2022
BLENDER FOUNDATION ANNUAL REPORT

blender.org

Content

Message from the Chairman

The year of 2022 marked the ending of the pandemic but unfortunately also the beginning of a terrible war in the heart of Europe. In the light of millions of lives that got damaged, it feels humbling and bittersweet to work on something so small like the Blender project. Yet, I also know we have a real impact - at Blender we do something relevant that makes a positive difference for people all over the world. So let's talk about that.

Last year was a good year for Blender. We could finally meet again and do workshops, hire new contributors and attend conferences. The year wrapped with an absolute highlight the Blender Conference in Amsterdam.

After three years, seeing 700 people celebrating Blender in all its different ways was simply amazing. I've been glowing with delightful energy for many weeks.

Another significant event was the announcement of the Blender Lab, our initiative to **'seize the future'**; to get a team of top talents to prepare for free/open source 3D creation in the next decade. Organising and funding this will keep me occupied for the coming year.

On the business side some clouds have emerged. The tech industry experienced the highest layoffs since the dot-com bubble burst more than a few decades ago. For that reason, growth of donation income in 2022 stalled, with a decrease expected in 2023.

For the time being this does not affect Blender's projects though. In the past three years we've accumulated a healthy buffer that will help us through this dip for at least until mid 2024. I would like to end with a special thanks to everyone who made Blender even more awesome. Thanks for an amazing year, let's do another!

Ton Roosendaal

Blender Foundation board report

Starting with the year of 2022, Blender Foundation will deposit the annual financial report at the public Chamber of Commerce register. The following text is a legal requirement for such reports. In all of 2022, 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 sections 'the Blender Organization', pages 10 to 26, and 'the Projects 2022' from pages 57 to 79.

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. In 2023 the board will investigate acquiring the full ownership of Blender Institute B.V.

Chairman Ton Roosendaal
AMSTERDAM, MAY 2023

The Organization

The freedom to create
The Blender mission

BY TON ROOSENDAAL

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

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.

The freedom to create
The Blender vision

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

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

The freedom to create
The Blender vision

Story is my personal favorite

It 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.

The Blender Organization
The Three Entities

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.

The Blender Organization
The Three Entities

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. By the end of 2023 (for tax reasons not sooner), ownership of the Institute's shares will be transferred to the Foundation, making the Foundation+Institute a powerful combination. 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.

- **Mission** Get the world's best 3D CG technology in the hands of artists as free/open source software.

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

- **Activities** Blender pursues its vision and mission through several activities. Such activities are coordinated by Blender Foundation, a non profit organization, in collaboration with fully controlled subsidiary businesses Blender Institute and Blender Studio, who take care of the operational aspects. Institute and Studio are based in Amsterdam, the Netherlands and share an office space called Blender HQ.

The Blender Organization
The Three Entities

Community Contributions

WHAT

Contributions to Blender Modules, technical and user documentation, design, code, testing and QA, demo files.

WHO

Individuals and organizations with any background, from all over the world.

WHERE

Online on *blender.org* websites.

Development

WHAT

Contributions to Blender Modules. technical documentation, design, code. Strategic projects and initiatives. DevOps and infrastructure. Product leadership. Communication.

WHO

Blender Institute: developers, engineers, project managers, designers.

WHERE

Blender HQ Amsterdam. Online

FUNDING

Donations at *fund.blender.org*

Production

WHAT

Creative projects focused on pushing Blender development, developing and sharing Blendercentric professional production knowledge, such as training and documentation.

WHO

Blender Studio: a team of artists, TDs, developers and producers.

WHERE

Blender HQ Amsterdam. Online.

FUNDING

Subscriptions at *studio.blender.org*

The Blender Organization
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.

The Blender Organization
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.

FREE TECHNOLOGY

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.

FREE CREATIVITY

The Blender Organization
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. Currently 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.

Work has been done in 2021 to unify the looks and feel of all websites of the Blender organization. This has continued in 2022. Currently, the actively maintained websites for Blender are:

The main portal, for global information about our mission, structure and latest news:

www.blender.org

For developers and technical talk:

projects.blender.org	projects website for 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

The Blender Organization
Web Infrastructure

General data information:

lists.blender.org	mailing list server
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

The Blender Organization
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. 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.

The Blender Organization
Module Teams for Core Blender Development

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
Module Teams for Core Blender Development

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.

The Blender Organization
Module Teams for Core Blender Development
/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 Wiki**.

In 2022, some module teams started to meet more regularly, every week or couple of weeks, while other projects formalized their own tactical teams: Pipeline/Asset/IO, Eevee/ViewPort, Sculpt/Texture/Paint, and Grease Pencil were all new regulars to the calendars

The Blender Organization
Quality

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.

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.

Moving development platform: to Gitea!

In March 2022, a discussion with the community was started to figure out the future of Blender's development platform. The previous one, Phabricator, was no longer being maintained and had been deprecated a year back. After a few weeks of evaluations, Gitea was chosen as its next-generation development-forge. Compared to other available solutions, Gitea met more requirements than simply being available and usable: the SysAdmin team at Blender found it fit with Blender's mission of being a leading voice in Open Source advocacy. The Gitea project is very actively maintained, this gives the promise of it being built to last a long time and aims to deliver on a number of topics Blender had been wanting to have with Phabricator: more straight-forward project-management, CI/CD integration, and a more accessible process for code contributions.

The Blender Organization
Quality

Thus started the efforts to migrate from one platform to another. First off, Arnd needed to run tests to gather data and answer some questions. The goal was to define, precisely, what Gitea could actually handle and do, as well as determine the process to port all the development history and processes. One of the key challenges then was the difference in basic philosophies between Phabricator and Gitea - to put it simply, some of the core concepts of a forge like repositories, projects, teams, tasks/issues, labels, statuses have different meanings, different relationships between each other in each platform. With this first phase, a list of questions to tackle came together: some things that could be left for later, however there were a number of obvious

'must-haves' before even considering being able to switch.

While the team at Blender started working out some issues, discussions started to set up a support agreement with the Gitea project. The idea was to have them support Blender in its migration by funding work on missing features, code and bug fixes that would be fully available to Gitea users under Gitea's MIT license.

This project touched one of the core modules of the Blender ecosystem, it was a big endeavor. After a few months of Arnd working on this mostly by himself, in parallel to his other DevOps duties, the migration was still underway by the end of 2022. In January 2023, a task force of Blender

core developers was set up to finalize this process - the end of this journey will then be part of next year's annual report!

To learn more about this process, you can go read Arnd's series of articles, as well as watch a series of videos he shot:

https://code.blender.org/2022/07/gitea-diaries-part-1/

https://code.blender.org/2022/08/gitea-diaries-part-2/

https://youtu.be/M3zIldWMMo0

Back on the VFX reference platform

In September, Dalai Felinto announced on the code.blender.org website that in 2023 and 2024 Blender would be fully compatible with the VFX Reference Platform specs.

Besides helping studio integration, this will facilitate ongoing development to integrate Hydra render delegates with Blender, which requires more strict dependencies alignment. In Q3 of 2024 this decision will be reviewed based on feedback collected on the blender.org channels: code.blender.org, devtalk.blender.org, and mailing lists.

The Blender Organization
Quality

Currently, the official Blender 3.3 LTS is compiled with Python 3.10 making it incompatible with the VFX Reference Platform of 2022. However, there is a new build option in the blender-v3.3-release branch to compile Blender with Python 3.9 support.

As part of its ongoing outreach effort, the Blender development team is open to hear from professionals working in a pipeline that needs integration with Blender and relies on VFX Reference Platform compatibility. Organizations and studios are always welcome to join the conversation and be an active part of the development process.

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.

The Blender Organization
Offices - Blender Headquarters

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 1320m² 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.
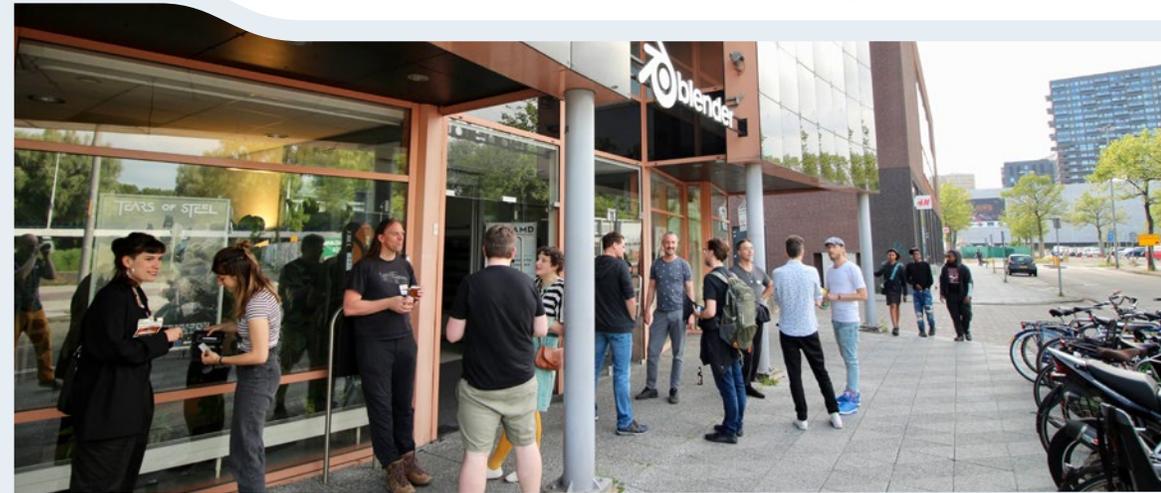
20 years of Blender

Twenty years of free and open source software

A summary:
Blender's impact in film
Milestones in Blender's movie history

BY JIM THACKER

↑ Young Ton Roosendaal at the start of the Blender adventure

My career as a visual effects journalist coincides almost exactly with Blender's existence as an open-source application. As the new editor of the newsstand magazine 3D World, one of the first stories I ever commissioned was on the original Free Blender crowdfunding campaign, followed a few years later by a series of production diaries from the set of the first Blender open movie.

Later, as the editor of the technology news website CG Channel, I covered subsequent, more ambitious attempts at open movie-making, the industry's own shift towards open-source technology and, eventually, Blender's use in the production of Oscar and Emmy Award-winning films.

The next pages represent my pick of the milestones in Blender's movie history: the key steps (and occasionally, missteps) along its path from initial release to industry staple. It isn't a definitive history, but I hope that it gives an idea of how the software was seen by outsiders: not the diehard open-source advocates, but those engaged in the day-to-day business of making movies.

About the author
Jim Thacker edits the technology news website CG Channel. He was previously editor of 3D World magazine, has worked on books from Focal Press and Design Studio Press, and has been a technical writer for a lot of CG software developers, including, on occasion, the Blender Institute itself.

2002 – 2006:
Free Blender

If anything, the need for open-source 3D software was even greater in 2002, when Blender was first released under the terms of the GNU General Public Licence, than it is today. This was a period when the main applications used in visual effects and feature animation cost thousands – in some cases, tens of thousands – of dollars, leading many students and freelance artists to resort to cracked software, while some studios were still using IRIX-based SGI Octane workstations in production. (As the decade wore on, most would be recommissioned as display cabinets or beer fridges, while their rendering duties were taken over by much less expensive Linux boxes.)

Yet the open-source apps bulking out the cover discs of contemporary computer graphics magazines were, by and large, an unprepossessing bunch: programmers' pet projects, or hobbyist tools intended for teenagers looking to mod video games. Two things

↑ ↑ Workshop in July 2005 to prepare Elephants Dream
↑ ← Bassam Kurdali, Ton Roosendaal, Andy Goralczyk
↑ → Clay sculpts for characters Emo and Proog

2002 – 2006:
Free Blender

separated Blender from the pack. Firstly, ambition: even before the first open-source release, Ton had established the non-profit Blender Foundation, meaning that right from the start, Blender was developed not by a loose-knit community of bedroom coders, but through an organization akin to a commercial software developer.

And secondly, the size and dedication of its user base: long before Kickstarter, at a time when just buying things online was still a novelty, the Free Blender crowdfunding campaign was able to raise the €110,000 needed to buy the source code back from investors in Ton's previous company, *Not a Number*. There was still a long road ahead of it, but Blender was on its way.
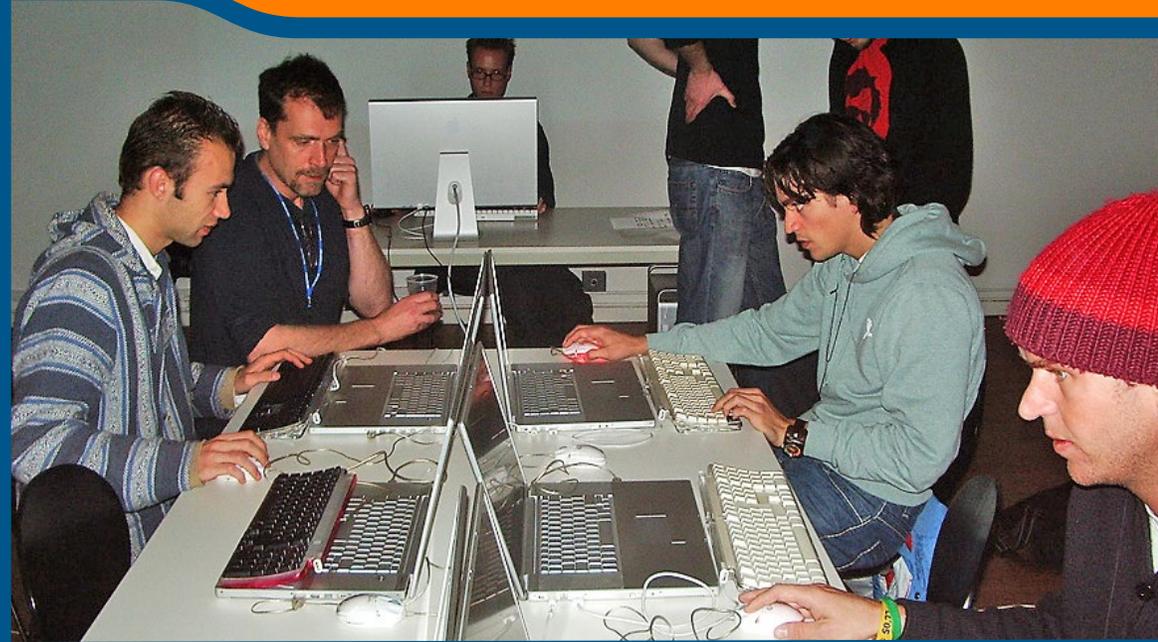
↑↑ November 2005, Blender training workshop with Netherlands Film Institute
↑← Orange was the code name of the project then
↑→ Workshop in July 2005 to prepare Elephants Dream

2006 – 2011:
Developing by doing

Another thing that distinguished Blender from most other early open-source graphics tools was Ton's insistence that it should be possible to use the software in production – or at least, under conditions similar to those of a commercial production. And so, in 2006, work began on *Elephants Dream*, the first Blender open movie.

'Movie' is an ambitious description for what is actually a nine-minute animated short, completed at a fraction of the cost of a typical Pixar production. But the €120,000 budget – raised through pre-orders of DVDs and a grant from the Netherlands Media Art Institute – meant that *Elephants Dream* had a price-per-frame in the same ballpark as indie animated features of the time.

More importantly, the new render pipeline created during its production became part of the public release of Blender: a pattern of developing by doing that became formalized in 2007 with the foundation of the Blender Institute to oversee the production of future open movies.

↑↑ November 2005, Blender training workshop with Netherlands Film Institute
↑← Orange was the code name of the project then
↑→ Workshop in July 2005 to prepare *Elephants Dream*

2006 – 2011:
Developing by doing

As a promotional tool, Elephants Dream was something of a mixed blessing: dark, semi-abstract, and adult in a way that most English-language animations of the time were not. But its successor, 2008's *Big Buck Bunny*, was a viral hit, channeling an underlying streak of cartoon sadism into a more familiar Looney Tunes format.

Its cast of cute (ish) woodland critters – released, like all of the other assets from the short, under a Creative Commons licence – proved irresistible to marketers, with images from the movie popping up in everything from pamphlets for the Boy Scouts of America to ads for Google phones. Awareness of Blender began to spread outside the open-source community.
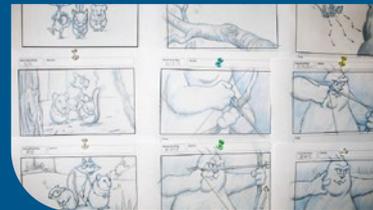
↑↑ The Blender team at the Big Buck Bunny premiere, 2008
↑← Storyboard plates from *Big Buck Bunny*
↑→ Still from *Elephants Dream*

2011 – 2014:
Conquering Hollywood by stealth

Between 2003 and 2011, there were 33 major public releases of Blender: a development schedule on a par with commercial applications. The frequency and regularity of the updates reassured potential users that the software wasn't about to disappear overnight – not always a certainty with open-source projects – but while professional artists would have regarded the new features as "good", many would have qualified that assessment with the caveat, "for free software".

That changed at the end of 2011 with the release of Blender 2.61. Cycles, the new render engine that it introduced, was a production-capable ray tracer before ray tracing was common in movie production: at the time, Arnold was best known as Sony Pictures Imageworks' in-house software, while V-Ray was still largely an architectural renderer.

The following year, open movie *Tears of Steel* brought new camera tracking, compositing and grading tools – things that commercial visual effects applications tended to throw in as afterthoughts – and by the time Grease Pencil 2.0 was introduced later in the decade, it was clear that Blender was beginning to do things that no other 3D application could.

↑ On set for *Tears of Steel*, the only live action Open Movie yet, directed by Ian Hubert (2010)

2011 – 2014:
Conquering Hollywood by stealth

Meanwhile, major studios were taking their first steps towards open-source, albeit in the form of pipeline technologies like OpenEXR and Alembic: the idea of open-sourcing an entire in-house tool, as DreamWorks would later do with its MoonRay renderer, was still unthinkable.

As they did so, Blender began to move in from the margins. At the start of the decade, its largest users were firms in Asia and South America, some of which had switched over from cracked copies of commercial software; by 2014 it was being used on the Oscar-nominated *Song of the Sea*.

The following year, Pixar revealed that Blender was one of the third-party 3D applications that the studio supported for use internally, and the software finally had Hollywood's seal of approval.

↑ On set for *Tears of Steel*, the only live action Open Movie yet, directed by Ian Hubert (2010)

2014 – 2019:
(Mis)adventures in open movie-making

But in the second half of the decade, it often seemed that the goal of the Blender Institute was not to seduce Hollywood, but to set up in opposition to it. In 2014, the Institute announced Project Gooseberry, a crowdfunded feature-length animation, to be pro-duced by a network of decidedly non-California-based studios, including the Oscar-winning Autour de Minuit.

While crowdfunding had worked for Blender itself, it failed to scale to movie production, with the project securing just under € 300,000 of its initial

€ 500,000 target: not far off the record for a crowdfunded animation at the time, but a long way short of the €3.5 million needed to complete the film, and orders of magnitude less than a typical Pixar or Disney feature.

Project Gooseberry was eventually scaled back to a short, the surreal *Cosmos Laundromat: First Cycle*, and went on to win several major animation awards, plus a nomination for a Webby Award, almost certainly making it the first short film about a suicidal sheep to be shortlisted.

↑↑ Stills from *Agent 327*
↑← Ton Roosendaal and Francesco Siddi preparing the 2016 Annecy Festival MIFA booth with an *Agent 327* banner
↑→ Online *Cosmos* banner for the premiere

2014 – 2019:
(Mis)adventures in open movie-making

The Institute had a second try with the more conventionally commercial *Agent 327: Operation Barbershop*, an adaptation of the Dutch comic series, produced as a teaser for a full-length animated feature. But while the trailer, directed by former Pixar artist Colin Levy, was well-received on its release in 2017 (this time, it actually won a Webby), the movie itself has yet to materialize.

However, not all of the work was in vain: the Blender Development Fund, Blender's crowdfunding platform – introduced in 2011 and relaunched in its current form in 2018 – was to play a crucial role in the next chapter in Blender's story.

↑↑ The Blender HQ team in front of the new office building in Amsterdam Noord, 2018
↑← The Blender art team (Colin Levy, Hjalti Hjálmarsson, Beau Gerbrands, Pablo Vazquez) hard at work on the Agent 327 project
↑→ Still from *Agent 327*

2019:
The breakthrough

Throughout the 2000s and 2010s, Blender's interface and workflow had been stubbornly, even defiantly, different to that of other 3D applications. 'Just because everyone else does it, that doesn't mean it's right,' seemed to be the prevailing opinion in the development team.

That's undoubtedly true, but for software to be adopted on large projects, studios need to be able to call on enough freelance artists to get them through crunch periods, and the way that Blender did things deterred many freelancers from making the switch from commercial tools. (The convention that you right-clicked rather than left-clicked to select things was a particular turn-off.)

But in 2019, following an unprecedented two years of development, that finally changed, with what was to become

the most significant update in Blender history since the original open-source release.

Not only did Blender 2.80 standardize Blender's interface and dispense with the default right-click, but it introduced Eevee: to this day, a more capable viewport renderer than those in most 3D applications, and a real unique selling point at the time.

The images that early users, like Lucasfilm concept artist Jama Jurabaev and Daniel Bystedt, then Head of Modeling at Goodbye Kansas Studios, produced with it would prove invaluable in building a buzz ahead of Blender 2.80's release.

Under the hood, the update overhauled the dependency graph, improving performance on large scenes, and introduced the Collections system, making it easier to manage assets in

↑↑↑ Part of the team discussing developments during the BCON19. Credit Jelmer de Haas

↑↑ Geometry Nodes developer Jacques Lucke presenting his project at the Blender HQ, February 2019

↑↑ Francesco Siddi, Hjalti Hjálmarsson and Andy Goralczyk decorating the new studios, November 2019

↑ Still from Spring

2019:
The breakthrough

production. Suddenly, Blender began to look like a viable proposition not just for teams of 20, but of 200.

Outside the core software, there was a growing ecosystem of third-party add-ons, available through sites like Blender Market. Plugins have been key to the success of many professional applications, expanding popular toolsets in more focused ways, and some of those add-ons, particularly hard-surface modeling tools like Boxcutter and HardOps, proved to be a major draw to new converts.

Blender also benefited indirectly from the massive success of Fortnite, some of the profits from which Epic Games redistributed to the industry through its MegaGrants program. The $1.2 million it donated to the Blender Development Fund over a three-year period convinced

other tech giants to do likewise – Amazon, AMD, Apple, Google, Intel, Meta, Microsoft and NVIDIA have all contributed to the fund – funding a rapid expansion of Blender's development team.

Convinced by the positive PR, major studios began switching to Blender, with both Ubisoft Animation Studio and anime powerhouse Khara, Inc. announcing that they were adopting the software as their primary production tool.

By end of the year, even skeptics knew that the Blender of the 2020s would be a very different beast to the Blender of the 2000s, or even the 2010s, and as smaller commercial tools faltered, switching to open-source became not just a viable strategy for freelancers, but a career survival strategy.

↑↑ Anja Vugts-Verstappen, long-time friend of Ton, financial manager and well-known manager of the BCONs merchandise booth. Credit Jelmer de Haas
↑← Still from *Spring*
↑→ Ton and dr. Sybren Stüvel, holding one of the Suzanne Awards. Credit Jelmer de Haas

2020 – 2023:
Living up to the hype

The problem with extraordinary growth is that people expect it to continue, long after they have forgotten that it is extraordinary. While enthusiasts might have hoped that by now, Blender would dominate movie production, the past three years have been more about consolidation than conquest.

While the software remains widely used for asset development, its adoption in other parts of production pipelines has been slower, with the long-awaited overhaul of the character animation tools now scheduled for completion in 2025.
And in 2021, Blender lost one of its highest-profile users, the Emmy Award-winning Tangent Animation,

prompting an acrimonious online debate about whether the studio's closure was the result of its Blender-based pipeline, or its subsequent decision to abandon it. (For what it's worth, it was probably neither.) Nevertheless, Blender continues to be used on high-profile projects like Netflix's *Love, Death & Robots* and Amazon Prime Video's *Undone*, while the Blender Development Fund receives over €130,000 each month, helping to pay the salaries of over 25 full-time developers.

The software even has a grown-up new release schedule, having recently moved to a two-year cycle with regular long-term support releases.
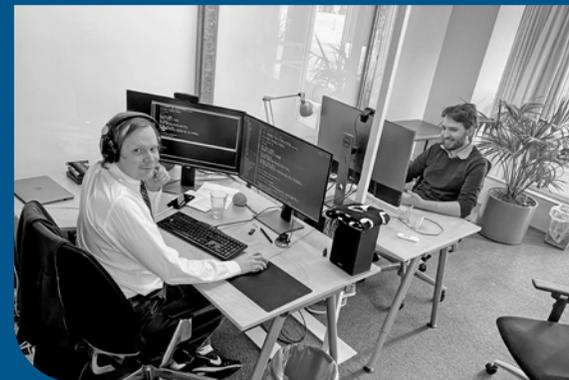
↑↑ Still from the 1980s horror movies' inspired *Sprite Fright*
↑← Core Blender members and main engineers Sergey Sharybin and Brecht Van Lommel, working on Cycles X
↑→ Tangent Animation's presentation during BCON16 (Ken Zorniak and Jeff Bell)

2020 – 2023:
Living up to the hype

As the recent decision (thankfully quickly reversed) to break with the VFX Reference Platform reflects, it doesn't always do what visual effects facilities expect, but then, it probably never will: Blender is an application whose development is dictated by the needs of millions of individual users, not a handful of large studios.
As it hits 20 as an open-source appli-cation, Blender is no longer a preco-cious child or a rebellious teen, but it's a long way from sinking into middle-aged conformity. The software has taken on adult responsibilities without losing the youthful desire to shake up the established order that has taken it from the hobbyist community to the very heart of the movie industry. Here's to another 20 years of rule-breaking.

↑↑↑ Still from the Eevee-rendered Open Movie *Charge*
↑↑← Still from the Eevee-rendered Open Movie *Charge*
↑↑→ Still from the 1980s horror movies' inspired *Sprite Fright*
↑← Still from the 1980s horror movies' inspired *Sprite Fright*

Points of view on Blender:
the impact on people

BY FIONA COHEN

What have we achieved in twenty years? What impact did Blender really have on people, the animation industry or the software world?

Keeping in mind that honest feedback will always make us grow stronger, Ton wanted to interview people outside the organization, all with different perspectives and relationships with Blender. People who played a role in Blender's past, for some, and who also have an independent business so they can share their outsider's point of view as well. We reached out to them explaining that those conversations were not meant to be a promotion piece, we encouraged honesty and distinct view points or recommendations.
For those who worked with Blender and

Ton, I poked their memory to better grasp what the project had been, at the beginning. How was it perceived then? And since, what do they think of our track record? Can they point out strategy errors? Is Blender still relevant in their eyes? And above all: what about the next twenty years?

Through all four different points of view, a clear consensus emerged: for people who have followed the project or known Ton for a long time, Blender is above all a great tool linked to great memories. Times at the BCON, meeting passionate people, the

amazing community, or times working on a project, be it a crappy experiment or an award-winning feature, with all the possibilities the software can offer. The fun. The joy. The freedom. Thus, I wish to present those four conversations as a way to recognize past accomplishments and stories that have shaped Blender into what it is today. And next to this, take the opportunity to look into what lies ahead. To the next chapters!

The interviewees' words have been edited for clarity

About the author
Fiona Cohen is an animation producer and project supervisor from France. During her 7 years of working with producers and studios to make animated short films, series and feature films, she discovered Blender at Autour de Minuit in 2018. Then started a journey of curiosity and learning, diving more and more into the Blender technology and its community. She visited Amsterdam in October 2022 for the Blender Conference and got to experience the full power and thrill of the project.
In February 2023, she joined Blender Studio as a producer, managing movies, editing the Studio website and taking care of Blender-global tasks like the writing and editing of The Blender Foundation Report 2022.

Jon Peddie
industry wiseman

Does Jon Peddie need any introduction? In our industry, at large, his reports have accompanied hundreds of companies and, with over 35 years of working in the business, he has given his consultancy to many CEOs and CTOs. His website presents him as a recognized pioneer in the graphics industry, president of Jon Peddie Research, and named one of the world's most influential analysts. When Ton contacted him to offer the interview, Jon responded with much enthusiasm and even started digging into his memory of their relationship. Indeed, the two men have known each other for more than 20 years now, meeting at conferences over the years, often gathering over dinner - *"Ton knows his food and wine!"* - after meeting during the Not A Number years. A strong bond connects Jon and Ton, as they share the same appreciation for honesty, directness and, you got it, a good meal.

With his wide knowledge of the international market, spanning hardware and software evolutions for decades, what does Jon Peddie see in Blender?

"Blender was fully functional in 2000, it only got bigger and better", he explains. *"Ton's vision was to design a universal pipeline for 3D animation, in the nineties, to make movies."* Nothing like it existed then, studios were juggling with different softwares, if any. Ton's ambition was to streamline the processes to put back the creators at the center of the experience: here we can already hear the premises of today's core value, The Freedom to Create.

When the internet bubble popped and Not A Number ended, Ton reflected on his experience so far: *"since he had been dealing with struggling entrepreneurs and artists, he knew that there was a population there - that's when the open source idea came"*. Jon recalls the night that his developer friend told him that, during a nice dinner: *"It was like a switch went off. He went from mildly depressed to enthusiastic, with his face lit up"*. Jon's first thought? *"Don't do it!"* He couldn't imagine anyone making a living out of this, *"selling manuals"*, and was worried about

his friend. He could see that, while many people working on open source projects were doing it on top of their day job, Ton was going to go all in and make it his primary activity: *"He was gonna live or die on this. I'm thinking, you know, he's not fat to begin with, he doesn't have a lot of weight to lose without eating!"*. However, Ton's vision proved him right, finding like-minded people to build the project and ways to have a line of income: *"he actually managed to support himself selling manuals, as he thought!"* Regarding Ton himself, *"he's self-actualized, he genuinely is [because] he has realized his dream!"* As history will have it, Blender managed to deliver

Jon Peddie

on its core goal: *"Blender's biggest achievement is to have given the industry the first functioning linear tool."* Although, as Jon Peddie recalls it, the open movies might be the project Ton is most proud of: when the first open movie came out, *"if [Ton] could have floated he would have."*

How relevant is Blender today, according to the experienced analyst? *"It's a vehicle"*, with so many bright people working on it. With communities working together, like when computers got started: *"you would gather and share, show each other's code [so it taps] into the DNA / spirit of the field."* Like a Volkswagen, it is *"a tool for everybody, and anybody"* - plus *"it's got too many bright people working on it.[...] I would say that probably every studio in the world is using it - not necessarily 24/7, but for something, for a tiny part even."* That is if you consider only the movies, which Blender is not even restricted to! In 2010, Jon recalls asking the Pixar or Dreamworks team (he can't remember precisely) if they

were using Blender, or considering it: *"they said very cautiously, wondering if they were going on record and I was going to write an exposé on it, 'uh we're looking at it, it's - interesting'. So I wrote a note to Ton saying that this big studio was gonna use Blender - and Ton already knew!"*. Even when people couldn't believe that Blender was as good as others said it was, the project gained more users and contributors. *"It was really a grass root growth."* The community at work, again.

Nowadays, Jon Peddie sees Blender as a *"a full member of the open source world"*, and, in the CG world at large, Blender is *"no longer a curiosity or a question"*. While it is now firmly installed in the landscape, it still carries its singularity: *"Blender brings a robust set of tools, functions and libraries, as well as a user interface that developers understand and quickly relate to."* A strength that the analyst clearly attributes to the open source nature of the project: *"it is made by the people who use it. And it will perpetuate because

they want to use it - they'll keep it alive."* There were a couple of missteps, like the Ray Tracer: *"It didn't work out to people's expectations. It was a good tool, but [the problem was mainly] the materials' library, then other Ray Tracing softwares that were selling for very expensive rates became available for free."* Still; Blender managed to grow and get robust, while staying relevant for the users and interesting enough for developers to remain invested.

When I asked Jon, a long-time friend of Ton, about the doubts expressed by Blender's creator, he was quick to respond: *"It's his cross to bear, he's doing that to himself!"*. Ton's impression that Blender can be seen as not accessible, or apart from the global open-source movement is not well-founded: *"If you do a survey of the industry, you'll find out that they don't share that view. But let him have that! Keep him hungry!"*. As the founder and leader, Ton both has a very specific point of view on Blender's place - maybe even skewed - as well as an obvious responsibility

Jon Peddie

in it. So keeping him on his toes, always, is another way of getting the project to move forward, asking the hard questions and improving.

We then talked about the project's relationship to big corporations, subject to criticism in the past: *"Every organization needs patrons"*, and yes, often one or some of the FAANG get involved. *"Since there's no advertising involved or attempt at ownership of the final product, if those companies and organizations feel generous - and it is generosity, not charity - then yes, I think you should accept it. I don't think it diminishes the open-source-ness, reputation or objectivity of Blender."*

The broad picture is nuanced though, as Blender has patrons in various corners of the industry, as well as many private individuals contributing. And, as it's always been said and enforced, the project keeps its independence, So, we could look at other entities to work with, and we are - Jon Peddie encourages

the project to broaden the scope furthermore: *"The analyst in me, I would start identifying the industries that benefit from using Blender - look at who uses content-creation software in other, in every industry?"* Jon wouldn't go into specific recommendations though, as he says *"anytime I've done that ,Ton says 'yeah I know, I've already talked to them' - He's always two steps ahead of me!"*

As we start the project's journey into the next 20 years, Jon believes that *"Blender will still carry on - it does need a leader with a vision otherwise the direction will wander, to whatever the current crisis is in content creation"*, influenced by the outside. As many people in the industry, he senses that the next step has to do with AI. *"Tell the computer to do [things], to do what you want. [..] Work on an AI interface."* Isn't Jon Peddie afraid of the effects of AI on the quality of projects, or on the people working on them? *"Now, everybody's a creator. It will all come down to, not the mechanics of Blender, but*

the quality of your story." He sees this next step as a natural progression, one similar to others before: if you divide people between the technical ones and the artistic ones, even if you give more technical means into the hands of the artists, they'll still reach *"the limits of [their] own use. [Blender users] will still get to a point where they're not quite getting what they want, which is when you reach a tipping point; they'll still want to see what's behind the curtain. Maybe you don't become a coder, but a tweaker."* In other words, like other technical innovations, AI will put more possibilities into the hands of more people; it will give more direct access and power over tools and results many couldn't reach before. Still, it will have a limit, and other people will still have a purpose in helping cross that new boundary.

For Blender's organization itself, the analyst recommends we hire a person for... data analysis. *"Look at the communication's traffic [...] are we at a steady state, or are we falling off somewhere?"*

Jon Peddie

Do some auditing: quality control, keep an eye on the global and the details so that we can fix things when they slip or pinpoint what people don't use - a more difficult thing to track, in contrast to bug report. As he remembers, *"Ton is always thinking about how to make Blender better."* I gather that a person dedicated to gathering intelligence and helping turn those info into actionable items would ensure that this spirit endures. With time, Blender could become one of those open source projects that rallies (almost) everyone into building industry-standard tools. A common basis for more innovation, like Khronos: *"they make Vulkan, an API software that allows communication with the hardware. They are an open source organization as well, they invited various companies trying to build software drivers to come together and build an API that [they] would want to use, efficient. It took a lot of diplomacy, and it worked"* which allowed the mobile phone manufacturers to align on important things and then the market to skyrocket.

Participate in change, rally organizations, keep a close eye on the quality: can Blender lead tomorrow's innovation?

Nicolas Schmerkin
daring to create

Nicolas Schmerkin is a French award-winning producer. Founder of the independent production company Autour de Minuit in 2001, he then created the animation studios ADV Studio (2011, Paris) and Borderline Films (2014, Angoulême). Known for impertinent, quirky and experimental movies, his company has produced around 100 short films, 5 series, 7 TV Specials and recently released its first feature film, *Unicorn Wars* - most of them using Blender, since its introduction in their pipeline in 2008. I should mention right from the top that I worked at Autour de Minuit for four years and thus know Nicolas quite well - it is through working alongside him that I met open-source enthusiasts, discovered Blender and, well, ended up writing this article. Having seen first hand how much Blender contributes to the projects Autour de Minuit produces, it only made sense to dig into the history between the two.

It must have been 2007, when Autour de Minuit (ADM, for short) was still a small experimental lab for filmmakers. Mathieu Auvray, mostly known in the Blender community as the director of *Cosmos Laundromat*, is the first to mention Blender to Nicolas. He was then a champion of After Effects, the compositing tool of the Adobe suite, but he wanted to go into CG and was inspired by a short, Meischeid, directed by Chilly Gonzalez - where music and effects come together in a poetic way. It's not until 2009 that this interest for Blender turned into something tangible, on the pilot episode for Babioles: *"It was really a director's choice, and he managed to convince other After Effects 'bidouilleurs' [DYIers who like to experiment] to join and give it a try"*. Manu Rais, one of those new converts, then stayed and became the pipeline supervisor of the studio for almost 10 years, later joining Blender-based French studio TNZPV as their CTO. At the time though, Autour de Minuit may well have been the only studio in France to use the open-source software. *"It was only beginners, we lacked skills in rigging, in animation, no one worked on Blender back then. We had to hire people who*

Credits Eric Delage

were not animation professionals, based all over France, who had learned Blender for fun." Still, for Nicolas this choice to try a new software didn't really pose a question. As a non-technical person, he was mostly curious because of the experimental and explorative appeal. It was exciting to get out of the big business loop and, although it might be tempting to think of the open-source software as one less line

Nicolas Schmerkin

in the budget, the logistics proved to be complicated: *"Despite what it may seem, it wasn't a money-driven decision, we had to train so many people on our own."*
What made the production company stick to Blender, then? As the projects added and the studio grew, the need for skilled professionals grew too. *"After Babioles we did the first short-film for Jean-Michel, the first fully-made CG film in Blender, then a short called Francis, then the first projects around the platypus No-No. Still with Mathieu, still using Blender."* And in 2012, when the series for *Babioles* went into production, the Blender seed had grown into a bigger, fuller and more diverse community. Patience proved to be key! With small projects, shorts and small series, Autour de

Minuit built its network of Blender people, which then evolved and grew as the projects grew bigger, until the 52 episodes of No-No, the series, were entirely made on Blender in 2017-2018. *"We even managed to get our service provider for animation, TeamTo, to work on Blender"*. Nicolas recalls feeling a great sense of pride back then, being the first ones to do so: convince a big studio to adopt their pipeline, and making all of this volume of animation 100% in Blender.

After a few years of hearing the name on a regular basis, Nicolas grew familiar with the Blender ecosystem and its founder. *"I can remember meeting Ton and discussing render farms. At the time the Institute people were using some red Ikea metal drawers to host*

their farm, so we did the same, built it ourselves too. With Blender we even found inspiration for the hardware!" he jokes. Though, from the start, Mathieu had brought a plethora of information with the DVDs and manuals. Also, Ton's idea of using the production of short films to develop specific features had already been noticed by the team at ADM. This was unique and inspiring. When I talked with Nicolas, what stood out to me was how much this was a story about people, again. As

a producer, technology is one tool, it could be many other ways. However with Blender it led the ADM founder to meet key people he's kept close with for many years, people who shaped the studio as much as Blender shaped their view of the animation industry. On the critically-acclaimed short *Peripheria*, Christophe Seux joined the team and filled a key position that they had been struggling with: rigging. As it turned out, in 2014 there were only a couple of people in France

Nicolas Schmerkin

who could call themselves competent Blender riggers. A collaboration that proved fruitful in more than one way: for the *No-No* series, Christophe did all the setups for the characters but then had to leave for another project - no negative feedback came from Team-To, which animated all 52 episodes of 7 min each - more than six hours of animation without an issue on the rig (or at least, functional enough for the teams to deliver), a rarity in the industry; years later, the same Christophe created the cornerstone tool to transform *Unicorn Wars* into a fully 2D-looking film. Today he is still one of the key supervisors and developers at ADM, while participating in other productions. He would hate me for saying this, but he is one of the most well-known Blender technicians in France,

having worked on multiple features, shaping entire pipelines with his expertise and specific eye for pipeline design. I have been around enough studios to know it's not far from the truth, at all.

One of the unicorns from *Unicorn Wars*: modeled, rigged and animated in 3D, then converted into Grease Pencil 2D objects via the GP Tracer, a tool developed in-house by Christophe Seux.

Because Blender was part of the Autour de Minuit DNA, people stuck around, people who had a taste for experimental or odd projects, people who had the desire to be part of this gigantic community of developers and artists. Because Blender is lighter on the ADM pipeline, some short films

↑ One of the unicorns from *Unicorn Wars*: modeled, rigged and animated in 3D, then converted into Grease Pencil 2D objects via the GP Tracer, a tool developed in-house by Christophe Seux

were made possible thanks to it. Projects that then gave voice to international artists and directors, from countries where there is less money for cinema - like Argentina, Chile or Czech Republic. Another story about people, the opportunities Blender created, and, dare I say, the Freedom to Create. At least, that's what I see from my corner of the narrative.

I'm pretty sure that Nicolas Schmerkin, as strong-minded as he can be seen on the producing scene, would have done many of the projects he did with or without Blender.
He is tenacious. However, having the right tool put a lot of grease in the gears of his studios, and it also allowed him to distinguish himself furthermore and sharpen his tongue.

Nicolas Schmerkin

In 2014, he recalls *"starting to raise my voice at the animation schools during a conference, to push them to teach Blender. I became an advocate for Blender, unintendedly."* Almost a political posture, in a conservative industry. People were surprised that such a software could be used professionally, and even though they were starting to recognize the open-source name, no training really existed: *"the CNC [French Center for the Cinema] didn't listen back then".* When Adobe and likes started to raise their fees and change to a monthly-subscription model, more studios started to listen though. But it took years for schools to start incorporating Blender into their curriculum, and it is still a work in progress. *"The only issue I can recall, really, is when others [studios, people]* *don't want to work on [Blender]. When you're splitting the work, for instance."* There's also the obvious issue of the software not being production-ready or the projects straining its possibilities, like on *Peripheria*: *"We had to work on Photoshop because Grease Pencil wasn't even an alternative yet."* The team may remember the project as a very hard one to make, although the producer adds *"I've almost never heard people doing one project with it and complaining afterwards; rather the opposite."*

Working in an industry always looking for innovation although often reluctant to alternative models, what has been Blender's impact on cinema? *"Blender is made for the users, by the users and yes, it had a real impact on independ-* *ent cinema: I Lost my Body [directed by Jérémy Clapin, winner of the Annecy Cristal, two Césars and going all the way to the Academy Awards], Flow [directed by Gints Zilbalodis, currently in production], they were all possible thanks to Blender. It opens the door to experimental cinema, and it may even allow the junction from short to feature film."* Not just that, but I know first-hand how high Nicolas' expectations are: *"With ADM we've always ambitioned to make beautiful images, even for kids' shows. Blender allowed us to do it, for a lesser cost."* In that sense, studios using Blender both pushed for a more mature cinema, as well as tried to elevate the artistic ambitions of a genre too often abandoned (cartoons for kids). Today, Nicolas wishes we wouldn't see studios using Blender as revolutionary. For many years now, the software has shown it can handle producing high-quality content. *"One thing remains to be seen though; could Blender handle a big 2D series? With puppet rigs? There's a big push to do in that direction, so that it can get to the same level as its 3D side and other 2D softwares".* A wish that should be fulfilled in the next couple of years as the Grease Pencil tool is getting a makeover, with first a full rewrite to make it ready for the array of features 2D artists have been dreaming of.

What about further away in the future? *"The AI thing can be scary, even polarizing in the industry. We already see that in the grant application process, in the committees."*

Nicolas Schmerkin

The French producer doesn't really believe AI would be a good direction, and neither the AR/VR one: *"Only a few projects use that, however the real time side would be interesting."* Nicolas confesses again that he is not the best placed person to talk about the technical side of Blender. *"Above all, I wish it remains independent, and that the Blender Studio keeps on produc-ing movies. Maybe also, I don't know if that already exists, to have more official means of sharing the devel-opment updates from the different studios [using Blender]."*
And, as my former colleague Mario Hawat proclaimed in our talk dur-ing the BCON23, the 'Holy Grail': everything in Blender. *"One software can really do it all. We need to fill the gaps and improve what still isn't*

optimal. Editing the film, pre-editing the sound?"

It was quite interesting to dig into that side of Nicolas' memory and vision. Over the years, I became more and more interested in Blender, working on building innovative pipelines and defining new tools; the endless pos-sibilities were mesmerizing. Through this interview, I understood something I didn't before: Nicolas' seemingly lack of interest in the technical side of the projects, the lack of investment some-times, had been disappointing for me. I now realize I may not have been there when Autour de Minuit invested the most into Blender. Maybe it wasn't what I had in mind, however it is thanks to producers like Schmerkin that directors and artists alike can take a

↑ The war-hungry bears in *Unicorn Wars*, fully animated using the 2D tool Grease Pencil

chance on a new tool, experiment, try, fail, create their own challenge. You need a bit of distance from the details to agree to such a crazy and scary gamble. To dive into a process that no one has done before. To pitch and promise movies to the world, when you don't even know how you'll make them come to life, yet.
It takes passionate and stubborn

people to believe that technology and art will align, that the right people will come along to make it all take shape. In a sense, this is where Blender and independent cinema share a striking resemblance: people truly shape the project.

This conversation was held in French and has been translated into English during writing.

Jono Bacon
a view from the open source world

Jono Bacon is a well known face in the open-source community. As stated on his website, Jono is a leading community and collaboration speaker, author, and podcaster. He is the founder of Jono Bacon Consulting which provides community strategy/execution, workflow, and other services. He previously served as director of community at GitHub, Canonical, XPRIZE, and OpenAdvantag, he consulted and advised a range of organizations, including Blender. In 2020, when Ton was reconsidering his position at Blender in the light of his illness, he reached out to Jono to get insight on what the future of Blender could be. This wasn't the first time Jono and Ton met, of course. Ton can recall getting the Best use of CG with Linux Open Source Award from Jono's hands in 2006, for the first open movie Elephants Dream. This was one key moment of recognition by the open-source community. To go over the last twenty years and discuss Blender's legacy, we had to give a voice to an open-source persona.

Jono Bacon discovered Blender around 1999, when he had *"this wild aspiration to create a 3D movie"*.

His personal interest in both CG and open source naturally pushed him towards Blender. Plus *"it was a killer app on Linux!"* He can recall following the Free the Sources campaign with enthusiasm: it turned Blender into one of the first open-source softwares that wasn't an OS.

Since then, Jono hasn't stayed close to the project but still has an interest and thus an opinion about it. *"I don't have anything negative to share"*, although Jono remembers *"the bad reputation"* that Blender had in the early days, for being *"difficult to use"*. However, he quickly notes that *"lots of work went into the usability, making it easier to use, much more intuitive"*. Today, *"Blender can be compared to Linux, Kubernetes, Docker, npm, Angular, React [...] It is miles ahead of other open-source creative tools."* When discussing Blender's development and what it did well, Jono has a few examples in mind: *"There's so much to be proud of! [...] The sheer technological progress is amazing [...] and what I truly admire, [in an artistic-centric project] is finding developers to*

build really, technically, mathematically challenging software and doing that without being paid for it: it's a huge accomplishment." It is admirable that *"Blender made the community attractive not only to artists but also to engineers. Thanks to Ton, first, for being an open and transparent man, about the technology, where the weaknesses are."* It allowed Blender to build a diverse community.

And it is that community which is Blender's most striking singularity. *"I think there's a real personality around the Blender community [...] I remember going to my first Blender event in Amsterdam, in that miniature castle. I didn't really know anybody, I had only talked to Ton over email. There was a real*

Jono Bacon

sense of fun and excitement, a real togetherness. And that's special." As an Englishman himself, Jono also notes that, although that could be construed as a stereotype, *"It is very European too, uniquely Dutch: generous, fun, no bullshit."* A particularity that Jono also sees in European open-source gatherings, compared to the ones held in America: *"There's a less formal [vibe], it's looser."* But what is our community, if not one that produces high quality content? *"There's a very high level of accomplishments, in software, documentation... A significant amount of output, when a lot of other open-source communities don't have output. A lot of other open-source projects tend to be in the engineering, enterprise space [...] thus it's easier to fund development, whereas Blender does not have such a direct line of revenue. Plus this output is diverse: Reddit, Blender Today, Blender Nation, Blender Chat... the Blender community is both productive and pragmatic."*

The diverse output from the Blender project are also reflected in *"a real focus on education and learning;*

there are so many resources out there" and, of course, all the open movies: they are *"a profound achievement, a genius move"* as it is *"rare to see an open-source project invest outside of the software."* All those elements come together to build a true ecosystem that attracts different people for different reasons, but with the same end goal: create a better tool, year after year, together, to be always more free to create.

When it comes to recognition in the open source movement, Jono has a different perspective from Ton: *"Ton is one of the most important members in the history of open source [for a couple of reasons] And the fact that he's done it with such grace and empathy, he [truly is recognized as] a nice guy."* Blender is visible, and *"if you know what Blender is, even just on the surface, it is widely regarded and much loved."* Jono then goes on to take a personal example: a few kids at his ten-year-old son Jack's school are learning how to use Blender, for fun. The fact that it is a software used in the professional

world is very attractive to them, and the fact that it is free and open puts it in their reach.

"Maybe what Ton means [with this question] is that not a lot of people know about Blender. And it is true, compared to other projects that have less accomplishments and get more communication. It is a more niche tool. Because a lot more people are focused on infrastructure or enterprise projects in the open-source world. Blender isn't alone though, the same pattern applies to other 'non tech facing tools': InkScape, VLC, Linux Desktop, Libre Office."

What about Blender's future? How does Jono, someone who's followed the project since before it was even open source, imagine the next years? And what about Ton's legacy?
"There is so much cultural and institutional knowledge wrapped up in him. [....] Obviously, it will be the end of an era. The act of stepping down means you create systems and workflows to be viable without, to be healthy. [...] A transition needs to happen."

Jono Bacon

Regarding the direction that Blender should focus on, Jono had a few ideas. For the next ten years, *"My gut feeling is, and take that with a pinch of salt of course, Blender should incorporate AI into it, to make it really easy to formulate rich environments. Imagine giving [a prompt] to the AI about creating a planet like Mars. [...] It could get it super close and could be used as a base to then tweak. Generative AI. [...] This would allow Blender and its users to become even more efficient: getting 80% of the work done and spending most of the time on tweaking and refining would be a game changer."*

Another path would be *"weaving Blender into game development and AR, Augmented Reality. Because, as much of an enthusiast as I am, I strongly believe VR is going to struggle [...] I am not a technology Nostradamus - Apple is always a good sign of where the industry goes, because they're never first but they always create an industry changing product. It is rumored that their AR glasses will replace the iPhone. It is going to take years, and Blender should*

be in a position to be ready for that. It would be very powerful to use Blender there to create assets, worlds... to create the environments, experiences and apps."

As the Blender project has been good at gathering people, it should *"really invest in the outreach, get Blender into the mindset of anyone who has any kind of creative interest or ambition. [For example by going to] colleges and universities, where people are learning art and design, running competitions for people to create great art, working with platforms like IndieGogo or Kickstarter to encourage people to create [projects there], and also building relationships with movie studios or artistic colleges."* And because the work on documentation has already been strong, putting Blender into everybody's hands should be a priority.

We ended our conversation exchanging about the future, the next fancy technological piece, and the new generation. Looking back; how much technology has changed in 20 years, how it has shaped the

world we live in, and how much this could all be turned upside down again in the next couple of decades. At some point it came to my mind that, maybe, we haven't been public enough about the efforts already put into preparing that transition. Since 2020, Ton has been implementing changes, new ways of organizing, to little by little take a step back and let another team run the project. Francesco Siddi has been at the forefront of this effort, taking on more responsibilities, officially, as he had already been Ton's right hand for years. Although Ton isn't ready to step down just yet, he is thinking about the future of Blender, its legacy, and doesn't intend on leaving it to chance.

All in all, Jono Bacon has a very positive view of Blender, its development and future. As a CG enthusiast, first and foremost, I could sense that he is fond of the project, despite not following it closely anymore. Blender has played a meaningful part in Jono's growth into an open-source connaisseur, with a free and endearing spirit he still recognizes to this day.

Angela Plohman
former insider

When Ton mentioned his idea of interviewing different people from the industry, the name of Angela Plohman came out right on top. *"She is so sharp and knowledge-able."* Currently Executive VP of Strategy, Finance and Operations at the Mozilla Foundation, involved in high-level topics about the future of technology, Angela Plohman worked at Blender in the early days of the Foundation, around 2004-2007. As a freelancer, she helped Ton on many structural aspects: she organized multiple BCONs, managed a large European subsidy, took care of artists working on the first open movie and was, overall, a great support and facilitator.

Angela was involved during a key moment of Blender, when *Elephants Dream* was in production and the first structural pillars were set. Since then, a deep respect and mutual admiration has remained between her and Ton - for those reasons, this conversation was less about the technology and more about the human side of Blender.
What does the nonprofit executive remember from her time at Blender, more than 15 years ago?

"I really, truly do not remember how Ton found me... He was looking for help on more operational matters, plus he had just got a EU grant. Quite complex, a lot of paperwork. You know, there was no Institute at the time, it was mostly Ton doing everything by himself.

And a lot of volunteers, which was kind of incredible. [...] It was definitely the wild west there for a little bit. Ton doesn't like rules, or things that feel like they stop him from doing something and you know, european funding is 90% rules and 10% money.

It was an interesting challenge but also taught me a lot about being creative with how you can work within the system to get something that you want. Which is something very characteristic about Ton, he will find a way to get to the place that he wants. Which can be challenging for some people, but is also mostly a learning experience for everybody."

This is what came out the most during our conversation, Ton's tenacity: *"Ton is a very inspiring person. [...]*

↑   Angela and Ton during a Blender Conference

Angela Plohman

He is very unafraid [...] and doesn't compromise what his vision is. Which was so inspiring for me too. He has such a strong perspective and confident vision. He knows so clearly what opportunities [are in reach] and is great at not being distracted."

Obviously, with such a strong key figure at its core, we can't help but wonder what will become of the project once Ton steps back. *"He is an iconic figure. [But] Blender without Ton: it has to be possible. [This question] is common with strong founders who've remained involved over a long period of time."* Angela then explained how she sees the parallel with Mozilla and Mitchell Baker, current CEO for the Corporation, Chairwoman for the Foundation, who has been playing a key role there since the very first days of Mozilla. People look up to her, and to Ton, as the embodiment of their respective creation - but people are not eternal, and even founders deserve a break. So how do you set up the future? All in all, it is about *"how to empower others to create their own vision [...] Ton is good at attracting people*

and making them work together. [...] If the open-source world wants to thrive, it has to have faith in the community aspect, and not in that 'genius leader - godlike figure' [...] Looking at the photos on the annual report, there are people who have been there for a really long time as well. Artists that have been committed to working with Blender, kind of champions out in the world, whether at the Institute or in their own places of work. I think those people, playing that role of champion, knowing what the values are that underpin Blender, being able to separate them from Ton's values - the project itself is so strongly set up." Later in our discussion, she adds *"I'm very curious about what discussions are being had around [that subject] because you do need leadership. That can take so many different forms, it doesn't have to be in a single human [...] When you write the story of Blender over 20 years, making a choice around not making it the story of Ton but the story of Blender is gonna be a really key piece for setting up the future."*

Looking back at her own connection with the open-source community, Angela recalls: *"the [Blender] conference was very meaningful to me. It's interesting because you could compare it a bit to the Mozilla Festival - this gathering place where the people who care passionately about the issues and Blender really come together in this beautiful way, people are so generous, kind, and open, and sharing, creative. It felt like a big family of people who wanted that to succeed. [...] I made so many significant connections."* As a person who has strived to link arts and technology, she loved *"facilitating great ideas" "seeing developers from up close, understanding their language and building trust. I think I'm a very good translator between developers and organizers or artists; speaking those languages without having to be an expert is a skill to truly facilitate, and it's always been exciting for me to connect in that way." "doing the Blender conferences was always a trust building exercise, to show up for the community and help people."* Blender is certainly a place where different points of view not just collide, but embrace

Angela Plohman

each other. Surrounded by artists, developers, makers, people with ideas but also the will and skills to bring them to life: connections are made. *"Ton has always been about demonstrating through making. It inspired me in other ways, around how you can fuse the creative act of making with the tools-side of things, and that both can reinforce one another."*

To Angela Plohman, there aren't any specific milestones that stand out, but rather *"points that propelled the project into a different level of maturity."* Of course, she still thinks of the first open movie as *"a pivotal moment"* in setting up the future at that time, working more permanently with artists, but her vision is mostly *"a nostalgic memory [of it all]"* and not as much a bird's eye view on development, be it technical or company-wide. When asked about a possible collaboration between Mozilla and Blender, for example on some meta-world work, she admits to not being around those conversations. However, she quickly adds that *"When I started at Mozilla, everyone knew Blender."*, thus laying Ton's concerns to rest -

Blender is indeed visible in that part of the open-source world. We may even have mentioned some connection between the work Angela did at Blender and her start at Mozilla, although we would neither deny nor confirm that statement - *"we wouldn't hear the end of it with Ton!"*, we joked.

"When I left [Blender], the Institute was becoming more formalized. I am a little bit amazed by how much it's grown, how much output there has been." Amazed, *"but not surprised!"* she quickly adds. *"Ton probably has been more ambitious than I expected"* which is saying a lot when we see Plohman's track record in the tech, culture and art world. She is definitely a person who seeks to push boundaries.

What about the next steps? As a key member of her organization, Angela can't help but see the parallel: *"Mozilla just turned 25, too, and we've had our own highs and lows of relevance. Our whole campaign around this is not looking back but really looking at what the next 25 years will hold."* On open source at

large, Angela wishes *"to show that we can develop a successful product or projects with values, ethics and the greater good in mind. With a healthy and diverse community that represents a true global perspective. Because not all open-source projects are the same, some have a toxic culture. [...] Open source is a concept that's very specific, and it's the motivations behind it that I find interesting. Around alternatives to centralized technology superpowers. [I want] to keep pushing for the good of society. For instance, with the Mozilla Foundation we've started researching 4 years ago about trustworthy AI; now it's exploded everywhere in the mainstream and there's no ethical framework."* Thus the goal for an organization like Blender should be *"to inject your values into the way things are done. Whatever the technical path, it should be an opportunity to show up as a leader and illustrate how to commit for the public good."* She notes that the way Blender is structured with a nonprofit Foundation at its core, similarly to Mozilla, is already a visible commitment to ethical values: we should be talking about those values, and make

Angela Plohman

sure the contributors can be true champions, not just of the project, but also of those values, at their day job. There is leverage in that community, and Blender should continue to support it strongly.

"Where Blender has been very successful: it's not only about the technology, but it's how do you build and foster a community that can work well too support the bigger picture- it's really hard work and not everyone wants to do that work with the same amount of care for human beings and their volunteer contributions in a lot of the time."

All in all, Blender should focus on *"Prioritizing the health and value of the work while also having a business-minded approach - so, not losing its soul"*, even though Ton can be seen, in many ways, as the soul of the project. According to Angela, we have to *"protect the desire to contribute, communicate, while it is also important to keep a business mindset to move forward and keep the ambition alive."* As a trailblazer in the community-driven world, Blender

should be a role model for other organizations and people: we can do tech, we can innovate, we can give more power to the people, and as a mission-driven organization, we must do it with clear goals and strong moral values.

For Angela, it seemed that our discussion brought a lot of good memories from her time in Amsterdam. Some I can even relate to, now that I have joined the team at the HQ in a very similar position. Apart from all the business and ethical topics, I could see an idea taking shape: from the start, Blender and Ton were ambitious, very ambitious. Though, Ton was no fool and tried to surround himself with smart, motivated people, as passionate about their area of expertise as he's always been about his own project. This is something that does transpire from the last 20 years: Blender is driven by its diverse community, through and through, from the earliest volunteers to the highly-skilled developers, while also including the people who supported the project in many other ways. The people at its core, adding their own vision

and ambitions to Ton's. It seems like quite a solid basis for the next 20 years.

Activity Report

ACTIVITY REPORT

The Projects 2022
A Symphony of Creation:
Blender's Four Seasons, Development Update

BY MARIO HAWAT

As the curtain falls on the tumultuous year of 2022, we pause to reflect on the accomplishments of the Blender developers, community and overall project. Blender, celebrating 20 years of Open Source, is steadfast in vision and direction. The year 2022 proved to be one of the most prolific in Blender's history in terms of sheer number of releases, with 4 major versions released during the span of the year, building on the previous year's 3.0 launch. Beyond these massive releases, the Blender Studio released their latest Open Movie project, **"CHARGE"**, and the biggest Blender Conference ever was finally held after a 3-year-long pandemic-induced hiatus.

This year's release cycle, poetically matching the four seasons in a year, brought several groundbreaking features and updates to its users. These enhancements have elevated Blender to new heights, solidifying its position as a contender in the digital content creation landscape. Blender is now actively being used by millions across all industries, empowering artists, designers, engineers, developers, and more, with the freedom to create. Let's take a look at what the Four Seasons of Blender in 2022 brought to the table.

A journey through Blender's Development and new features to the rhythm of the four major releases.

The Projects 2022
Development Update
/Act 1, Spring: **Blender 3.1**

Spring of 2021 gave us Blender 3.1, which was released on March 9th, 2022. If this release is to be summed up into a single word, it would be "Performance". Blender 3.1 transformed Blender's performance and speed across modules, while still managing to squeeze in new features.

Blender 3.1 Splash Screen by Orencloud

Blender 3.1 included **Metal GPU backend support** contributed by Apple for Apple M1 computers running macOS 12.2 or newer, and Apple computers with AMD graphics cards running macOS 12.3 or newer. As a result, Cycles rendering speed across these devices gained a massive boost.

Another GPU-centric update is the addition of GPU acceleration for Subdivision modifier. This allows for

faster mesh editing and improved performance when working with complex models, when the subdivision modifier is the last one on the stack, with performance increasing by orders of magnitude.

Even the **Image Editor** got some performance upgrades, gaining the ability to display massive images without lagging or crashing.

The **Obj exporter** got the first of its many upgrades this year, being entirely re-written in C++ and increasing performance by more than ten-fold.

The **Asset Browser** indexing has also been improved, allowing for faster and more efficient browsing of assets. Blender 3.1 also introduces a **new Point Cloud object** that can be

rendered directly with Cycles to create sand, water splashes, particles or even motion graphics. This feature is much more memory efficient than manually instancing mesh spheres and allows for faster render times and the rendering of scenes that were hitherto impossible in Blender. Point Clouds can be generated with Geometry Nodes or imported from other software.

The Projects 2022
Development Update
/ Act 1, Spring: **Blender 3.1**

After the initial introduction of the powerful "Fields" architecture for Geometry Nodes in Blender 3.0, Blender 3.1 brings performance in **Geometry Nodes** to the next level, with many nodes being now multithreaded and using less memory. Memory usage has been reduced up to 100x in large fields and there has been up to a 20% improvement in memory use in most cases.
Improvements to multi-threading with medium loads have resulted in up to a 10x speedup, and processing single values with field nodes is now 2-3x faster.

Blender's ever-growing procedural system didn't just get performance updates, but also got 19 new nodes, including mesh modeling tools, access

to time, advanced Fields control, and much more. The User Interface has also been improved with the ability to drag sockets to get a list of automatically filtered nodes. This speeds up the workflow by only showing nodes that can be connected to the selected socket.

Instances can now also have their own dynamic attributes! This fully elevates them to be their own domain now and enables a powerful workflow by completing the pipeline where realized meshes can inherit data from instances that inherit data from points that inherit data from instances...

And that was just in spring, after which came the...

↑ ↑ Artwork by Mario Hawat - Over 60 million points rendered by Cycles in this scene

↑ Image by Paul Szajner - Fully destructible procedural house in Geometry Nodes

The Projects 2022
Development Update
/ Act 2, Summer: **Blender 3.2**

...Summer, with its gifts of light, sun and Blender 3.2, released on June 8th, 2022! And you can't say light without Cycles coming to mind, and boy did the venerable path tracer get a vision upgrade this release!

First off, **Cycles** got one of its most awaited and most powerful features to date: Light Groups. Light Groups are a powerful system allowing the generation of user-determined lighting passes/AOVs based on light sources, which can include scene, environment, and material lights. This allows for huge flexibility at the compositing stage and unlocks one of the most important and infamously missing workflows in Blender's main render engine.
Next up, **faster shadow caustics**, courtesy of developer Olivier Maury,

based on the Manifold Next Event Estimation algorithm. Behind this intimidating name lies a very simple and welcome improvement: once toggled, this feature gives the ability to have very fast sharp caustics in the shadows of refractive objects, with sharp caustics appearing after a few samples where previously thousands were needed.

And finally, Cycles gains the ability to render motion blur of imported VDBs, unlocking a massive area of VFX rendering and interoperability with other simulation software packages and studio pipelines.

Many other areas received major updates as well: **Vertex Colors** are now generic color attributes, and can be

↑   Blender 3.2 Splash Screen by Oksana Dobrovolska

The Projects 2022
Development Update
/ Act 2, Summer: Blender 3.2

painted in vertex paint or sculpt mode using the new sculpt paint tools.

A **new Curve Pen** Tool was added, which allows the direct drawing of curves and their further manipulation quickly and intuitively. This tool is at the heart of the plethora of great Geometry Node setups, where the initial drawing of the curve is done using the new Curve Pen Tool.

Speaking of Geometry Nodes, **Named Attributes** made their way back in this release, allowing for greater flexibility and granularity when working with massive node trees, on top of a slew of new nodes.

The **Obj exporter and importer** continued their upgrade path, both gaining magnitudes of performance in their operations.

And finally, the proxy system has been deprecated, leaving the stage to the new king of the reference workflow: **Library overrides**.

The days are now starting to get shorter, but this in no way impedes Blender's development, as next came....

The Projects 2022
Development Update
/ Act 3, Fall: **Blender 3.3 LTS**

...Fall, the season of serenity and stability, serving as the perfect backdrop to the first LTS release of the 3.x series: Blender 3.3 LTS released on September 7th, 2022!

Blender's LTS program runs alongside the regular Blender releases and provides long-term support for a stable version of Blender to allow studios and individuals to finish big productions without having to swap versions to benefit from bug updates. **This is the third Blender LTS version, and will be supported until 2024**.

This release featured big updates to **Line Art**: The Line Art modifier is now able to calculate accurate cast shadow and light/shadow separation lines given a light source reference object.

Intersections are now also much more customizable. Line Art also got a massive performance boost, especially noticeable on larger objects/scenes

This release also contains the building blocks of the **new hair system**! Combining a new curve sculpt mode with and powered by Geometry Nodes, the possibilities are endless. The new Sculpt mode for curves gives unprecedented control for grooming hair. The list of tools includes: *Add / Delete*, *Density*, *Comb*, *Snake Hook Pinch*, *Puff*, *Smooth*, and *Slide*. Blender's Open Movie Charge served as a trial by fire for the new hair system, with the short's protagonist, Einar, having his hair groomed using the new system.
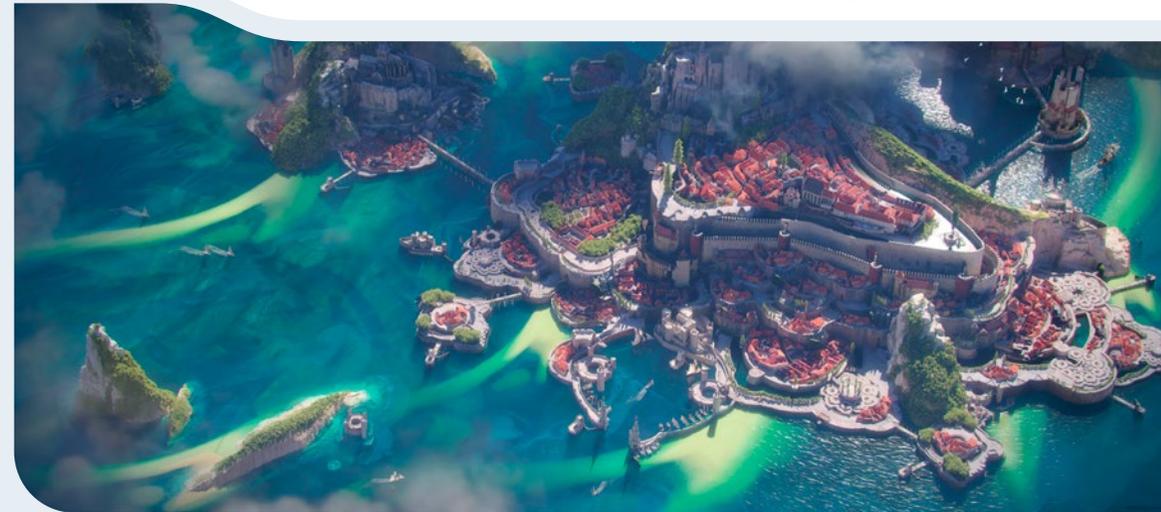
↑   Blender 3.3 Splash Screen by Piotr Kryński
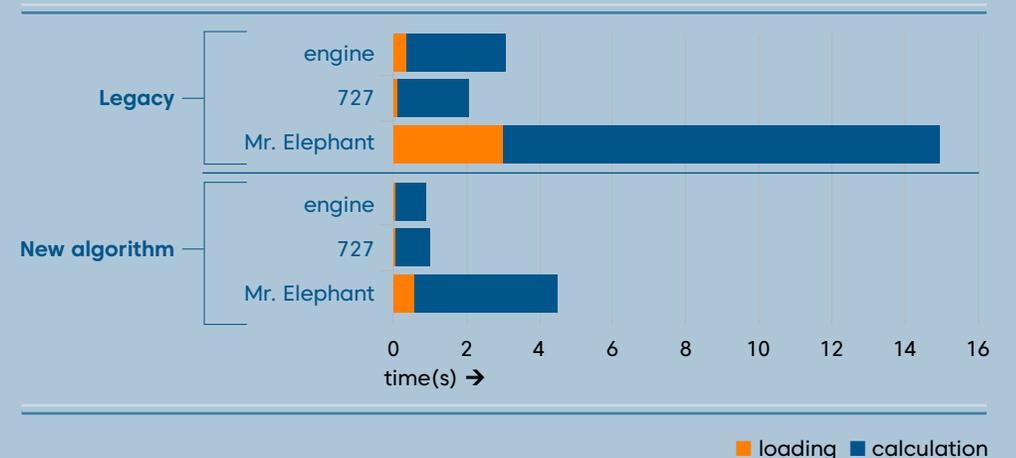
The Projects 2022
Development Update
/Act 3, Fall: **Blender 3.3 LTS**

Geometry Nodes gained three major functionalities. First, the **Shortest Path Node**, which allows for path-finding across mesh edges and unlocks the creation of mazes, lightning, growing vegetation, and much more. Next, is the Volume Cube primitive, which unlocks all kinds of mesh deformation and manipulation possibilities within Geometry Nodes, being particularly well suited for use with 3D textures, fractals, and more. Finally, **UV Nodes**, allowing to procedurally deal with generating and packing UVs right from the node tree.

A **new Image from Plane Marker operator** was added, to quickly allow the touching up of a tracked plane in the motion tracking module before being reprojected.

Finally, contributor Aras Pranckevicius continues his I/O optimization streak, this time touching on **USD import and export performance**. The year is coming to an end, but we are owed one last hurrah, one more season...
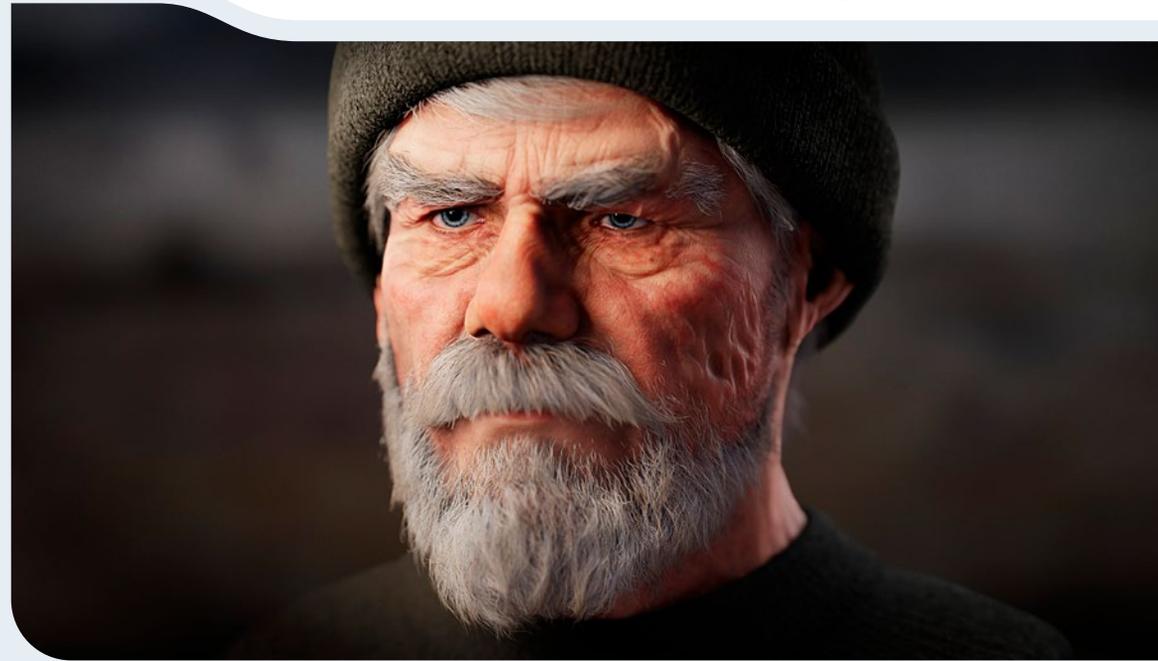
The Projects 2022
Development Update
**/** Act 4, Winter: **Blender 3.4**

Blender 3.4 Splash Screen by Blender Studio

...Winter is here, but rather than succumb to the cold, Blender's developers are on fire, releasing Blender 3.4 on December 7th, 2022. Coming one short week before the release of Charge, Blender ends the first half of its 3.x cycle with a bang.

Thanks to the work of Sebastian Herholz, an Intel path-tracing engineer, Cycles now integrates Intel's Open Path Guiding Library, adding support for Path Guiding in CPU to help reduce noise in scenes where finding a path to light is difficult for regular path tracing. This is particularly useful for indoor or underwater scenes lit by indirect lighting. Guiding is supported for surfaces with diffuse BSDFs and volumes with isotropic and anisotropic scattering.

Geometry Nodes now have the long awaited **Viewer Node**, which acts like the Shader/Compositor Viewer Nodes, only here showing an overlay of currently evaluated Geometry Nodes node tree in the 3D Viewport. This makes the act of debugging and testing parts of node trees that much easier.
Many new nodes have been added to retrieve mesh and curve data, sample UV surface, Node Group assets now show in the Add menu, and so much more.

Grease Pencil gets an improved Fill Tool as well as a new outline modifier. **Storypencil** is a new GP based storyboarding add-on now bundled with Blender as an official add-on.

The **UV editor** received several updates to existing tools as well as new operators to align UV rotation, randomize islands, support for non-uniform grid, and more. The auto-masking tools in Sculpt/Paint mode are now accessible from the 3D Viewport and support cavity, view, and area-based Auto-Masking.

This overview can barely begin to do justice to the huge developments, contributions, features, and bug fixes Blender received in 2022. Check out the release notes for a more in-depth look at all the changes, in the meantime, let's take a detour at the through the headquarters and the studio to see what they have been up to in 2022.

The Projects 2022
At the Headquarters
/Workshops 2022

BY DALAI FELINTO

With the ease of restrictions, the Blender HQ slowly came back to life, hosting workshops, attending conferences, and taking more steps to ensure the future of Blender.

↑ The "Sprite village" shot from Sprite Fright, using over 90 library overrides, including more than 60 overrides from 5 different characters

Workshops are back!
Workshops made their way back to the Blender HQ. The cornerstone of Blender's community driven ethos, this year's workshops dealt with Library Overrides, Hair, VSE, Animation, and more.

Library Overrides
Library Overrides was introduced in Blender 3.0. It enabled artists to edit and animate their assets, while still keeping them in sync with the library files content.

Shortly after its debut, overrides were stress tested in *Sprite Fright*, peaking at over 90 library overrides for a given scene. The film was released in October 2021, and in February of the next year the Blender Studio conferred with the developers at the Blender headquarters to address performance and usability issues that were raised during the film production.

Read more on: https://code.blender.org/2022/02/overrides-workshop/

Hair
During the months of May and June, developer Hans Goudey visited the Netherlands for a series of workshops for hair. Jacques Lucke visited twice during the period to help kickoff the project, as well together with Dalai Felinto and Simon Thommes.

At the time the Blender Studio was developing the *Charge* project, and its realistic human protagonist became the ultimate use case for the project. The workshop also counted with the presence of Andy Goralczyk and consulted with Brecht Van Lommel and Sergey Sharybin. During the period industry partners were also consulted, in particular from Epic and Nvidia.

Read more on: https://code.blender.org/2022/07/the-future-of-hair-grooming/

The Projects 2022
At the Headquarters
/Workshops 2022

Motion Tracking

To celebrate the 10th anniversary of *Tears of Steel* in April, Sebastian König was invited for a three-day workshop with Sergey Sharybin in Amsterdam. They worked together during the making of the open movie on what became Blender's motion tracking system.

The topics were mainly the accumulated backlog of tasks and ideas, and produced an updated roadmap for the VFX module.

Read more on: https://code.blender.org/2022/05/motion-tracking-workshop-april-2022-report/

Video Sequencer Editor

In May, Richard Antalík visited for a week to have a workshop focused on the VSE (Video Sequence Editor). He was joined by Francesco Siddi, Sergey Sharybin and Sebastian Parborg. The main goal of the workshop was to review and confirm key design tasks as part of the VSE roadmap. The topics included: retiming tools, media manipulation, coloring, specific audio channels and much more.

Read more on: https://code.blender.org/2022/06/vse-workshop-may-2022-report/

Character Animation

Prior to the Blender Conference in October, the Animation & Rigging module got together to define the vision and principles upon which the 'Animation 2025' project should be built. The main participants were Brad Clark, Christoph Lendenfeld, Daniel Salazar, Jason Schleifer, Jeremy Bot, Nate Rupsis, Nathan Vegdahl, Sarah Laufer, and Sybren Stüvel.
The principles outlined were: fast, intuitive, focused, iterative, direct and … *"Suzanne"* (i.e., tight Blender integration). The workshop findings were later presented at the Blender Conference.
Read more on: https://code.blender.org/2022/11/the-future-of-character-animation-rigging/

↑↑ From left to right: Jacques Lucke, Hans Goudey, Jeroen Bakker, Julien Kaspar, Dalai Felinto, Simon Thommes
↑ Hair workshop, June 2022 – Dalai Felinto, Hans Goudey, Jacques Lucke, Simon Thommes. Photo by Andy Goralczyk

The Projects 2022
At the Headquarters
/Workshops 2022

Simulation and Geometry Nodes

To wrap up the year, in November a final workshop was organized to re-iterate over the Geometry Nodes targets for the upcoming year and to flesh out design topics.

This time, besides Dalai Felinto, Hans Goudey, Jacques Lucke and Simon Thommes, there were the occasional visits from Brecht Van Lommel, Jeroen Bakker and Julien Kaspar.

The main topic was Simulation Nodes, which will pave the way for physics and non-physics simulations in the future. It was also discussed: loops, geometry objects, menu switches and a couple of other small topics.

Read more on: https://code.blender.org/2022/11/geometry-nodes-workshop-2022/

Photos by Haru Legouge

The Projects 2022
At the Headquarters

/All Hands on Deck: ever growing industry support

Volkswagen	**Intel**	**AMD**	**Meta**	**Apple**	**Animation studios Les Fées Spéciales and SPA Studios**
joins development fund	contributes to ARC support, Contributes Pathguiding and additional Cycles Development	contributes HIP support	contributes NMEE Caustics	contributes Metal Backend Development	contribute to Grease Pencil development

The Projects 2022
At the Headquarters
/Blenderheads documentary

At the end of 2022, Blender hired documentary maker Maaike 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.

The first episode (published in early 2023) is set during September-December 2022, with new episodes being published on a quarterly basis.

↑ Documentry maker Maaike Kleverlaan

The Projects 2022
At the Headquarters
/Major Announcements

Among the many major announcements made during the conference, a few stand out:

Blender LAB

The Blender LAB initiative was announced, aiming to not only future-proof the Blender project, but to keep and further its position as a trailblazer in the world of creative software. This skeleton crew of brilliant minds will be unfettered by Blender's current iteration and baggage, and will be able to freely conceive the Blender of the Future. As Ton puts it in his Keynote at the Blender Conference: *"I want to have five or ten of the best brains that we can find, to seize the future!"*

Blender Apps

Blender Apps were also announced this year, and they are portable, experience-focused applications powered by Blender, as a natural evolution of the Blender Application Templates system. They can be used for various purposes such as education, production pipeline, final products, or small games. They can be distributed as a single file, zip project, or bundle, with the bundle option being the most portable and not requiring Blender to be installed. The development of Blender Apps is a collaborative effort, with feedback from the community encouraged before the development process begins.

Blender Extensions Platform

Another major announcement which took place a couple of weeks before the Blender Conference was the Blender Extensions Platform. It is no secret that Blender's ecosystem is particularly rich thanks to the thousands of add-ons contributed by its users. The Blender Extensions platform at extensions.blender.org aims to help Blender users discover and download add-ons, themes, keymaps, and asset libraries within the Free and Open Source spirit. The platform will offer only GNU GPL compliant software or CC-BY-SA compatible content, with no commercialization. The BE roadmap includes allowing users to discover, download, and rate add-ons, enabling developers to manage their creations, and facilitating a team of community reviewers to maintain add-on quality. The platform will feature unique names, descriptions, supported Blender versions, download links, documentation, category/tags, ratings, and ways to report abuse for each add-on.

The Projects 2022
At the Studio

CHARGE! Open Movie Released

Open Movies are an incredibly unique aspect of the Blender ecosystem, and a boon for both its developers and the community at large. On the one hand, the various Open Films tackle challenging areas and CG/VFX production, serving as a testbed and proving grounds for Blender's latest and greatest and not yet developed tools.
On the other hand, the whole film-making process is extensively shared on the Blender Studio website, from the earliest sketches to the finished assets and scenes, making this an incredible learning resource for the community.

Charge's aims were to challenge Blender and the creative and development teams behind it to create highly realistic characters and environments, using Blender's real-time render engine, Eevee. Areas of focus included the new hair system, Geometry Nodes, sculpting, baking, and more.

The resulting short film, written and directed by Hjalti Hjálmarsson, was released on the 15th of December in 2022 and was a massive success online, receiving praise for its storyline and impressive production value.

Flamenco 3 Released

The official Blender Render Manager gets a complete rewrite this year, focusing on simplicity and interactivity. The new version replaces v2 which had a five-year tenure at the Studio. Flamenco 3 was battle-tested as the render manager for *Charge*!, and was released on the 12th of September 2022. Flamenco 3 features a sleek modern interface, and is easy to install and extend.

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.

The Projects 2022
Around the World

Here are some highlights of projects made with Blender in 2022:

Unicorn Wars

Directed by Alberto Vázquez: Award Winning Feature Film made entirely with Blender

RRR

Directed by S. S. Rajamouli: Blockbuster with a huge chunk of VFX made with Blender

Scooty

Directed by Peter France: Ambitious short film, VFX made with Blender

The Projects 2022
Events

/Annecy Animation Festival

For a few years now, a Blender delegation has been attending the top Animation Industry event in Europe: The Annecy Animation Festival. One part of the event is the film market (MIFA), a place where filmmakers, schools, production companies and software developers can exhibit their work.

The Blender booth is always very popular, packed with crowds watching Grease Pencil demos, open movie breakdowns and learning about the meaning of free software.

The audience at the festival is very broad, from experienced artists, to students, to studio managers and technical directors so it's a great outreach opportunity for Blender.

A couple of highlights of the festivals were:

- *Sprite Fright* being part of the official selection at the festival - quite an honour!
- *Unicorn Wars*, a feature film entirely made with Blender using a hybrid 2D-3D pipeline
- A screening of the *Spring* open movie, with a soundtrack re-score, performed live by the orchestra of the Annecy Conservatory, in the Castle of Annecy!

↑↑ The Blender booth at the MIFA - Pablo Vazquez, Hjalti Hjálmarsson and Daniel Martinez Lara presenting the software and projects to professionals and students alike
↑← The Blender Studio team was present too - Pablo Fournier, Simon Thommes and Pablo Vazquez enjoying the festival
↑→ A screening of the Spring open movie

The Projects 2022
Events
/BCON22

The Blender Conference 2022 was a special event, in more ways than one. With the pandemic, most of us saw our daily lives disrupted, and gatherings soon were canceled all over the world. The yearly conference didn't take place in 2020, and then again in 2021. During that time of global health emergency, Ton went through a very personal battle. Diagnosed with leukemia in the spring of 2020, Ton had to take a step back from the Blender daily activities to focus on his health and treatment. As one can imagine, this deeply impacted the Blender team and posed a lot of questions, even after Ton recovered - how to function without Blender's founder, how to make sure the Blender project and spirit endure? What would be Ton's legacy when the time comes for him to retire?

The Projects 2022
Events
/BCON22

As Blender was approaching a significant birthday, those questions became even more potent: in 2022, it would be 20 years since the release of Blender as the Open Source software it still is today. A great time to talk about Blender's future and the next ten, twenty years!

For all of these reasons, the BCON22 was a very exciting event a lot of people had been looking forward to. The Blender team wanted this conference to be a joyful celebration of its community. A gathering of like-minded people pushing the limits of innovation in many different fields, from various angles, coming together to share, discuss, debate and relish the past (and future!) accomplishments.

As always, this was a team effort. For more than six months, Francesco and Ton coordinated the endeavors to make this BCON the best yet.
It had to be different, bigger: a new location would be a great starting point. Located in the beautiful

↑↑ Julian Eisel presenting in the Developer Attic:
   "A bird's-eye view on the asset browser system"
↑← The Blender logo at the entrance of the BCON
↑→ The BCON22's theme was succulents - in print and
   in all their green glory

The Projects 2022
Events
/BCON22

center of Amsterdam, on a canal, the Felix Meritis venue offered more room to hold parallel events and allow informal meetings. At the Market, artists, developers, CG students or producers alike could hangout, chat around a ginger tea and discuss with the different sponsors present. While some people were polishing their presentation (they could easily be recognized with their computer and their frown), others were debating the next great update, with large groups gathering around the tables and making their way to and from the vegan buffets. It was also the perfect place to go talk to some of the Blender developers and pick their brain about some new idea - or just take a picture for a nice souvenir!

Many people joined BCON22 online via the Blender YouTube and PeerTube channels. Whether it was a 20 min presentation on 2D animation process or a 50 min talk about the asset browser system, each event found its audience and broadened somebody's
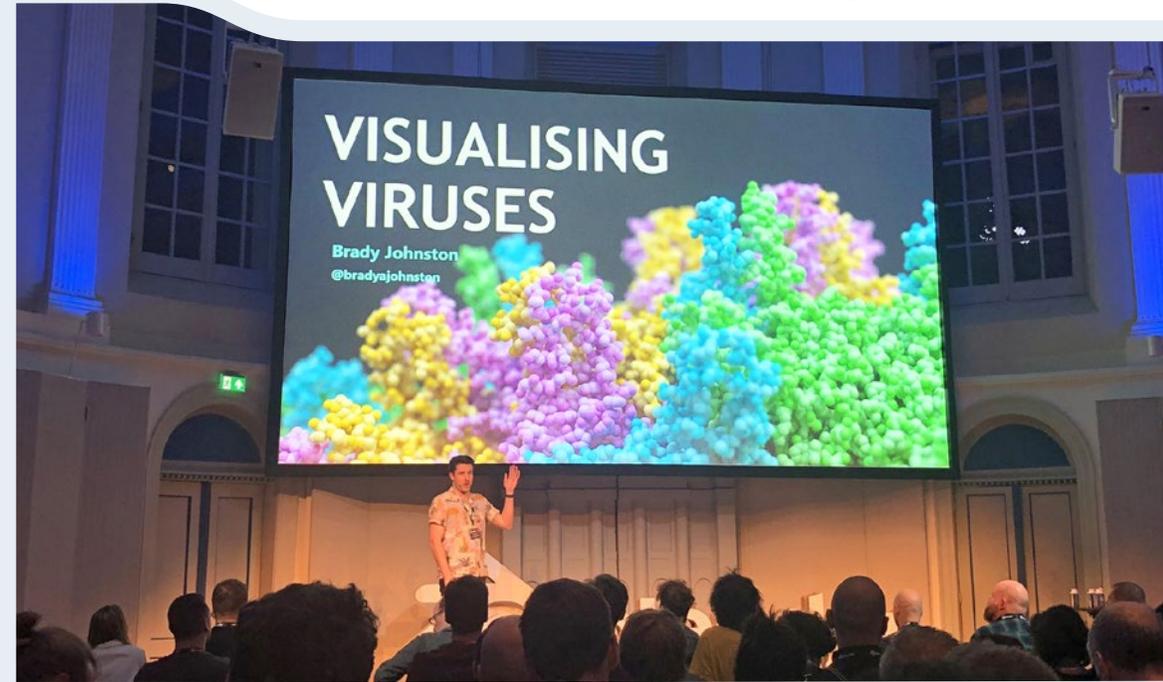
↑↑ Brady Johnston presenting his work in structural biology, using Blender to visualize viruses
↑← CTO Flavio Perez and developer Amélie Fondevilla, from Les Fées Spéciales (France), discussing and drawing ideas about Grease Pencil 3.0 with Dédouze, French 2D artist
↑→ The Felix Meritis venue

The Projects 2022
Events
/BCON22

horizon on what Blender can do. All presentations of the event were recorded in high quality and shared online a few hours after that. This is a strategic target to keep everyone connected while the event is happening.

This is why we do it.
Blender means to share knowledge and tools, offer possibilities to create things and gather people.
We plan for the best and embrace the mess - after all, there's always a debug phase and a new version that comes after.

Thank you to everyone who made this very special conference possible, and to all the people who came from far or near to join in on the fun. As the regulars and the newcomers gathered for one last drink in the streets of Amsterdam, the same promise was on many lips: see you next year!
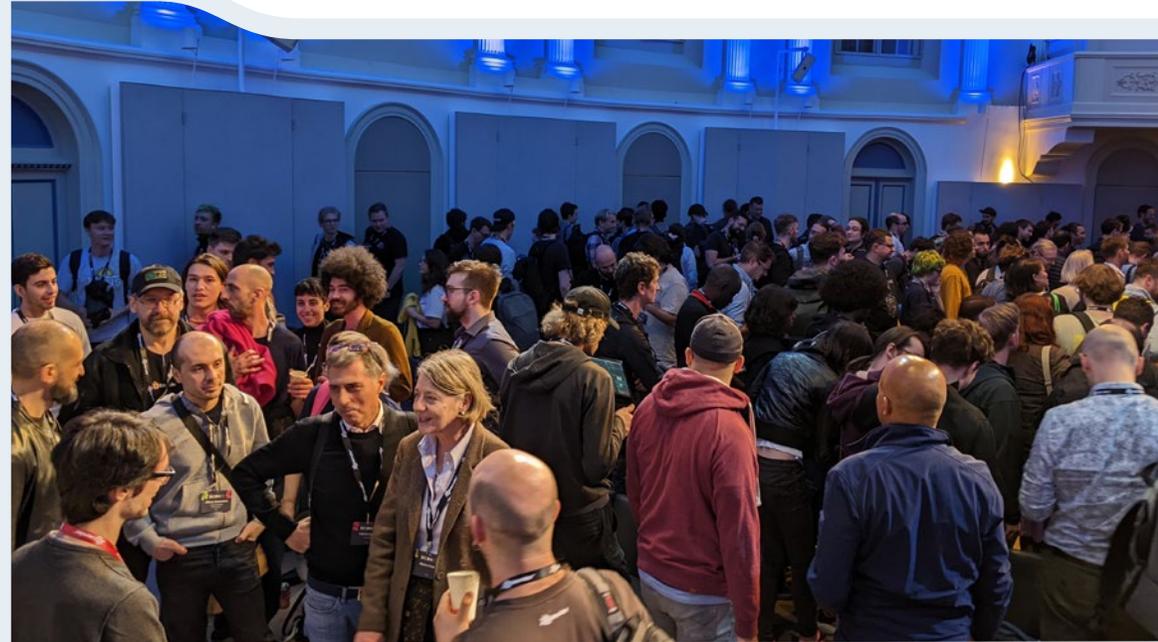
↑↑ Visitors gathering in the Theater of the Felix Meritis
↑← A tour to the live studio
↑→ A non-stop VJ was present at the BCON22

The Projects 2022
## Events
/BCON22

Credits

Special thanks to everyone who took part in the organization of the event before and while it was happening. You made this possible!

- BCON22 Sponsors:
  Intel, Coreweave, Sketchfab, Render Street, Protocube, Chocofur & Comovid
- Anja Vugst-Verstappen – Ticketing and store management
- Andy Goralczyk, Simon Thommes and Pablo Vazquez – BCON22 artwork
- Philipp van Ekeren – Conference booklet
- Clement Piot – Blender logos at the entrance and Theater stage
- Pablo Vazquez – Website experience, podcast management

- Beau Gerbrands – Suzanne Awards identity and video processing
- Anna Sirota – Website experience, video processing pipeline, venue screens management
- Andy Goralczyk and Simon Thommes – Audiovisual show
- Marit Stüvel, Pablo Fournier, Simone Eggengoor – Sponsors support, check-in desk and shop
- Arnd Marijnissen – IT systems
- Hannah Umit, Menno Hageman, Tess Fischer – Video processing and general support
- Thomas Beck – Lightning talks

- Bastien Montagne, Sergey Sharybin - Logistics and coordination
- Jelmer de Haas – Photography
- Daan van den Berg – Video recaps and interviews
- Faber – Theater projection and video recordings

- The staff and catering service of Felix Meritis
- All of the speakers!
- Francesco and Ton – Production

↑　The Blender team and some friends posing for Jelmer de Haas' camera

The Projects 2022
Events
/SIGGRAPH

↑   SIGGRAPH 2022 booth. Picture by Jacques Lucke

After a 2-year hiatus, Blender was back at SIGGRAPH in Vancouver!

Front and Center

For the first time we were able to move the Blender booth from the sidelines of the trade show into the middle of it. Thanks to a simple layout featuring 4 bar tables, a few plants, 3 demo workstations and one massive LED wall playing non-stop Blender reels, the booth was easily recognisable, stood out and attracted crowds.

With a delegation of over 10 people coming from Europe, plus some local help, the booth was always well attended, with lots of interesting conversations and demos happening around the clock.

Every day, hundreds of people came by to say hi, reconnect, or learn about Blender.

In contrast with past SIGGRAPH editions, almost nobody asked the infamous question: *"How do you make money?"*. Instead, many people said *"Thank you"*. People using Blender since the pre-2.8 days. People who have been using for 10+ years while attending high school and college, and now have a job at a studio, or work as content creators, making a living thanks to the skills they honed in Blender. Sometimes they can't use Blender at work, but it's their tool of choice for personal work. Many recognise that Blender was instrumental in helping them get where they are.

Many studios, including major ones, are also successfully using Blender, and are looking into adopting it further in their pipeline.

Finally, the Ton factor. Ton was a walking (or standing) landmark, with people approaching from afar, asking for pictures and handshakes, sharing gratitude. It was a joy to watch!

SIGGRAPH

The Projects 2022
Events
/SIGGRAPH

Special Interest Group Meeting

As per tradition, Blender Foundation organized a public Special Interest Group (SIG) focused on sharing the ongoing activities of the Blender project, gathering feedback and providing a networking opportunity. The event was attended by a diverse group of individuals, teachers, researchers, and developers from tech companies and studios. A lot of interest in the future roadmap of Blender was expressed.

Other Activities

Next to the SIG and the trade show booth, a couple more activities were set up: a dedicated meeting about USD, and a Geometry Nodes demo session.

Both activities were successful and helped people to connect better with the Blender team and the project. Geometry Nodes were very popular, with a full house and even people waiting outside!

Development Fund Connections

Finally, as live events are a great opportunity to meet in person, we held a few strategic meetings with Blender Development Fund sponsors. Overall the feedback on the state of Blender is positive and the support given via the Development Fund is perceived as a very good investment. We also had initial conversations with some animation studios on the topic of joining the Development Fund.

↑   Picture by Orange Turbine

The Projects 2022
Events
/SIGGRAPH

Blender in the Film Industry

Whenever having an informal conversation with someone working in a medium/large animation or VFX studio, one or more of the following topics came up:

> Blender is happily used as part of a production pipeline

> Blender is used in a key part of the artistic process, because it does something better than any other software

> Unless blender adds feature X, we can't use it in production

> Blender needs to stick to the VFX reference platform!

> Blender is used, but we can't talk about it

All these topics are very interesting, and there is work to do in order to set up a more effective collaboration with the film industry. This can be done by enabling studios to effectively get involved in the Blender project, but also making sure that studios feel empowered to own and tackle issues directly.

Trends

USD, AI, and Metaverse were hot topics in several conversations. At this time, the most practical translation for the idea of Metaverse is collaboration. This can be further interpreted into making content creation processes and pipelines more interactive and interoperable, both from an architec-tural and data structures point of view. The topics of collaboration and content sharing are something that the Blender project aims to investigate as well, sticking to the Free and Open Source principles, by creating something as a community (bottom-up) rather than as a company (top-down).

Blender is for Artists

Overall, this SIGGRAPH has been a positive experience. Blender is very much loved, especially by individuals and small teams, who really thrive thanks to the freedom to create that Blender affords them.

The People
Leadership

As Blender scales up, the organization seeks to attract experts with complementary skill sets to join the team, as well as redefining existing roles.

Ton Roosendaal
CEO and Founder

Spearheading the organization is Ton Roosendaal, original creator of the Blender software. His focus is on securing the future of Blender.
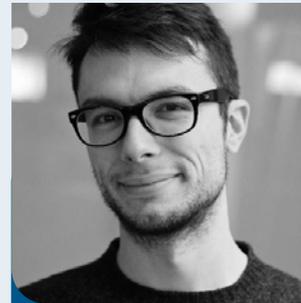
Francesco Siddi
COO

Francesco acts as the CEO's right hand, involved with all business and strategic topics. He also heads up Blender Studio and manages several projects related to the Blender online infrastructure (Blender Studio website, Development Fund, Open Data, etc.).

The People
Operations and Content

Anja Vugts-Verstappen
Financial Manager

Anja has worked as financial manager and bookkeeper for Blender since the beginning. She is especially well known for managing the e-store and conference back office.

Arnd Marijnissen
Devops, Infrastructure

Involved with the Blender community for many years, Arnd joined the Blender 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.

Dan McGrath
Web Administrator (Canada)

Blender has a dedicated rack in a datacenter, to run all blender.org websites on. Dan keeps our web services sane and safe. He is a specialist in networking infrastructure, which he manages remotely for the Blender offices too.

Maaike Kleverlaan
Filmmaker

Maaike is the editor and director of the documentary series **Blenderheads**. She joined during Fall 2022 to cover the activities and office life of the people working at the Blender HQ.
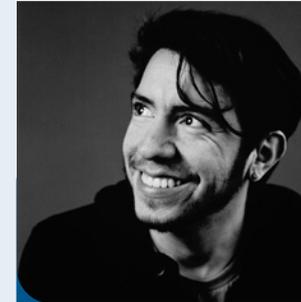
Pablo Vazquez
Communications Manager

For several years now, Pablo has hosted a frequent live stream about Blender development and other blender.org activities. He is the main editor of blender.org, including release logs. He loves to travel around the world as a Blender evangelist, and was able to pick it up again in 2022: Pablo went to Canada for SIGGRAPH, Mexico for the Pixelatl Animation Festival and France for the Annecy Animation Festival, among others.

The People
The development team

The Development team now has a development coordinator and the developers roles have been redefined, spanning in seniority from junior developer to regular, senior and principal developers. Most of these 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, regular and junior developers. The full diagram of the main developers' roles, including for remote positions, have been shared online for further feedback.

The four main developers' roles can, in short, be characterized by:

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

Regular 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.

The People
The development team

/Development Coordination

/Principal Developers

Dalai Felinto
Development Coordinator, Product Management

Connecting the different parts and supporting the scale up process of Blender, Dalai worked overall planning and communication, specifically for the team in the Amsterdam HQ. He acts as the product manager of the Geometry Nodes and Hair projects.

Thomas Dinges
Development Coordinator, Release Management (Germany)

Thomas has been an active contributor to Blender since 2009, during his high school and student years. He now helps coordinate the online community of developers, including onboarding new developers and releasing the Weekly Report for everyone to follow the development updates. He also manages the release process and coordinates Google Summer of Code.

Brecht Van Lommel

Brecht works on making Cycles a fast full-fledged render engine and coordinates the growing industry contributions to Cycles and the larger Cycles team.

Campbell Barton
(Australia)

Working from Australia, Blender's top committer (804 commits in 2022) focused on general contributions, patch review and bug fixes, more BMesh operator optimizations and Wayland support for Linux.

Clément Foucault
(France)

EEVEE lead developer Clément continued the upcoming EEVEE-next. He contributed to big refactors for the draw manager and the internal math API.

Sergey Sharybin

Sergey organized two workshops in 2022: Motion Tracking and Video Sequence Editor. He also worked on regular tasks such as on-going maintenance, bug fixing, code review and support for the GPU, rendering and VFX modules.

The People
The development team
/Senior Developers

Bastien Montagne

Bastien finished the library override system with a usability overhaul, while the old proxies were finally removed. He also worked on core module improvements and started on the Brush Asset project.

Jacques Lucke
(Germany)

Working from Berlin, Jacques is the tech lead in the Geometry Nodes project, bringing modeling nodes into Blender.

Jeroen Bakker

Jeroen manages the drawing and GPU code. In 2022 that led him to work on 3D texturing / brush, Vulkan and to help with EEVEE-next.

Sybren Stüvel

Sybren coordinates the Animation & Rigging module and leads the Flamenco render manager. In 2022 he worked on the Flamenco 3 release and started putting together the team and main design for the Character Animation project.

The People
The development team
/Regular Developers

Hans Goudey
(USA)

Hans is a core member of the Geometry Nodes project. He worked on the new hair system and also brought in several performance improvements to the Geometry nodes system.

Kévin Dietrich
(France) until June 2022

Kevin worked on Cycles optimizations, Alembic streaming, GPU OpenSubdiv for viewport and integrating Geometry Nodes attributes with EEVEE.
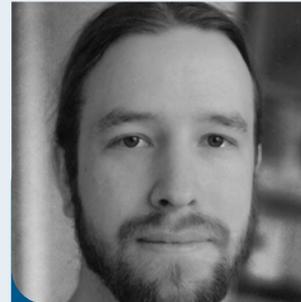
Julian Eisel

Julian worked on the Asset system, Outliner integration for library overrides, organized the technical documentation efforts and started the asset shelf for the new Brush Asset manager.

Sebastian Parborg

Working as a bridge between the Blender Studio and the development team, Sebastian implemented headless rendering support, Wayland, Grease Pencil and Video Sequencer bug fixes.
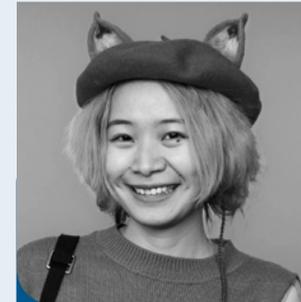
Weizhen Huang

Weizhen joined the team to improve Cycles rendering and implement a new hair shading system based on her awarded research.

The People
The development team
/Triaging Team

Germano Cavalcante
(Brazil)

Germano mainly worked on bug triaging and bug fixing, and is also increasingly active in the modeling and rendering modules.

Omar Emara
(Egypt)

Omar developed the viewport compositor and helped with bug triaging.
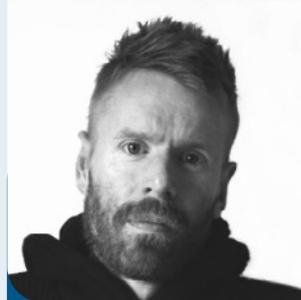
Philipp Oeser
(Germany)

Philipp was responsible for coordinating the bug triaging team, leading by example with his hands-on approach as one of the triagers. He also manages the LTS versions with regular updates.
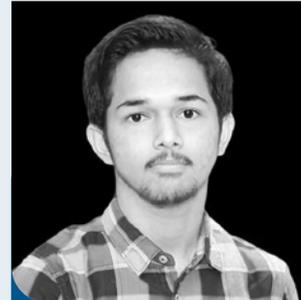
Pratik Borhade
(part time, India)

Pratik was involved on the tracker and helped both with triaging and bug fixing.
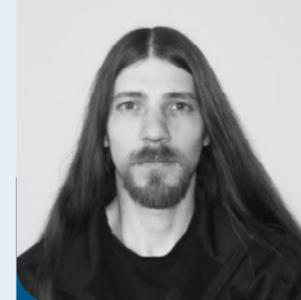
Richard Antalík
(Czech Republic)

Richard worked on the Video Sequencer Editor and helped with bug fixing and triaging.

The People
The development team

/General Support   /Grant Recipients

Aaron Carlisle
(USA, part time)

Aaron contributed to User Manual enhancements and is coordinator of the Blender documentation efforts.

Chris Blackbourn
(New Zealand, part time)

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

Christoph Lendenfeld
(Spain, part time)

Christoph helped on the Animation & Rigging module to bring the vision of animation 2025 into reality.
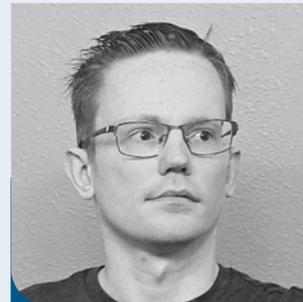
Joe Eagar
(USA)

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

Jon Denning
(USA)

Jon worked on improving retopology tools.

The People
The development team
/Grant Recipients

Lukas Stockner
(Germany, part time)

Lukas is a member of the Cycles module. He worked on an updated principled shader and helped with bug fixes and code review.

Miguel Pozo
(Spain, part time)

Miguel helped with GPU/ Viewport development, porting the Workbench to the new draw manager.

Peter Kim
(Japan, part time)

Peter picked up the OpenXR integration project working on VR navigation as well as VR inputs support.

Yiming Wu
(China)

Aside from bug fixing and support, Yiming is the main developer on the LineArt feature for Grease Pencil.

The People
The Blender Studio team

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.

Andy Goralczyk
Art Director

As a seasoned concept and 3D artist, Andy lends his skills to the Blender Open Movies on many aspects: in 2022 he was the Art Director for Charge, creating concept arts, helping the director's vision come to life and leading the lighting and rendering of the project.

Beau Gerbrands
3D Artist

Beau focuses on the modeling of sets and props as well as the lighting of shots and other 3D generalist work as needed by each project.
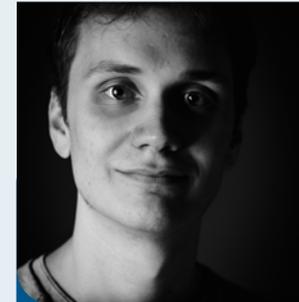
Demeter Dzadik
Character TD

Demeter's role includes rigging characters, props and sets alike, as well as setting up and maintaining tools for the Blender Studio pipeline. He is the creator and maintainer of the Cloud Rig tool.

Harukaze Legouge
Videographer and Communication Designer

Joining in Fall 2022, Haru follows the Studio team to share their work with the community through video production logs. He also helps the communication team with visuals for other projects.

The People
The Blender Studio team

Hjalti Hjálmarsson
Animation Director

In 2022, Hjalti directed the short film Charge. A man of many skills, he wrote the film, took care of layout/ previs as well as the edit, and directed the animation.

Julien Kaspar
3D Artist

Julien is a modeling and sculpting specialist, working on characters as well as props and sets. He is also involved in some Blender modules, bringing his skills and experience to the development process.

Pablo Fournier
Animator

Having worked in studios across Europe, Pablo brings his love of detail and high-end animation to the team.
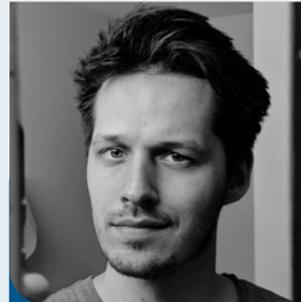
Rik Schutte
Lead Animator

After many years working at big international studios, Rik came back to his home country and joined Blender in 2020. At the Studio, he usually leads the animation process, discussing rigs with Demeter and helping bring the vision of the director to life.

Simon Thommes
3D Artist

Simon is well-known in the community as the GeoNodes and shading artist, having published many videos and articles about his process. On the Open Movies, he works on shading, effects and lighting, often coming up with new ways to achieve the desired look.

Vivien Lulkowski
Concept Artist

Vivien works on concept design for characters, sets and props alike, often hand in hand with Andy and the 3D artists that bring those paintings to life.

Members and Industry Relations
Corporate Development Fund members

The year 2022 started with the highest number of corporate members so far, with Intel upgrading to 'Patron', with China's largest game studio Netease joining, and with two new members from the metaverse and crypto community (Decentraland, Egirl).

Around the SIGGRAPH and Blender Conferences several high level meetings were held with our industry relations, including Unity, Apple, Epic, Khronos, Nvidia, Intel and AMD. The interest from the industry to keep contributing to Blender remains very high, but for economic reasons (stock value, losses) most tech companies are facing massive lay-offs, which is why some decided to suspend renewals of the Blender Development fund by the end of 2022.

Members and Industry Relations
Industry contributions to Blender

Industry relations and members of the Development Fund are actively involved in Blender development itself. Notable examples are:

Amazon

An Amazon employee is an active member of our animation module team, participating in regular meetings and doing QA reviews.

AMD

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

Apple

Apple assigned four engineers on making Blender fully ready to support the Metal API for drawing and rendering (first Cycles, but also the entire UI and viewports).

Academy Software Foundation (ASWF)

Blender uses various open source software developed by the industry, including AWSF members, where bugs reported by Blender developers were fixed and code contributions reviewed.

Members and Industry Relations
Industry contributions to Blender

Facebook

Facebook 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.

Unity

Unity allocated two developers to help with USD fixes such as new hair curves support, shapes and vertex color.

Finances
Blender Foundation

(*)   This is 70% of the CEO's total wage, the other 30% is being paid by Blender Studio.

(**)   Insurances, employer taxes, wage administration, office rent and costs, computers, financial manager, system admin.

(***)   Blender Studio gets costs covered for work done for Foundation, such as Dev Fund relations, Blender Conference management, Blender development, web development.

(****) Website admin, backend/frontend development, design, content, support, project coordination and infrastructure.

Income	2021		2022	
Epic Mega Grant	€ 334,609	16%	€ 87,540	4%
Dev. Fund patron	€ 687,896	32%	€ 1,073,684	49%
Dev. Fund corporate	€ 314,546	15%	€ 218,000	10%
Dev. Fund individual	€ 364,032	17%	€ 423,837	20%
Blender Market	€ 126,502	6%	€ 155,673	7%
Google Summer of Code	€ 2,649	0%	€ 2,003	0%
Other large donations	€ 148,486	7%	€ 160,819	7%
Cashing in Crypto donations	€ 119,852	6%	€ 0	0%
Generic small donations	€ 34,877	2%	€ 48,694	2%
	€ 2,133,449	100%	€ 2,170,250	100%

Expenses	2021		2022	
Developer salaries staff	€ 640,786	30.0%	€ 639,285	29.5%
Remote developer staff	€ 348,335	16.3%	€ 339,521	15.6%
Developer grants	€ 238,889	11.2%	€ 337,538	15.6%
Chairman salary (*)	€ 75,264	3.5%	€ 82,624	3.8%
Developers overhead (**)	€ 250,496	11.7%	€ 247,352	11.4%
Blender Studio services (***)	€ 72,000	3.4%	€ 72,000	3.3%
Blender Conference contribution	€ 0	0.0%	€ 50,429	2.3%
Travel costs	€ 0	0.0%	€ 43,968	2.0%
Blender.org costs (****)	€ 105,895	5.0%	€ 128,914	5.9%
Siggraph booth	€ 0	0.0%	€ 27,040	1.2%
Transaction fees	€ 27,472	1.3%	€ 38,952	1.8%
Gitea migration	€ 0	0.0%	€ 15,116	0.7%
Various cost	€ 3,919	0.2%	€ 23,577	1.1%
Accounting cost	€ 12,363	0.6%	€ 14,417	0.7%
Corporate income tax	€ 65,007	3.0%	€ 17,147	0.8%
Reservation for coming years	€ 293,023	13.7%	€ 92,370	4.3%
	€ 2,133,449	100%	€ 2,170,250	100%

Finances

Development Fund in 2022

The development fund income stabilised in 2022. Several companies decided to not renew in 2022 - which was a tough year for the tech industry, with a lot of budget and job cuts.

It remains an action point for 2023 to run a campaign to increase awareness in the community that individual donations matter, to keep the Blender organisation independently funded.

Reservation

The reservation for 2023 is significantly lower, but still 5% of the total income. Goal remains to maintain a large buffer to cover unforeseen expenses and tougher times.

SIGGRAPH and travel costs

After two years of cutting on travels and conferences, there was a great enthusiasm among the Blender staff to participate in events again. A large delegation of 12 people went to Vancouver to participate in SIGGRAPH.

Blender Conference

After skipping the conference twice, the 2022 Blender Conference was destined to be an epic and memorable event. Costs for the event, especially because of last minute withdrawal of sponsors and the unknown new venue, proved to be higher than expected. The tremendous success of the conference made it worth the investment though. The 2023 edition is expected to become break-even again.

Blender Studio

Income and expenses for Blender Studio (film projects, studio.blender.org content) have not been included in this overview or in this report. The studio is a separate corporate entity and - although the studio contributes to Blender's mission - it is funded entirely independently by studio.blender.org subscribers. The studio pays its share in facilities and services to Blender Institute.

Blender by the Numbers 2022
The Blender.org Website

Following the 2020-21 trend, Blender's growth was moderate in 2022. The blender.org website and several of its subdomains have received a combined 27M unique visitors. This means that the Blender websites are visited over 2M times each month.

Monthly Unique Visitors on blender.org (Millions)

— 2019   — 2020   — 2021   — 2022

Yearly Unique Visitors on blender.org (Millions)

■ 2019   ■ 2020   ■ 2021   ■ 2022
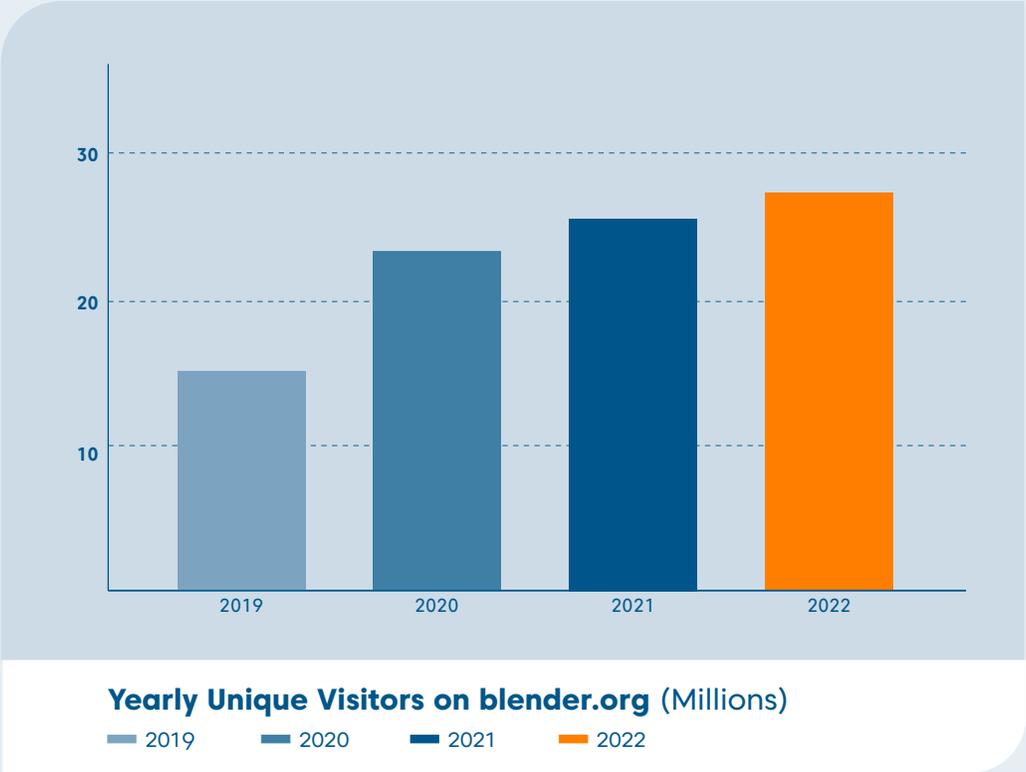
Blender by the Numbers 2022
Blender Download Counts

During 2022, Blender has been downloaded over 17M times from blender.org, plus another 1.6M times from other sources (Microsoft Store, Steam and Snap). This is a 5% increase compared to 2021, with the Microsoft store showing a 60% increase.

Distribution across operating systems slowly changes, with a 23% growth for macOS and 120% growth on Linux (with Linux counting for 3.5% of overall downloads).
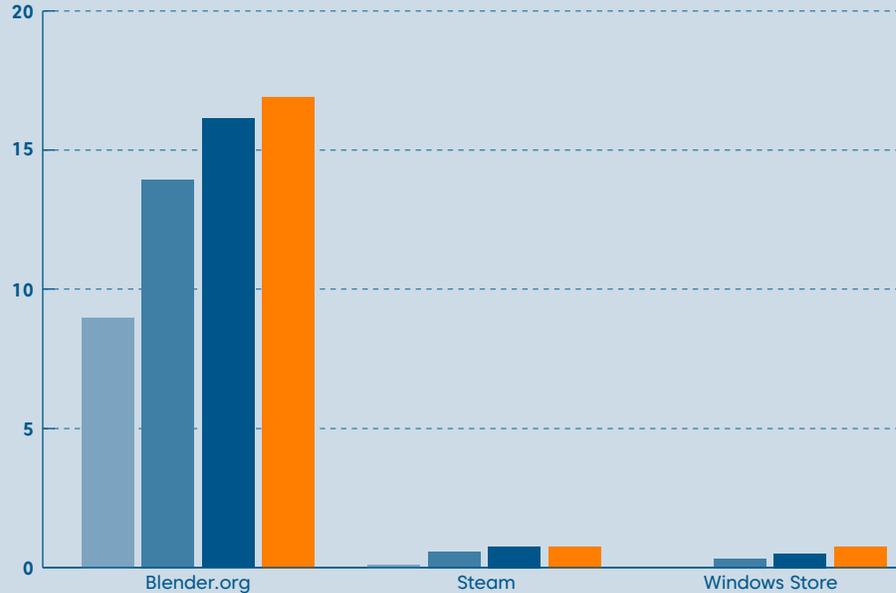

Blender downloads (Millions)
- 2019
- 2020
- 2021
- 2022
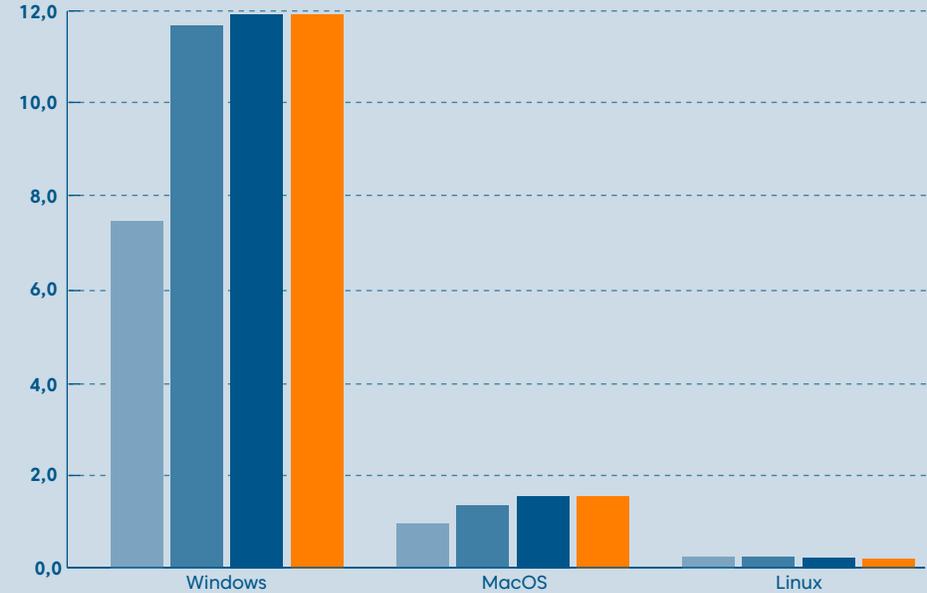
Downloads on blender.org by OS (Millions)
- 2019
- 2020
- 2021
- 2022

Blender by the Numbers 2022
Blender Download Counts

Steam remains a popular distribution outlet for Blender, with over 6000 concurrent users running it at all time. This brings Blender close to the top 100 apps on Steam.

Code Contributions

On the software contribution side, Blender has seen 113 new contributors providing improvements and fixes (down 16% compared to 2021), while the total number of contributors reached the all-time high of 133.
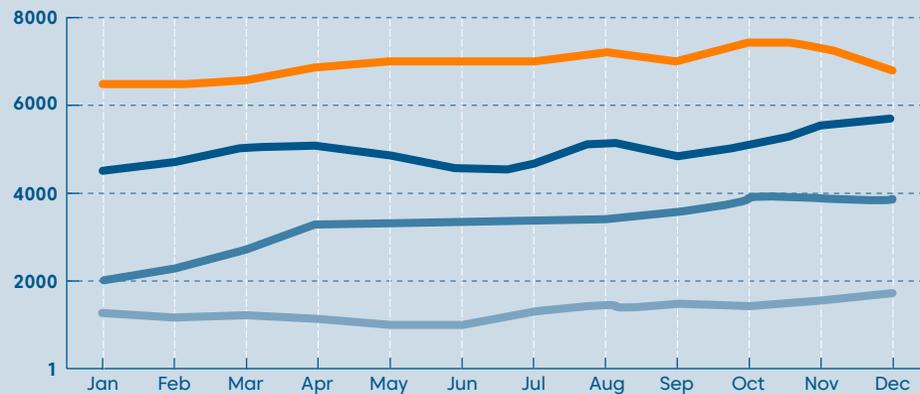
Concurrent users on Steam

— 2019   — 2020   — 2021   — 2022
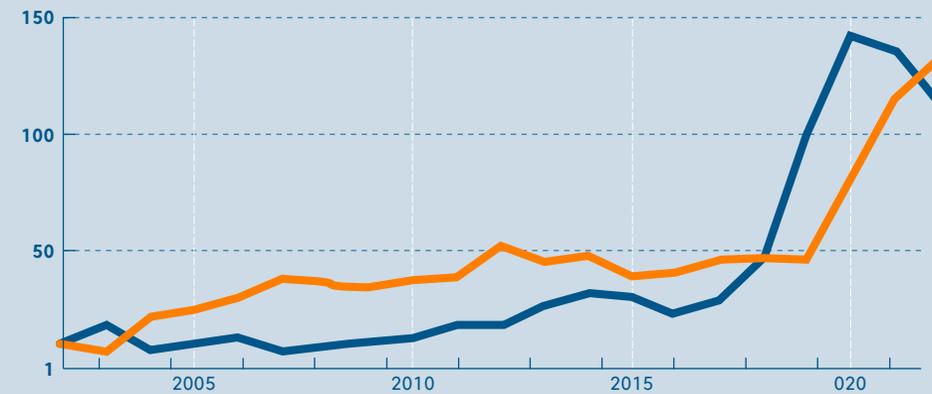
New Dev and Active Dev since 2002.

— New Dev   — Active dev

Blender by the Numbers 2022
Development Portal

The following chart displays in orange how long it took for a developer to respond to an issue since it was reported. For example: of the total 2340 issues reported in 2022, 18 (1%) were resolved within 15 minutes.
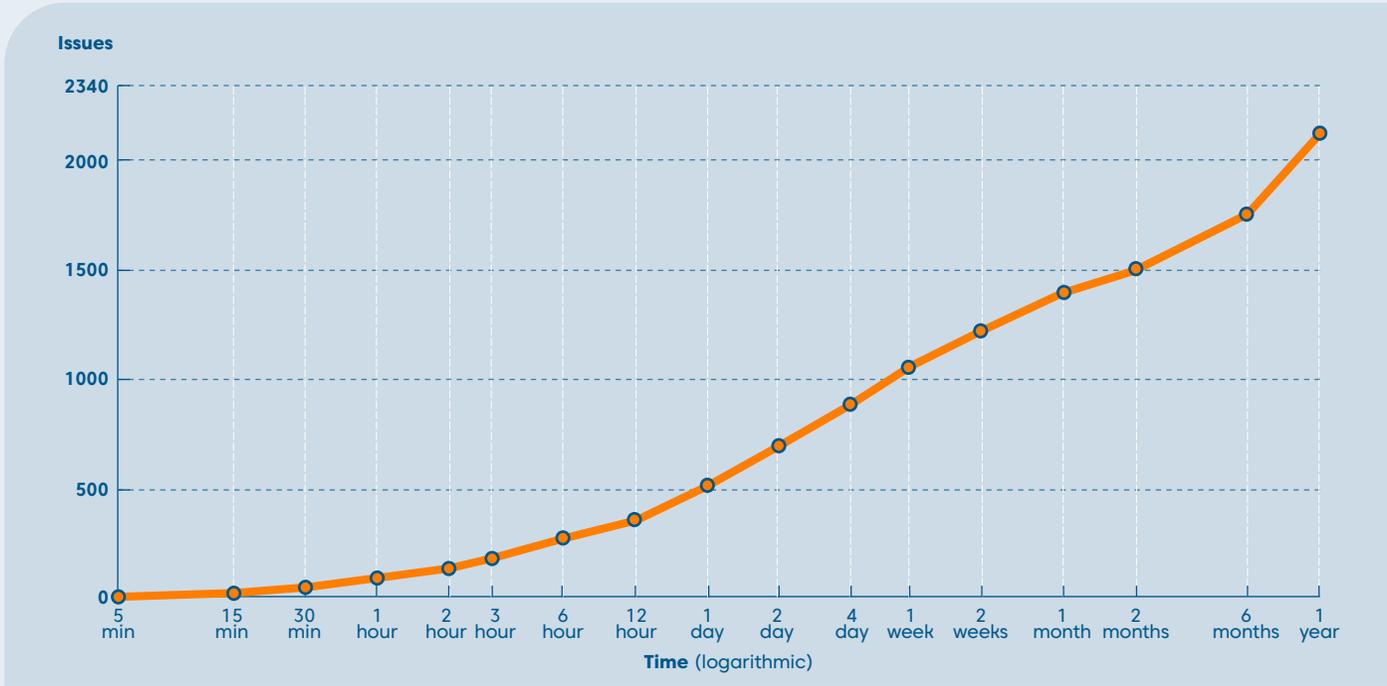
Issues

Issue Response Time 2022

To everyone who makes
Blender possible:

Thank You