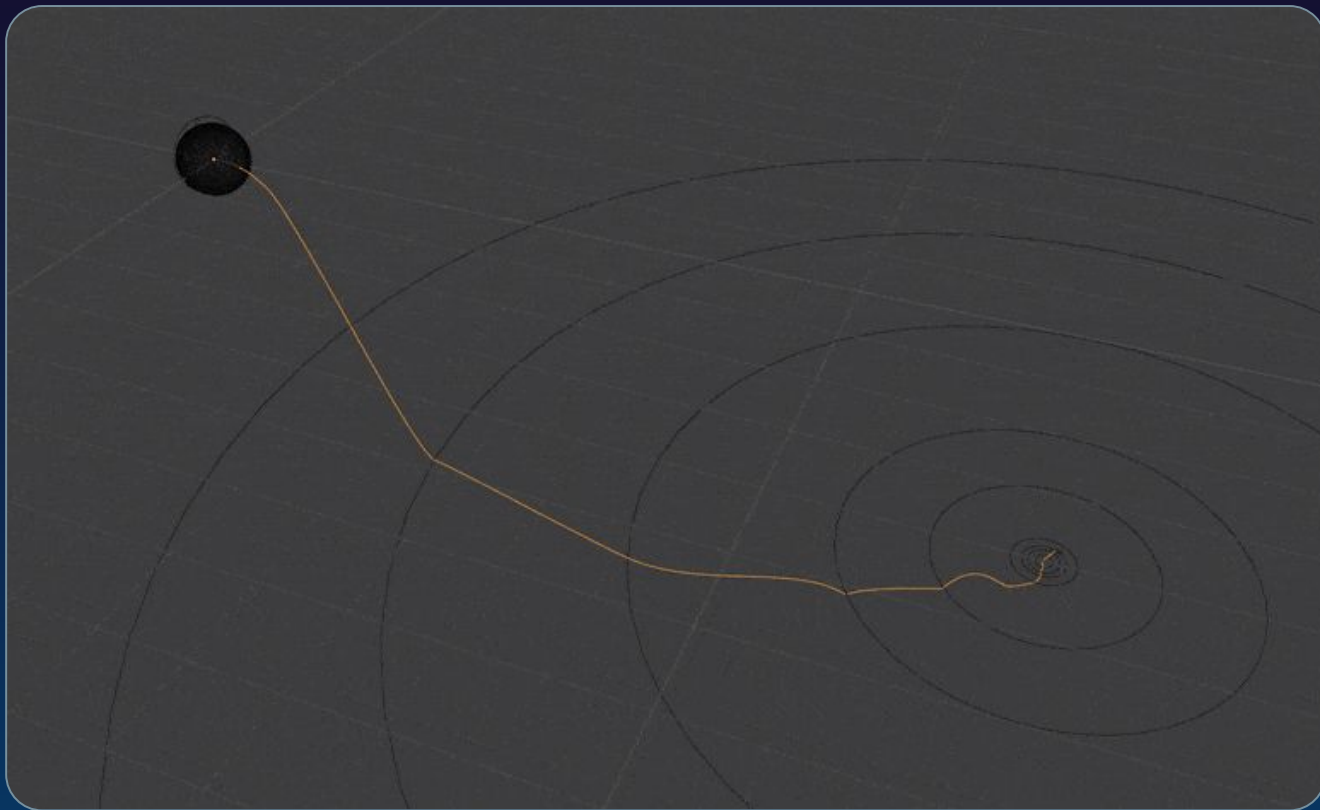
 Tracking 2D $\rightarrow$ 360°



Solar System



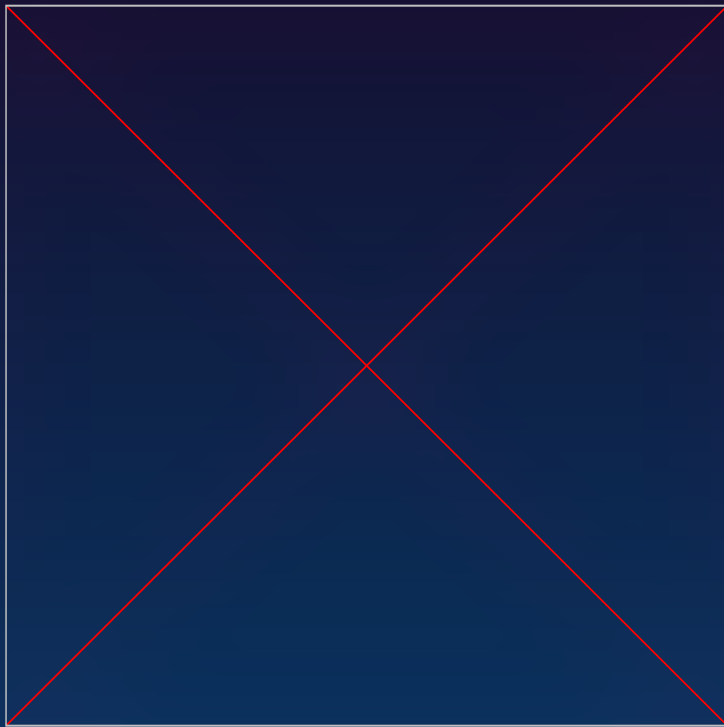
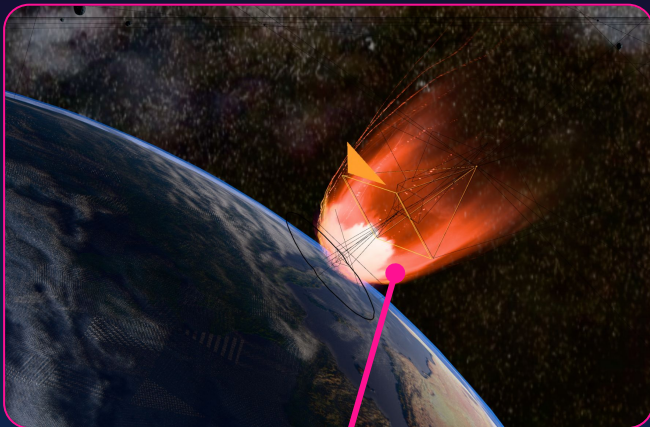
🌻 Solar System - Camera path



Path position
in time



From cosmic scale to Earth re-entry





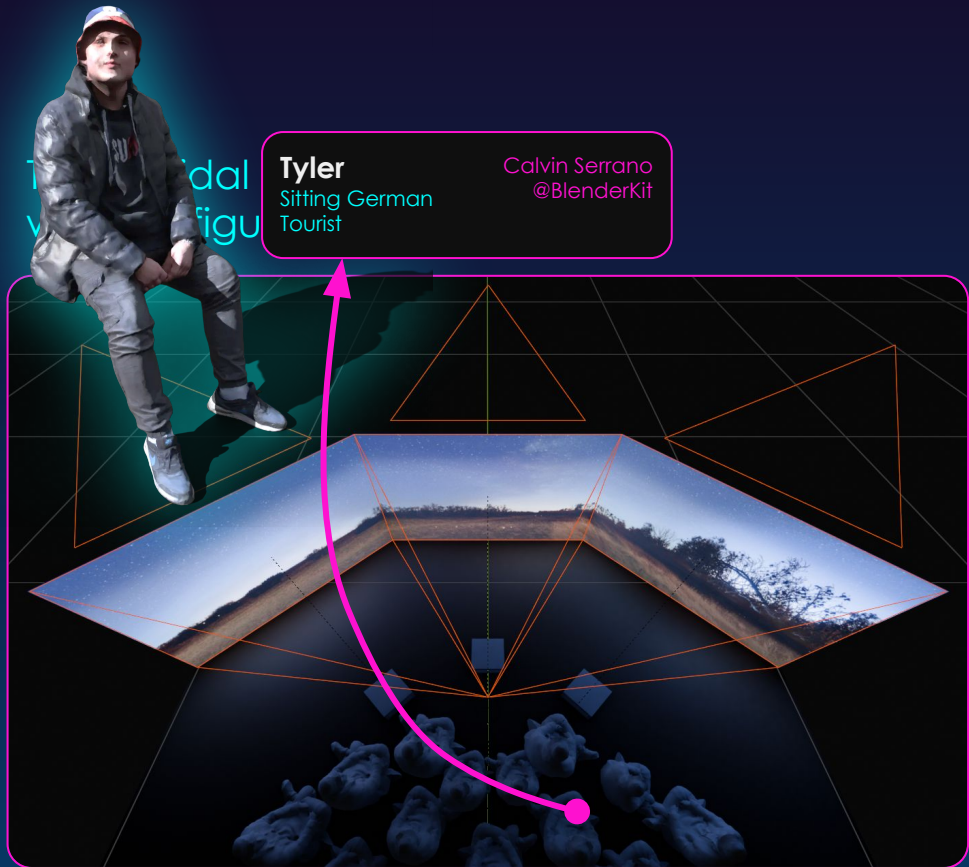
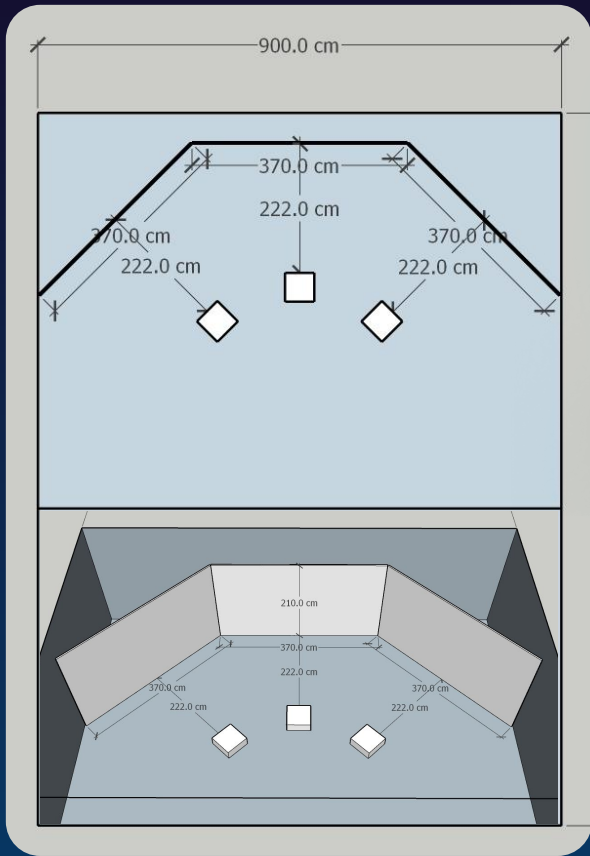
From cosmic scale to Earth re-entry



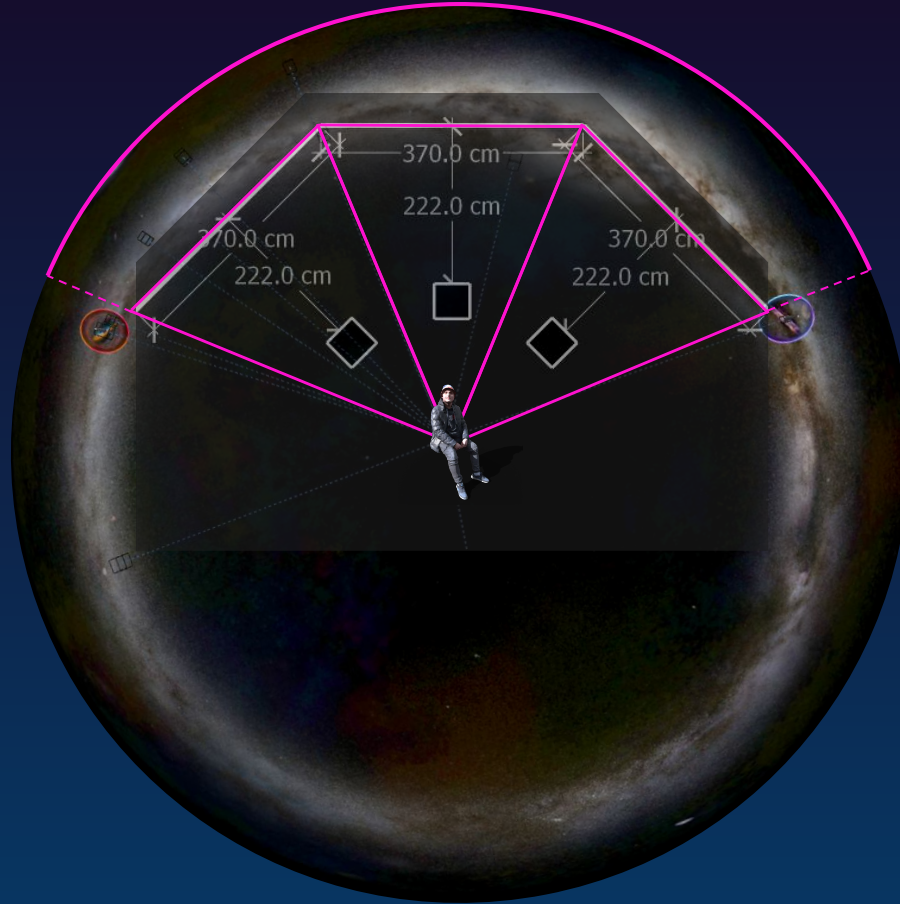
Trees



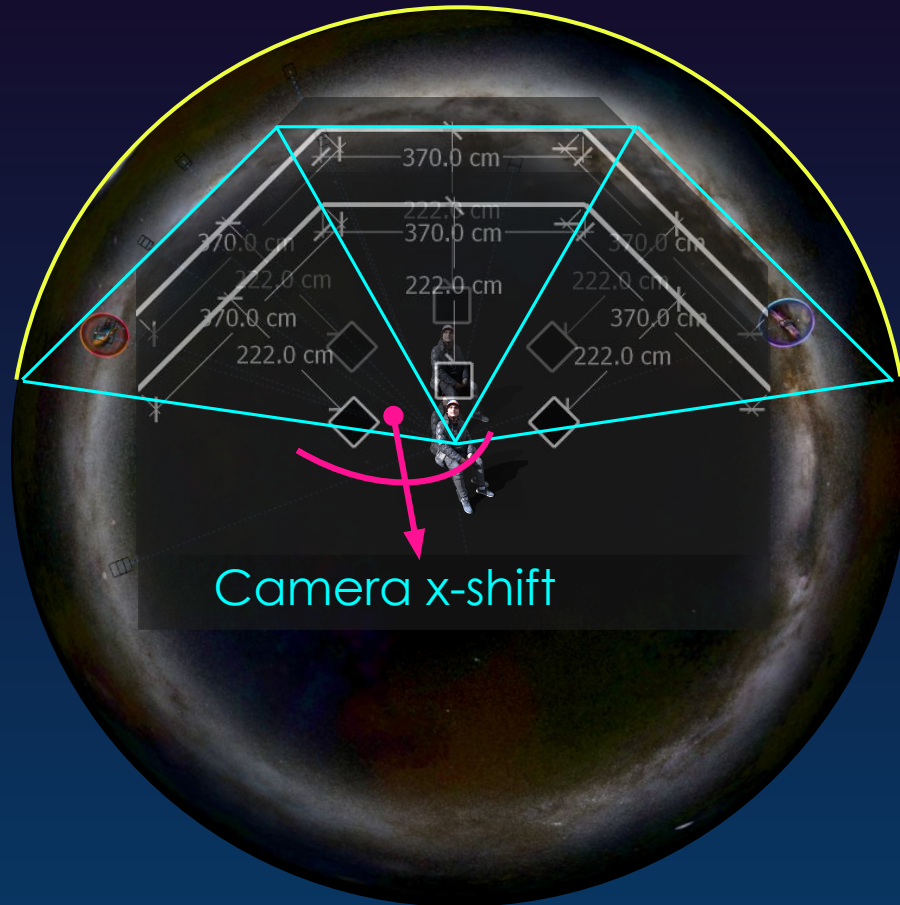
More trees



$$\text{FOV } 45^\circ * 3 = 135^\circ$$

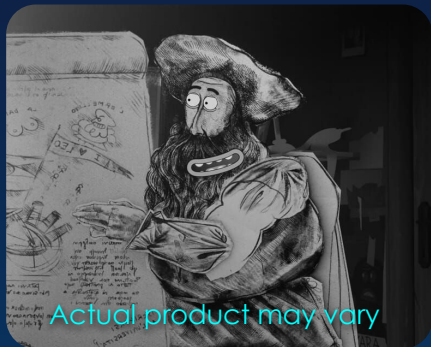


$$\text{FOV } 54^\circ - 59^\circ - 54^\circ = 167^\circ$$





 Eevee



Actual product may vary

 Leonardo
CINECA



- ★ Real time preview
- ★ Limited volumetrics
- ★ Rendertime:
5'' - 60''/frame
= ~ 350 hours

 Eevee

- ★ CLI rendering
- ★ Output: 43000 frames
/ ~ 60 gb
- ★ Rendertime:
8h @ 20 nodes * CAM

 Leonardo
CINECA



The request A video for a dome projection space



EEVEE

- EEVEE: Conditionally enable viewport
- ♦ EEVEE: Material Lighting Nodes - M
- EEVEE: Blocklist aov_consecutive_view
- ♦ EEVEE: Add Support for Panoramic Camera View

Fixes

- Fix: GPU: Shader Tool: New BSL compi
- Fix formatting - Clément Foucault
- Fix Thread unsafe compositor con

projects.blender.org/blender/blender/pulls/159474

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EEVEE: Add Support for Panoramic Camera View #159474

Merged Clément Foucault merged 44 commits from L3GiaBao/blender:eevee-panoramic-camera-view into main 5 days ago

Conversation 65 Commits 44 Files Changed 43 +1005 -228

Le Gia Bao commented 4 months ago · edited Contributor

Implemented

- Panoramic camera types: equirectangular, equiangular cubemap face, fisheye equidistant, fisheye equisolid, fisheye lens polynomial, central cylindrical, mirror ball.
- Render 6 subviews (fixed 90° FOV each, 5% overscan).
- Subview enable/disable masking (PanoramicViewBits) to skip faces not needed for narrow FOV.
- Accumulate radial depth for panoramic projections.

Reviewers: Clément Foucault

Labels: Interest EEVEE Module Viewport & EEVEE

Milestone: No Milestone

Projects: No projects

Intro Hola! Compositor Core Cycles EEVEE Geometry Nodes Grease Pencil Modeling Nodes Outliner Overlay Paint Sculpt User Interface Video Sequencer Q&A Outro

