



Leading your game studio into the future

How next-gen tools help accelerate your creative workflow

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01 | Intro

Having the right set of digital content creation tools is vital to keeping game studios' pipelines on the right track, especially as the demand for more complex gaming experiences continues to grow on what feels like shorter and shorter timelines.

The best software for these purposes can expedite creative workflows and help alleviate those pressures so studios can deliver high-quality game content—from modeling and animation to look development and cinematics—with greater ease and efficiency, every time.

Investments in future technologies are also key in helping to build a more resilient future. Open standards such as Universal Scene Description (USD) for data exchange can help unlock new levels of collaboration, while procedural workflows—both connected and real-time—reduce friction and accelerate pipeline efficiency so artists and teams can stay focused on the art.

Explore how innovative 3D tools can help transform your studio's creative journey and lead your team into the future.



02 | Managing complexity with open standards

As multiple studios get involved in one project at a time and data manipulation in a production pipeline grows heavier and heavier in games, having open standards in the industry becomes increasingly more important. Otherwise, wires get tangled, workflow processes become messy and inefficient, and sharing assets down the supply chain becomes unnecessarily complicated.

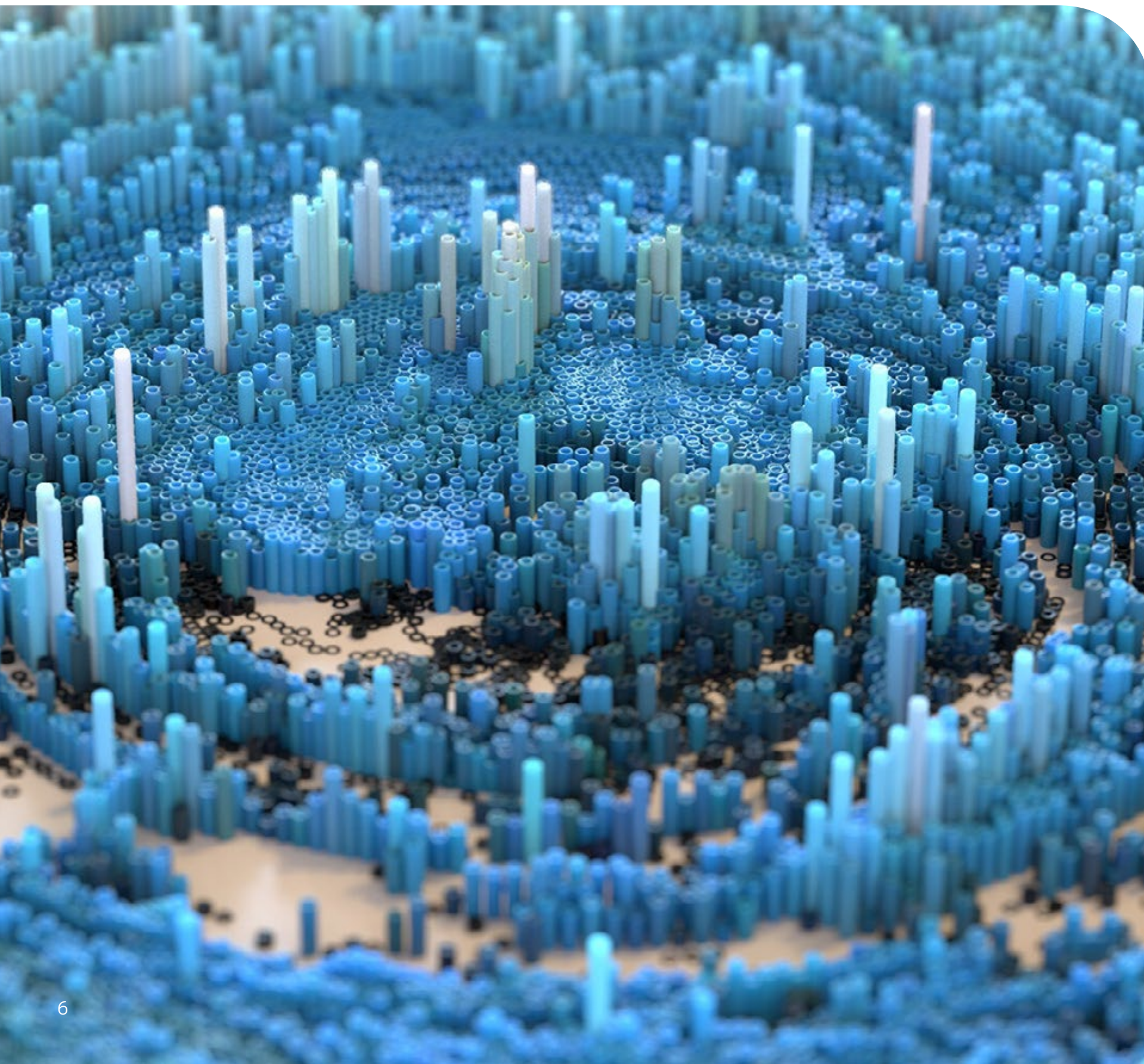
Standardized formats can help address these critical workflow challenges and streamline data exchange across teams. Open standards like USD, OpenColorIO, OpenTimelineIO, glTF, and MaterialX help ensure that quality is maintained as assets move through the pipeline and avoid costly, time-consuming rework later in production.

For the film and TV industry, studios everywhere are adopting open standards. Long gone are the days of a single visual effects or animation house working on a project, especially when consumer expectations for higher quality content keeps rising and the supply chain keeps growing. Studios like Animal Logic and Luma Pictures rely on open source solutions to help their teams save time and energy, but also to future-proof their studio.



“The main benefit of using USD for us is to bring all the departments closer and to allow us to have faster iterations.”

Fabrice Macagno, Animal Logic



Take USD for instance—a format introduced by Pixar in 2016 who used this technology while making the 2012 film *Brave*. USD has been used in many Pixar projects since, including *Finding Dory*. With USD, large-scale data can be quickly exchanged, viewed, edited, stored, and navigated by multiple participants at once. Artists can also jump between DCCs without having to change the file format, and the source code is widely accessible.

USD is also a non-destructive workflow for game engines, meaning artists can work on their tasks without disrupting whatever their colleagues are working on. Any scene can also be built on top of another, and objects can be placed directly within the engine.

Unify your teams, assets, and workflows with USD

Adopting new technologies for improving workflows are worthwhile investments. Continued efforts on building robust integrations for these standards into core content creation tools like Maya and 3ds Max reassure studios that they can rely on those tools anywhere they implement them. Maya USD enables artists to quickly load, edit, and work directly with massive data sets. As for 3ds Max, its USD integration allows those artists to import and export data, as well as cameras and photometric lights.

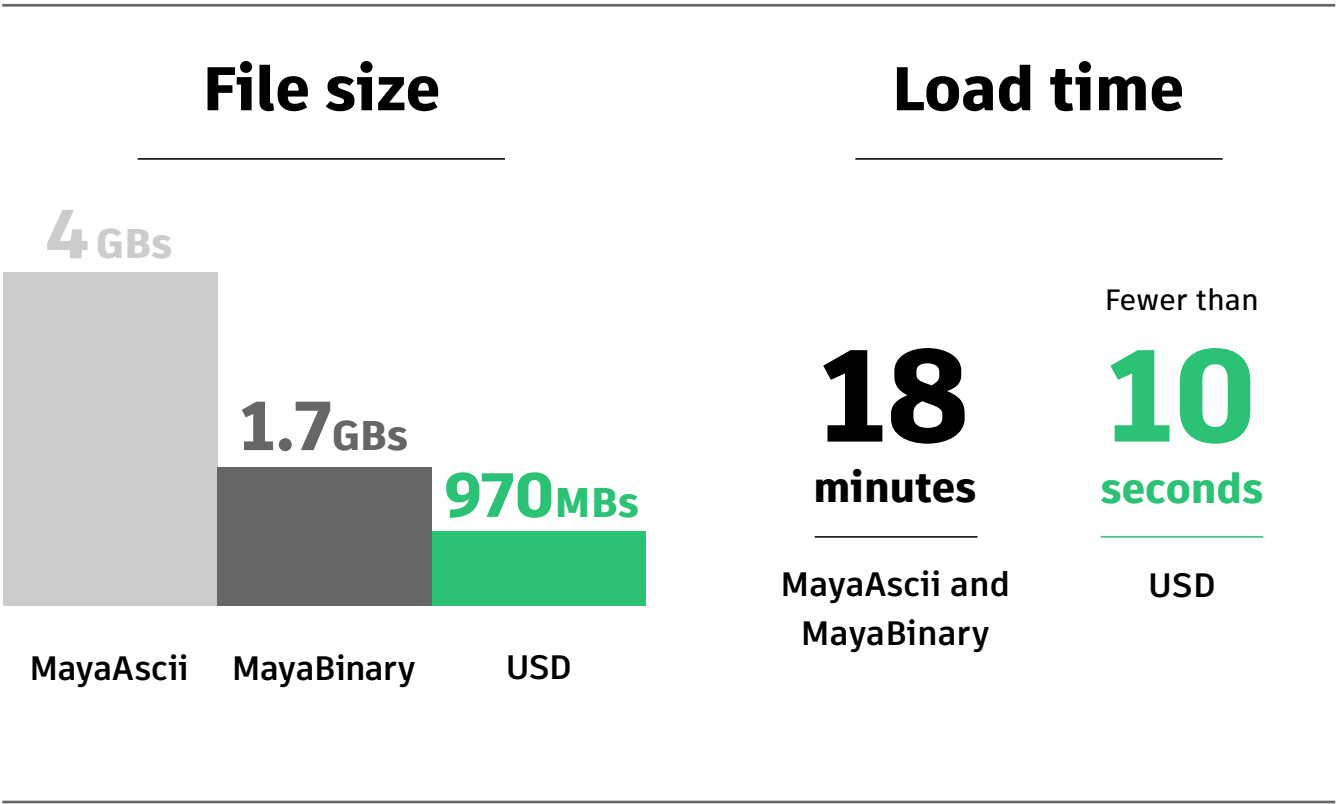
Large game studios like Eidos Montréal and NetEase Games have been experimenting with USD. First, they needed to revamp their DCC pipeline and file formats. Having initially used FBX, Eidos Montréal experimented with various formats before circling back to USD. Though they have not yet fully implemented it into their pipeline, it's allowed them to jump more easily between different DCCs.



For NetEase Games, they wanted to find a way to produce more content using their ideal application, while simplifying their teams' workflows. The increasingly heavy data manipulation load became an issue and led to more time waiting for scenes to load in Maya. They needed a more efficient solution. USD's ability to load assets for editing across various types of software was a selling point, since no file format changes, or exporting were necessary.

They performed a test with 1,700 assets to see if this created more available content on drives. With USD, they could take up much less space, and their assets became significantly smaller in size. While their file sizes using MayaAscii and MayaBinary were between 1.7 to 4 gigabytes, USD reduced these to 970 megabytes. These tests would bring them from a load time of 18 minutes to fewer than 10 seconds.

Though USD still isn't widely adopted within games, studios are beginning to experiment with the technology signaling a brewing transformation to the industry. Adopting open standards can help unlock new levels of collaboration, efficiency, and insights for game studios just like it has for various film & TV productions.



03 | **Push your game further with powerful content creation tools**

From epic space alien battles to explorations in foreign lands and fantasy realms—3D artists rely on the right digital content creation tools to bring expansive worlds, realistic characters, and immersive experiences to life that delight game players.

Modern character creation workflows in Maya and robust worldbuilding tools in 3ds Max empower artists across teams to deliver their most ambitious games, faster.





Create complex 3D game characters with Maya

Powerful character creation tools

From hyper-realistic to highly stylized, create jaw-dropping characters using Maya's deep 3D toolset.

- Build character models more artistically and intuitively.
- Create and edit UVs quickly and interactively.
- Add mesh detail with ease and speed.

Unmatched rigging capabilities

Create sophisticated rigs that deliver lifelike performances.

- Build character skeletons and control rigs with powerful constraints and IK systems.
- Use a robust suite of deformers to bring a character's geometry to life.
- Bake complex deformations for export to game engine friendly rigs.

Robust and feature-rich animation tools

Create realistic character and facial animations with full creative control.

- Transform joints, bones, IK handles, and models over time.
- Easily navigate clips and adjust timing using non-linear workflows.
- Preview animations faster with cached playback.



“The fabric of our animation and rigging pipeline is Maya. It is and will be, for the foreseeable future, an integral part of that pipeline.”

Will Pryor, Axis Studios

Build expansive worlds and detailed props with 3ds Max

An all-in-one 3D modeling tool

Build elaborate worlds and detailed props with 3ds Max's extensive modeling toolset.

- Build complex hard surfaces and organic models with powerful polygon modeling tools.
- Rapidly conceptualize, iterate, and explore ideas with a unique modifier stack workflow.
- Produce accurate low poly content from reality-captured sculptural data using retopology tools.

Easy-to-use texture and shading tools

Finalize game asset lookdev with advanced texture-creation, material, and viewport tools.

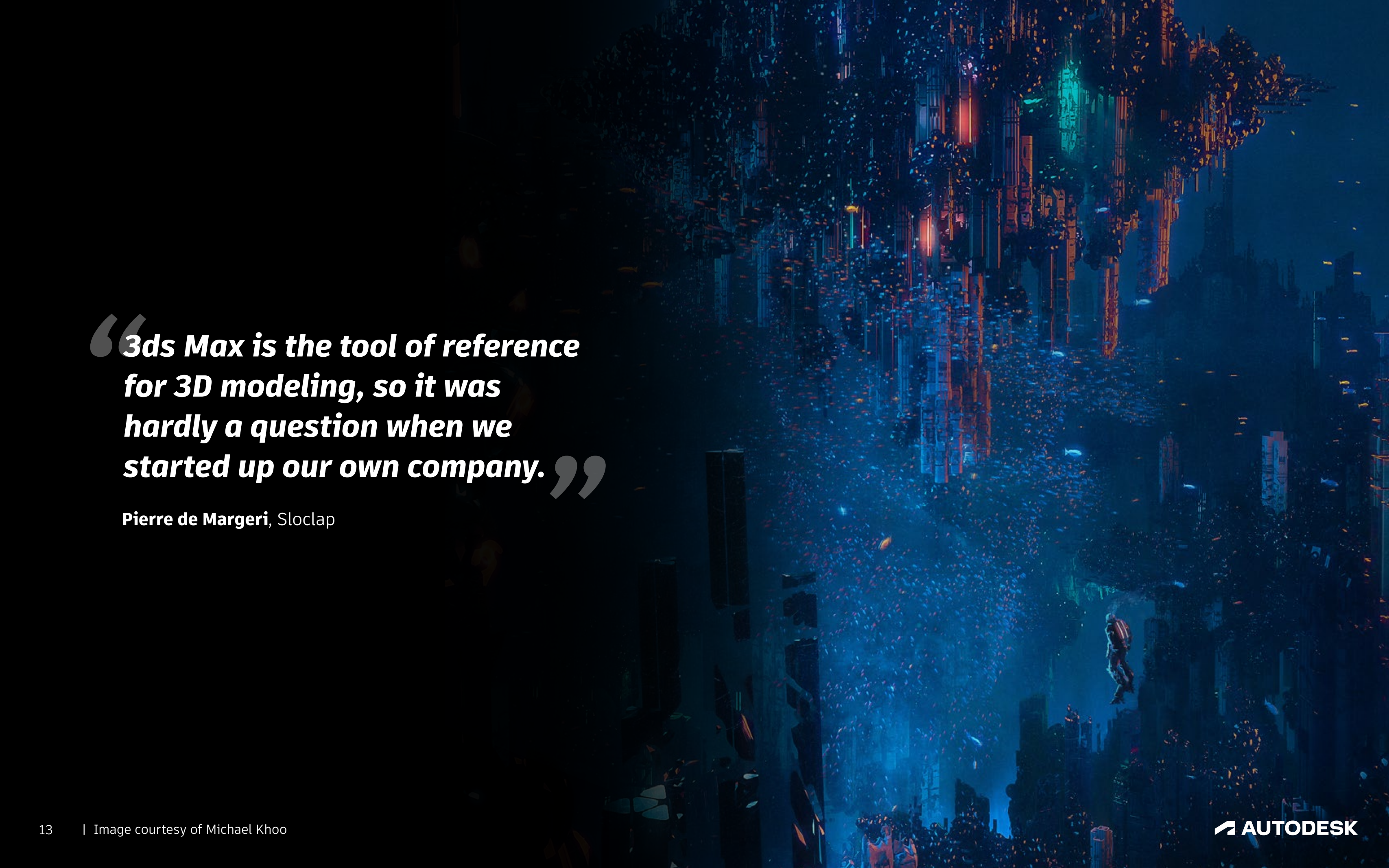
- Visualize final game results directly inside 3ds Max using a PBR compatible viewport.
- Create and apply complex materials with support for Substance maps and Open Shading Language (OSL).
- Leverage a fully scriptable texture baking tool to generate PBR compatible textures with your renderer of choice.

Customizable pipeline integration

Bring your studio together with best-in-class pipeline and automation tools.

- Easily collaborate on projects of any size.
- Work with a wide range of data formats.
- Build tools with Python 3, C++, and MAXScript to meet demanding, custom expectations.





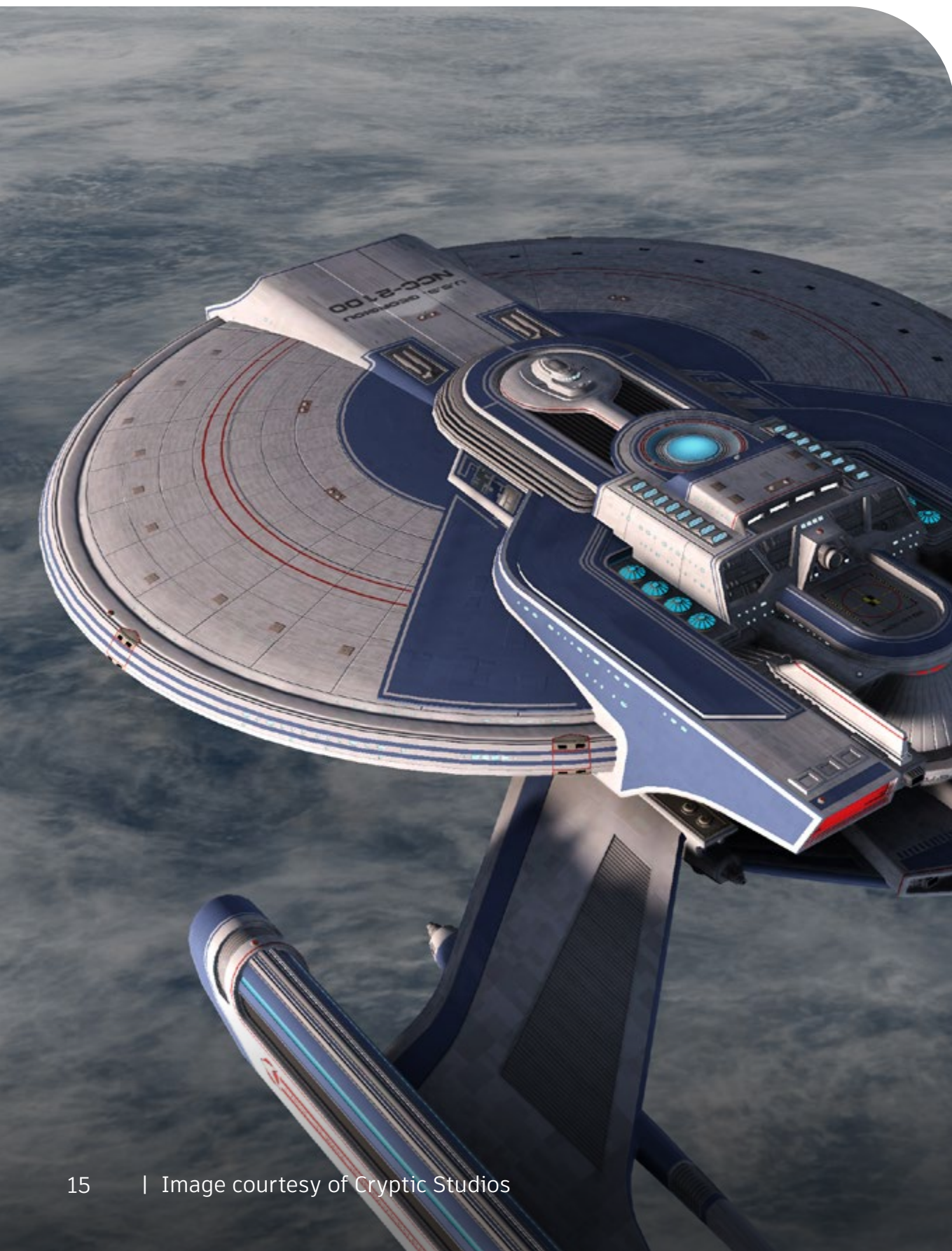
***“3ds Max is the tool of reference
for 3D modeling, so it was
hardly a question when we
started up our own company.”***

Pierre de Margeri, Sloclap

04 | Create more complex characters and worlds faster with automation

Having the most efficient and modern tools to boost productivity—both individually and as a team—is a must for creative studios. Proceduralism is the way artists think about creative workflows today especially as they try to keep pace with the ever-growing demand for content. Artists **need** the functionality of 3ds Max and Maya, **plus** the flexibility and speed of full procedural workflows.





Creating flexible and modular game assets

3ds Max empowers artists to shape and mold anything they set their mind to, from the most intricate details on characters and props to massive environments and worlds.

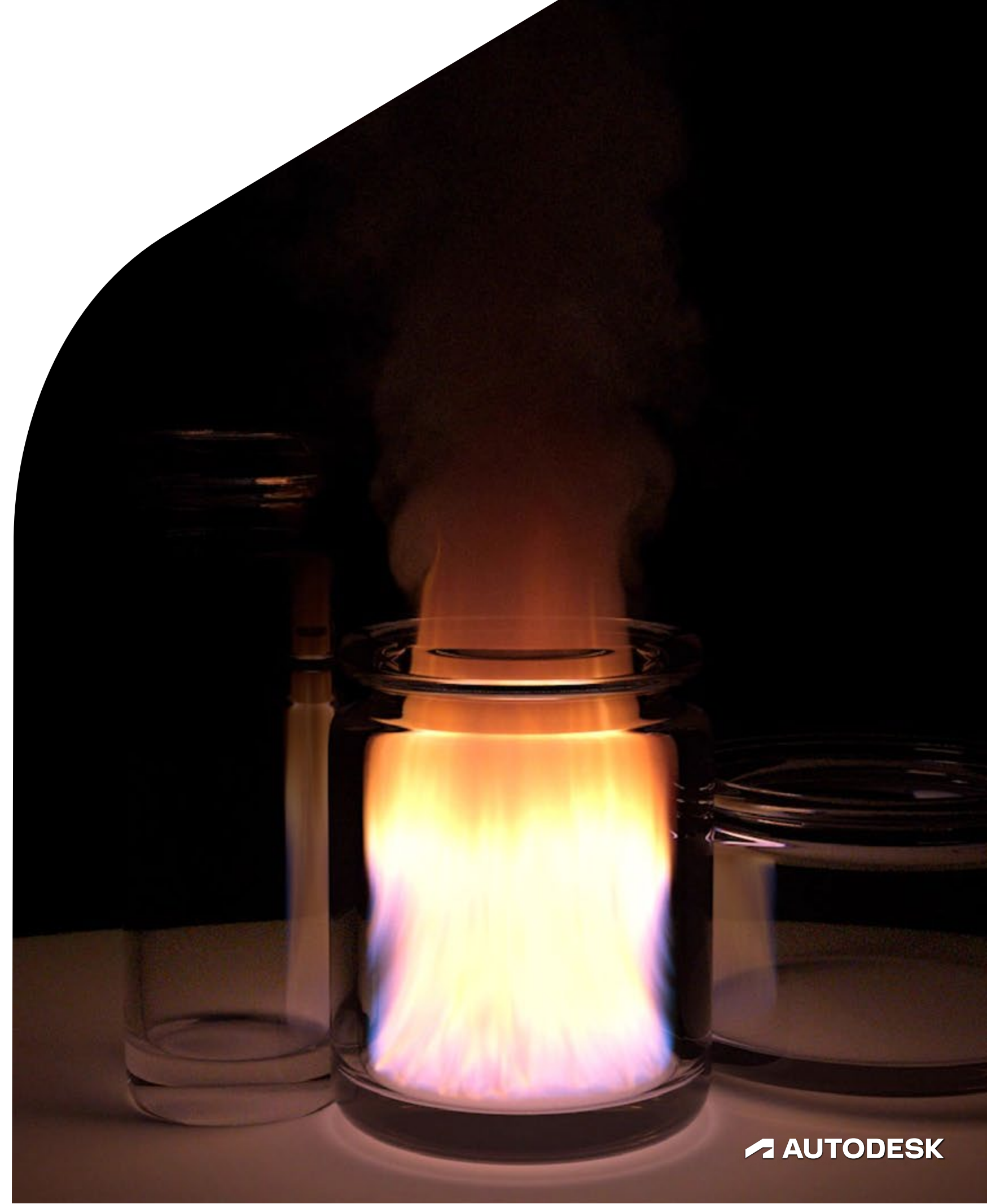
Modeling workflows using tools like Smart Extrude or the Retopology toolset enable artists to work more efficiently and achieve professional results, while 3ds Max's growing number of modifiers provides simple and intuitive methods for sculpting and editing models. For example, artists can use the Chamfer modifier to procedurally add edges to specific parts of an object; the Relax modifier to change the surface tension in a mesh for smoother appearing objects; or the Symmetry modifier to perform common modeling tasks such as mirroring and slicing a mesh or welding vertices along a common seam.

The classic MMO game, *Star Trek Online* (STO), has achieved incredible retention and loyalty of its player base over the years thanks to the mix of ground and space-based gameplay in addition to its starship customization. The creative team at Cryptic Studios uses modular modeling and unwrapping techniques in 3ds Max to create final in-game assets so that players can build ships with different textures and materials to choose from, as well as various modular pieces. Utilizing tools like Chamfer and the Weighted Normals modifier enables them to adjust the look of assets and add final detail, enhancing their hard surface modeling workflow.

Building custom effects faster with procedural workflows

Another next-gen tool is Bifrost—our vision for the future of proceduralism. A unified, high-performance procedural environment for quickly and efficiently creating sophisticated simulations like blizzards, sandstorms, and explosions.

From viral music videos to big blockbusters—studios everywhere are using Bifrost on bigger and bigger productions. In the film & TV space, VFX artist and Director, Sam Mason was tasked with creating a unique music video for the late Mac Miller’s “Colors and Shapes”, while Luma Pictures used Bifrost on massive films like *Spider-Man: No Way Home* and *Doctor Strange in the Multiverse of Madness*.





We're also seeing Bifrost make its way into games. Maxime Jeanmougin from PlatinumGames used Bifrost to create a hair simulation solver for game cutscenes and built a tool to mass produce game-ready buildings. He found that his hair simulator, for instance, was more easily controllable and produced higher resolution results when utilizing Maya and Bifrost than with a standard engine. From there, a rig and dynamic solver are created within Maya, allowing him to start simulations and manipulate objects. Making simulations within Bifrost and Maya also granted Jeanmougin more runtime performance, using tools superior to most standard joint chain dynamics.

Bifrost brings flexibility that many VFX artists seek. They can build on top of Maya's already powerful toolset and build their own custom solutions, procedurally. By doing so, they can tackle more complex problems, reduce development time overhead, and, ultimately, turnaround projects faster.

05 | **See your changes quickly leveraging seamless interoperability with Unreal**

The creative process is highly iterative. Artists need to be able to see previews of their work in real-time so they can quickly implement necessary changes, and ultimately, keep games on track.

Interoperability between tools like Unreal Engine and Maya push the creative needle forward for game studios as they enable their teams to focus on delivering projects on time and less on translating data and making tools work together.

The Unreal Live Link plugin for Maya allows artists to stream animation data in real-time between the two apps. Artists can work on character assets in Maya while Unreal shows instant previews as edits are being made.





Demand for immersive games played at home has skyrocketed and studios must move faster to meet rising expectations, churning out more content in less time. The Unreal Live Link plug-in for Maya has a revamped UI, improved user-friendliness, and is easier to install. For artists focused on character animation, rigs can be constructed in Maya before being migrated to a skeleton in Unreal, where your designs can be streamed.

Working with both plugins gives artists a more fluid, in-context experience. The end results? More iterations, as well as better validating decisions on character behavior. Maya and Unreal allow creative teams working on pre-visualization and final frames for linear shot-based workflows to have them be smoother than ever.

As the link between these tools grows stronger, studios will be able to reduce countless work cycles and make it easier to create real-time virtual and immersive gaming experiences.

06 | Lead your game studio into the future

With every indication pointing towards demand continuing to rise, studios will be turning to new technology and new ways of working to adapt and produce work faster, while maintaining the highest visual quality—and keeping players coming back.

Fuel your games success by leveraging advanced 3D content creation tools like Maya and 3ds Max for modeling, animation, look development, and anything in between.

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3ds Max

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