The Unity roadmap for games in 2023

An overview of new features
and tech planned for the coming year

What we will cover

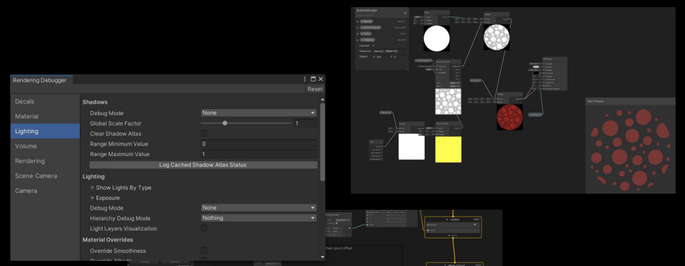
- → **GAME FOCUS VISION**
- → **HOW TO SHAPE UNITY**
- → **RELEASE OVERVIEW**
- → **ROADMAP**
  Rendering
  Unity artistry
  Expanded scale
  Multiplayer
  Platform reach
  Empowering teams

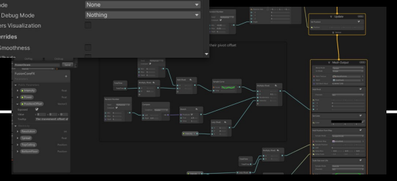
Rendering that scales with your needs

→ Scriptable Render Pipeline and graphics foundations

→ URP

→ HDRP





Scriptable Render Pipeline and graphics foundations

Cross-pipeline workflows and API

Universal Render Pipeline

2D and 3D, optimized for maximum platform reach and customizability

High Definition Render Pipeline

Off-the-shelf photorealistic 3D rendering on PC and Consoles

Scriptable Render Pipeline and graphics foundations

→ **Material Variants**

Fast authoring of materials at scale

→ **Full-screen master node**

Custom post process and full screen effects with Shader Graph

→ **VFX Graph improvements**

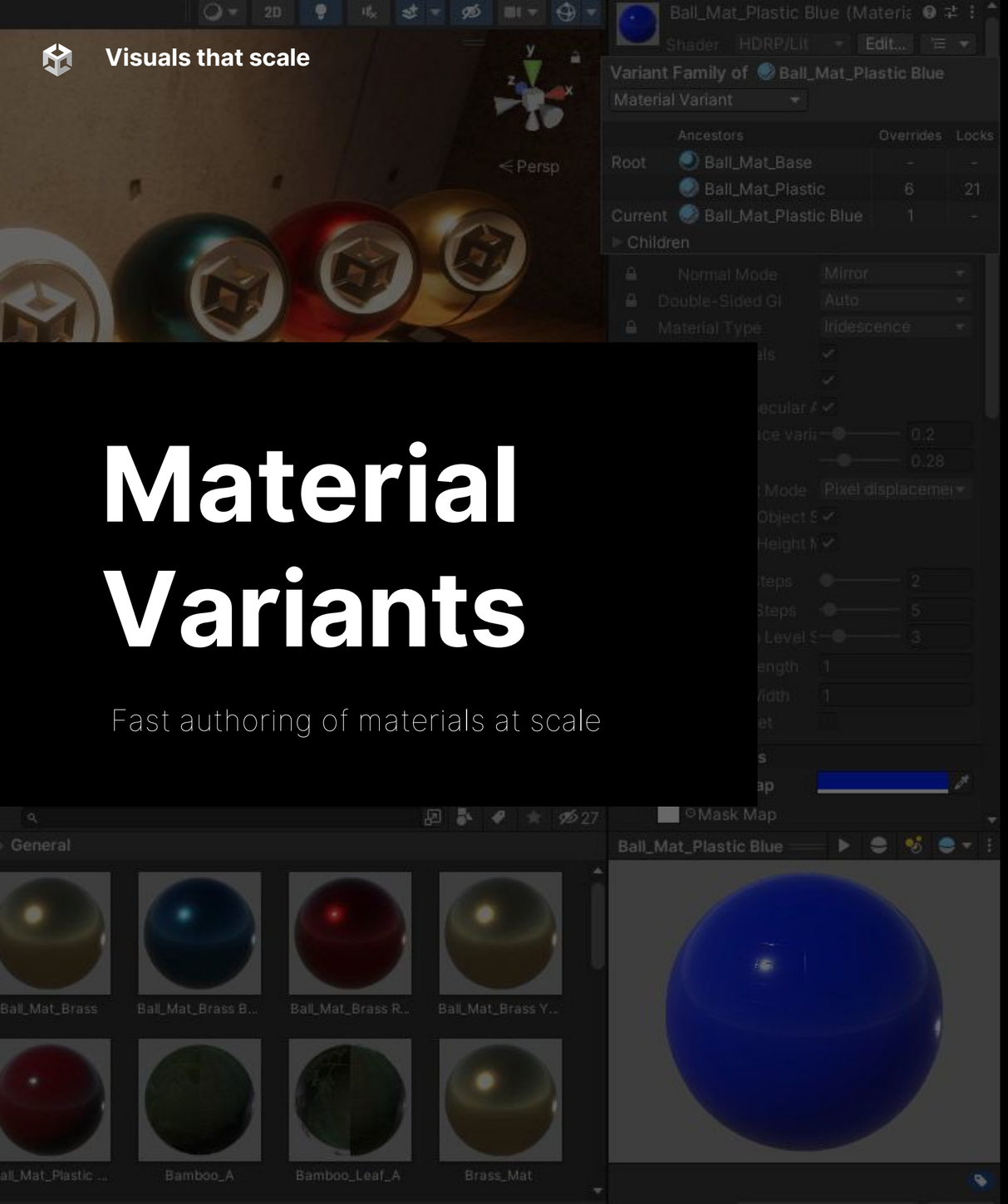
Build advanced effects that can be reused at scale

→ **Adaptive Probe Volumes**

Global illumination that scales with your needs with improved authoring workflows

→ **Unification**

Streamlined cross-platform content authoring using both URP and HDRP



Material Variants

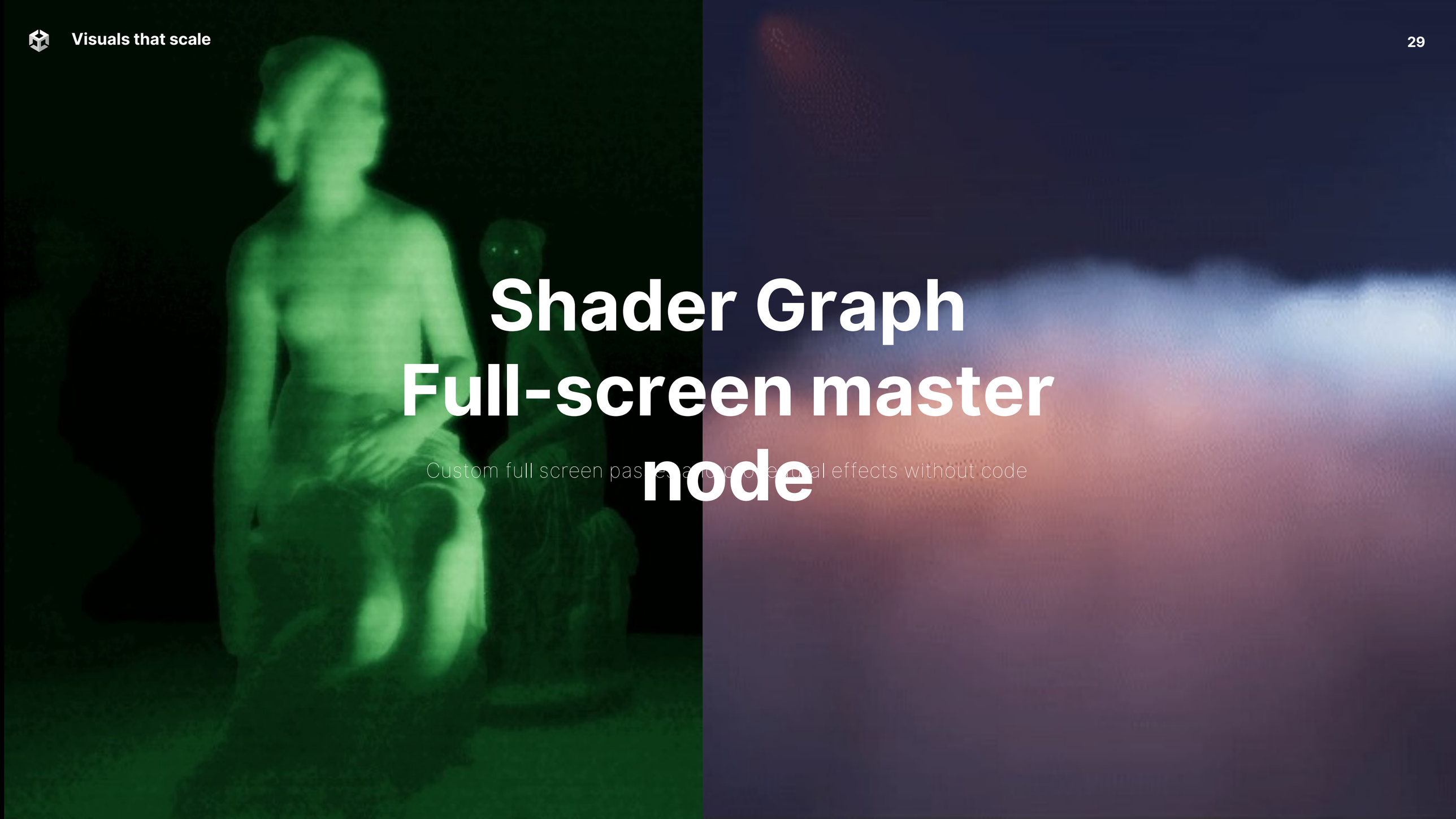
Fast authoring of materials at scale

→ **Reusability**

Build and reuse libraries of materials, override only needed properties

→ **Safe and speedy iteration at scale**

Visualize material hierarchy and lock properties to prevent mistakes



Shader Graph Full-screen master node

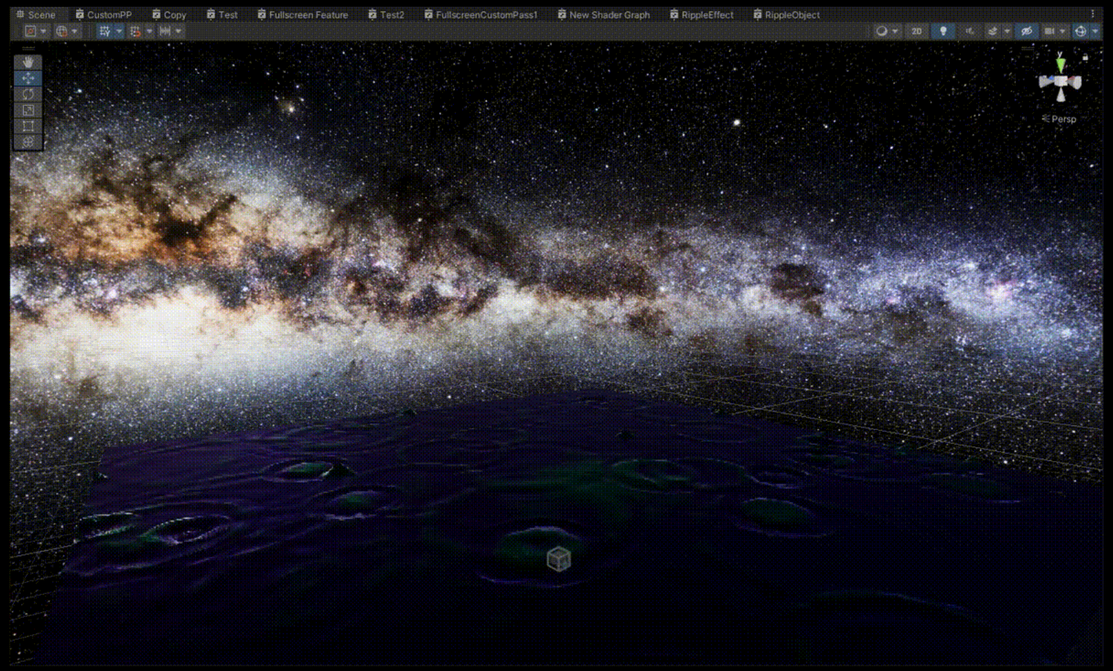
Custom full screen pass and complex visual effects without code

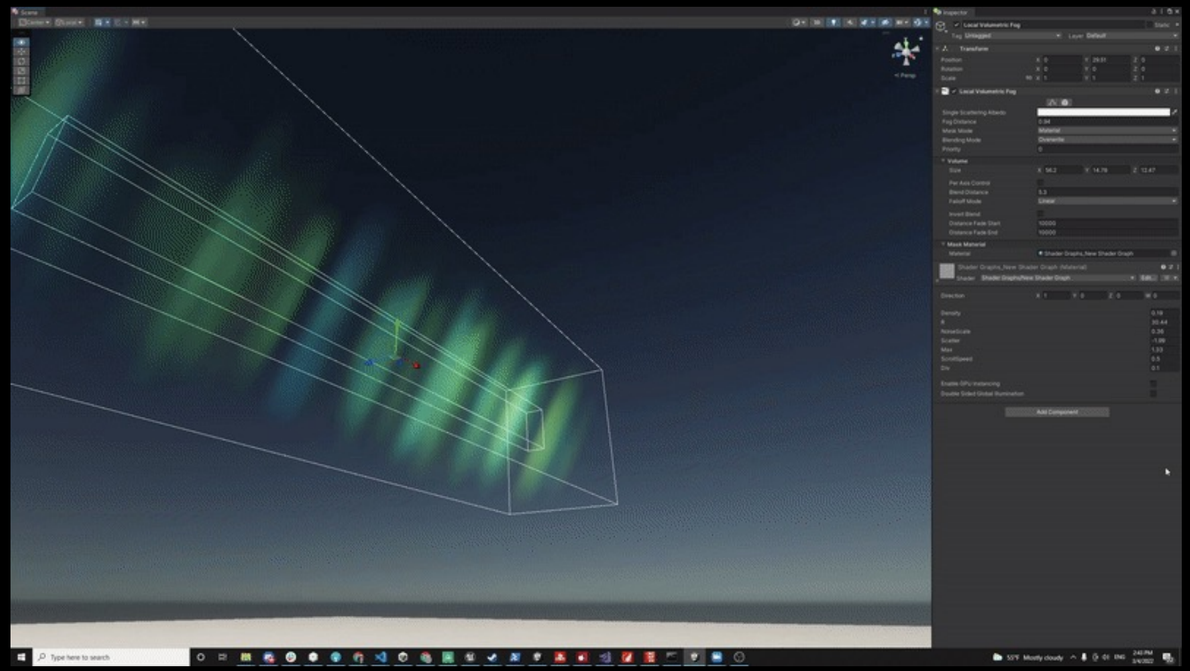
→ **Custom Post-Processing**

Create effects such as night vision and color blindness filters

→ **Custom passes**

Create passes for edge detection and object highlights





→ **Custom render textures**

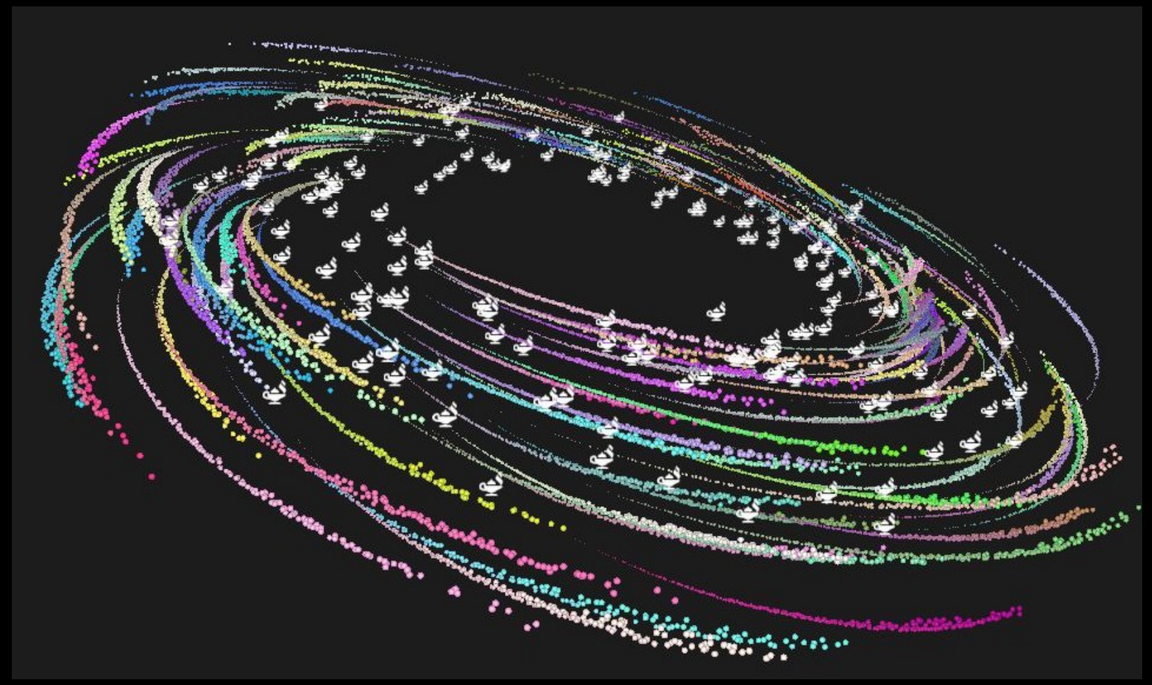
Procedural textures generation such as
custom night HDRI and animated rain droplets

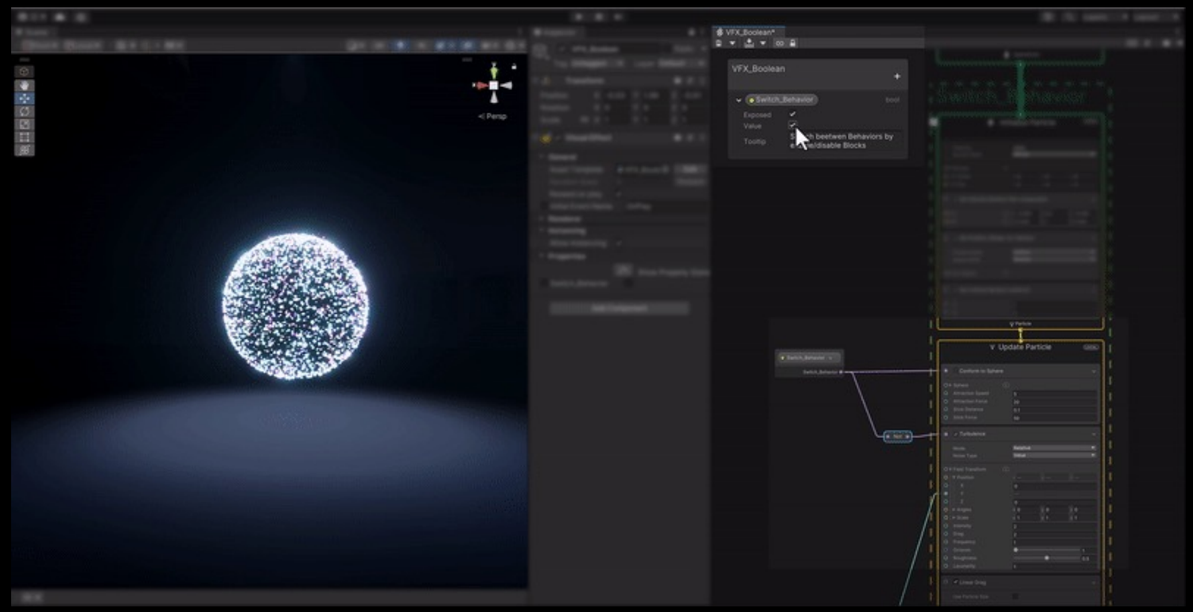
→ **Local Volumetric Fog (HDRP)**

Custom procedural fog effects

VFX Graph

Build advanced effects that can be reused at scale



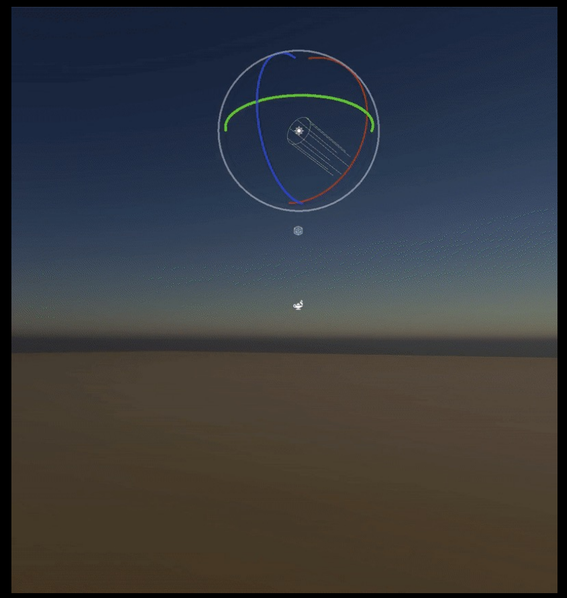


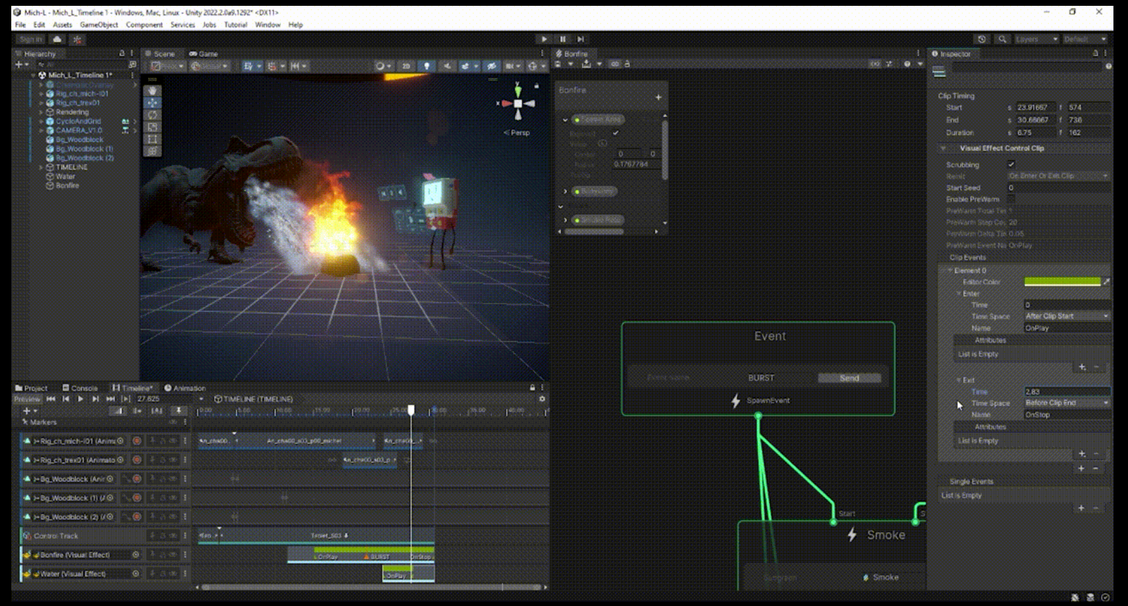
→ **Instancing**

Improve performance when reusing the same system

→ **Boolean ports**

Create configurable uber effects





→ **Six-way lighting (HDRP)**
Create better looking and more reusable smoke FX

→ **Timeline scrubbing**
Sequence complex effects or cinematics

Adaptive Probe Volumes

Simplified light probe placement tool, designed to increase iteration speed and improve visual quality

→ **Adaptive Probe Volumes**

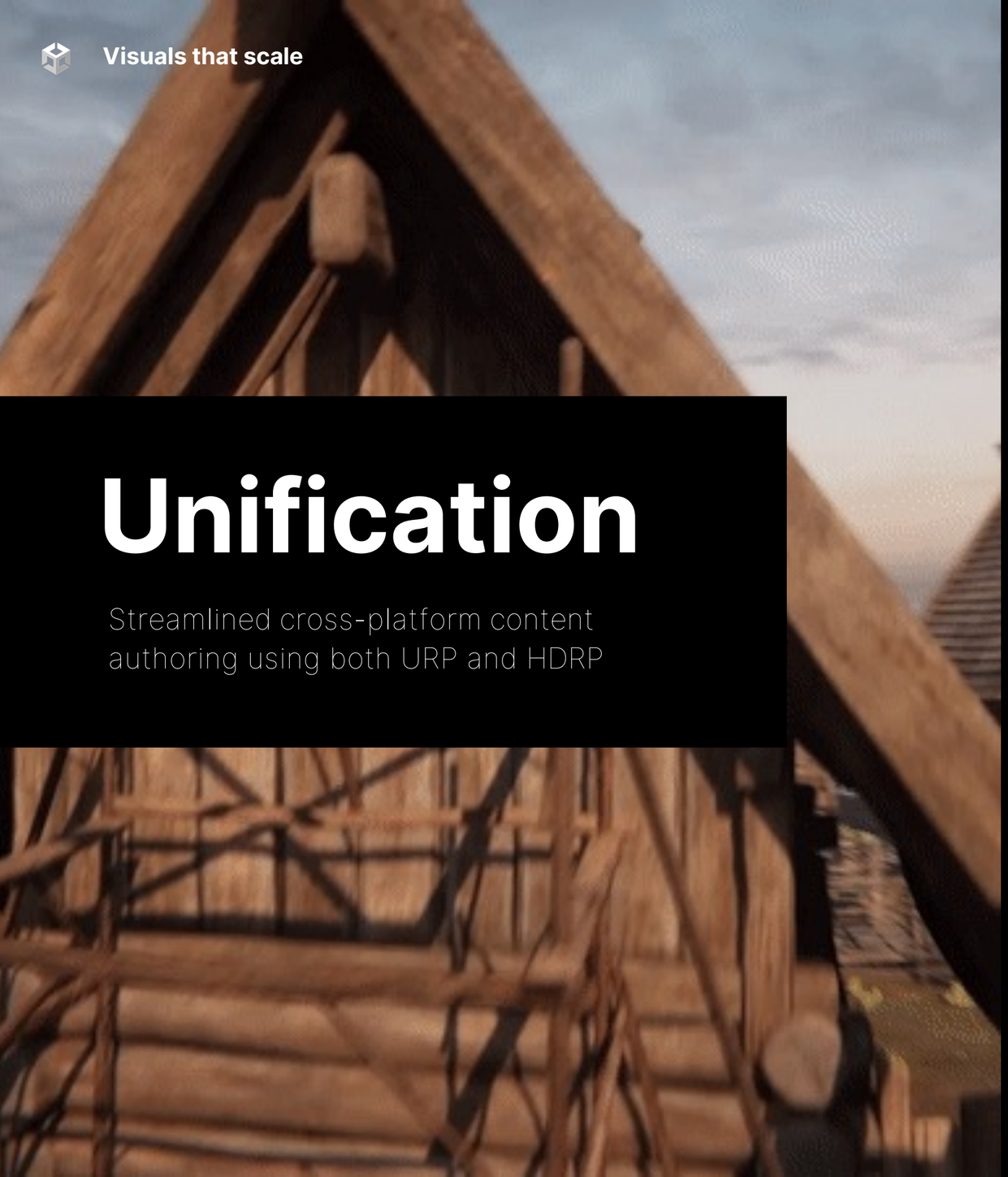
Available in preview for HDRP in 2022.2

→ **Visual quality**

Light leaking prevention for static objects
Initial support for URP
Lighting scenario blending
Light probe data streaming
Volumetric fog influence (HDRP)

→ **Additional GI improvements**

Improved Screen Space GI (HDRP)
Path traced preview of baked GI in Editor
Light baking C# API



Unification

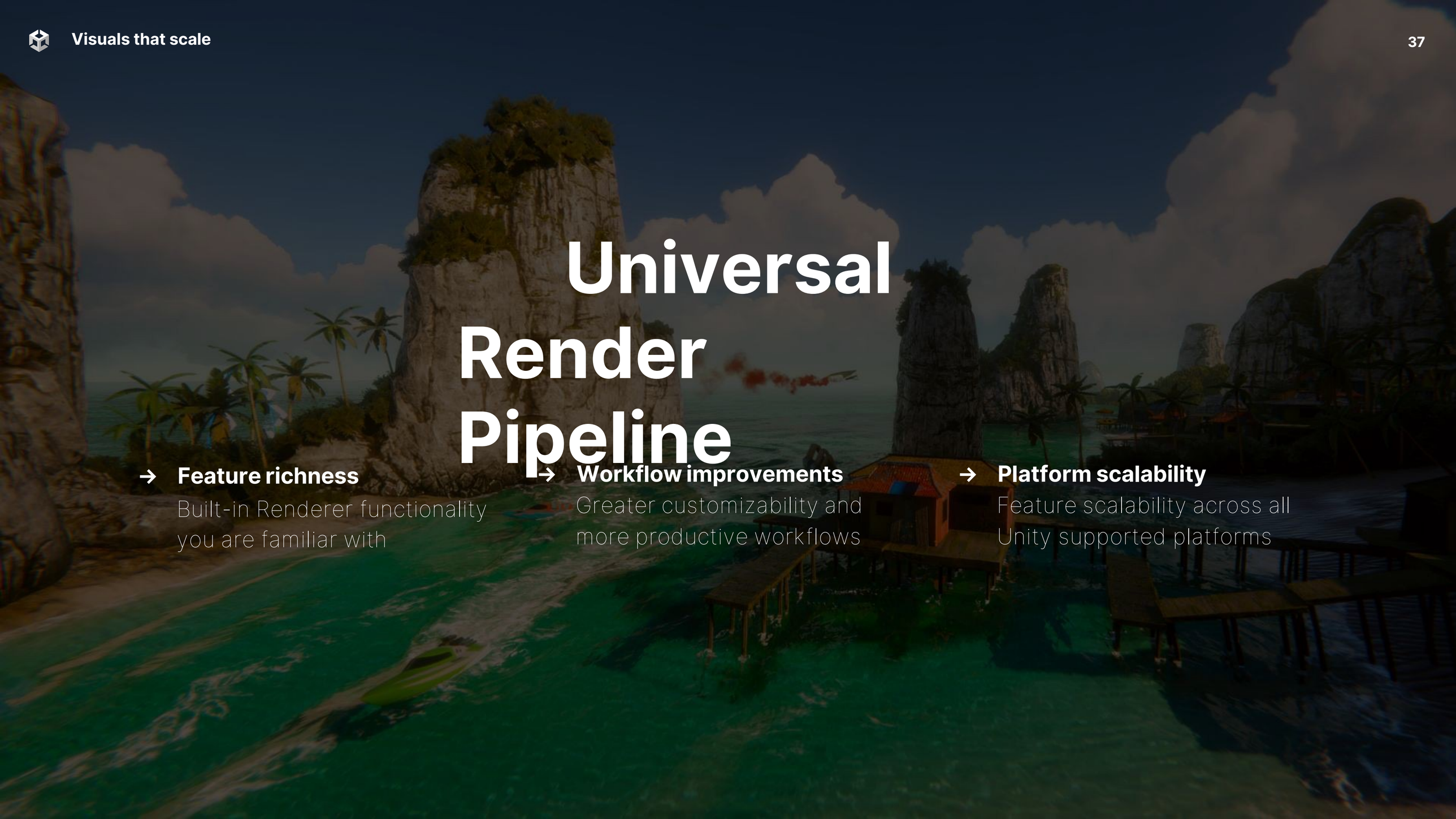
Streamlined cross-platform content authoring using both URP and HDRP

→ **SRP coexistence**

Ability to include URP and HDRP in the same project
Author and maintain different visual assets tailored to each pipeline

→ **Block shaders**

New intuitive syntax and unified shader authoring workflow across the rendering pipelines

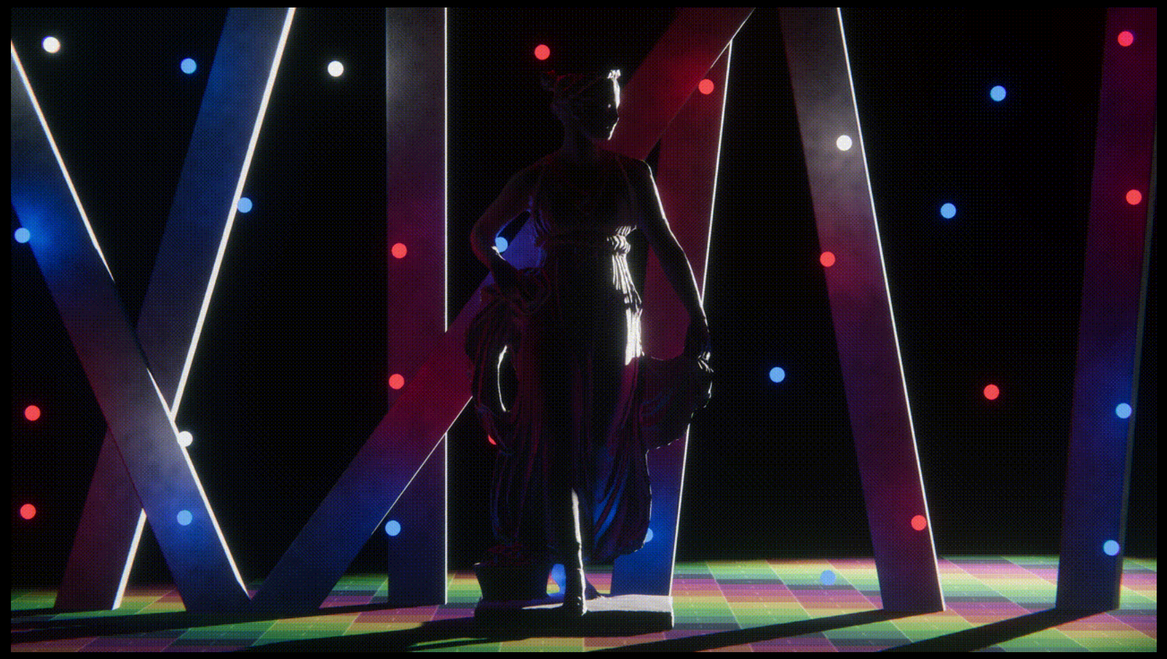


Universal Render Pipeline

→ **Feature richness**
Built-in Renderer functionality you are familiar with

→ **Workflow improvements**
Greater customizability and more productive workflows

→ **Platform scalability**
Feature scalability across all Unity supported platforms



→ **Forward+ rendering path**

High-quality real-time lighting across a wide range of platforms

→ **LOD crossfade**

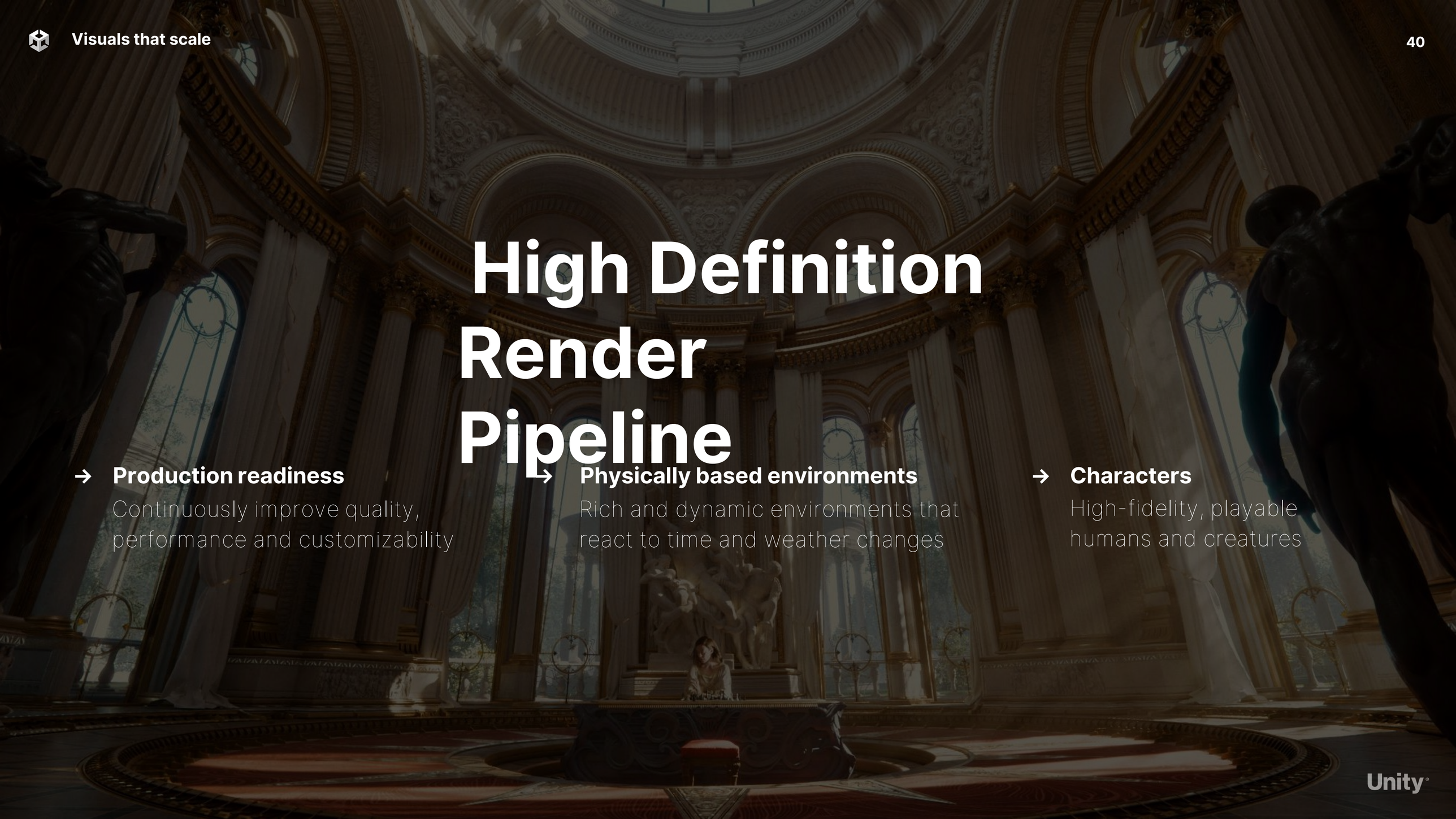
Smoother transition blending between the current LOD and the next LOD

→ **Decal Layers**

High-quality real-time lighting across a wide range of platforms

→ **Temporal AA**

Supplements MSAA, FXAA, SMAA



High Definition Render Pipeline

→ **Production readiness**

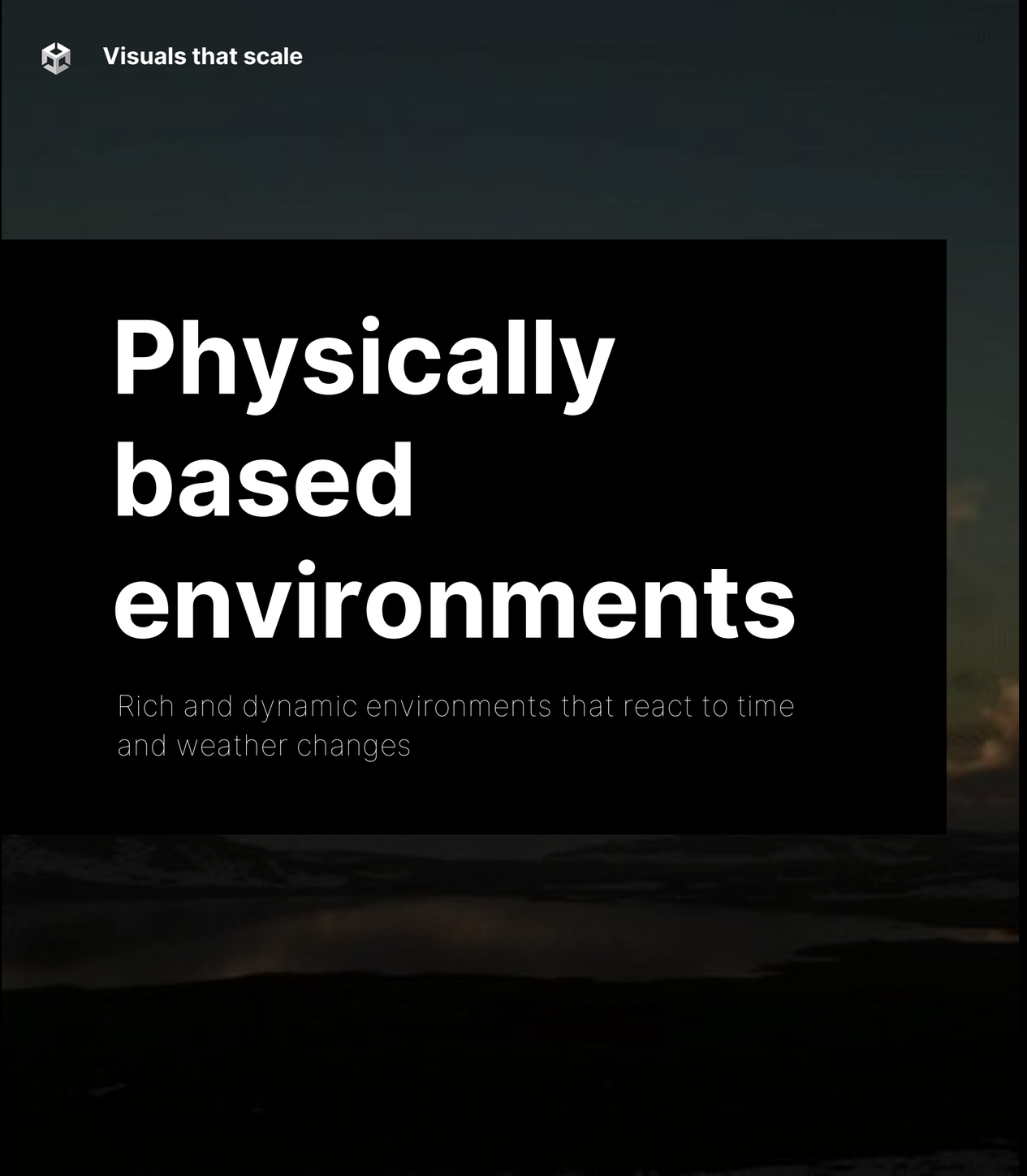
Continuously improve quality, performance and customizability

→ **Physically based environments**

Rich and dynamic environments that react to time and weather changes

→ **Characters**

High-fidelity, playable humans and creatures



Physically based environments

Rich and dynamic environments that react to time and weather changes

→ **Water**

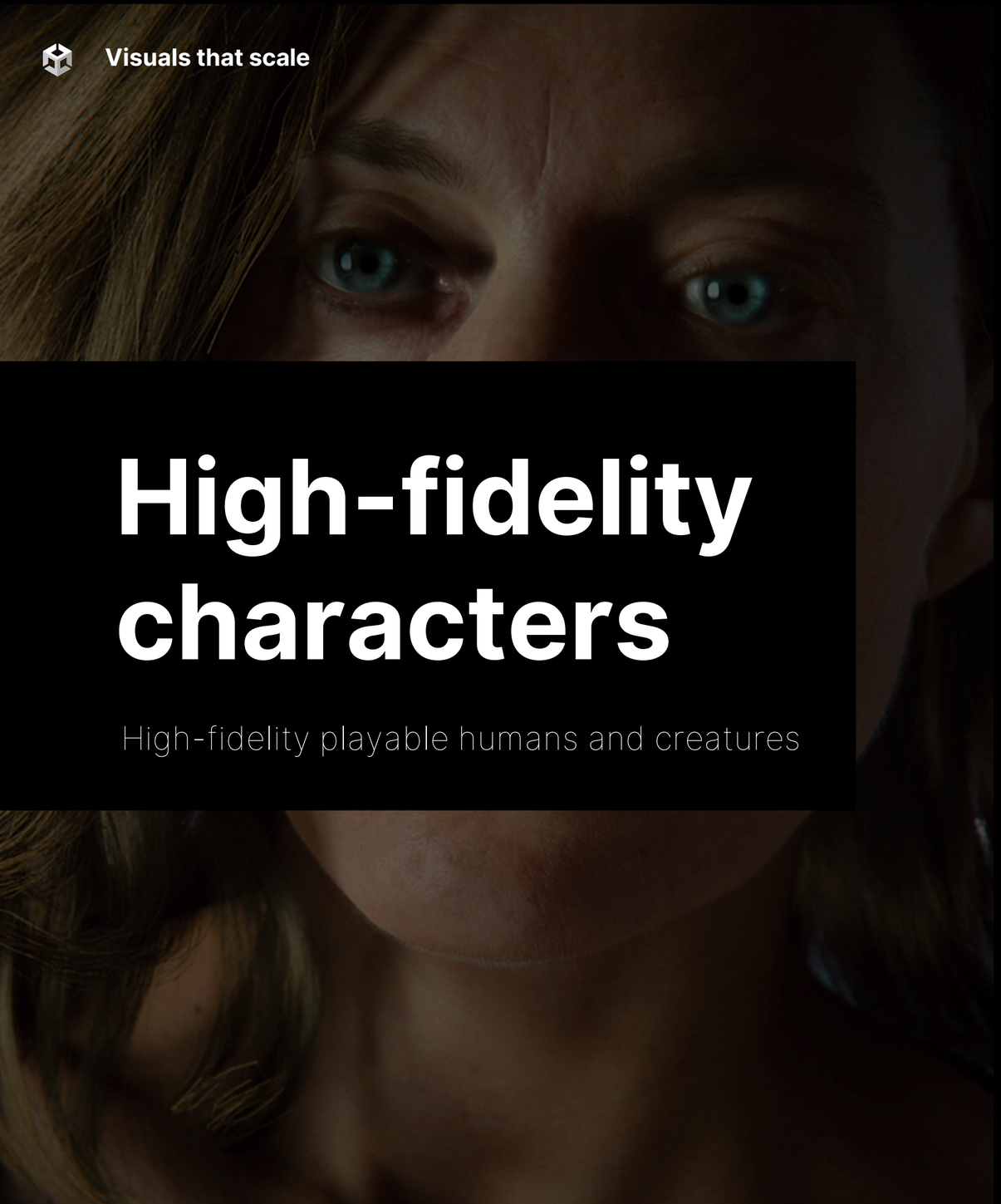
Oceans, rivers or pools that react to the wind and currents

→ **Sky**

Procedural clouds and sky that react to time, light, wind and weather changes

→ **Improved transparency and translucency**

Beautiful natural or manufactured objects



High-fidelity characters

High-fidelity playable humans and creatures

→ **Physical hair shading**

Realistic hair and fur shading and samples

→ **Hair and fur rasterizer**

Specialized hair renderer for high fidelity lighting and anti-aliasing

→ **Eyes**

High fidelity eyes with optional caustics and eye sample

→ **Improved Shadows**

Area lights high fidelity PCSS shadows, capsule shadows for large environments or cached shadows

Artistry tools

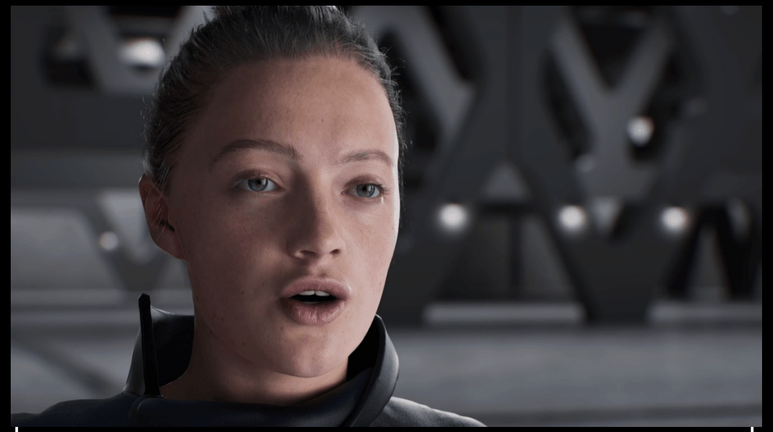
→ Character and Creature Creation

→ Environments and Vegetation

Serenity by Marc Schneider

Unity®

Bringing Ziva to real-time



Ziva VFX

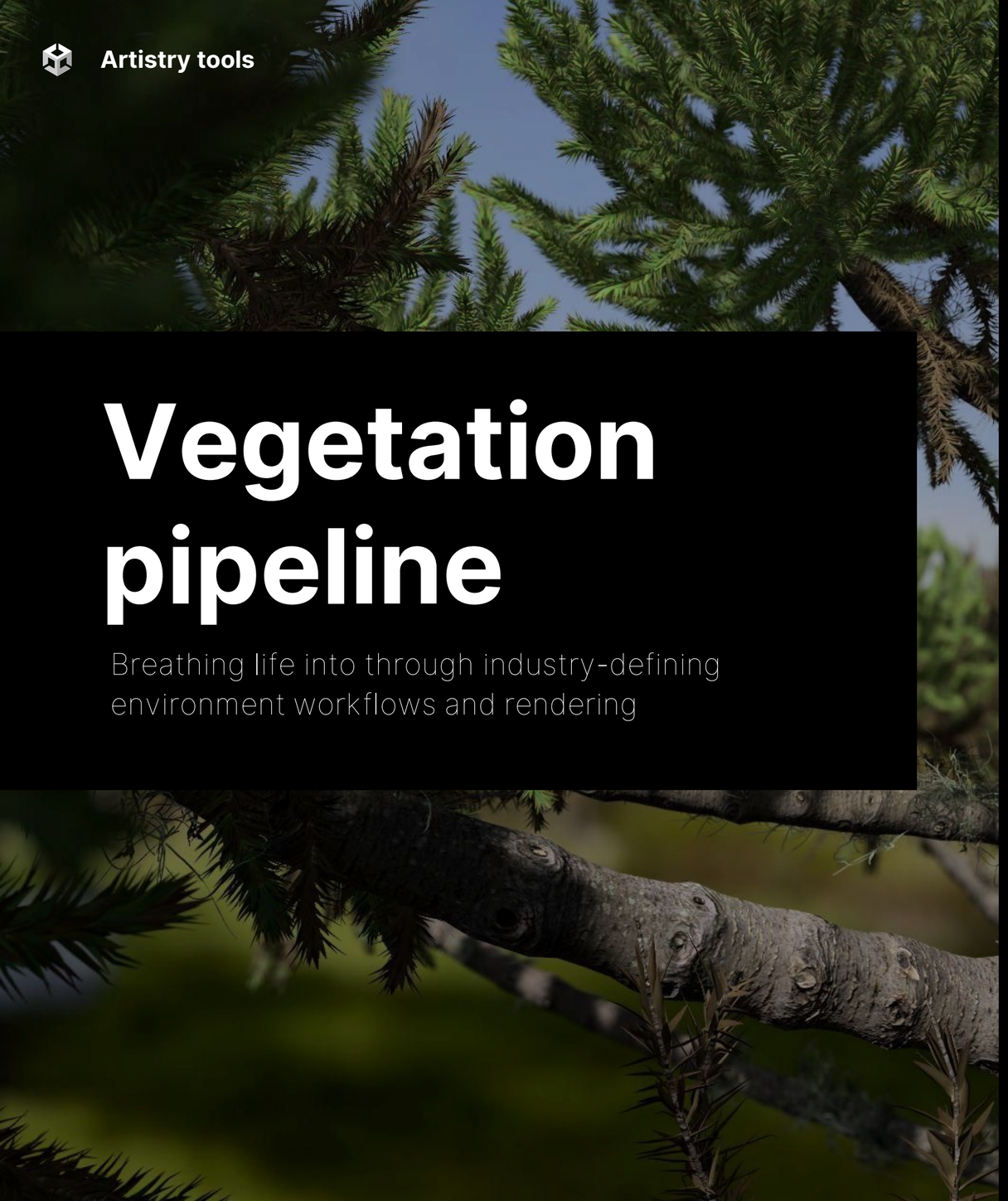
Advanced simulation helping artists replicate organic physics and biomechanics of muscles, fat, skin and cloth for photo-realistic character and creature assets

Ziva Real-time

Machine learning to adapt high-quality character simulations into real-time game engine assets, bridging the gap between film, real-time gaming and metaverse environments

Ziva Facetrainer

Accurate and scalable real-time face capture and playback technology supporting **ARKit** and markerless head-mounted camera performance capture



Vegetation pipeline

Breathing life into through industry-defining environment workflows and rendering

→ **Production-tested**
Environment authoring workflows powered by SpeedTree procedural modeling and new asset libraries

→ **Constantly improving**
Better workflows, performance, and rendering coming to the Unity Editor throughout 2023

→ **Industry-leading**
Adoption of Wētā vegetation and worldbuilding technology

SpeedTree environment tools

SpeedTree Modeler

SpeedTree 9.3 Q4 2022

- Convert photogrammetry to procedural trees instantly
- Unlock stylized modeling with Freehand sculpting
- Blend sculpted mesh details seamlessly with procedural geometry

SpeedTree + Unity

The latest SpeedTree tech

- Improved integration with HDRP and URP
- New wind techniques with less overhead and increased fidelity for AAA visuals and virtual production

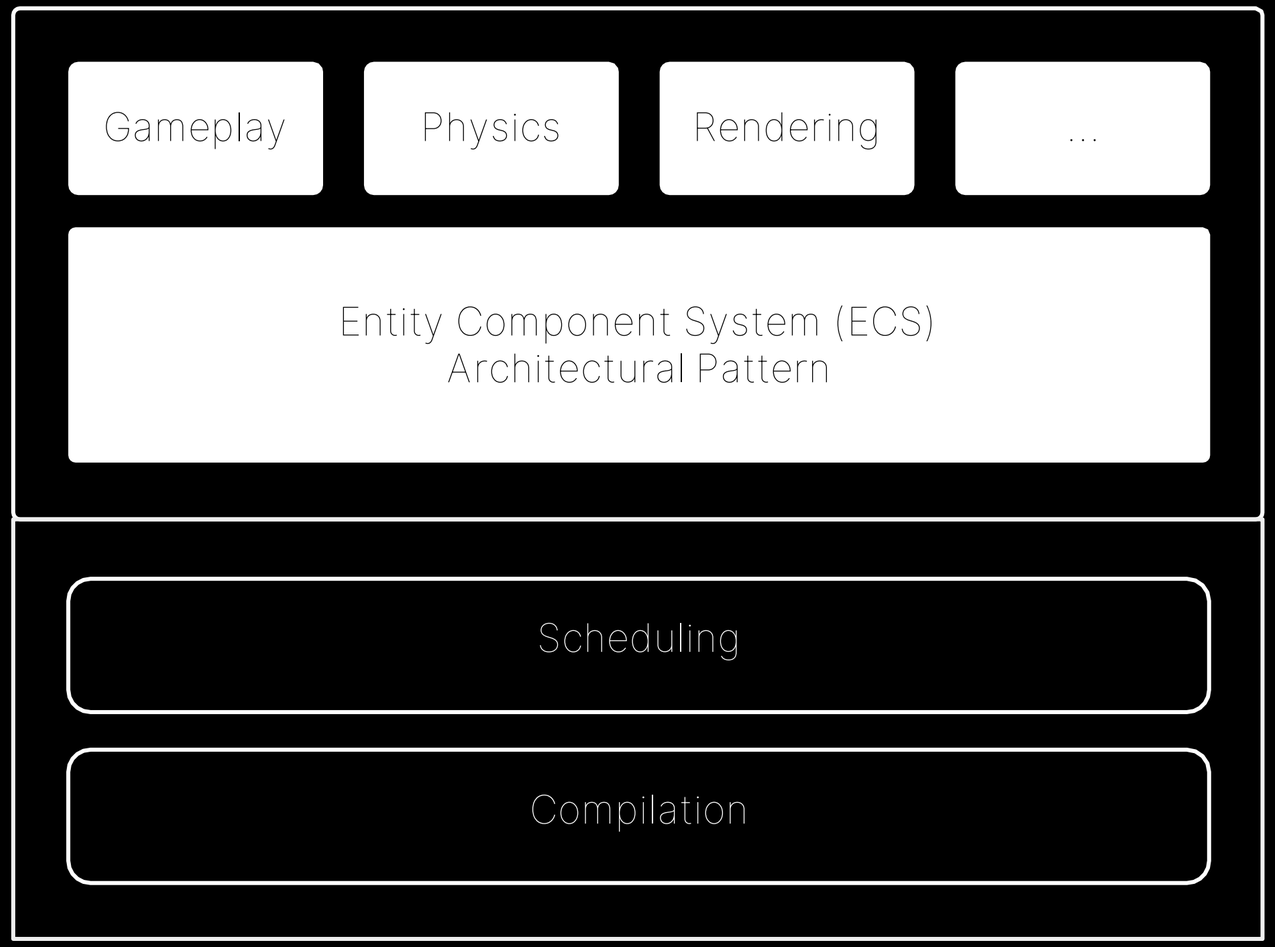
SpeedTree Library

Ever -growing variety

- Hundreds of new games models coming to the SpeedTree Store from around the world
- New photometry based materials, photogrammetry scans

Expanded scale for ambitious games

Data-Oriented Technology Stack (DOTS)



Entities graphics,
Netcode for Entities, Unity Physics,
Havok Physics for Unity ...

Entities package

C# Job System

Burst compiler

ECS support for production

Transition ECS from Experimental to being fully supported for production on all platforms

→ **Experimental Entities 0.50**
Reach ECS compatibility with 2020 LTS
Available since March 16, 2022

→ **Experimental Entities 0.51**
Reach ECS compatibility with 2021 LTS
Available since June 22, 2022

→ **Entities 1.0 Release**
Reach ECS compatibility with 2022.2 Tech Stream
An ECS foundation supported for use in production

ECS for Unity 2022

Enable seasoned Unity creators to build more ambitious games with a fully supported data-oriented foundation

Streamlined ECS workflows
Compatible with GameObjects

Flexible game architecture
Adapts well to gameplay changes

Control and determinism
New gameplay opportunities at scale

Best leverage the hardware resources
Optimize use of memory & CPU

Made for massive data streaming
Large scale scene and rendering

Unprecedented simulation scale
Unity Physics and Havok Physics for Unity

Large multiplayer games
Medium to large competitive action games

Upcoming ECS samples and tutorials

Megacity

Large-scale streaming

Subscene authoring workflows that scale well to thousands of entities with high-performance streaming capabilities

ECS Racing

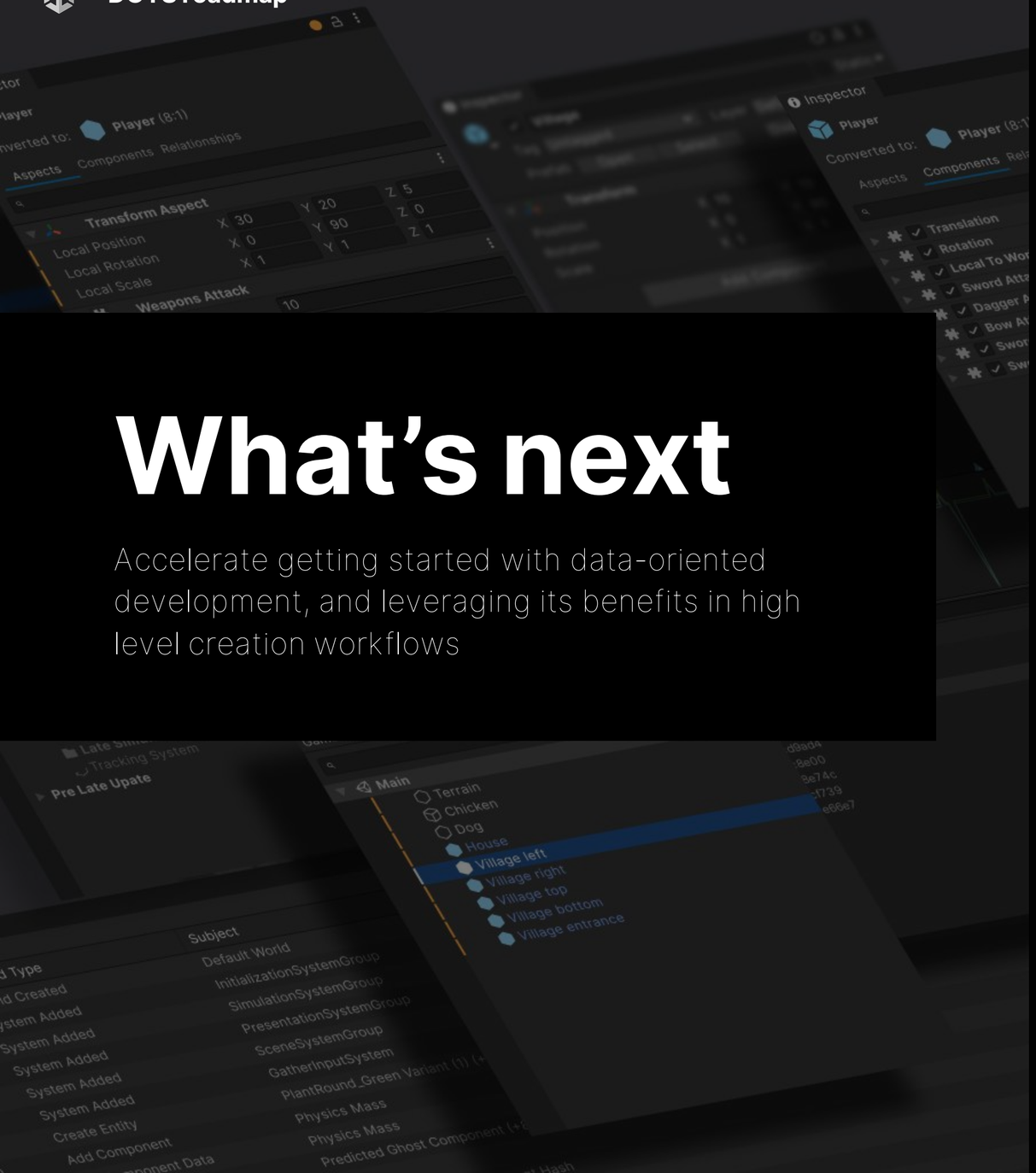
Competitive multiplayer

Client/server architecture with client-side prediction, interpolation, and lag compensation

ECS tutorials

Reducing learning curve

Self-guided tutorials, videos and samples for users to learn and use ECS for Unity, including Entities, Collections, Burst, Mathematics, and C# Job System



What’s next

Accelerate getting started with data-oriented development, and leveraging its benefits in high level creation workflows

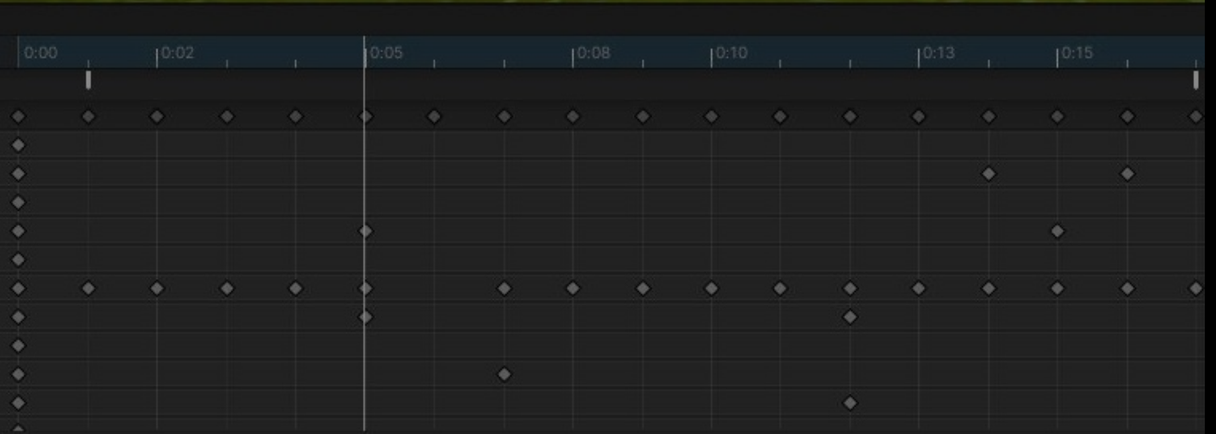
→ **Consolidation of data-oriented development**
Acquisition of Rival character controller

→ **Multiplayer foundation gaps**
Cross-play determinism

→ **Open-world foundation gaps**
Streaming, authoring scalability

Animation

Progressing toward a highly performant, extremely customizable, and accessible 3D animation system



→ **GameObjects and ECS**

Targeting all users and project types with GameObjects, and leveraging ECS performance benefits wherever possible

→ **Mecanim**

Focusing on stability and performance and continuously delivering and backporting fixes

Worldbuilding

Integrated environment authoring workflows to help you build organic 3D worlds

→ **Spline authoring**

Create tools to draw geometry
Branch, merge, extrude

→ **Environment workflows**

Overlays for terrain
Scattering improvements
Detail density

Scene
Game
Asset Store
Center
Global
Layers
Layout
2D
Persp
Isolation View
Exit
Editor

Maximizing your platform reach

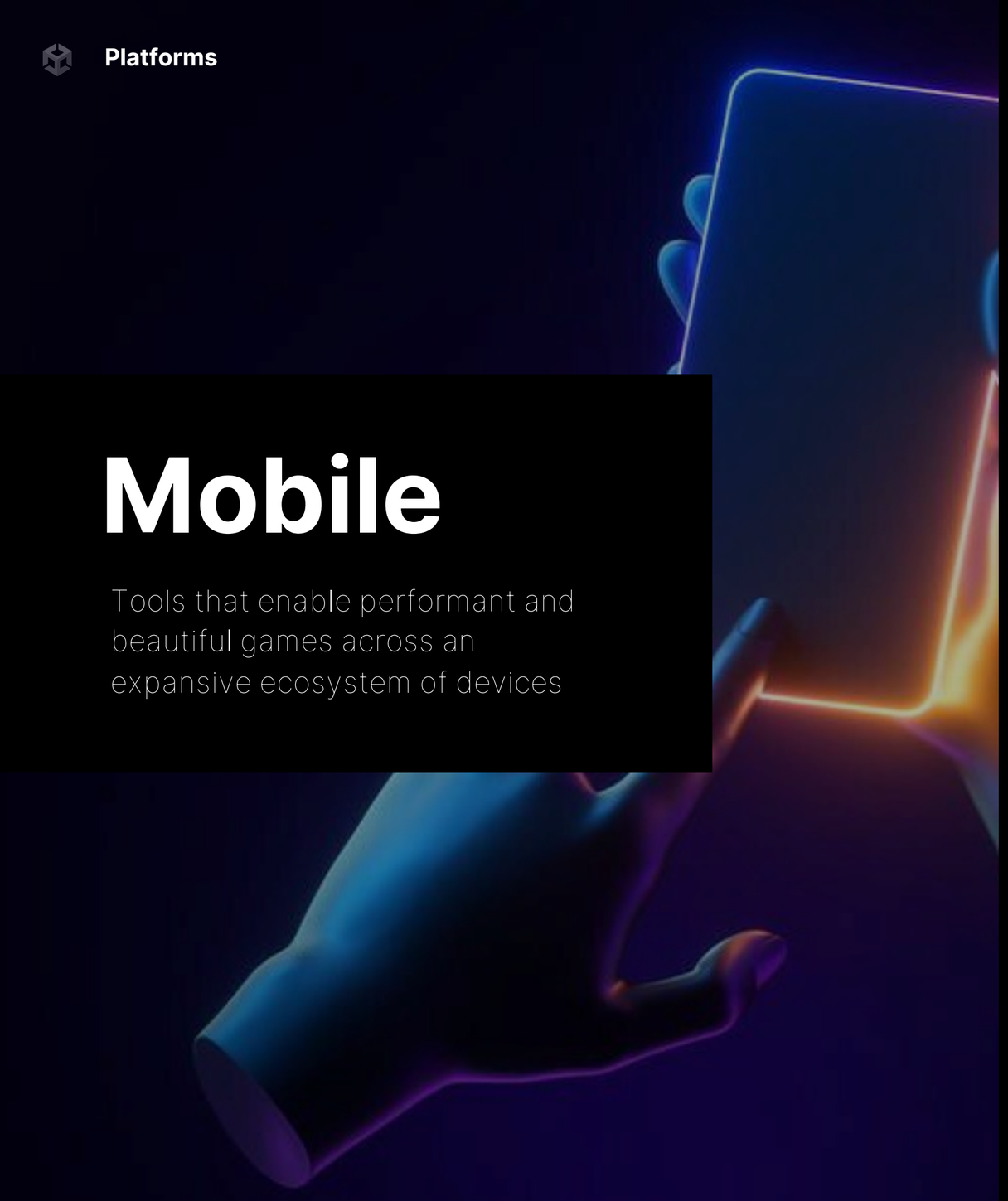
→ Mobile

→ Desktop and console

→ Web

→ XR

Lego Builder's Journey by Light Brick Studio (iOS, Nintendo Switch, PC, XBox One, XBox Series X/S, PS4, PS5)



Mobile

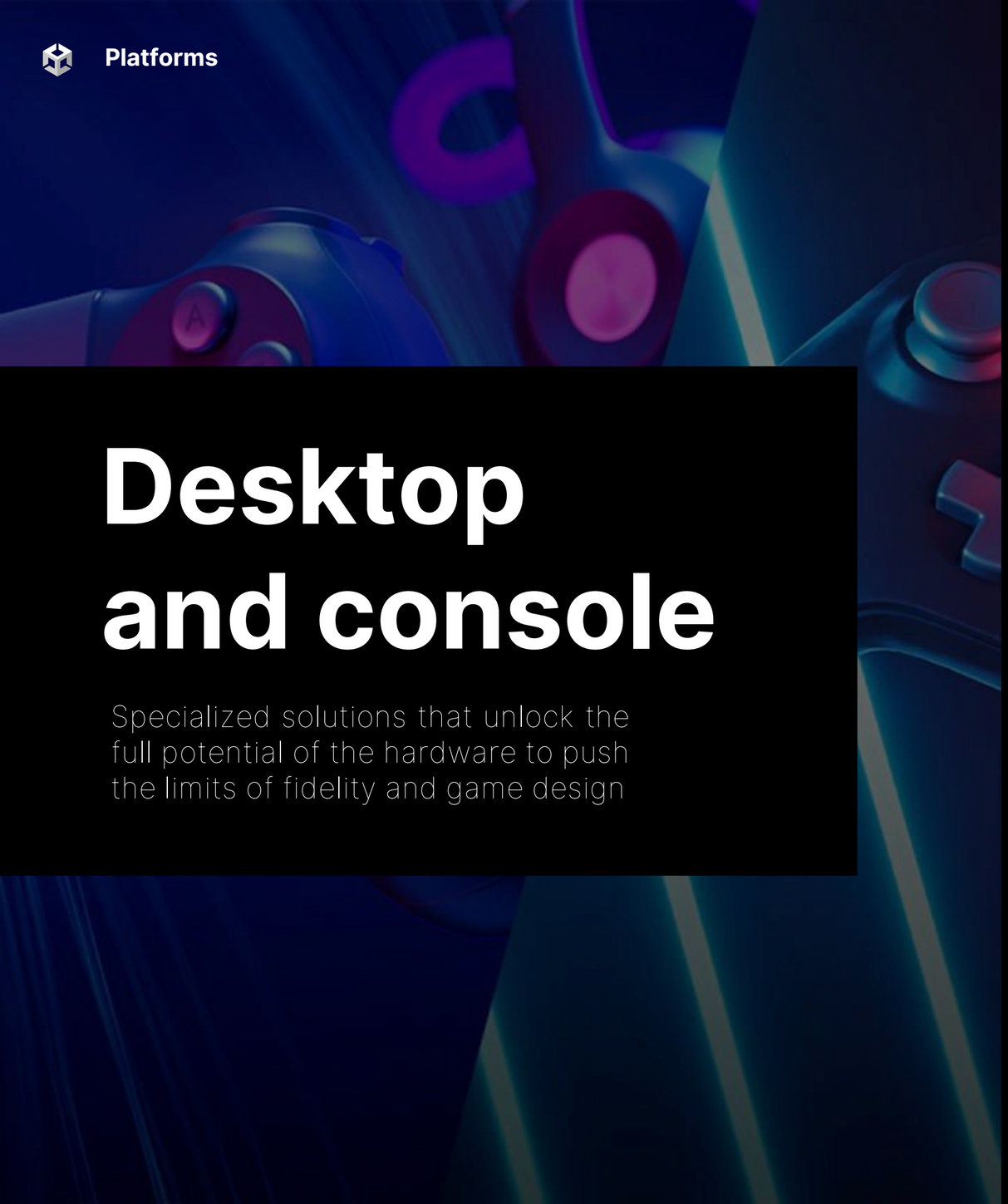
Tools that enable performant and beautiful games across an expansive ecosystem of devices

→ **Fast deploy for Android**
Improving iteration time on device, by only updating what has changed

→ **Android configuration manager**
Easily manage your configuration files inside the Unity Editor

→ **Game activity for Android**
Bringing support for the GameActivity API from Google

→ **Toolchain updates**
for Android and iOS to ensure compatibility with the latest devices



Desktop and console

Specialized solutions that unlock the full potential of the hardware to push the limits of fidelity and game design

→ **DX12 out of preview**

DX12 out of preview in 2022.2 for significant performance and stability improvements across Editor and Player

→ **Ray tracing**

Xbox Series support introduced in 2022.2
Ray Tracing out of experimental in 2023.1

→ **Incremental builds**

Coming to all supported console platforms this year.

→ **ChromeOS build and run**

Quick deploy to ChromeOS over Wifi

→ **Arm support for Windows**

Native ARM64 support for windows standalone player coming in 2023.1

Web

Expand the reach of your content

→ **Mobile browser support**

Touch/keyboard support
Mobile texture compression

→ **WebGL memory management**

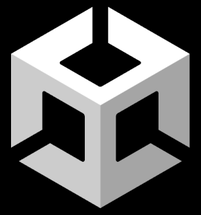
New player setting for fine grained control over memory usage and a new diagnostic overlay to measure performance

→ **Tool chain updates**

Updates to Emscripten 3.1.8 toolchain

→ **WebGL multithreading**

Support for native (C++) multithreading



Unity® HMI 行业案例

Industry Customer & Partner Portfolio

And more...

HMI Made with Unity®

Industry Customer & Partner Portfolio

And more...

Mercedes-Benz

“We’ve adopted radical software driven approach to the UI/UX. For the first time, we’ve used a game engine to elevate the UI to the next level of digital luxury.

In doing so, we partner with Unity Technologies, whose products are the basis of at least half of the mobile games, augmented realities since 2018. Their experience is evident, the visuals are like nothing you’ve ever seen in the car industry!”

Magnus Östberg
Chief Software Officer at Mercedes-Benz AG

Unity

P7
P7

G9
G9

XPeng G9

沉浸式跨屏交互

3D导航

无缝3D体验

et7

NIO
20:21
25 PM2.5 QUIET
kontraskjæret
Nedre Slottsgate
Nedre Voldgate
Rådhuset
座椅
空调
香氛
A/C
MAX
MAX
切至后排
自由
5
A
自由
26.5
26.0

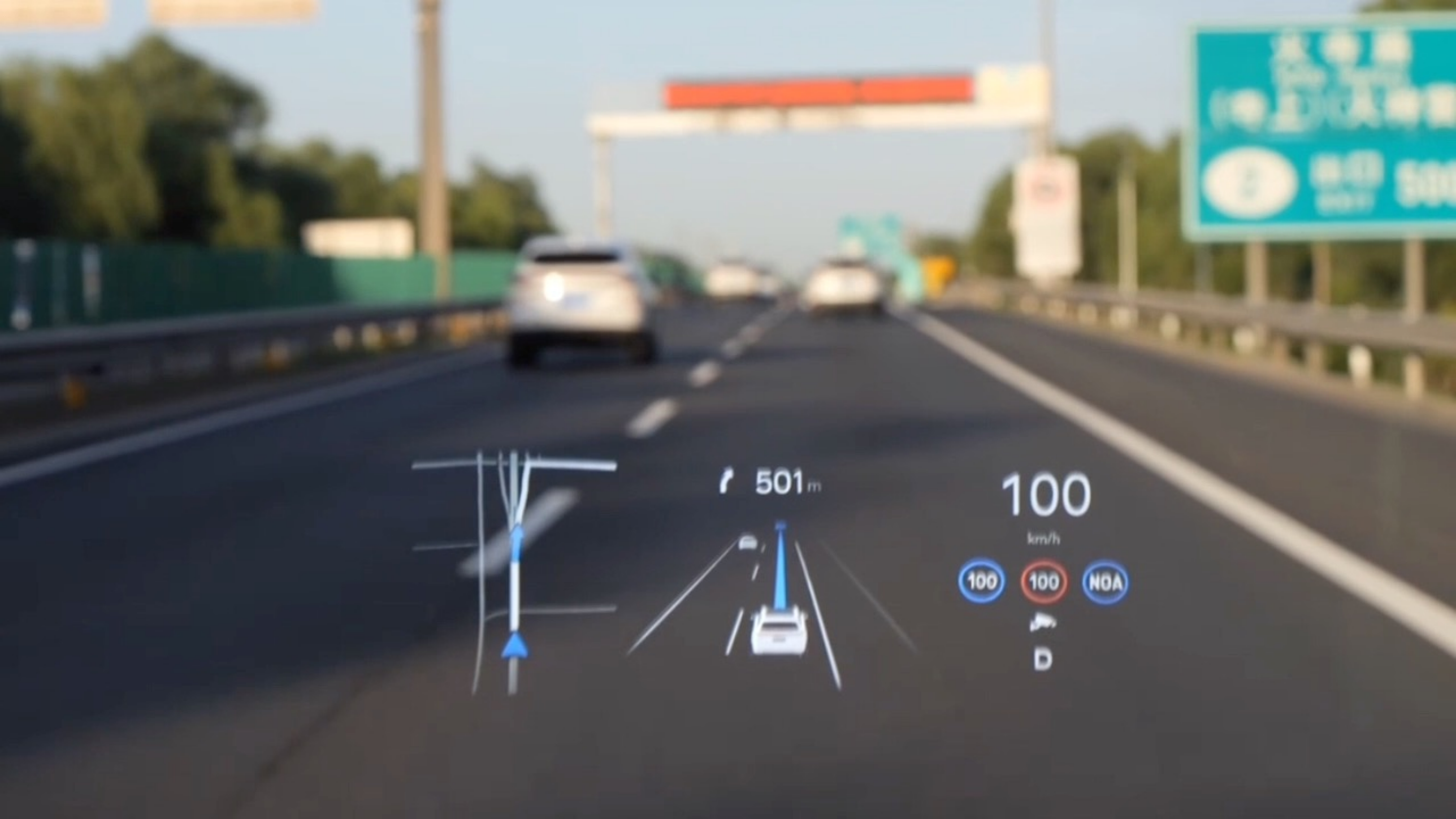
D-DAI.COM PHOTOGRAPHIC
LiXiang L9Max
Camera: Sony A9
Lens: FE 135mm F1.8 GM / Batis 85mm F1.8 / FE 50 F1.2 GM

Li Auto – L9

中控屏HMI

AR HUD

XR体验&BYOD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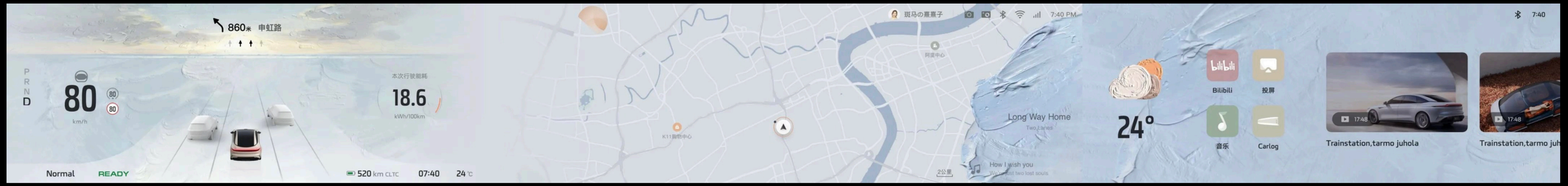
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READY
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斑马の熹熹子
7:40 PM
阿里中心
K11购物中心
Long Way Home
Two Lanes
How I wish you
2公里
7:40
24°
Bilibili
投屏
音乐
Carlog
17:48
Trainstation,tarmo juhola

860米 淮海中路
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860米
申虹路
1小时15分
22.8公里
12:30到达
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K11购物中心
申长路
智己熹熹子
7:40 PM
阿里中心
浦东新区
Long Way Home
Two Lanes
How I wish you
200米
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Bilibili
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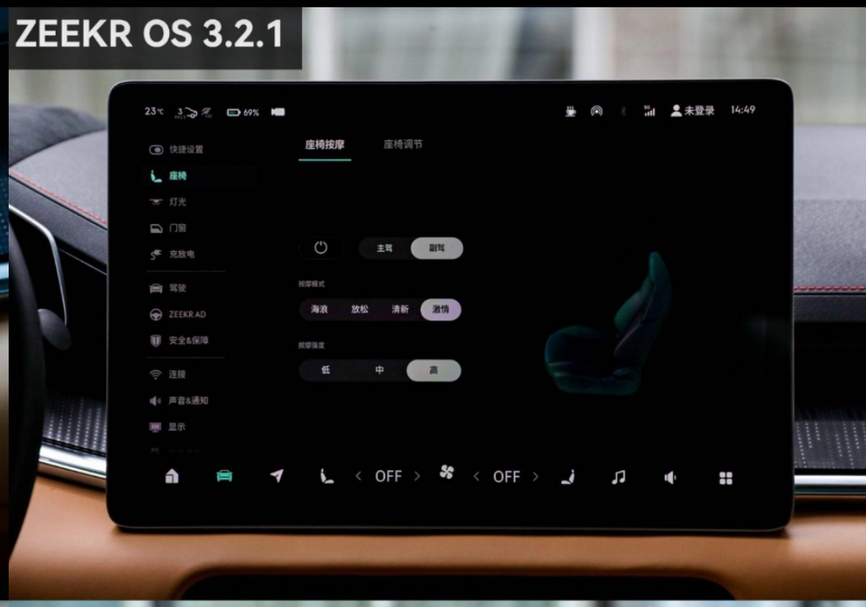
ZEEKR 001

009

ZEEKR OS 3.2.1

ZEEKR OS 3.2.1


ZEEKR OS 3.2.1

ZEEKR OS 4.0

ZEEKR OS 4.0

ZEEKR OS 4.0

3D 地图

3D
2D

3D
2D

Thank you

For more information, visit:

unity.com/roadmap