



**Blender
Annual
Report —
2023**



Project Gold concept art — © Blender Studio, from 2023

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Blender Annual Report — 2023



Message from the chairman

The year 2023 was a great year for Blender. We witnessed an increase in high-quality productions realised using Blender across various fields, ranging from Hollywood movies to product design.

One of the highlights of the year was our Siggraph booth in Los Angeles, equipped with a giant LED video wall, which attracted thousands of visitors. Almost all of them knew about Blender or were already using it. It seems that nearly all large companies and studios are now adopting Blender in their production processes. However, some notable exceptions still do not trust the GNU GPL licence or believe that it will endanger their business, which is, of course, not true. I made this the leading topic of my keynote at the Blender Conference in October.

With Blender becoming a part of the industry - I might even dare to say an *"industry standard"* - the Blender project must adapt and accept the challenge of being one of the leading forces shaping the future of 3D creation.

The *"Blender Lab"* initiative, announced in Q4 2022, will continue to be the place where the future takes shape. However, no significant progress was made in 2023 in that area. To prepare for this challenge, several key aspects need to be secured. Firstly, we need to organise ourselves better to enhance design and engineering quality. Secondly, we must invest in our own talent and become an attractive place for world-class talent to join as developers or contributors. This means we need to accept market realities and reward developers at a level

that is more competitive with the IT industry, at least here in the Netherlands. A significant part of the reservations Blender made last year will be invested in a salary raise of 10-30% for the core team in 2024. Furthermore, if we wish to be competitive in hiring international talent, salary levels will need to increase even more during the 2024-2025 period.

Another long-term project I am working on is expanding the Blender Foundation board with additional members. I am very pleased to mention that Blender COO and my right-hand, Francesco Siddi, has accepted a position on the Foundation board and a director position at the Blender Institute. This will become active on January 1st 2024.

” **2023 was a great year for Blender.**

Thanks especially to the *"Birthday Gift to Blender"* donation campaign in December, the Foundation's income in 2023 increased by 20% to 2.5 million euros. This figure does not include Blender Institute revenues (from conferences and subsidies) and Studio income (from subscriptions). For 2024, we plan to achieve similar growth of 20% again.

— TON ROOSENDAAL
Amsterdam, June 2024

The Blender Foundation board report

In all of 2023, Chairman Ton Roosendaal was the only board member of the Stichting Blender Foundation, performing all board roles.

Blender Foundation facilitates a public project on *blender.org* with the mission to get the world's best 3D CG technology in the hands of artists as free/open source software. The Foundation's vision is that everyone should be free to create 3D CG content, with free technical and creative production means and free access to markets.

The Foundation's goals are:

- **Manage the facilities on blender.org** for users and developers who want to contribute to Blender.
- **Maintain and improve the current Blender product** via a public accessible source code system under the GNU General Public License.
- **Establish funding or revenue mechanisms**

that serve the foundation's goals and cover the foundation's expenses.

- **Provide** individual artists and small teams with a complete, **free and open source 3D creation pipeline**.

Blender Foundation provides development grants to individuals and uses the Blender Institute B.V. as a working company to further achieve its goals. A detailed overview of how the Blender organisation works, its projects and results, can be found in the next chapters of this report.

The board is satisfied with the financial reserves that have been created in the past years, which will ensure sufficient continuity for the coming year. Actions should be taken to find new corporate donors and organise a community campaign to receive more small donations. The board confirms the need to expand the board with more people.

The board confirms to provide ongoing financial support for the Blender Studio, to reward the Studio's continuous high quality contribution to the Blender open source project.

In 2024 the board will continue to investigate acquiring the full ownership of Blender Institute B.V.

— TON ROOSENDAAL

Amsterdam, June 2024



The freedom to create

If one thing would define me, it's the insatiable curiosity and desire to study and master 3D creation in the widest sense.

The Blender mission

— TON ROOSENDAAL

Whether as an artist, developer, or producer, I'm fascinated by anything to do with the field. For me, "3D" is the ultimate blend of creativity and technology. It's like magic.

This is the core of my personal motivation, one I wish to share as widely as possible.

The Blender mission: Get the world's best 3D CG technology in the hands of artists as free/open source software, and make amazing things with it.

To elaborate:

- Provide access to the world's best 3D CG technology and make amazing things with it.

- Use and contribute to Free/Open Source software and Free Culture.
- Change reality, have an impact, make a difference.

A mission means the organization's purpose is its core DNA. A mission is where we are, it's what we do every day. To prevent a mission drifting, a longer term goal can be defined - the "vision". For Blender, this thinking can be encapsulated in the following tagline:

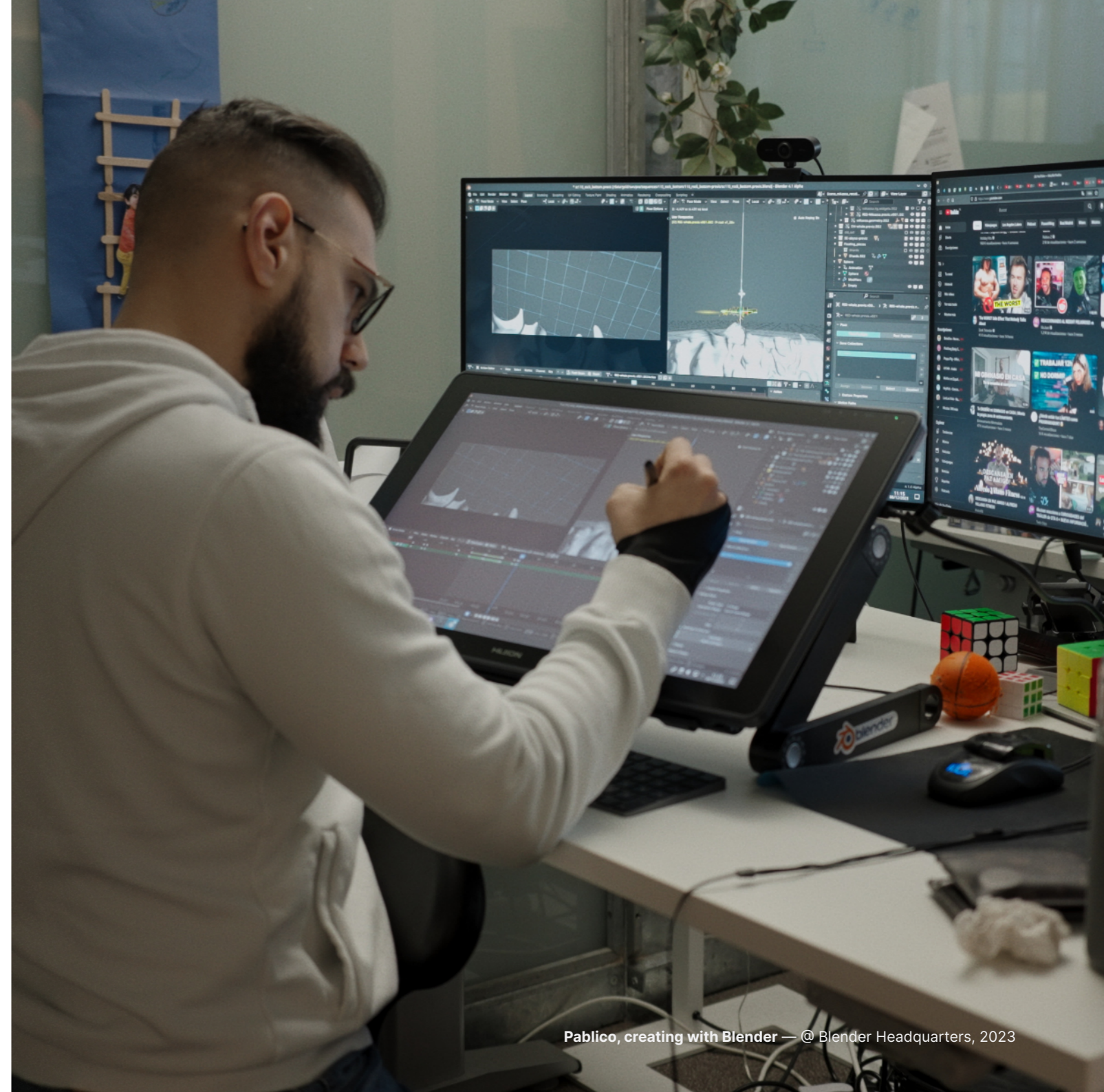
” The freedom to create.

The Blender vision

Everyone should be free to create 3D CG content, with free technical and creative production means and free access to markets.

To further explore this vision, this freedom has **three key aspects:**

- **Freedom to deploy** production software. This is the *blender.org* project itself, developing Blender as a Free Software (GNU GPL) 3D creation tool. Blender is free to use, for any purpose, forever. It's why the Blender Foundation exists.





Wing it! — © Blender Studio, 2023

- **Freedom to apply** creative resources. For an aspiring artist or studio, access to creative resources and production knowledge are equally important - free to be used for any purpose as well. It's why the Blender Institute was originally founded, to contribute to Free Culture by means of Blender Open Movies and other Creative Commons projects.
- **Freedom to participate** in the market. For creative people, all over the world, it's a pressing topic. Neither the new streaming giants (Netflix, Disney), the game markets (Steam, App Store) or the platform economy (Youtube, Patreon) is solving this really. What's the benefit of having all the tools and resources, and no way to get a decent living? While we don't have all the answers, this is something we're committed to exploring further.

Finally, **the core values for everyone involved with Blender** are:

- We **care** (passion)
- We **share** (community)
- We **work together** (openness)
- We **have a story** (vision)

The first three values are straightforward. They simply state who we are, and what motivates us.

"The fourth value - 'story' - is my personal favorite."

"Story" means you have something to tell. It's an attitude as well as a motivation. It's about the drive to make a difference to stand out, to have an impact, to not be afraid to fail, to experiment, to dare, to not follow the masses, to try and retry, to make amazing things happen and sometimes fail miserably. The story of Blender is like that - a true story that can be told over and over, which started over 25 years ago with a Dutch guy who had an idea, and gave it a go.

— Ton Roosendaal

The Blender organization

The Blender project is a huge success, but with success comes a certain responsibility. Many people and organizations now depend on Blender.

This is why we must build a stable organization in which Blender's future is secured for the long term. Sustainability also requires establishing a board of directors in order to oversee day-to-day management, as well as adding a supervisory board for annual meetings.

The Three Entities

Currently, the Blender organization consists of three entities:

- **Blender Foundation**, the public benefit organization with a goal to support Blender as a free/open source project.
- **Blender Institute**, the corporation that functions as a working company for the Foundation (hiring employees, offices).

- **Blender Studio**, the corporation hiring artists to make open movies and share assets and production knowledge.

The IP made by the corporations is being transferred to the Foundation by default. Currently, the Institute and Studio's ownership is in the hands of the Foundation chairman Ton Roosendaal. In 2021, the Blender Institute formally registered COO Francesco Siddi as second board member.

As announced in 2019, the Foundation chairman and Institute director will migrate his responsibilities to a new team, step down and move to an advisory function. This process is still ongoing.

There is also a strong motive to structure work on Blender in a way that it remains true to its core values. In other words, a public, open, community based project providing independent facilities to everyone, everywhere, at *blender.org*.

The Blender organization does not wish to sell either products or services, which means it isn't in competition with its community of users. This allows for a flourishing ecosystem of creatives and businesses to develop around the Blender organization.



The Institute's sole focus remains to act as the "working company" of Blender Foundation. We are still working on transferring ownership of the Institute to the Foundation, for tax reasons this has not been possible yet. All intellectual property and funds will remain in the Foundation (keeping it low risk and safe) and all corporate activities and liabilities will be outsourced to the Institute. The main income model for the Foundation and Institute is donations, using the Development Fund.

Blender Studio further explores open source pipeline and content development. It also challenges the market as an independent

production company providing free/open content, funded by Blender Studio subscriptions.

Mid term goals

- **Become a sustainable**, future proof organization dedicated to realizing Blender's mission.
- **Secure Blender's original spirit**, and the legacy of its founder.
- **Become an innovative organization** driven by curiosity, and the desire to excel at creative/technical projects.

One mission

Blender Foundation

To build a free and open source complete 3D creation pipeline for artists and small teams; by a publicly managed project on blender.org.

Blender Institute

Build a sustainable organization to support Blender Foundation in its mission. This includes managing offices, facilities, websites, events, workshops - conducting and coordinating research, development projects and product design.

Blender Studio

Support the foundation's mission by validating and stressing Blender in a production environment, by producing community funded animated film or other 3D media projects and sharing the entire production process.

The Blender project is a huge success, but with success comes a certain responsibility. Many people and organizations now depend on Blender.

This is why **we must build a stable organization in which Blender's future is secured for the long term.** Sustainability also requires establishing a board of directors in order to oversee day-to-day management, as well as adding a supervisory board for annual meetings.

Web infrastructure

Blender Foundation follows a policy to remain independent for core web services and infrastructure, and to use free/open source software there as much as possible.

About a dozen websites are actively used, which are being hosted in a dedicated server rack in an Amsterdam datacenter, with a direct connection to the internet backbone. Next to this infrastructure, a cloud service provider has been used in order to research and prototype deployment environments, and evaluate how moving parts of the infrastructure there.

Currently, **the actively maintained websites for Blender are:**

- www.blender.org — The main portal, for global information about our mission, structure and latest news.



For developers and technical talk

- projects.blender.org — Projects website for developers.
- developer.blender.org — Landing page to onboard developers.
- builder.blender.org — Daily builds, also for testing and branches.
- docs.blender.org — Official documentation project.
- wiki.blender.org — Developer documentation.
- code.blender.org — Developer's blog.
- git.blender.org — The git repositories.

- devtalk.blender.org — Discussions for module teams.

General data information

- download.blender.org — Blender releases and demo files.
- opendata.blender.org — Open data benchmarking.

Studio and other activities websites

- studio.blender.org — The studio's sharing website.
- flamenco.blender.org — The Flamenco render manager software.

- fund.blender.org — The Blender development fund.
- conference.blender.org — Blender conference talks and photos.
- store.blender.org — The official store.
- video.blender.org — A federated website for all important videos.
- id.blender.org — The centralized authentication system for most websites.

Managed independently

- blender.chat
- blender.community

Module teams for core Blender development

Blender is growing fast. With the success of the Blender Development Fund and industry support, it's important to make sure that the blender.org project organization remains future proof.

Presentation

Numerous activities around Blender are now performed by full-time employees or people working remotely on a grant. Together, they are responsible for core development projects, including improving code quality, documentation, developer operations, and support. All very important, but how do these efforts relate to work done by other (voluntary) contributors?

In the last months of 2020, the Blender Institute crew tackled our growing plans (and pains). It was

clear we needed operations management, coordinators, and human resources specialists, as well as to define developer roles and the projects organization better.

We reviewed popular development organizational styles, but felt that none of them provided the right direction for Blender. We should not emulate a software company. We believe there is one aspect of Blender we should never give up on:

” **Blender is a community effort.**

As we all know, communities are messy, noisy and disorganized. It takes much energy to get an online community moving in a chosen direction, to reach consensus and encourage effective collaboration. Worse, open source communities often bleed top talent because the best feel dragged down to the level of the group as a whole, including beginners. That's the main criticism on community-driven projects. How do you combine the quest for excellence with a public project accessible to everyone?

Luckily we already had an answer: the module team organization we've used for almost 20 years. It just needed an upgrade.

Let's divide Blender tasks into three categories: Operational, Tactical and Strategic.

- **Operational:** bug triaging, onboarding, documentation, website development, testing, communication, facility management, administration.
- **Tactical:** well-defined short term development projects, work that culminates in releases, student projects, maintenance and code upgrades, wrapping up unfinished features, making Blender releases.
- **Strategic:** general roadmaps, product designs, industry relationships, research, mission critical software projects, keeping top talent on board.

The Blender organization can be held responsible for all operational aspects, facilitating the *blender.org* project, and welcoming contributions from the community. In these roles we currently employ several people, including a DevOps engineer and forum moderators.

Developers hired by Blender Institute will be

assigned to specific strategic projects. These usually have only one goal: translating innovative designs into MVPs (minimum viable products), then handing them over to the module teams as quickly as possible.

This makes the modules teams on *blender.org* the "tactical teams" in Blender. That's where the real open source dynamic kicks in. This is where the actual magic happens. It's public, sometimes messy and noisy, but often incredibly rewarding and surprisingly effective. Good examples are work contributed in the areas of Grease Pencil and Geometry Nodes.

Strategic contributions to Blender can also be provided by other organizations or teams. This is already happening. For example, Intel and Apple made a lot of efforts to ensure that Blender runs smoothly on their platforms.

Obviously it's the Blender Foundation's task to frequently present and discuss strategic roadmaps for Blender, and to make sure the module teams are aligned.



How modules work

Modules are largely free to organize themselves, though each type of module might require different management styles or procedures.

Some modules will be more difficult to join (Cycles & Rendering), other modules might be stricter in terms of accepting patches (e.g. the Core Blender module).

Within a module there are two roles; the “owners” and the “members”.

The main rules for modules are:

- Module owners are empowered to commit code.
- Module owners decide together as a consensus (unanimous).
- Module members need an owner to accept or review their work.
- Modules only use public *blender.org* platforms (code & communication).

Blender module teams should be as large as reasonable. If they grow too big, they can split up. Technical Artists (TAs) must also be included among each module’s members.

Module teams are responsible for issues in their own code (the module) but should feel free to move open issues onto a to-do list to deal with later. Module Owners are held accountable: their role implies they accept responsibility. Modules can expect wide-ranging support from the Blender organization, both for operational tasks but also for Development Fund grants (to retain essential people). You can read more about how the module organization works in the Blender Documentation.

In 2023, a focus was put on structuring the UI Module’s organization better and getting more community members involved in the Grease Pencil module, for its big version 3 project.

Quality report

An important driver for Blender is the continuous improvement of quality within the Blender software and development process.

Since 2019, the Blender team has conducted various initiatives to professionalize its processes and gain even more efficiency and stability.

Sunsetting Subversions

In May 2023, Aaron Carlisle announced the first steps in saying goodbye to Subversion, also known as SVN. The Blender project first used CVS as its version control system, then migrated to SVN, and later to Git.

However while the Blender source code uses Git, other repositories like the user manual and libraries continued using SVN. This was due to poor support for binary files such as images and executables in Git. With the addition of Git Large File Support (Git LFS) and the recent move to Gitea, we can now use Git for all repositories.

Using Git rather than SVN gives developers and technical writers the following features:

- Ability to work and make commits offline
- Better branching and merging support
- Better 3rd party GUI clients
- Basic online editing in Gitea
- Less software to install

The first repositories that were migrated away from SVN are the Blender manual and its translations. The Blender libraries, test files and user interface translations will follow later.

More information: code.blender.org/2023/05/sunsetting-subversion

Towards a new technical documentation culture

Technical documentation can be vital for the long term health of software projects. In 2023, Blender developers started initiatives to foster a new technical documentation culture, based on success stories from other organizations. This includes a new developer documentation platform optimized for using and editing by developers themselves, and regular technical documentation days to focus on documentation.

Technical Documentation Days

January 27th 2023 was the first all-hands-on-deck technical documentation day. Developers, technical writers and other contributors were invited to spend a day on improving the developer documentation. It's not just about writing some pages; it's about learning how to write good technical documentation, making the process more enjoyable, and whatever else that contributes to a great technical documentation writing culture.

Technical documentation is important for the long term sustainability of projects like Blender. Knowledge about designs needs to be shared better, so more people can make good decisions. It reduces reliance on core developers, helps avoid conflicts, misunderstandings and a good amount of bugs. And it should lower the barrier to entry for Blender development.

The assessment was clear: the technical documentation for Blender is lacking – many parts of the design are even missing documentation entirely. Decent technical writing is difficult; it takes a lot of time and energy and may not feel immediately rewarding. Something tangible was needed to initiate change.

The plan is to make this a regular event, repeated

once every couple of months for the foreseeable future.

More info here: code.blender.org/2023/01/technical-documentation-day

New Documentation Platform

To pursue efforts in making Blender documentation more comprehensive and accessible, developer Julian Eisel shared a proposal to switch from the old Wiki to a new platform.

The key elements of the new platform:

- Material for MkDocs
- Continuous delivery via buildbot
- Edit with preview in Gitea
- Git LFS (Large File Storage) repository
- Possibly pulled with make update
- URL: developer.blender.org/docs

Material for MkDocs is a Material based theme and framework around the MkDocs static site generator. Essentially, it turns Markdown files into HTML pages that look great and offer a great browsing experience. It was chosen over alternatives (such as Sphinx, VitePress and Hugo) since it seems like the best fitting platform.

The main features are:

- Easy to set up and use. Developers can have it up and running in an instant.
- Markdown is readable in source, widely used (for example on most developer platforms) and well supported. Many IDEs have builtin Markdown editing and previewing support. Copy & paste from HackMD possible.
- Modern looking, rich in features (client side search, dark mode, ... see below) and a big amount of common markdown extensions and plugins.
- Live reloading.
- Python based.
- Good search.

Overall, it offers a great documentation experience for both writing and browsing.

With the migration happening at the end of 2023, the new platform *docs.blender.org* has now fully replaced the old wiki.

All the documentation, as well as the release notes moved to the new platform. Personal pages like the weekly reports of developers were also moved to personal repositories on Gitea, also using simple Markdown.

Although converters from Wiki syntax to Markdown are available, the transition required manual work. Mostly to fix issues from the conversion, fix links, add missing images, etc. This project was helmed by developer Julian Eisel, with the support of Brecht Van Lommel and Falk David.

More info on the original proposal here: code.blender.org/2023/12/a-new-developer-documentation-platform

DevOps

In summer of 2020, Blender hired a DevOps Engineer. The DevOps Engineer improves the development environment by implementing and managing the automation of (developers) tasks, including testing and building, delivery and deployment. Achievements range from new buildbot supporting patch building, automatic daily deployment for 3rd party stores - like Steam and Snapcraft to support for multiple versions of user manual developed concurrently. To continue on that strategic aspect, in 2022 Arnd Marijnissen joined the HQ team as a seasoned infrastructure engineer. Arnd is central in organizing and deploying key tools as well as overseeing the IT department. He has been a strong support for the development team in helping both on short-term needs and long-term improvements.

In November 2023, due to a DDoS attack at the *blender.org* infrastructure, significant efforts had to be made to ensure services and websites could keep running smoothly. This team effort was supported by DevOps, especially as a new part of the infrastructure (Cloudflare) was put in place.

Gitea release

As presented in the 2022 Annual Report, the Blender team worked on migrating the main development platform from Phabricator to Gitea.

In February 2023, the move was finalized: now all the development is hosted on projects.blender.org. It is the new platform for bug reporting, task management and code review.

- Bug reports and design tasks have been migrated to *projects.blender.org*. This includes task status, priority, labels and subscribers.
- User accounts have been migrated to Blender ID.
- Workboards and project descriptions had to be manually recreated by the modules.

The *developer.blender.org* website is now archived.

- Code reviews and pastes will remain permanently available as static web pages at the same location as before.

- Tasks links are redirected to *projects.blender.org*. A static archive of tasks is also available on archive.blender.org/developer.
- The *developer.blender.org* website will remain available as read-only for a few weeks to help in migration, in particular for workboards.

Congratulations to the migration task force: Arnd, Brecht, Danny, Sergey, and Sybren, with support from Dalai, Thomas, Pablo, and Philipp. Special thanks to the Gitea project and all the *blender.org* developers community!

More information here:

- code.blender.org/2023/02/gitea-test-drive
- code.blender.org/2023/02/new-blender-development-infrastructure

And from 2022:

- code.blender.org/2022/07/gitea-diaries-part-1
- code.blender.org/2022/08/gitea-diaries-part-2
- youtu.be/M3zIldWMMo0



Blender Translations Platform

Localization is an important aspect of the Blender project. Translating Blender's interface and user manual breaks down language barriers and makes tools and knowledge accessible to a wide group of people who are not comfortable with the English language.

Thanks to the hard work of Bastien, with the support of Brecht, Sergey and Arnd, it's now possible to contribute translations online via translate.blender.org. The platform is powered by the free and open source Weblate localization system.

More info here: code.blender.org/2023/10/blender-translation-platform

Welcoming strategic consulting

As part of our growth, the Blender Foundation connects with specialists in our areas of interest: human resources and software development management. To continue on the work started in 2020, Blender has been working with Bunchmark to scale up responsibly and durably, organizing bi-weekly sessions to discuss the growth and set up better processes in hiring, training and general management.

Some developers have also been given the opportunity to be mentored by an experienced development manager in a consulting role. In their monthly meetings they discuss best practices, organizational skills and product ownership, helping them gain valuable skills to work together with the community.



Offices Blender HQ

In 2018, Blender moved from its humble office in central Amsterdam to more spacious premises in the north of the city, a location better suited to this rapidly growing organization.

This office houses the entire Blender ecosystem: the Blender Foundation, the Blender Institute and Blender Studio.

The current lease runs until January 2027, with even more space since early 2022 - it allows for more comfort and facilitates the organization's future growth.

The 1,320m² space contains offices, a big canteen, and meeting rooms for gatherings, strategic core Blender projects and workshops.

With many different spaces spread across two floors, this allows each team to create its own environment and organization, while still remaining close to one another. Each room can be organized and decorated according to the needs of its occupants: some artists chose to surround themselves with figurines and in-house 3D printed models while one of the developers' rooms is filled with green plants. Ton's office, of course, is a good middle-ground for those two influences!

The Blender HQ is open to visitors, who can get a quick tour of the premises almost every workday of the year. On top of this, every year the team opens the doors and welcomes Blender enthusiasts on the Sunday following the Blender Conference, for a ritual grand tour of the office.





The projects in 2023

The Blender Foundation has made significant strides in 2023 with the release of three major versions: Blender 3.5, Blender 3.6 LTS, and Blender 4.0.

The latter taking a double dose of development time to mark the milestone shift from the 3.x series to the 4.x: the beginning of a new era in Blender's story.

Blender releases

Each release brought a plethora of new features, enhancements, and improvements, reinforcing Blender's position as a leading tool in the 3D creation industry, and its bastion in freedom of creation.

Blender 3.5 Viewport Compositor, Light Tree, Hair, and more



Released in March 2023, Blender 3.5 turned out to be a massive release with major leaps forward in workflow, tools, all while setting the stage for even greater changes to come.



While the new hair system was introduced in Blender 3.3, Blender 3.5 marked a progress in its functionality, shipping with 26 hair grooming nodes as a part of the new Essentials asset library. This new library made the new hair system much more powerful and accessible, and finished

the transition from the old particle-based hair system to the new Geometry Nodes one.



Another standout feature is the support for Vector Displacement Maps (VDM) in sculpt mode. This allows for the creation of complex shapes with overhangs using a single brush stroke, significantly enhancing the sculpting capabilities.



Blender 3.5 also brought significant improvements to both the Cycles and Eevee render engines, most notably Light Tree for Cycles. Light Tree allows the user to efficiently sample scenes with

numerous lights and mesh lights, a notoriously difficult rendering scenario, greatly reducing noise per sample in these cases and improving render times.



This release also marked the first iteration of the Viewport Compositor, part of the real-time compositor project. It can be activated to always be applied on the whole viewport, or only when in camera view, and does exactly what its name suggests: it applies the compositing node tree to be applied directly to the viewport, unlocking a whole new level of interactivity and novel workflows, thanks to it being based on the GPU.

Blender 3.5 introduced a Metal GPU backend for macOS, significantly improving viewport performance, stability, and compatibility on Apple devices. The transition to Metal addresses performance issues related to the older OpenGL backend, providing a more robust and optimized experience for macOS users.

Blender 3.5's support for USDZ files improves its interoperability with AR applications and various 3D workflows by enabling easy import and export of USDZ, a zip-compressed format that includes images, audio, and USD files, enhancing Blender's integration into USD-based pipelines

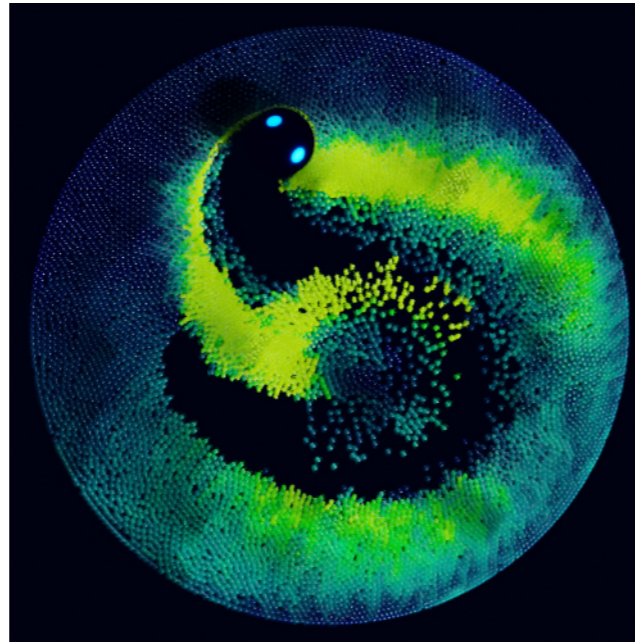
Last but not least, with 3.5 Blender re-aligned with the VFX Reference Platform.

Blender 3.6 LTS

Long-Term Support and enhanced stability and simulation



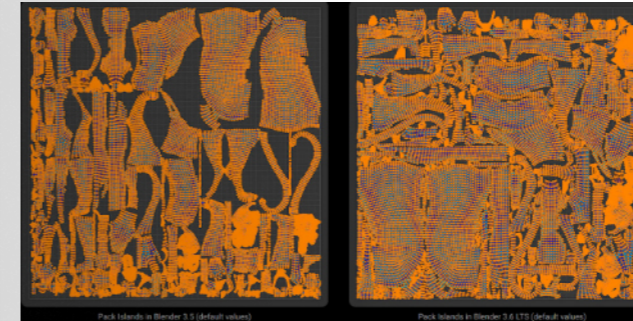
Blender 3.6 LTS, released in June 2023, focused on long-term support and stability, making it a reliable choice for professional workflows. This marked the last LTS release of the 3.x era, and while it focused on tons of performance and quality-of-life features, it also managed to pack some ground-breaking new features such as the introduction of simulation in Geometry Nodes.



Blender 3.6 expanded the Geometry Nodes system with new nodes and improved existing ones, facilitating more complex procedural modeling workflows. The undoubted star of this release is Geometry Nodes, with the addition of a new feature setting up the stage for the next step in the evolution of the module, and Blender in general: Simulation. The addition of the Simulation Zone feature allowed for more sophisticated simulations directly within the Geometry Nodes workspace.

Significant updates were made to the animation and rigging tools. The Graph Editor saw improvements with the new Ease operator,

which helps align keys on an exponential curve for smoother transitions. The Pose Library was also enhanced, providing new options and shortcuts to speed up the animation workflow.



The new UV packing engine dramatically improved performance on large meshes and provided better support for non-square materials, increasing layout efficiency. Users can now choose the final shape of the UV packing between Exact Shape (Concave), Convex Hull, or Bounding Box, and use the new Merge Overlapped option to stick overlapping islands together during UV packing

The Essentials Assets Library received a new "Human Base Meshes" bundle which includes 17 assets ready for sculpting, animation, and texturing, featuring multi-resolution levels, quad topology, UV maps, and more, making character creation more accessible.



After a few releases with massive new features, Cycles spent the last release of the 3.X series cementing these upgrades with massive performance boosts when dealing with large geometries thanks to improved geometry syncing, meaning much faster renders and faster switches from viewport to rendered view. The Light Tree feature also got much faster thanks to multi-threading and instancing support. Finally, Cycles got added experimental support for AMD hardware ray-tracing acceleration, using HIP RT.

After its introduction in Blender 3.5, the game-changing Viewport Compositor continued its steady road to parity with the traditional compositor, porting 13 new nodes to GPU in this release.

Blender 4.0

Ushering in a new era



After cooking for two development cycles (close to 6 months), the release of Blender 4.0 in November 2023 marked a significant milestone for the Blender Foundation, introducing groundbreaking, long-awaited features, and setting the stage for future innovations.

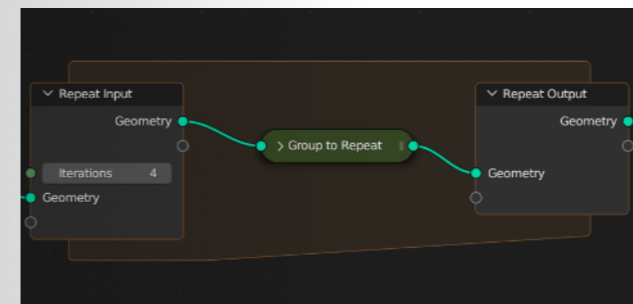


Blender 4.0 continued to push the boundaries of rendering performance and quality with massive new features, notably for the Cycles rendering engine: Light and shadow linking, a long awaited feature, finally made its way to the path tracer. The principled BSDF shader also benefited

from a re-write, and was reborn as the Principled BSDF V2, bringing it up to speed with the state of the art in shading algorithms, fixing long-standing issues with energy conservation and other limitations, while adding new sheen, coat, and glossy capabilities. This release also marks the introduction of AgX, Filmic's spiritual successor. The new default color transform aimed to be one of the best open source options currently in use in the CG world: it fixes the "notorious 6" issues with Filmic and provides a gorgeous path to white for highly emissive and over exposed areas, making it even more flexible to work with and closer to the emulation of real film photography.

Bone collections were introduced, replacing the bone groups and layers, allowing unlimited layers and much better navigation and usability, as well as paving the way for future improvements in rig and bone management.

A new long awaited base snap feature was also introduced in Blender 4.0, a boon for high precision tasks such as architectural modeling and detailed mechanical designs, allowing users to define a base point for snapping operations during transformations



Geometry Nodes received two major upgrades: Repeat zones, which unlocked a whole pan of dynamic serialized workflows that were previously tedious to set up, and the first iteration of Geometry Nodes tools, a groundbreaking new feature allowing for the easy creation of custom Blender Operators to be used in different modes based on Geometry Nodes setups.

Hydra Storm, a real-time renderer part of USD, was added as an add-on alternative to Cycles, Eevee, or Workbench in Blender 4.0. Primarily designed for previews, it allows users to see how scenes will appear when exported to other applications using USD. This renderer is particularly useful in production pipelines and for validating USD and Hydra integration.

This release also featured a lot of UI and Quality of Life improvements, including better search behavior and the addition of a new font: Inter.

The massive Vulkan Project continued in 2023, representing a significant shift in Blender's

rendering backend, transitioning from OpenGL to Vulkan. This update, made available as an experimental option in October 2023, aims to leverage modern GPU features and improve performance across different platforms. Vulkan would eventually offer better support for hardware ray tracing, mesh shaders, and HDRi displays, which are not supported by OpenGL. The move to Vulkan is expected to enhance viewport performance, particularly with scenes containing a large amount of geometry and complex visual effects. This transition also sets the stage for future improvements in areas like texture painting and rendering quality.

2023 has been a transformative year for Blender, marked by significant feature releases, performance improvements, and a focus on long-term support and usability. The Blender Foundation's dedication to innovation and community-driven development has solidified Blender's position as a leading tool in the 3D creation industry. With a clear vision for future advancements and continuous improvements, Blender is well-equipped to continue its trajectory of success and transformation in the years to come, inexorably marching forward to the beat of hundreds of contributors and millions of users working together and pushing Blender to new heights.

At the Headquarters

Self-hosted analytics

Hosting and managing as much as possible of the Blender infrastructure has been a guiding principle for the organization for many years. In order to keep things practical, sometimes it's needed to make an exception. This was the case with website analytics. For over a decade, the Blender websites used Google Analytics to keep track of traffic, monitor pattern to pages to optimize content, and to collect some statistics about Blender downloads. As Google Analytics cookie practices became more aggressive in order to provide deeper insight in user/customers behavior, we always tried to keep the amount of information collected to a minimum, and always keep it anonymous. The rolling out of the GDPR and the deprecation of Google's Universal Analytics prompted the search for a new analytics solution. After some research, Plausible was chosen. Plausible is a privacy-friendly Google Analytics alternative. It offers lightweight and open source web analytics. No cookies and fully compliant with GDPR, CCPA and PECR. The software is now hosted at analytics.blender.org.

Retiring mailing lists

Mailing lists have been a vital component of the Blender development ecosystem. It all started with bf-committers, and grew up to 70 lists over the years. With the introduction of more advanced discussion platforms such as devtalk.blender.org, code.blender.org and the rise of social media, communication around Blender development has evolved.

The use of lists.blender.org was in decline for a few years, with most content being simply reposted from other channels. For this reason the mailing list infrastructure was retired, and its functionality fully moved to devtalk.blender.org. The concept of "mailing list" changed. Contributors are now invited to participate in discussions or start a new topic by choosing a category (technical feedback, meeting report, etc) and then tag it with an "area of interest" or "module".

It is possible to set up email notifications for categories, so the original mailing list experience can be somewhat re-created. If you are subscribed to bf-committers, you can instead watch the announcements category to get all important announcements.

The existing mailing lists have become read-only, and are available at archive.blender.org.

Workshops

Physics and Nodes

May 15-17th



With the announcement of Project Gold, the very strong artistic vision called for some specific developments. The extremely stylized look is so integral to the story that the artists and developers explored new workflows. The idea was to make VFX tools (e.g., simulations) part of the early stages of production such as layout.

The Geometry Nodes team already explored this idea during the open movie Sprite Fright.

” The goal is to create purely artistic driven tools.

— Andy Goralczyk, Art Director at the Blender Studio

— The projects 2023 — At the Headquarters

The conclusion was that a more high-level interface was needed in order to make node assets more accessible for artists.

Then, the only way to access these settings was via the Geometry Nodes modifier. This proved to be a good initial approach, but it quickly showed its shortcomings. To address that, a workshop was organized at the Blender HQ in Amsterdam during May with the presence of:

- **Blender Studio:** Andy Goralczyk, Simon Thommes
- **Blender Institute:** Dalai Felinto, Jacques Lucke, Lukas Tönne

The agenda covered production use cases, tools, gizmos, and checkpoints.

Physics and Nodes

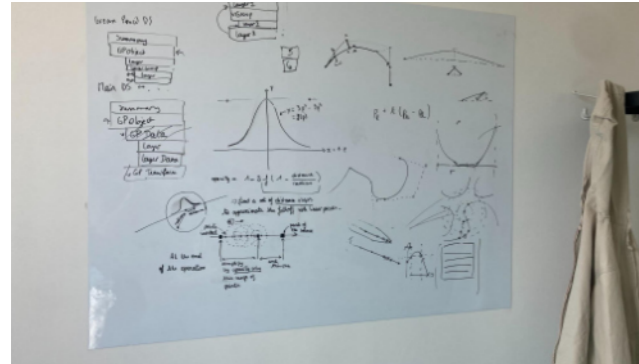
November 6-10th

WITH HANS AND JACQUES ON SITE
One week after the Blender Conference, the Geometry Nodes team came together in Amsterdam to discuss many design topics that affect the future of Geometry Nodes: volumes, gizmos, baking, subframe baking, menu switch node, dynamic socket visibility, asset menu path, replacement-based procedural modeling, modal node tools, Grease Pencil integration, dynamic

sockets, interactivity option, realtime mode, and asset deduplication.

In this workshop, the team managed to make quite a few design decisions: the volume, gizmo, and Grease Pencil integration lifted most blocking design questions. Other topics like the real-time mode and asset deduplication still required more discussion.

Grease Pencil



At the start of 2023, developer Falk David joined the team full time to focus on Grease Pencil 3: a full rewrite of the current implementation, aiming to lay a solid foundation for the next 10+ years. Since Grease Pencil started out as a community project, the goal was to include community contributors as much as possible. This was done through the bi-weekly online module meetings and the task boards, with a few developers regularly joining and helping the project move forward.

To tackle bigger chunks of the project more efficiently, French studio Les Fées Spéciales agreed to send their in-house research engineer, Amélie Fondevilla, to Amsterdam. Already familiar with the Grease Pencil code, she worked at the HQ with Falk, from June to August. Amélie most specifically contributed to the eraser and the dope sheet integration while Falk focused on edit mode operators, core API or outliner support. This proximity allowed Falk and Amélie to gain more momentum and split the work with ease.

Thank you again to Amélie for contributing her time and skills, and to Flavio Perez, Les Fées Spéciales' CTO, for supporting the project!

To learn more:

- [The Next Big Step: Grease Pencil 3.0](#)
- [Grease Pencil: Task Force](#)
- [Grease Pencil scenes for testing tools and algorithms](#)
- [Grease Pencil tools for animation productions](#)

Animation

At the end of June, a one-week workshop was organized at the HQ, as part of the Animation 2025 project, and a continuation of 2022's workshop in October.

The development goal is to speed up animators (and others working with animation data) by reducing manual data management. The Action has been Blender's main animation data container for over two decades. The team proposed a new data-block called "Animation", which will eventually replace the Action as the main container of animation data; then enabling multi-layer and multi-target animation.

To learn more:

- [Animation Workshop: June 2023](#)
- [Lessons from the 2023 Animation Workshop](#)

Web Development



With the hiring of Márton Lente as front-end developer, Oleg Komarov, and the return of Anna Sirota (both as back-end developers) in the last quarter of the year, the web team was finally complete.

The first priorities were to update the Blender website ecosystem to make it more current, cohesive, and stabilize it. Working closely with Francesco Siddi and Pablo Vazquez, the web developers started to tackle those tasks during a workshop, between October 9th and 13th.

The main focus for the October-November period was to prepare for the anniversary campaign on fund.blender.org, as it involved several steps, including the introduction of a new payment gateway (Stripe), which would make it easier to accept a wide range of payment methods and the development of a simplified payment and sign-up flow for the Development Fund.



Thanks to this work, it's now possible to easily donate once, or sign up for a recurring membership without the need of creating a Blender ID account first.

Further, a new embeddable component called the "donation box" has been created. This component could be easily integrated within any *blender.org* website in order to maximize exposure during the month of the campaign. A significant effort was put in finding a balance between encouraging people to donate and not be repetitive. For example, if a user decided to donate, the donation would simply stop showing up across all websites.

Line Art meeting

Taking advantage of developer Yiming Wu's visit to Amsterdam for the Blender Conference, on October 30th a workshop was organized to focus on the Line Art topic.

The goal was to discuss the porting of existing Line Art Modifier, the node-based-Line Art and their relation with the Geometry Nodes and the on-going Grease Pencil task force. Use cases and Line Art shortcomings were discussed, as well as the future of Freestyle, the other NPR rendering engine.

There, it was decided that Yiming would spend time helping the Grease Pencil 3.0 project generally, as a Line Art project wouldn't start before that project is finished.

More information:

- [2023-10-30 Line Art - Meetings - Developer Forum](#)

Blenderheads documentaries



At the end of 2022, Blender hired documentary maker Maaïke Kleverlaan to work embedded in the Blender headquarters, covering the activities and conducting interviews. The goal is to produce a series of documentaries for our YouTube channel, following the journey of people involved in the Blender project, documenting the process of creating the best free and open source 3D content creation software. This goes beyond software design and development, and focuses on life as part of the Blender community.

In 2023, the series released four episodes, centered around different team-members and focusing on some key events of the year - new episodes are published on a quarterly basis.

Blender Collectibles



Visitors who walked in around the offices at the Blender Headquarters would have noticed a large variation of collectible figurines everywhere. These figurines are mostly characters from well known movies and games. Made of durable PVC, the figurines have a stunning quality and detail level that's not possible to do with 3D printing – and certainly not as affordable. Wouldn't it be just amazing to have a collectible series with the beloved open movie characters?

Back in 2022, Ton Roosendaal contacted a renowned factory of designer toys, Demeng Toys in China. Working with them the Blender team learned a lot of how the production process goes for high quality characters.

It then was decided to go for a test batch of two *Sprite Fright* characters, 1,500 copies each.



If sales work out as expected, these characters then will be the first of a 30+ series of figurines, ranging all the way from *Elephants Dream* to the latest Blender open movie.

Last April, the container ship with the boxes arrived in the harbor of Rotterdam and the sale was opened via the website shortly after. As for all products we sell on *store.blender.org*, the proceeds will go to fund Blender projects.

Major announcements

BCON L.A. for 2024

The first officially recognized Blender Conference outside of Amsterdam is organized by Autotroph (CG Cookie, Orange Turbine, Blender Market). Taking place in April, this localized conference will gather Blender enthusiasts from all corners of the American continent.

More info at bconla.org/2024

Blender Store, closing and relaunch

After serving the Blender project for over twenty years, it was time to acknowledge that running our own internet store had become too impractical and expensive. Moreover, our financial manager Anja Vugts Verstappen, who had handled the store since the early days, wished to wind down her tasks to focus more on finances and get ready for retirement in the coming years.

For that reason we decided to close the store by the end of the year 2023.

In 2024, we will work on re-establishing our shirts and swag business based on using a high quality outsourcing business – as most other open source foundations currently do.

Excess stock of current products will be sold on events, like Blender Conference Amsterdam next year.



WING IT! — © BLENDER STUDIO, 2023

At the Studio

Wing It!

Launched at the end of 2022, the cartoony short film *Pet Projects* came to life in 2023 and was released on September 12th, as *Wing It!*. Pitched as the story of an uptight engineer who gets an unwelcome visit from an enthusiastic wannabe-pilot, this comedy is an homage to earlier 2D cartoons with classic cat-and-dog dynamic. It marked the directorial debut of lead animator Rik Schutte and allowed the Blender Studio team to research 2D looking shading and animation, exploring NPR and stylized rendering workflows.

You can watch production vlogs on the Studio's YouTube channel:

youtube.com/playlist?list=PLav47HAVZMjkgw-ueySUvvq1aynJ4s7ry



WING IT! — MOVIE POSTER

WING IT! — BLENDER TEAM CELEBRATING THE END OF PRODUCTION



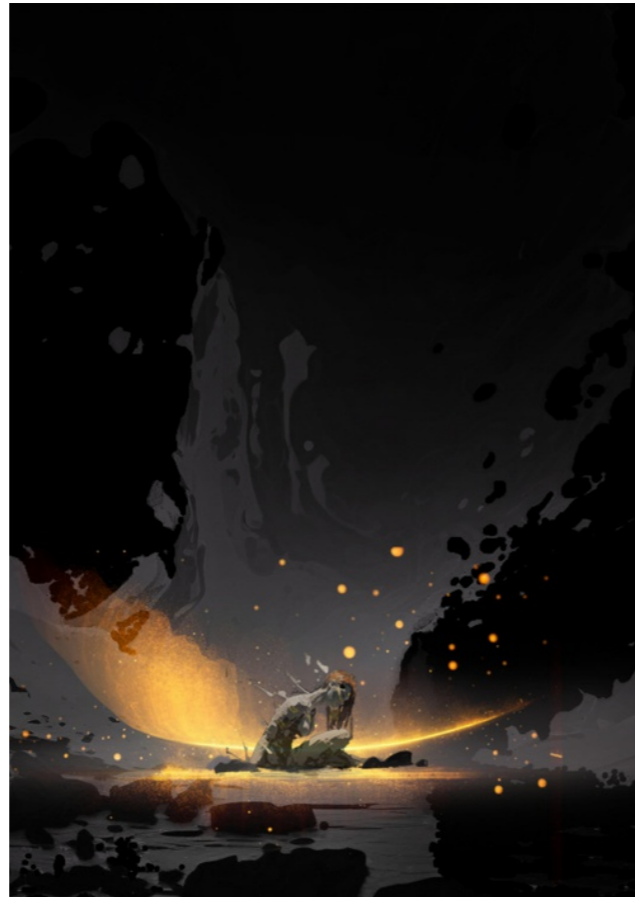
Project Gold

At the end of May, the next Open Movie project was announced: *Project Gold*, written and directed by Canadian filmmaker Jericca Cleland. A “story from the heart”, this metaphorical journey into the depths of human experience explores the fragility of life and our capacity for resilience and inner transformation.

Director Jericca Cleland is a seasoned storyteller and cinematographer with vast industry experience; she started her career in the early days of Pixar and moved on to work with several studios in Europe and North America. She was joined by production designer Florent Masurel, with whom she collaborated on feature films such as *Ballerina* and *Fireheart*.

Both working from abroad, Jericca and Florent also came to Amsterdam on multiple occasions to work with the studio team, on site. Los Angeles-based artist Casey Robin worked hand in hand with Jericca on the Story development early concepts, while Eliza Ivanova worked throughout the summer on additional character development. For the music, Austrian composer Dalal lent her talents to the project.

On a creative level, the film aimed at exploring an impressionistic, stylized aesthetic. It is visual poetry, a new territory for Blender Studio.



PROJECT GOLD — MOVIE CONCEPT

In preparation for this project, the team worked hard to align the creative and technical targets with Blender development. Here were the top targets:

- Advanced rendering techniques, such as light linking
- Simulation Nodes
- Geometry Nodes based tools
- Extend the viewport compositor and interactive image processing
- Art-directable, stylized, non-photorealistic rendering with Cycles

Flamenco

In 2023 Flamenco saw an unprecedented increase in popularity, due to its focus on simplicity and on-site extendability. Development moved forward at a steady pace, and this year Flamenco successfully joined the Google Summer of Code project.

Improvements include an increase in performance and stability, quality of life features to simplify upgrading and managing Flamenco farms, and more possibilities for customization to specific needs.

Blender Studio Tools and Asset Pipeline

The Blender Studio team released a slew of tools, documents and a dedicated page on the Blender Studio website showcasing their pipeline and processes, as a culmination of all the development made during the *Sprite Fright* Open Movie and beyond.

These tools include Watchtower, a visual production tracking software, the contact sheet add-on for Blender, the Shot Builder add-on, the Blender Media Viewer application template, the Asset Pipeline add-on, and more.



Events

Annecy Animation Festival

A large delegation of the Blender team attended the Annecy Festival. The festival - and the MIFA film market - keep growing, along with the vibrant animation community. Here are some impressions from the event.

The Blender stand at the film market - our first corner booth! - was always busy, with hundreds of attendees dropping by everyday to say hello and share how much Blender helped them in their personal or professional life. Blender is truly making an impact, especially in emerging markets where the first "fully local" large animated film projects are taking shape. Also, for the first time, some schools are starting to take notice of a slow industry shift towards Blender, and are planning to introduce Blender in their curricula.

Besides the film market presence, the Blender breakfast took place in a café in the old town. With over 70 attendees (some well-known community members, and some new people) this was an opportunity to share Blender project updates, network and connect.





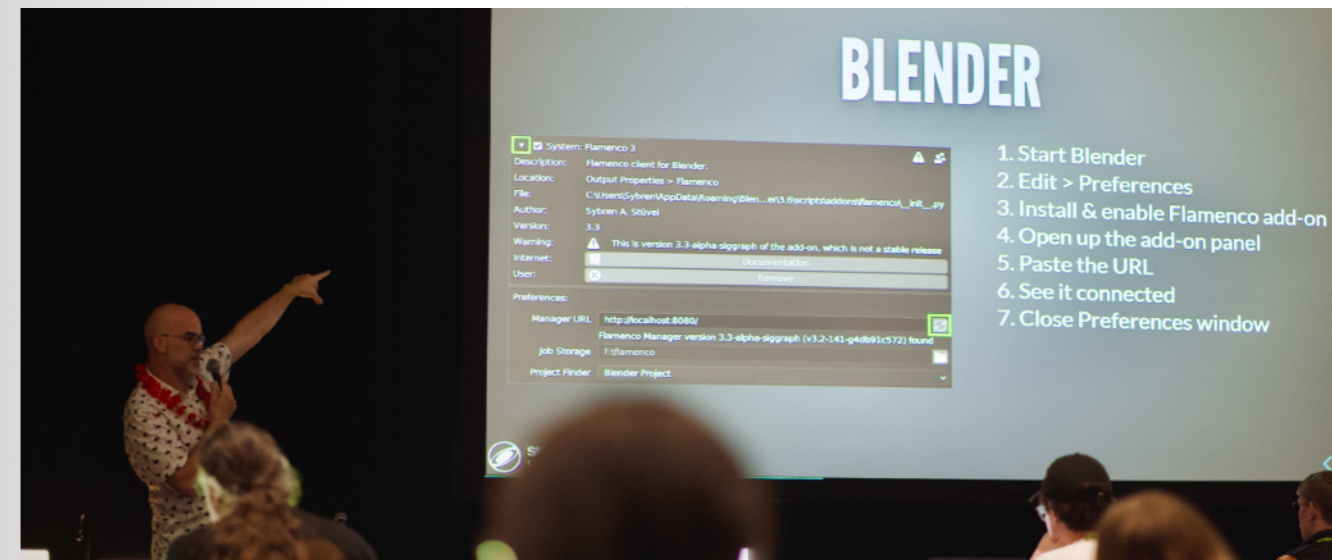
SIGGRAPH Los Angeles

SIGGRAPH is the absolute highlight of the year for the CG community, for scientists, developers and artists alike. The 2023 American leg of the conference took place at the Los Angeles Convention Center, from August 6th to 10th.

A dozen people from the Amsterdam HQ were joined by a few North-American contributors to take part in the conference. Ton and Francesco met with industry connections while Pablo Vazquez, Dalai Felinto or Hans Goudey greeted visitors at the Blender booth. Simon Thommes gave a masterclass on Simulation Nodes, in front of a full audience.

The feedback on Blender was very positive, with more and more studios and technology companies coming forward about using the Open Source software.

The positive energy from attendees was great and the whole team was very happy with this Siggraph edition: we're doing something really good here!



BCON23

Our yearly Blender Conference was again a memorable gathering of the Blender community, and it keeps getting better! With a similar number of attendees and the same location as last year, in the heart of Amsterdam, we could fine-tune some organizational aspects and make the event smoother.



BCON23 CREATIVE © HOAX GRAPHICS

You can enjoy all the recorded presentations on the YouTube channel, and on Blender's PeerTube.

Feedback for the event was overall positive, with improvements compared to last year.




About  **740** attendees


From  **54** different countries

 **128** presentations out of 186 submissions

More than  **70** hours of presentations

More than  **1.7 million** views on YouTube

 **22** festival entries selected out of the 52 projects submitted

Number of mentions of the word  **Blender** - who's counting, right?



Fiona Cohen presenting — @BCON 2023



30 years of Blender

On January 2nd, 2024, Blender turned 30 years old! To celebrate this milestone, Blender Foundation organized a donation drive during the month of December 2023. The theme was **"a gift for Blender"**, inviting everyone to contribute with a gift, no matter big or small, to show support for the project and to ensure its independence as it keeps growing up.



THE TEAM AT THE HQ CELEBRATING
30 YEARS OF BLENDER

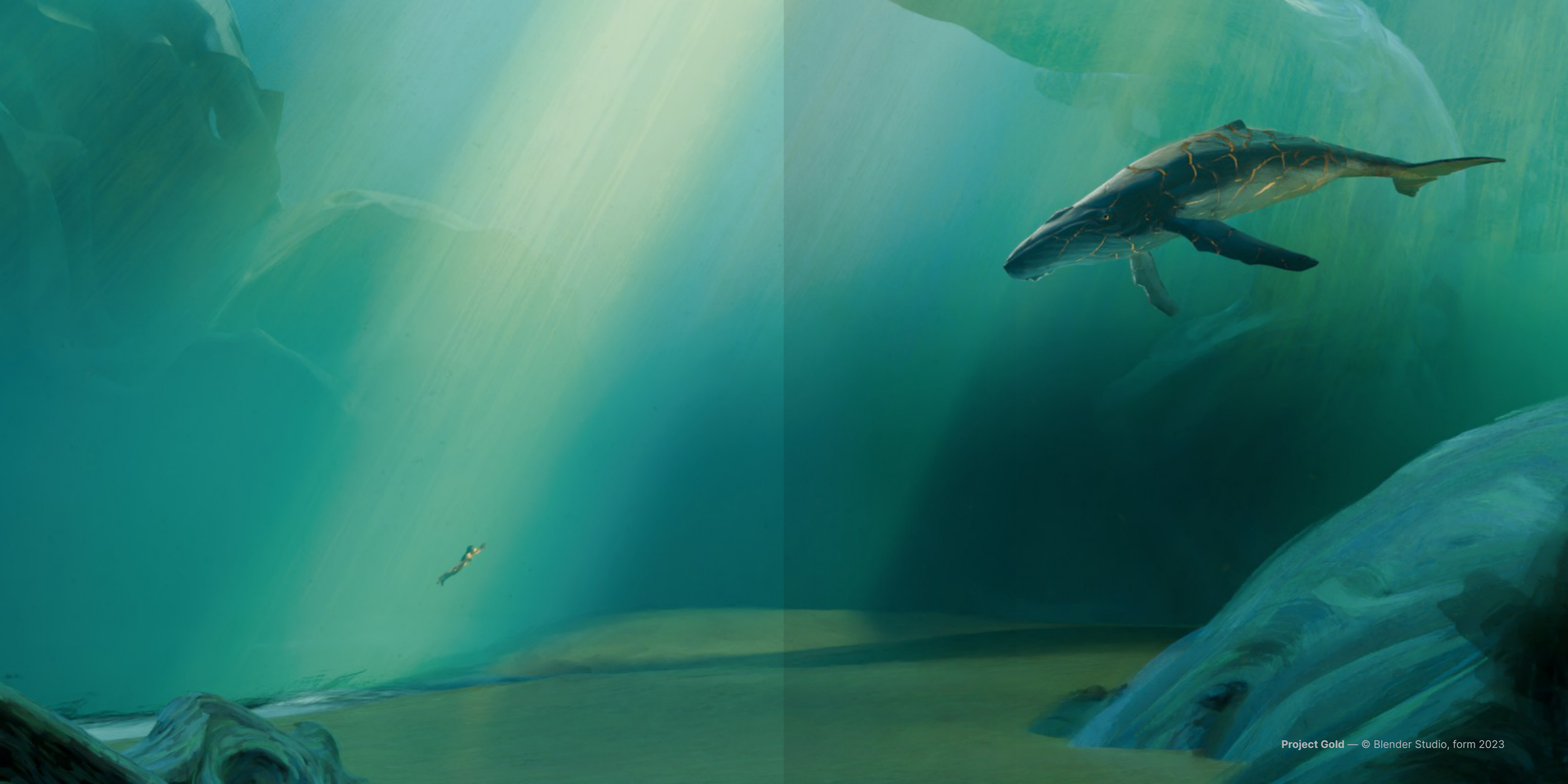


30 years campaign

Blender is free for everyone. However, developing and maintaining the project is not without cost. These costs are covered by donations from thousands of individuals and several corporations. While having a good relationship with corporations is important, individual donations from users are crucial, as they allow Blender to remain an independent community project. Every donation, no matter the size, contributes to the continued success of development projects at *blender.org* and Blender's ability to empower creative expression around the world. The campaign was a success, with over 10,000 gifts, evenly divided between one-time donations and Development Fund memberships, raising over 200K € in one month. Thank you to everyone who donated!

While this has been an amazing journey, there's no point in stopping to reminisce on each step of the way. To express this feeling, the team put together a little video - you can find it [here](#), on our YouTube channel.

Here's to the next 30 years!





The people

Leadership



Ton Roosendaal
CEO and Founder

Ton is founder of the Blender organization and the original developer and designer of the Blender software since 1994. He oversees the general strategy and project targets at Blender. He is well known for pioneering content driven open source development. He was awarded an honorary doctorate of the University of Leeds, in Creative Technology.



Francesco Siddi
COO

With a background in industrial design, Francesco joined Blender in 2012 as a 3D artist and has been contributing to the project in various roles ever since, organizing events, designing and developing software and producing open movie projects. As General Manager at Blender Studio and COO at Blender, he manages industry relationships and supports the implementation of strategies and project targets.

Leadership



Operations and content



Anja Vugts-Verstappen
Financial Manager

Anja is in charge of managing all finances in the Blender companies, including cash flow, tax rebates and supervising the budget controlling. She has worked as a bookkeeper and finance manager for Blender and its predecessor companies (NeoGeo, NaN) since 1991.



Anna Sirota
Back-end Developer

Since 2020, Anna has worked on web projects such as Development Fund, Blender ID, Blender Studio, Blender Conference and Extensions Platform, helping maintain their servers and code, and implementing new features. She holds a master's degree in applied mathematics and cybernetics from Lomonosov Moscow State University, and previously worked as a full-stack developer and devops at companies such as 3D Hubs B.V. and Byte B.V.



Arnd Marijnissen
Infrastructure

Involved with the Blender community for many years, Arnd joined the team in Amsterdam 2022. He is part of the general SysAdmin team at Blender as well as in charge of the BuildBot infrastructure. Next to that, he helped prepare the strategic task of transitioning from Phabricator to Gitea. With a background in electronics and networking, and 24 years of employment at an ISP in several different roles at Cistron B.V. and XS4ALL as part of multiple teams over multiple locations. Around *Sintel's* production, he became involved in providing a render-cluster for that movie; Justacluster.



Dan McGrath
System Administrator @Canada

McGrath is responsible for maintaining the IT infrastructure of *blender.org*, ensuring the organization's systems and networks are robust, secure, and efficient. His expertise in system administration and network security is vital for supporting Blender's global operations, development work, and community engagement platforms.

Operations and content



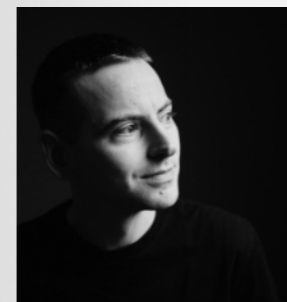
Fiona Cohen
Producer and Development Manager

Graduated from Les Gobelins in animation production, Fiona Cohen has spent the last decade working with award winning international producers and directors to turn their vision into reality (Autour de Minuit, La Cachette, Mikros, Sun Creature). With a knack for technical challenges, she joined Blender in 2023 to work on the Open Movies, then expanded her role to supporting the software development. She now plans activities, coordinates the teams and helps structure the overall organization.



Maaïke Kleverlaan
Documentary Filmmaker

Maaïke has been part of the Blender team since 2022, working as a documentary filmmaker on the series *Blenderheads*. Within this documentary series, she portrays the people behind the Blender Project, giving insights into what's happening at the Blender Headquarters. Maaïke holds a bachelor's degree in photography, film, and digital installations from AKV St. Joost in Breda, where she specialized in documentary film.



Márton Lente
Front-end Developer

As a member of the web team, Márton's responsibility is to design, improve and manage Blender's UI and visual presence on the web and beyond. He has been involved mainly in cultural and architecture related initiatives since 2016, when he completed his MA degree in architecture at the Moholy-Nagy University of Art and Design in Budapest.



Oleg Komarov
Back-end Developer

Oleg works on the web team, co-maintains the code and develops new features for Blender web projects, such as Blender ID, Development Fund, Studio Website and the new Extensions Platform. In his past roles at Yandex, Booking.com and Datadog, spanning over a decade, Oleg worked on multiple aspects of product and infrastructure development. Oleg holds a Master of Science degree in mathematics.



Trisha Partogi
Assistant Office Manager

Trisha joined the HQ team in early 2023 to help manage the offices. By taking care of the facilities, making lunches or running errands, she allows the teams to focus on their work in a pleasant environment.



The development team

Most of the developers work contracted by Blender, either from their homes or in-house at Blender's Amsterdam offices. They collaborate with the global Blender community online, constantly moving Blender forward.

Definition of roles in the development team

Within the development team, Blender makes a distinction between four different kinds of developers: principal, senior, intermediate and junior developers. The full diagram of the main developer roles, including for remote positions, have been shared online for further feedback.

The four main developer roles can, in short, be characterized by the following:

- **Principal Developer**

A developer working autonomously, contributing to engineering or product design to solve strategic needs and proposing and reviewing designs to improve Blender as a whole.

- **Senior Developer**

A developer who contributes as tactical team lead (coordinator, product manager, lead engineer, etc.) to projects, coaching junior and intermediate developers by working closely together, reviewing their code and giving them feedback.

- **Intermediate Developer**

A developer participating as a tactical developer, being supervised by seniors, contributing by coming up with designs to improve their own work.

- **Junior Developer**

A developer contributing to projects as an operational assistant, being supervised by regulars and seniors.

Development coordination and support



Aaron Carlisle

Technical Writer part-time, @USA

Aaron has been contributing his technical writing skills to our documentation since 2014, including User Manual enhancements. He studied computer science and is currently coordinator of the Blender documentation efforts.



Dalai Felinto

Product Manager

Once his architecture bachelor was complete, Dalai pivoted into interactive and visualization tools and moved to Canada to work with science communication at UBC. During this period he specialized in immersive technology such as fulldomes, panoramas and VR, in projects all around the globe, and presented in conferences such as IEEE VR in France and Siggraph Asia. His work with Protovis developed at IMPA in Brazil was used by Oculus Studio to explore the limits of 2D and 3D integration and helped set the foundations for virtual reality in Blender.

Connecting the different parts and supporting the scale up process of Blender, Dalai worked many years on planning and communication, specifically for the team in the Amsterdam HQ. He now acts as the product manager for projects ensuring there is a solid design and a common direction.



Pablo Vazquez

Senior Designer

Having used Blender since 2002, Pablo has been involved in countless initiatives around the project in various roles. In 2008, he joined the team in Amsterdam as a character artist for the open game Yo Frankie!. Later, he worked on open movies such as *Sintel* (2010), *Cosmos Laundromat* (2015), *Agent 327* (2017), *Spring* (2019), and created the cartoon series *Caminandes* (2013-2016). For several years, he hosted weekly live streams on YouTube, sharing Blender development news and engaging with the community. Throughout his career, Pablo has evangelized Blender at conferences and universities around the world. Pablo currently manages design responsibilities within the Blender project.



Thomas Dinges

Development Coordinator, Release Management @Germany

Thomas has been a volunteer contributor to the Blender project since 2009. He worked on the 2.5 user interface project, the Cycles rendering engine and also organized community meetups and conferences. During university, he participated three times in the Google Summer of Code program. He was employed by Blender in 2021 to coordinate the online development team, onboard new talents, and oversee the release process.

Principal developers



Brecht van Lommel

Principal Developer

Brecht started as a student volunteer working on Blender in 2003. He is the original creator and development lead of Blender's rendering engine, Cycles, focusing on enhancing its realism, speed, and efficiency. With a profound knowledge of computer graphics and rendering algorithms, Van Lommel's contributions have been pivotal in making Blender a competitive tool. Aside from Blender, his work experience includes work on Arnold Render for Autodesk.



Campbell Barton

Principal Developer @Australia

Campbell works on Blender's Python API, modeling tools, as well as Linux platform support. He started using Blender as a technical artist in 2004 and has been involved in Blender development since 2008 (with the open movie *Big Buck Bunny*). Over the years Campbell has worked on various projects including BMesh integration, projection painting, and multi-object editing. His more recent work includes improvements to Wayland on Linux and support for online extension repositories.



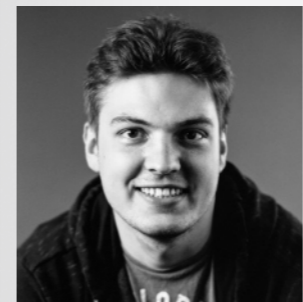
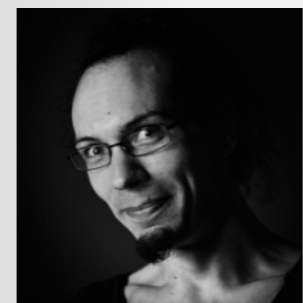
Senior developers

Bastien Montagne Senior Developer

Bastien discovered and started using Blender in 2002, when it had just become an Open Source project. After working on its documentation for a few years, he started contributing code in 2011. Since then, he has worked in many areas of the software, and is currently leading the work in the Core module (low-level back-bone code, internal data management, file I/O...). An autodidact, he likes to focus on code and software architecture quality.

Jaques Lucke Senior Developer @Germany

Jacques leads the Geometry Nodes project. Since 2014 he has been working on integrating node systems in Blender in the form of the Animation Nodes add-on. After finishing his studies at the Technical University of Berlin in 2018, he started working full-time for Blender to improve the procedural capabilities of the software.



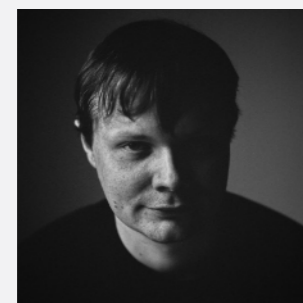
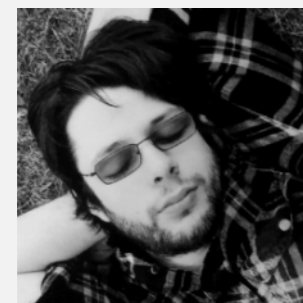
Senior developers

Clément Foucault Principal Developer

Clément leads the development of everything related to GPU rendering. He is also the lead developer of the EEVEE real time render engine. After receiving his diploma in animation filmmaking (DESFA), he worked for 4 years as a freelance 3D generalist before becoming a programmer in the game industry and later joining Blender.

Sergey Sharybin Principal Developer

Sharybin has a PhD in computer science, and is pivotal in driving the development of Blender's core systems, particularly focusing on simulation, tracking, and the software's overall architecture. With an extensive background in computer science and mathematics, his expertise has been crucial in advancing Blender's capabilities and optimizing performance.



Principal developers



Jeroen Bakker

Senior Developer

Jeroen leads the Vulkan integration, as a member of the Vulkan WG. With years of experience, he successfully executes highly technical and risky projects without losing focus on the bigger picture and is therefore a known troubleshooter for other projects as well. Jeroen was a technical lead in the financial sector (1998-2006), project architect during an airline merger (2006-2013), CTO of a tech startup (2013-2017), and has been involved with Blender development since 2008.



Lukas Tönne

Senior Developer

Lukas has worked on Geometry Nodes and the node editor in general, and is now working on the Grease Pencil 3 project. He has been a long time contributor to various subsystems, like particles, physics, the dependency graph, and more. Lukas was previously part of the *Cosmos Laundromat* film project in 2015, working primarily on simulation support. From 2017 to 2022 he worked as a software developer at Microsoft Ireland Research, building AR/VR middleware and related SDK software.

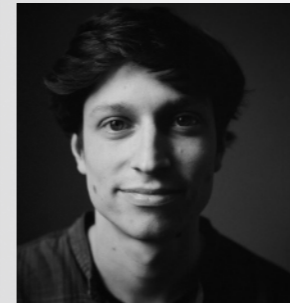


Sybren Stüvel

Senior Developer

Sybren leads Blender's Animation & Rigging module and is the primary developer of render farm software Flamenco. Since 2014 he has been a Blender developer, and was employed by Blender Institute in 2016 after obtaining his PhD in Computer Science at Utrecht University, specializing in computer animation and crowd simulation.

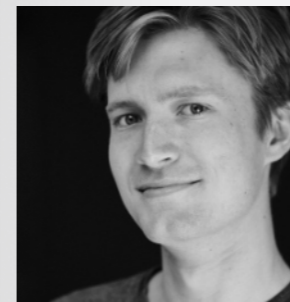
Intermediate developers



Falk David

Intermediate Developer

Falk maintains the Grease Pencil module, a 2D/3D hybrid animation tool in Blender. As such, his tasks include overseeing contributions from the community, reviewing code, and developing the software himself. Falk has a bachelor's in computer science from the Technical University of Berlin. He also has prior work experience at the award-winning animation studio "The SPA studios".



Hans Goudey

Intermediate Developer @USA

Starting with a Google Summer of Code project in 2019, Hans has contributed to a range of projects, with a focus on the user interface, procedural geometry processing, and overall software performance. Hans brings a drive for quality, motivation to undertake large refactoring projects, and a passion for communication and contributor involvement. He holds a bachelor's degree in computer science from Middlebury College.



Julian Eisel Intermediate Developer

Julian works on the user interface module and various projects. He combines a strong interest in usability with technical knowledge, enabling the implementation of new, forward thinking design patterns. Since getting involved in 2014, he implemented numerous core user interface features, native support for virtual reality, lead development of a new asset system and the implementation of a new developer documentation infrastructure. Julian holds a Bachelor of Science (Applied Computer Science).



Nathan Vegdahl Intermediate Developer

Now working as a software developer in Blender's Animation & Rigging module, Nathan started his involvement with Blender as a user in 1998. Since then he has worked in many different roles throughout his career, including as an animator and character rigger on two of Blender's open movie projects and as a UX designer at Nintendo Technology Development.



Omar Emara Intermediate Developer @Egypt

Omar first started contributing to Blender as a student with a Google Summer of Code project, and has since contributed to areas like Shading, Compositing, and Bug Triaging. After completing his degree, he joined Blender's development team in 2022 to work on Blender's new GPU compositor project. He holds a bachelor's degree in computer science from Helwan University.



Sebastian Parborg Intermediate Developer

After graduating with two masters in "Applied Physics and Electrical Engineering" and Computer Science, Sebastian has worked at Blender for five years to improve the free and open software landscape, be it by adding features or fixing bugs in Blender itself or working on other operating system components to make them live up to the standard required for film making.



Weizhen Huang Intermediate Developer

Weizhen has been working on the rendering engine Cycles at Blender since 2022, improving various algorithms for better rendering quality and richer expressiveness. She has experience with hair rendering as a visiting researcher at Weta Digital. Prior to that, she obtained her PhD from the Computational Light Transport Lab at the University of Bonn, focusing on physically based modeling of micro-appearance.

Intermediate developers

Triaging Team



Germano Cavalcante

Developer @Brazil

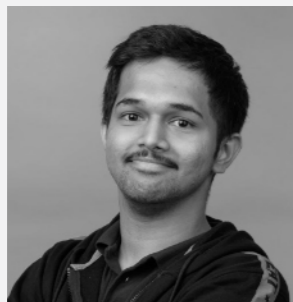
Germano was originally called to improve precision modeling for architecture in Blender. He now focuses primarily on bug triaging and fixing, and is increasingly involved in the modeling module, enhancing transform tools and the snapping system.



Philipp Oeser

Developer @Germany

Philipp coordinates the bug triaging process as well as LTS releases. When wearing a developer hat, he contributes in the form of bug fixes. After graduating as an engineer for computer generated media technology, he worked as pipeline TD and developer for award winning post production houses including the Mill, Dassault Systèmes, Liga01 Computerfilm, NHB studios or Animationsfabrik for 10+ years prior to joining Blender in 2018.



Pratik Borhade

Developer @India

Pratik is involved on the tracker and helped both with triaging and bug fixing. Lately he is involved in Grease Pencil 3 and user interface modules. Pratik graduated in computer engineering in 2023 and has been contributing to Blender since 2021.



Richard Antalík

Developer @Czech Republic

Richard is maintaining and improving Video Sequencer Editor, works on FFmpeg and sound subsystems. He is also active triaging bug reports. Richard joined Blender in 2020 after working as a mechanical engineer.

Grant recipients



Chris Blackburn

Developer part-time, until July 2023, @New Zealand

Chris worked on better UV unwrapping, making all of the pieces of the UV toolset work nicely together.



Christoph Lendenfeld

Developer part-time, @Spain

Christoph helped the Animation & Rigging module to bring the vision of "Animation 2025" into reality. After doing a Master of Arts, he started out in the animation industry as an animator. Later he pivoted into being a pipeline developer and eventually started contributing to Blender. Since 2022 he is working for Blender on a part time basis.

Grant recipients



Harley Acheson

Developer @Canada

Harley started programming 44 years ago and has enjoyed a full career in business ownership, network administration, and software development - the last 13 years specializing in user interface design. He started contributing to Blender in 2009 and has been a long-time member of the User Interface Module. He is known to be obsessed with pixel-perfect layout, spelling, grammar, fonts, icons, images, input, internationalization, translation, large-scale deployments, and accessibility.



Jesse Yurkovich

Developer @USA

Jesse began his Blender journey by helping triage incoming bugs, which eventually lead to contributions in a variety of areas inside Blender. Since then he's helped improve UDIM support, OpenImageIO integration, and now primarily works within the Pipeline and Assets module on Collection Exporters and USD improvements and features. Prior to Blender, Jesse worked as a software engineer with Microsoft for 19 years and graduated from the Illinois Institute of Technology with a bachelor's degree in computer science.



Joe Eagar

Developer until July 2023, @USA

Joe worked on the Sculpt/Paint/Texture module, implemented new features and also improved the performance and stability of it.

Grant recipients



Lukas Stockner

Developer part-time, @Germany

Lukas is a member of the Cycles module. He worked on an updated principled shader and helped with bug fixes and code review. He joined Blender through a Google Summer of Code, in 2016. Lukas graduated from the Technical University of Munich with a master's in computational science and has previously worked as a software engineer at Theory Studios, Tangent Animation and Genesis Cloud.



Miguel Pozo

Developer part-time, @Spain

Miguel is part of the EEVEE & Viewport module. He rewrote the Workbench engine and has helped with the development of the new Draw Manager and EEVEE Next. Before joining Blender, he developed the open source Malt NPR engine.



Yiming Wu

Developer @China

Aside from bug fixing and support, Yiming is the main developer on the Line Art feature for Grease Pencil and contributed to the Grease Pencil 3 project.



The Blender Studio team is a key part of the global Blender mission. As experienced artists use the software for their everyday tasks, they are able to test new features, give feedback and work hand in hand with the development team to improve Blender. Although both teams interact constantly, the Studio operates on a budget that is fully independent of the Blender Foundation.

The Blender Studio team

The Blender Studio team



Andy Goralczyk

Art Director

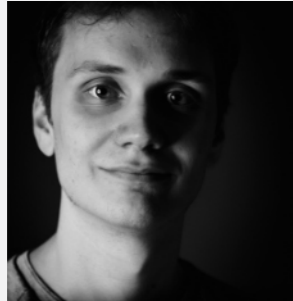
Andy has worked on numerous Open Movie projects and has contributed to and used Blender for well over 20 years. He offers guidance for stylistic and artistic decisions in and around Blender HQ. Having studied Media Arts at the Karlsruhe University of Arts and Design, he has a more experimental mindset and draws his inspiration from mixed media art, traditional animation, puppetry, photography, film, performance art and data visualization.



Beau Gerbrands

3D Artist

Beau started as an intern at the Blender Studio during the production of *Agent 327* back in 2016. After graduating from the University of the Arts Utrecht (HKU) with a Bachelor's degree in Design, he transitioned into freelancing working on the Amazon Prime Series *"Undone"*. In 2021, Beau rejoined the Blender Studio to work on Open Movie projects as a 3D generalist creating props, sets, production lighting and other media.



Demeter Dzadik

Character TD

Since 2019, Demeter has been responsible for providing the animators with expressive characters, as well as tools to facilitate their animation workflow. While working professionally as a self-employed animator and rigger since he was 15, he graduated from London's Uxbridge College in Games, Animation & VFX.



Harukaze Legouge

Videographer and Communication Designer

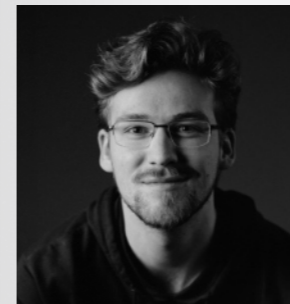
Having joined the media team in 2022, Haru has since been in charge of designing video content revolving around Blender Studio's ongoing projects, ranging from standard-length video logs on YouTube to short reels on social media platforms. He has a background in documentary filmmaking and video installations as a cinematographer, with a Bachelor's in Media and Culture from the University of Amsterdam.



Hjalti Hjálmarsson

Animation Director

For 8 years, Hjalti created numerous award-winning animated commercial campaigns using Blender. For the past 10 years he has worked at the Blender Studio on the Open Movies in various roles, such as writer, director, lead character animator, layout artist, editor and cinematographer. Hjalti is best known as the writer/co-director of *Agent 327: Operation Barbershop* (2017), co-director of *Sprite Fright* (2021) and writer/director of *Charge* (2022).



Julien Kaspar

3D Artist

Julien has worked on 5 Open Movie projects and has used Blender for 15 years. He applies his skills to characters, asset libraries and sets from early concepts to final production assets. With his experience and sense of design & aesthetics he contributes to educational material and software module coordination.



Nick Alberelli

Technical Director @Canada

Nick joined the Studio team remotely in March 2023 to support the production of *Wing It!*. By creating new tools and maintaining existing ones he helps artists build better processes, thus becoming more efficient. He also enjoys writing documentation and was key in updating the pipeline docs on the studio.blender.org website.



Pablo Fournier
Animator

Pablo Fournier has been an esteemed animator at Blender Studio since 2017. He was previously involved in films like *Despicable Me 3*, *The Secret life of Pets*, *Sing*, etc. Pablo is known for his expertise in character animation using the daily build of Blender in open movies including *Spring*, *Sprite Fright* and *Wing it*. Beyond his animation work, he is also active in mentoring emerging talent and contributing to educational initiatives within the Blender community through tutorials on studio.blender.org.



Rik Schutte
Lead Animator

Rik started his career as a freelance animator, working on the first Dutch 3D animated feature film *The Little Vampire* and several European productions including *Louis and the Aliens*. He then became a lead animator at Sony Pictures Imageworks in 2017 and worked on feature films like *Smallfoot*, *Spider-man: Into the Spider-verse* and *Vivo*. In 2021, he joined Blender Studio as a lead animator and worked on *Sprite Fright* and *Charge*. Then making his directorial debut on Blender's open movie project: *Wing it!*



Simon Thommes
3D Artist

Simon is mainly responsible for the implementation of the various art styles the Blender Studio creates for their projects. His skillset is tailored to finding creative solutions to a range of technical problems with a focus on the visual aspects of the studio's films. He frequently engages in creating educational material and his technical expertise has been instrumental for the design of systems in Blender such as the Geometry Nodes project. Before starting at Blender in 2020 he acquired a bachelor's degree in physics at the RWTH Aachen University.



Vivien Lulkowski
Concept Artist

Vivien is a visual development artist, contributing concept art, color scripts and any other design work that helps in shaping the look of the movie. Having worked as a freelance artist in video games, advertisements, print media and animation before joining the Blender Studio provided her with a swiftness and creative flexibility when approaching any kind of new project through digital and traditional means.

The Blender Studio team

The numbers and growth

Industry relations

Corporate Development Fund members

The year 2023 started with a decline in top level corporate members, as expected due to administrative hurdles and reorganisations. In the course of the year, things caught up with new members which made corporate contributions in 2023 as good as the year before.

Around the SIGGRAPH and Blender Conferences, several high level meetings were held with our industry relations, including Apple, BMW, Khronos, Nvidia, Intel and AMD. The interest from the industry to keep contributing to Blender remains very high. New is the growing interest from the automotive industry.

Industry contributions to Blender

Members of the Blender Development Fund are actively involved in Blender development itself.

Notable examples are:

AMD

AMD assigned a small team of engineers to support and stabilise Blender Cycles HIP besides Hydra and MaterialX.

Apple

Apple assigned internal resources to make Blender fully ready to support the Metal API for drawing and rendering (first Cycles, but also the entire UI and viewports).

Meta

Meta works with the team on essential improvements in Cycles rendering.

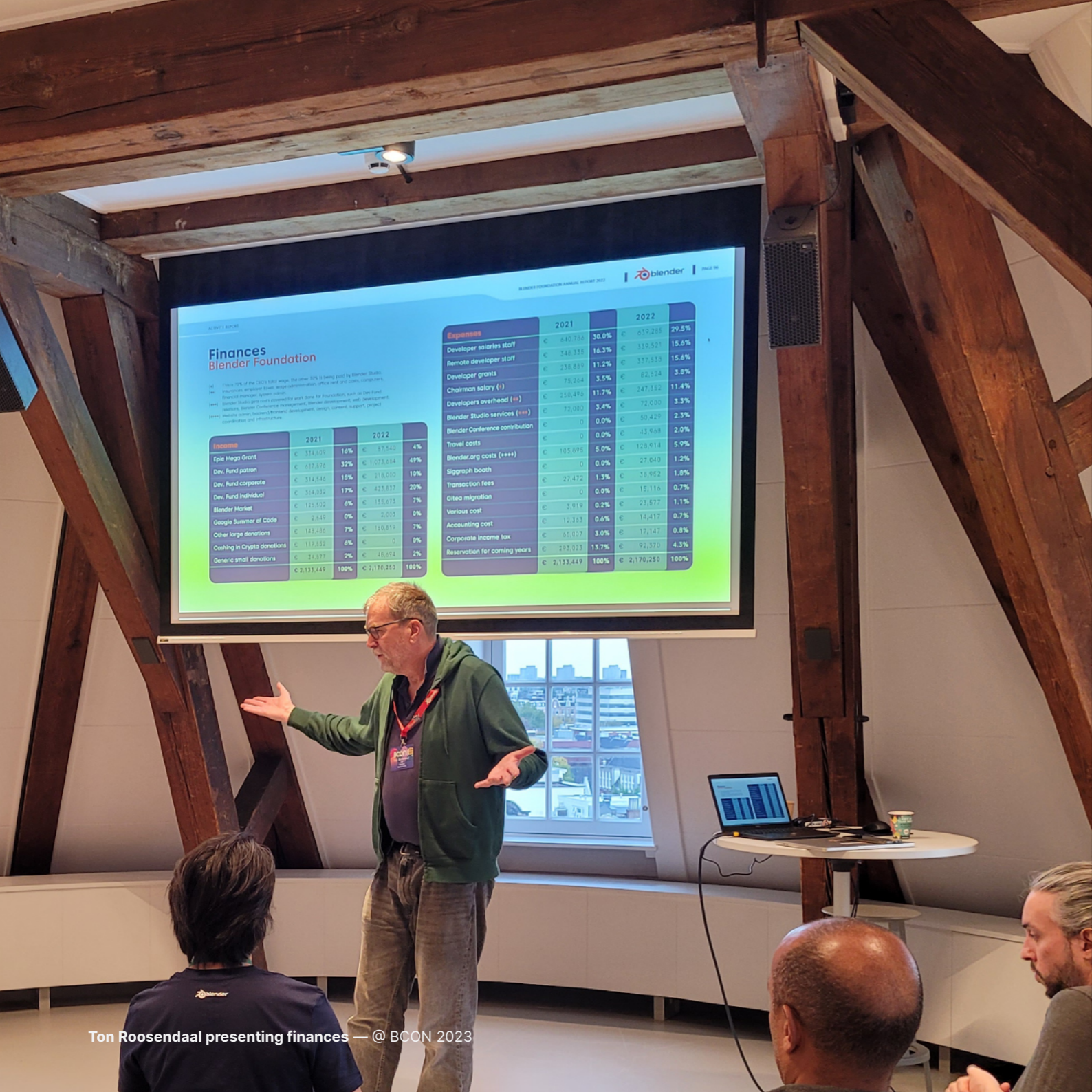
Intel

Intel involved their GPU team from scratch, including early access to hardware. Intel assigned multiple developers to work on rendering optimization and oneAPI support.

Nvidia

Nvidia has assigned two developers to improve Open Shading Language support in Cycles rendering and USD.





Ton Roosendaal presenting finances — @ BCON 2023

Finances

Development Fund in 2023

The development fund income stabilised in 2023. Some companies decided to not renew in 2023, but other new members joined. End of 2023 Blender Foundation successfully ran a campaign to increase awareness in the community that individual donations matter, to keep the Blender organisation independently funded.

Developer costs

Contributions to developers went up from 1,320K to 1,777K €. This was made possible thanks to donation income increasing with 400K. Nearly 70% of the donation income went to developers in 2023 (was 60% in 2022).

Board salary

Note: Chairman salary in 2022 was paid for 30% by the Blender Studio, in 2023 it was paid for 100% by Blender Foundation/Institute.

Blender Conference

Thanks to better budgeting, more ticket sales and more sponsoring, the 2023 conference was break-even (excluding Blender staff costs, which was paid by the Foundation).

Blender Studio

The Blender Studio is an independent entity with its own income from Studio subscriptions. In 2023 several Studio employees worked (part time) on Blender Foundation projects and all of the Studio artists have been using the daily Blender build for testing and reviews. For that reason the Foundation supports the Studio, as it provides strategic value for the Blender mission.

SIGGRAPH

Due to unforeseen USA union regulations, costs for Siggraph in 2023 nearly doubled. Basically all labour for booth setup has to be paid twice.

Reservation

The reservation for 2024 is lower than expected. Goal remains to maintain a large buffer to cover unforeseen expenses and tougher times.

Finances Blender Foundation

2021: 100% of the 2023 budget, the other 10% is being paid by Blender Studio. 2022: 100% of the 2023 budget, the other 10% is being paid by Blender Studio. 2023: 100% of the 2023 budget, the other 10% is being paid by Blender Studio.

Income	2021	2022	2023
Epic Mega Grant	€ 314,029	€ 31,640	€ 314,029
Dev. Fund patron	€ 287,836	€ 3,079,884	€ 287,836
Dev. Fund corporate	€ 314,436	€ 210,000	€ 314,436
Dev. Fund individual	€ 314,032	€ 422,837	€ 314,032
Blender Market	€ 128,502	€ 155,073	€ 128,502
Google Summer of Code	€ 2,445	€ 2,003	€ 2,445
Other large donations	€ 149,486	€ 180,816	€ 149,486
Cooking in Crypto donations	€ 119,332	€ 0	€ 119,332
Generic small donations	€ 14,377	€ 46,894	€ 14,377
Total	€ 2,133,449	€ 3,170,250	€ 2,133,449

Expenses	2021	2022	2023
Developer salaries staff	€ 440,768	€ 639,285	€ 440,768
Remote developer staff	€ 348,336	€ 339,521	€ 348,336
Developer grants	€ 238,895	€ 337,519	€ 238,895
Chairman salary (-)	€ 75,264	€ 82,324	€ 75,264
Developers overhead (**)	€ 230,458	€ 247,332	€ 230,458
Blender Studio services (***)	€ 72,000	€ 72,000	€ 72,000
Blender Conference contribution	€ 0	€ 43,968	€ 0
Travel costs	€ 0	€ 128,914	€ 0
Blender.org costs (****)	€ 105,695	€ 27,640	€ 105,695
Siggraph booth	€ 0	€ 26,982	€ 0
Transaction fees	€ 27,472	€ 15,116	€ 27,472
Gitex migration	€ 0	€ 23,877	€ 0
Various cost	€ 3,919	€ 14,417	€ 3,919
Accounting cost	€ 19,363	€ 17,147	€ 19,363
Corporate income tax	€ 65,037	€ 92,370	€ 65,037
Reservation for coming years	€ 293,123	€ 2,170,250	€ 293,123
Total	€ 2,133,449	€ 3,170,250	€ 2,133,449

Income	2022		2023	
Dev. Fund Patron	1,161,224 €	54%	1,193,261 €	47%
Dev. Fund Corporate	218,000 €	10%	256,209 €	10%
Dev. Fund Individuals	423,837 €	20%	440,916 €	17%
Blender Market	155,673 €	7%	149,556 €	6%
Other Large Donations	160,819 €	7%	250,194 €	10%
Generic Small Donations	50,697 €	2%	263,256 €	10%
Total	2,170,250 €	100%	2,553,392 €	100%

↑ Income

Expenses →

Expenses	2022		2023	
Developer Salaries Staff	639,285 €	29.5%	1,061,583 €	41.6%
Remote Developer Staff	339,521 €	15.6%	374,119 €	14.7%
Developer Grants	337,538 €	15.6%	341,432 €	13.4%
Chairman Salary	118,034 €	5.4%	121,730 €	4.8%
Office Overhead	247,352 €	11.4%	181,123 €	7.1%
Support Studio for Testing	72,000 €	3.3%	72,000 €	2.8%
Blender Conference Contribution	50,429 €	2.3%	0 €	0.0%
Travel Costs	43,968 €	2.0%	16,533 €	0.6%
Non-dev staff Costs	93,504 €	4.3%	108,949 €	4.3%
Siggraph booth	27,040 €	1.2%	47,441 €	1.9%
Transaction fees	38,952 €	1.8%	61,839 €	2.4%
Gitea migration	15,116 €	0.7%	7,125 €	0.3%
Various cost (cryptos)	23,577 €	1.1%	-50,670 €	-2.0%
Accounting + Fiscal advisory cost	14,417 €	0.7%	48,043 €	1.9%
Corporate income tax	17,147 €	0.8%	31,639 €	1.2%
Reservation for coming years	92,370 €	4.3%	130,506 €	5.1%
Total	2,170,250 €	100%	2,553,392 €	100%

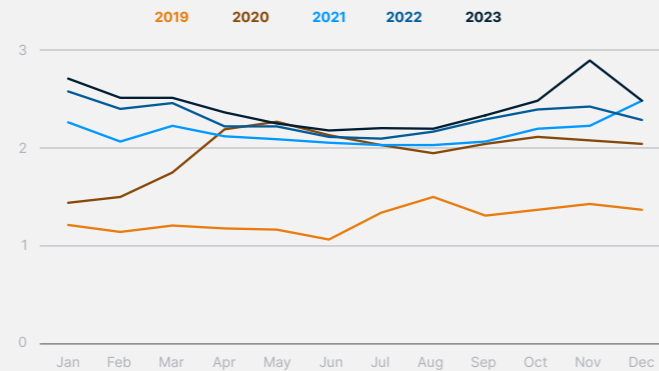
Blender by the numbers

The Blender.org website

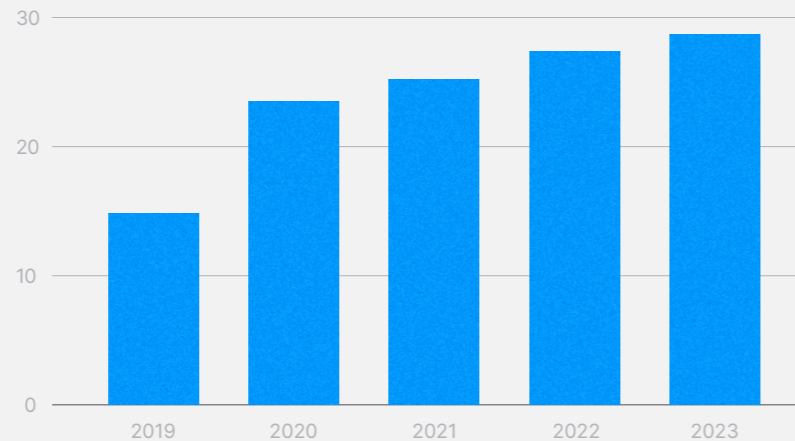
Blender continues with a single-digit growth, following the trend of 2020-22. The *blender.org* website and several of its subdomains have received a combined 30 million unique visitors.

This means that the Blender websites are still visited over 2 million times each month.

Monthly unique visitors on blender.org (millions)



Yearly unique visitors on blender.org (millions)

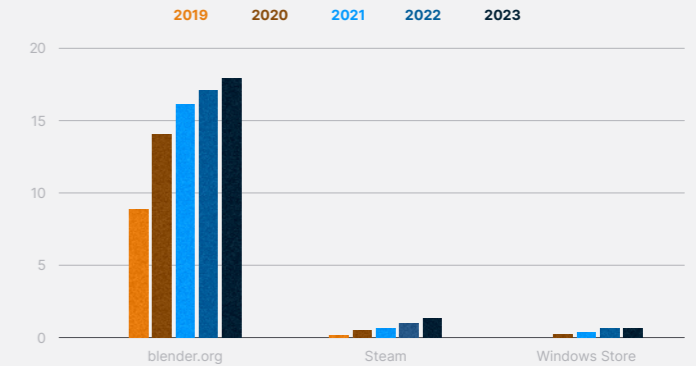


Blender Download Counts

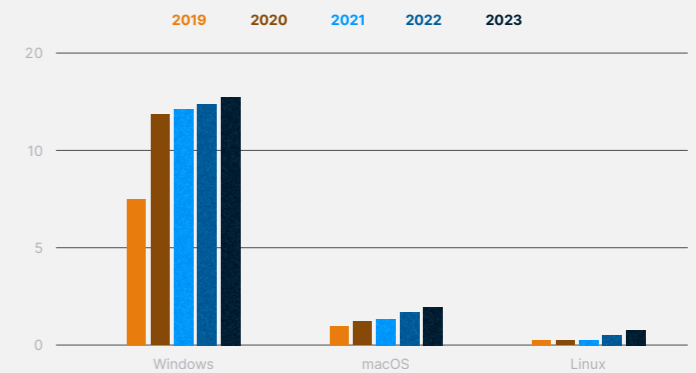
During 2023, Blender was downloaded almost 18 million times from *blender.org*, plus another 2 million times from other sources (Microsoft Store, Steam and Snap). This shows a steady growth, aligned with the traffic received by *blender.org*.

The distribution across operating systems slowly follows the trends of previous years, with Windows conceding a small percentage of users to macOS and Linux.

Blender downloads (millions)

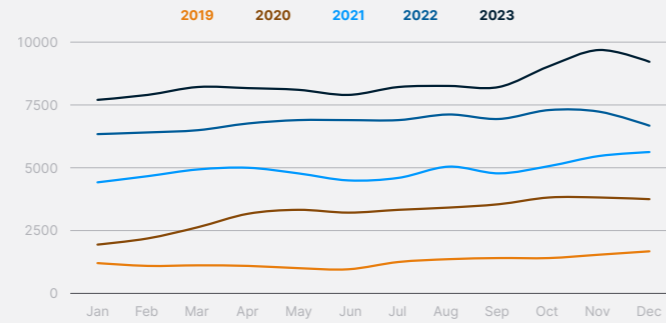


Downloads on blender.org by OS (millions)



Concurrent Steam usage continues to increase, almost hitting 10K in the month of December!

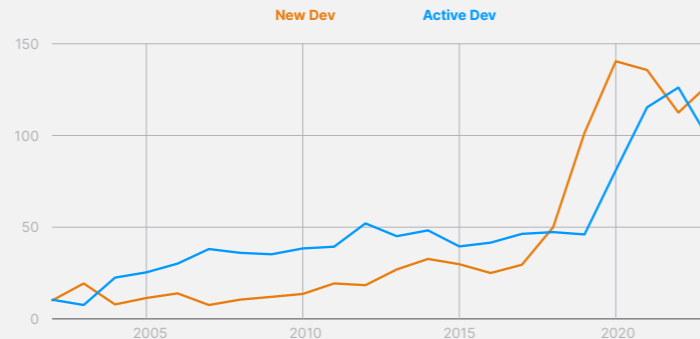
Concurrent users on Steam



Code Contributions

While code contribution rates have overall increases, there has been a change of trend from the past years, with active developers count decreasing. This is due to an adjustment of how contributions are counted, and the move to the Gitea development portal.

New dev and Active dev since 2002



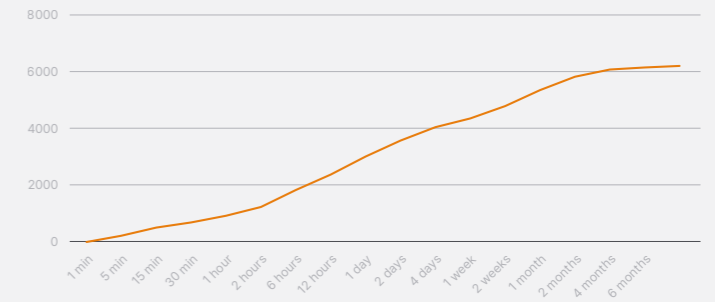
Development Portal

The new development portal allows for deeper analysis of activity patterns on the Blender project. This is something that we will further investigate in the upcoming year. Here is some information that surfaced from an initial analysis. Special thanks to Falk David for the data mining and data analysis.

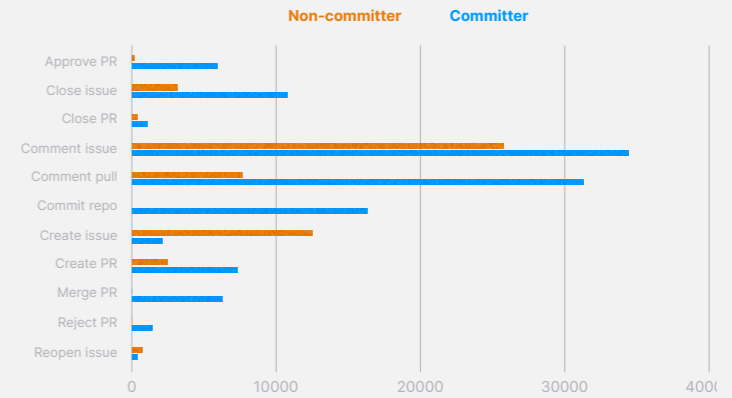
This chart displays the distribution of the resolution times for issues related to the Blender project. More than 50% of the issues get resolved within one week.

We can visualize the type of activity, grouped by contributor type (with or without commit access, as a way to summarily distinguish core contributors from occasional contributors or users).

Issue resolution timing in 2023

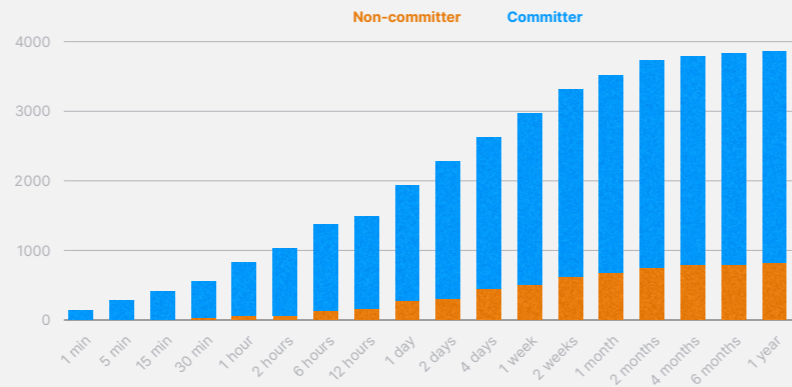


Activity distribution by type and contributor



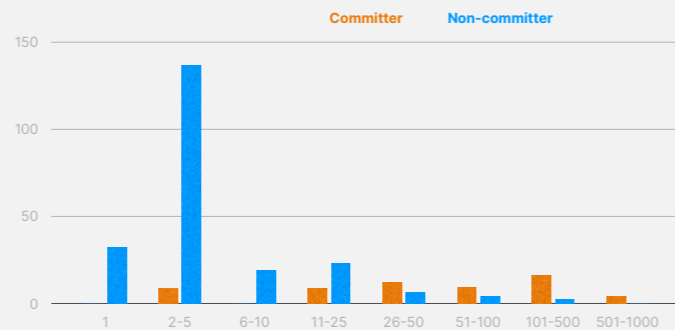
Here is the timing for approval of pull requests, divided between committers and non committers. 50% of the approved pull request were approved within two weeks.

Pull request approval time



Here is the distribution for created pull requests. 230 contributors without commit access created at least one pull request during 2023. The contributors with commit access who created a pull requests are were 64.

Pull request created distribution



This is just a sample of the data available on the development portal. There are plans to transparently aggregate and share more of it in the future.

To everyone who makes Blender possible:

Thank you!

