

/\* ACADEMY  
SOFTWARE  
FOUNDATION

# Overview

January 2025

# Antitrust Policy Notice

Linux Foundation meetings involve participation by industry competitors, and it is the intention of the Linux Foundation to conduct all of its activities in accordance with applicable antitrust and competition laws. It is therefore extremely important that attendees adhere to meeting agendas, and be aware of, and not participate in, any activities that are prohibited under applicable US state, federal or foreign antitrust and competition laws.

Examples of types of actions that are prohibited at Linux Foundation meetings and in connection with Linux Foundation activities are described in the Linux Foundation Antitrust Policy available at [linuxfoundation.org/antitrust-policy](https://linuxfoundation.org/antitrust-policy). If you have questions about these matters, please contact your company counsel, or if you are a member of the Linux Foundation, feel free to contact Andrew Updegrove of the firm of Gesmer Updegrove LLP, which provides legal counsel to the Linux Foundation.

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#ASWF

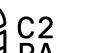
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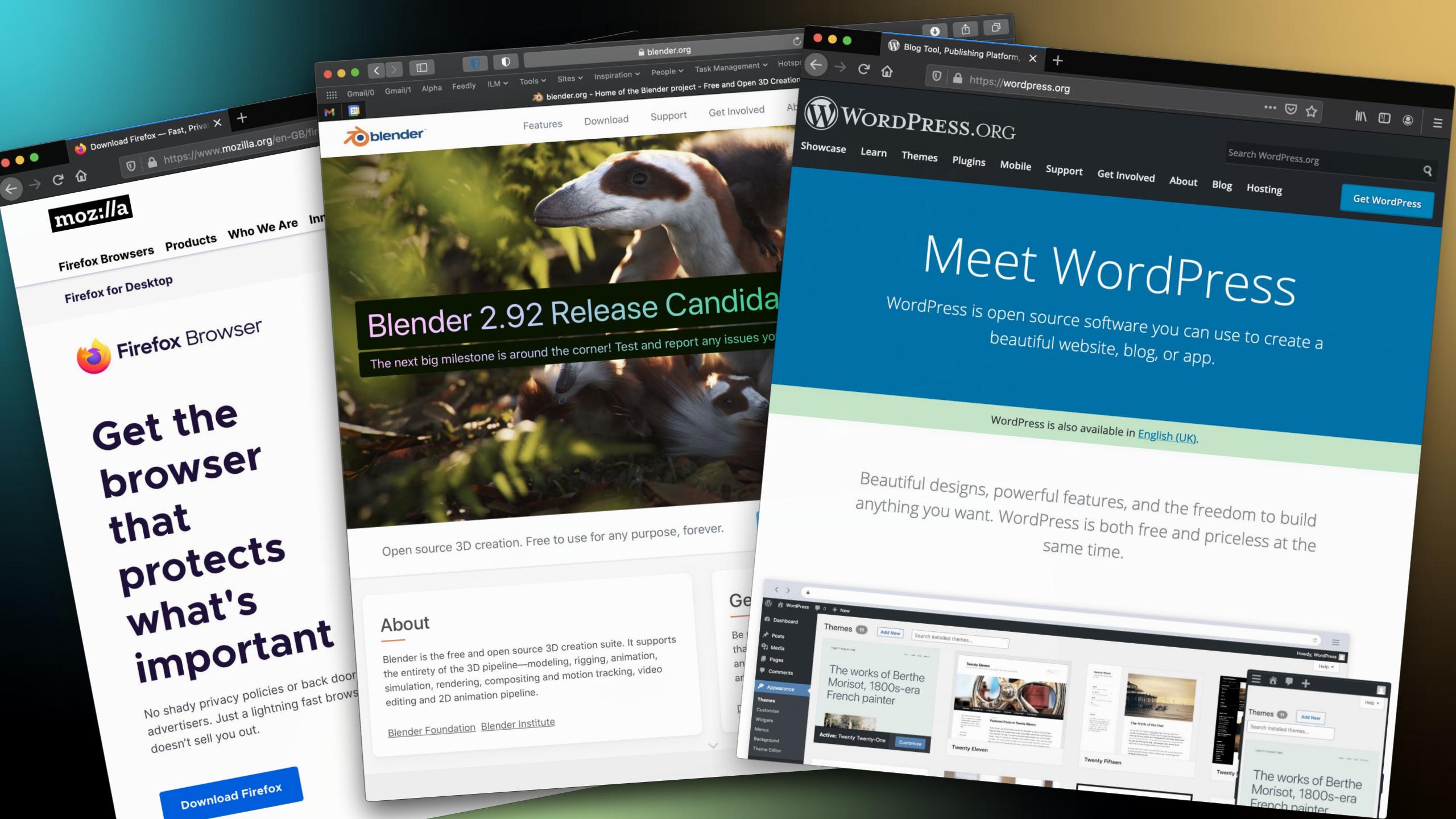
# Why Open Source?

# Why Open Source?

- Software development has a **cost**
  - Development
  - Maintenance
  - Documentation
  - Training
- Open Source ecosystems **share** those costs
- Empower developers to lead development

# Open Source Projects

Vertical Industry	     
Security	      
AI & Data	       
Cloud	       
Networking	       
Edge & IoT	       
Web	       
Visual Effects	      
Sustainability	      
Digital Trust	     
Hardware	     
Standards	      



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# Open Source: Innovation Accelerator

Standardization on open technologies

Neutral environment for collaboration & cross-pollination

Innovation multiplier

Enables better interoperability

Minimizes fragmentation

Qualifies reference architectures

Lowers barriers to enter a new domain

Enables new business opportunities

Leads to better products

Allows shared cost of development

# About the Academy Software Foundation

#ASWF

/\* ACADEMY SOFTWARE FOUNDATION

# Open Source in Entertainment

*How the Academy Software Foundation  
Creates Shared Value*

A report from  
 | Research

Written by  
Barbara Robertson  
[report.aswf.io](http://report.aswf.io)

DUNE Image Courtesy of DNEG © Legendary  
Warner Bros. Entertainment Inc. All Rights Reserved.



# An Open Source Foundation Developed in Partnership



The Academy Software Foundation provides a neutral forum for open source software developers in the motion picture and broader media industries to share resources and collaborate on technologies for image creation, visual effects, animation and sound.



# Why the Academy Software Foundation?

- Legal Framework
- Continuous Integration and Build Infrastructure
- Clear path to accepting contributions (neutral forum)
- Versionitis

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FOUNDATION

# ASWF created

August 10, 2018

Founding members:

Animal Logic

Autodesk

Blue Sky Studios

Cisco

DNEG

DreamWorks

Animation

Epic Games

Foundry

Google Cloud

Intel

SideFX

The Walt Disney

Studios

Weta Digital



## Scitech Council

Open source investigation concludes

01

## First project

October 23, 2018

**OpenVDB**

New members:

Sony Pictures

Entertainment

Warner Bros.

Blender Foundation

Visual Effects Society

February 8, 2019  
**OpenColorIO**

02

## Open Source Day 2019

July 29, 2019

**OpenTimelineIO**

Netflix

Amazon Web Services

Rodeo FX

MovieLabs

Sept 13, 2019  
Apple  
Microsoft

05

April 16  
2020  
**Open Shading Language**

AMD  
DockYard

06

## Open Source Days 2020

August 19-20 2020

Unity

Conductor

Technologies

SMPTE

08

Dec. 15  
2020  
Adobe  
ETC

09

## Open Source Days 2021

August 4-5 2021

**MaterialX**

Maxon

10

Jan. 28  
2022  
Wevr

11

## Open Source Forum 2022

March 10, 2022

**Rez**

**DPEL**

**Raw2ACES**

## Open Source Days 2022

August 8-9, 2022

**OpenFX**

**OpenAssetIO**

**Open Review**

**Initiative**

Canonical

Khronos Group

Open Source Forum 2023

Feb. 16 2023  
HP  
Framestore

13

14

5  
YEARS

## Open Source Days 2023

July 25 -

August 7, 2023

**OpenImageIO**

Otoy

Bolt Graphics

Coreweave

Open Source Forum 2024

Feb 22 2024  
Mod Tech  
Labs

15

16

## Open Source Days 2024

July 23-29 2024

Samsung

Caligra

Open Source Forum 2025

Feb 13 2025

**OpenAPV**

Stability.ai

RaynaultVFX

17

18



# Membership

## Premier



ACADEMY  
OF MOTION PICTURE  
ARTS AND SCIENCES



## General



ANIMAL LOGIC



BOOMSIGHT  
GRAPHICS



Canonical



CoreWeave



FRAMESTORE



ftrack



hp



MAXON



otoy



Rainault



Red Hat



SideFX



stability.ai



FOUNDRY.



WB

## Associate



blender



etc  
MEDIA ENTERTAINMENT



movie  
labs



SMPTE



KHRONOS  
GFX



VES  
Visual Effects Society

# Governing Board Representatives



Rob Bredow  
**Chair**  
SVP, Chief Creative Officer  
Industrial Light & Magic



Alexander Forsythe  
Senior Director, Science and Technology  
Academy of Motion Picture Arts and Sciences



Daniel Heckenberg  
Senior Software Engineer  
Netflix, Inc.



Darin Grant  
**Treasurer**  
CTO  
Netflix



Eric Bourque  
**Vice Chair**  
VP Content Creation  
Autodesk



Eric Mejdrich  
Advanced Micro Devices (AMD)



Gregory Ducatel  
Executive Director, Software Development  
Sony Pictures Entertainment



Guido Quaroni  
Senior Director of Engineering, 3D & Immersive  
Adobe Inc.



Guy Martin  
Director, Open Source & Standards  
NVIDIA Corporation



Jeremy Smith  
Chief Technologist  
Hewlett Packard Enterprise Company



Kimball Thurston  
Chief Technology Officer

Wētā FX Limited



Kwang Pyo Choi  
Vice President of Software Technology  
Samsung Electronics Co. Ltd.



Larry Gritz  
/ Distinguished Engineer  
Sony Pictures Entertainment



Mark Jackels  
Director of Research Development  
DreamWorks Animation



Michael B. Johnson  
Innovation Architect, Pro Workflow  
Apple Inc.



Paul Salvini  
Global Chief Technology Officer  
DNEG



Phil Parsonage  
Director of Engineering  
The Foundry Visionmongers Limited



Sean McDuffee  
Graphics Software Engineer  
Intel Corporation



Sean Wallitsch  
Solutions Architect  
Amazon Web Services, Inc.



Sebastien Miglio  
VP Product and Engineering  
Creator Tools  
Epic Games, Inc



Simon Crownshaw  
Worldwide Media and Entertainment Strategy Director  
Microsoft Corporation

# Governing Board Alternates



Alexander Wilkie  
Head of R & D  
Netflix



Bhanu Srikanth  
Partner  
Engagement,  
Technology  
Partnerships,  
Standards  
Netflix, Inc.



Carol Payne  
Color & Imaging  
Workflow Leader  
Individual - No  
Account



Duncan Burbidge  
Epic Games, Inc



Erik Niemeyer  
Intel Corporation



Greg Denton  
Senior Program  
Manager  
Microsoft  
Corporation



John Canning  
Dir of Dev  
Relations -  
Creators  
Advanced Micro  
Devices (AMD)



Kevin Sprout  
Director of  
Developer  
Relations,  
Omniverse  
NVIDIA  
Corporation



Mallory King  
Pipeline Td,  
Systems Engineer  
Apple Inc.



Martine Bertrand  
Senior  
Researcher AI  
DNEG



Morgan Prygrocki  
Sr. Strategic  
Development  
Manager  
Adobe Inc.



Rachel Rose  
Director,  
Research &  
Development  
Industrial Light &  
Magic



Robert Fanner  
Engineering  
Manager -  
Platform  
The Foundry  
Visionmongers  
Limited



Sarah Connas  
DreamWorks  
Animation



Tony Micilotta  
Senior Director,  
Content Creation  
Engineering  
Autodesk



Youngkwan Lim  
Principal  
Researcher  
Samsung  
Electronics Co.  
Ltd.

# Technical Advisory Council (TAC)



**Larry Gritz**  
**Chair**  
Software Architect / Distinguished Engineer  
Sony Pictures Imageworks



**Carol Payne**  
**Vice Chair**  
Color & Imaging Workflow Leader  
Individual - No Account



**Cary Phillips**  
R&D Supervisor  
Industrial Light & Magic



**Chris Hall**  
CAD focused  
Radeon ProRender Solutions  
Advanced Micro Devices (AMD)



**Chris Kulla**  
Principal Rendering Engineer  
Epic Games, Inc



**Cory Omand**  
Director of Engineering, Pixar Software R&D  
The Walt Disney Studios



**Diego Tavares da Silva**  
Software Engineer  
Sony Pictures Imageworks



**Eric Enderton**  
Dir. Film Rendering Tech.  
NVIDIA Corporation



**Eric Reinecke**  
Sr. Software Engineer, Video Engineering  
Netflix, Inc.



**Erik Niemeyer**  
Senior Staff Software Enabling and Optimization Engineer  
Intel Corporation



**Gordon Bradley**  
Senior Software Architect  
Autodesk



**Greg Denton**  
Senior Program Manager  
Microsoft Corporation



**Jean-Francois Panisset**  
Consulting Engineer  
Visual Effects Society



**Jean-Michel Dignard**  
LEAD PROGRAMMER  
Epic Games, Inc



**Jonathan Stone**  
Lead Rendering Engineer, Materials and Shading  
Lucasfilm



**Ken Museth**  
Senior Director, Simulation Technology  
NVIDIA Corporation



**Kimball Thurston**  
Chief Technology Officer  
Wētā FX Limited



**Matthew Low**  
Principal Engineer  
DreamWorks Animation



**Michael Min**  
Adobe Inc.



**Michael B. Johnson**  
Innovation Architect, Pro Workflow  
Apple Inc.



**Ross Dickson**  
Amazon Web Services, Inc.



**Scott Dyer**  
Senior Imaging Engineer  
Academy of Motion Picture Arts and Sciences



**Youngkwon Lim**  
Principal Researcher  
Samsung Electronics Co. Ltd.

# Behind the Screens

[aswf.io/behind-the-screens](http://aswf.io/behind-the-screens)



# Our Mission

Increase the *quality* and *quantity* of open source contributions by establishing a *governance model*, a *legal framework* and a *community infrastructure* that lowers the barrier to entry for developing and using open source software.

# Our Goals

- Provide a neutral forum to coordinate cross-project efforts, establish best practices and share resources.
- Develop an open continuous integration (CI) and build infrastructure to enable reference builds from the community.
- Streamline development for build and runtime environments through the sharing of open source build configurations, scripts and recipes.
- Provide individuals and organizations with a clear path for participation and code contribution.
- Provide better, more consistent licensing through a shared licensing template.
- Create working groups for exploration of new or larger projects.
- Focus on diversity and inclusion and raising the profile of software engineers in our industry.

# Our Projects



Contributed By

Academy Software Foundation



Contributed By

Lucasfilm



Contributed By

Academy Software Foundation



open shading language

Contributed By

Sony Pictures Imageworks



Contributed By



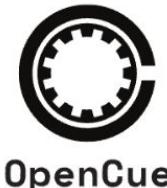
Contributed By

Foundry



Contributed By

Sony Pictures Imageworks



Contributed By

Sony Pictures Imageworks and Google Cloud



Contributed By

Lucasfilm



Contributed By

Open Effects Association



OpenImageIO

Contributed By

Larry Gritz



OpenTimelineIO

Contributed By

Pixar Animation Studios



Contributed By

Dreamworks Animation



Contributed By

The Academy of Motion Picture Arts and Sciences



Contributed By

Allan Johns

# Diversity & Inclusion

## Diversity & Inclusion Working Group

“Open source has the power to break down racial, gender, and corporate barriers to unite people around a shared goal...”

Read more at [aswf.io/diversity\\_inclusion](https://aswf.io/diversity_inclusion)

# ASWF Landscape

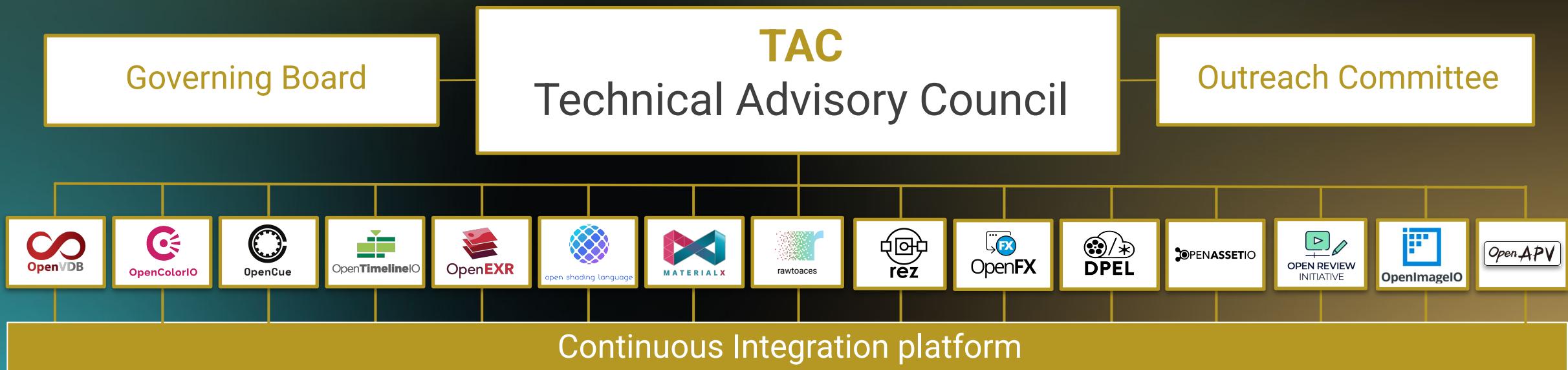
The screenshot shows the ASWF Landscape website interface. At the top, there are navigation links for 'EXPLORE' (underlined) and 'STATS'. A search bar with placeholder text 'Type / to search items' and icons for search, download, and refresh are also at the top. Below the header, there are sections for 'Filters' (with 'Open Source Projects' selected), 'GROUP: Open Source Projects', 'ASWF Members', and 'ASWF Projects'. The main content area is organized into several categories:

- Image Formats, I/O, and Processing Libraries:** Includes OpenEXR, OpenImageIO, OpenAPV, RIS, depix, FFmpeg, gatling, THE OPTIE PROJECT, libitm, openMVG, pfstools, Ptex, PySceneDetect, sequencer, three.js, and VMAF.
- Display and Review:** Includes OPEN REVIEW INITIATIVE, ASWF SANDBOX, t!Render, and various logos for JERI, DV, and Open RV.
- Color Science:** Includes OpenColorIO, rawtoaces, ACES, ALEMBIC, COLOUR, and wetaFX PhysLight.
- Interactive Compositing and Painting:** Includes AUTHORITY FX, Aton, CinePaint, gimp, NATRON, and PhotoFlow.
- Scenes and Geometry:** Includes DPEL, /\* ACADEMY SOFTWARE FOUNDATION USD Working Group, ALEMBIC, MESHROOM, AliceVision, COLLADA, ONEG, OpenSubdiv, OpenFlipper, OpenMesh, PhysX by NVIDIA, and USD.
- Software Foundation and System Administration:** Includes rez, ASWF LANGUAGE INTEROP, ASWF WORKING GROUP, AUTHORITY FX, ForestFlow, Lumis, pyString, QtPyConvert, and Scala Migrations.
- Pipelines and Frameworks:** Includes OPEN, AYON, blender, vortex, gaffer, kdenlive, Olive, Google Cloud OpenProductionData, PRISM, TACTIC, and various icons for adl, trackchannel parser, openannotation.io, and timecode.
- Timelines and Animation:** Includes icons for adl, trackchannel parser, openannotation.io, and timecode.

## 1.aswf.io

- Public list of open source projects in the animation and VFX industry
- Updates can be submitted via GitHub
- Goal is to have all active, open source projects in animation and VFX industries represented.

# Academy Software Foundation Structure





*The Croods; courtesy of DreamWorks Animation*



[openvdb.org](http://openvdb.org)



*How to Train Your Dragon: The Hidden World; courtesy of DreamWorks Animation*

- First project adopted by ASWF in Sept. 2018; first project to graduate to adopted status in July 2019.
- Developed by DreamWorks Animation in 2012.
- C++ library for volumetric representations including fluid simulations, animated volumes and environmental effects.
- Academy Technical Achievement Award recipient.
- Key contributors include DreamWorks, Autodesk, DNEG, Industrial Light & Magic, NVIDIA, SideFX, Weta Digital.



# OpenColorIO

[opencolorio.org](http://opencolorio.org)

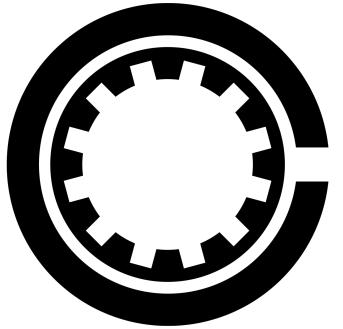


Spider-Man™: Into the Spider-Verse; all images courtesy of Imageworks

- Joined ASWF in Feb. 2019; adopted status in Nov. 2019.
- Developed by Sony Pictures Imageworks in 2003.
- Provides a consistent user experience across digital content creation applications; widely adopted in VFX and computer animation studios and software.
- Academy Technical Achievement Award recipient.
- Key contributors include Imageworks, Autodesk, DNEG, ILM, Foundry, Framestore.
- OCIO v2 released fall 2020, led by Autodesk.

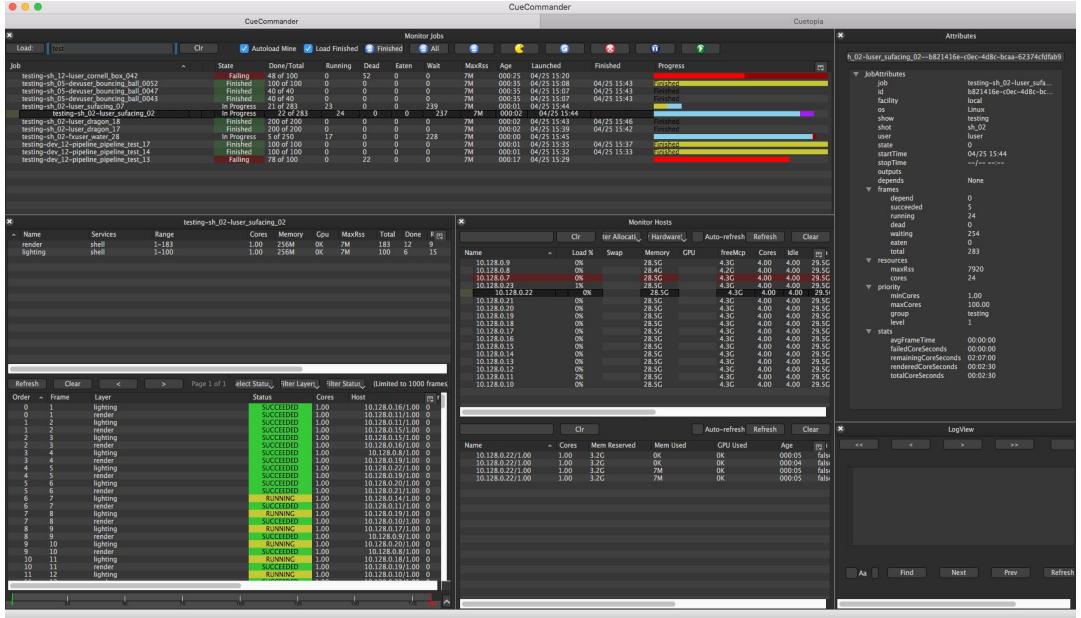


Smurfs: The Lost Village; courtesy of Sony Pictures Imageworks



# OpenCue

[opencue.io](http://opencue.io)



OpenCue screenshot

- Joined ASWF in April 2019.
- Developed at Sony Pictures Imageworks as its internal render farm manager (“Cue3”); collaboration with Google Cloud to release as OpenCue in January 2019.
- Fully featured render manager for media and entertainment that can be used to break down complex jobs into individual tasks.
- Contributors include Imageworks, Google, Netflix, Microsoft, Amazon.
- Monthly releases over the past year, including adding Python 3 compatibility, Windows support, new documentation.



Images from *Solo: A Star Wars Story*. © and TM Lucasfilm Ltd. All Rights Reserved.



# OpenEXR

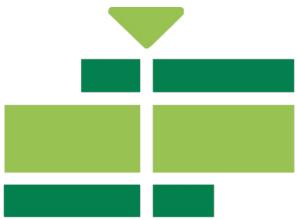
[openexr.org](http://openexr.org)

- Joined ASWF in April 2019; adopted status in Nov. 2019.
- Developed by ILM in 1999; first release of a major open source project by a studio.
- High dynamic-range (HDR) image file format for high-quality image processing and storage; widely adopted standard in computer graphics.
- Academy Technical Achievement Award recipient.
- Key contributors include ILM, Disney Animation, Imageworks, Epic Games, Weta Digital, Pixar, Autodesk, and DreamWorks.
- OpenEXR 3.0 just released.



OpenTimelineIO used on Coco for transitions and linking media to the latest renders.

Image courtesy of Pixar Animation Studios.



# OpenTimelineIO

[opentimeline.io](http://opentimeline.io)

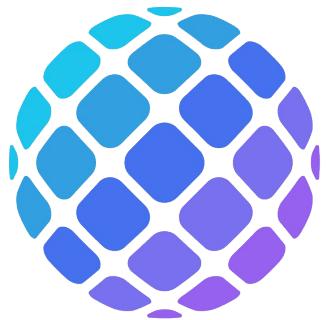
- Joined ASWF in July 2019.
- Developed by Pixar Animation Studios.
- Open source interchange format for editorial timeline information – clips, timing, tracks, transitions, metadata etc.
- Key contributors include Pixar, Netflix, DreamWorks, Autodesk.
- In Public Beta



*The Angry Birds Movie 2*; courtesy of Imageworks



*Spider-Man: Far From Home*; courtesy of Imageworks



open shading language

[openshadinglanguage.org](http://openshadinglanguage.org)

- Joined ASWF in April 2020.
- Developed by Sony Pictures Imageworks; released as open source in 2010.
- De facto standard shading language for VFX and animation, ideal for describing materials, lights, displacement, and pattern generation.
- Academy Technical Achievement Award recipient.
- Key contributors include Imageworks, Animal Logic, NVIDIA, Pixar, DNEG, Autodesk.

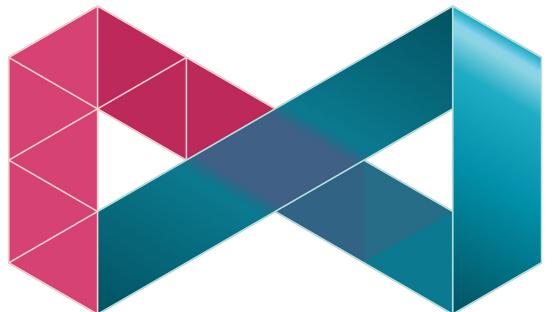
ILM Production tests using  
MaterialX



ILM UNIFIED



STANDARD SURFACE



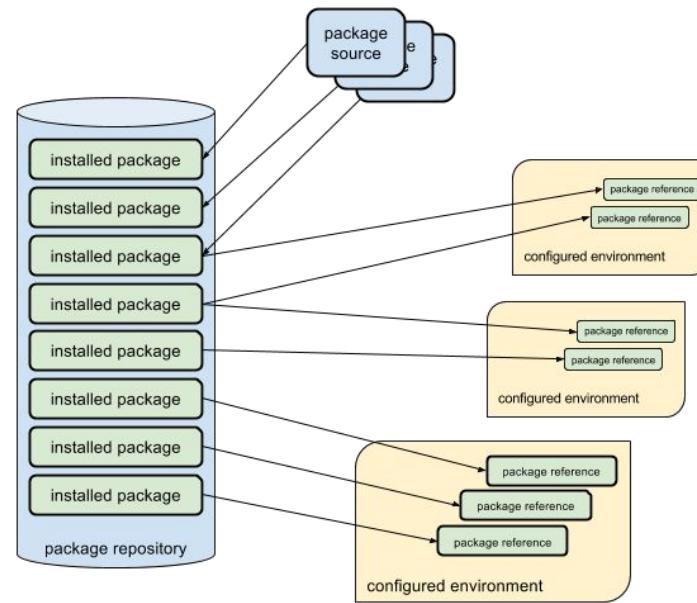
M A T E R I A L X

[materialx.org](https://materialx.org)

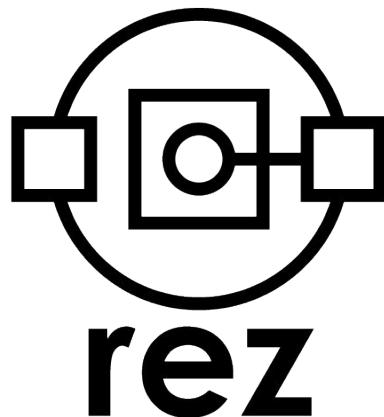
- Joined ASWF in March 2021.
- Open standard for representing rich material and look-development content in computer graphics, enabling its platform-independent description and exchange across applications and renderers.
- Launched at Industrial Light & Magic in 2012, MaterialX has been a key technology in their feature films and real-time experiences since Star Wars: The Force Awakens and Millennium Falcon: Smugglers Run.
- Key contributors include Sony Pictures Imageworks, Pixar, Autodesk, Adobe, and SideFX.



Typical package managers  
install packages into an  
environment



Rez installs packages once,  
and configures environments  
dynamically



[rez-project.io](https://rez-project.io)

- Joined ASWF in February 2022.
- Developed by Allan Johns of Method Studios.
- Cross-platform package manager that leverages a central repository for storing packages instead of installing into each environment separately, reducing the time to create complex environments to just a few seconds.
- Key contributors include Luma Pictures, Method Studios, NVIDIA, and Shotgrid



# rawtoaces

[rawtoaces.org](http://rawtoaces.org)

- Joined ASWF in January 2021.
- Software package that converts digital camera raw files to ACES container files containing image data encoded according to the Academy Color Encoding Specification (ACES) as specified in SMPTE 2065-1.
- Key contributors include AMPAS and Weta Digital



OpenFX Overlay Draw Suite



[openeffects.org](http://openeffects.org)

- Industry-wide common interface between image-based visual effects plugins and host applications
- Used by Autodesk Flame, Foundry Nuke, Blackmagic Design DaVinci Resolve and Fusion, Sony Catalyst and MAGIX Vegas Pro, Assimilate Scratch, Filmlight Baselight, Boris FX Sapphire and Silhouette, RE:Vision Effects and more.
- Open, extensible C API currently version 1.4 with version 1.5 in development.

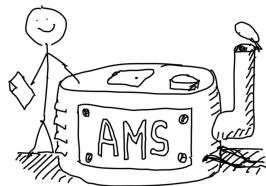


Launching with ASC Standard Evaluation Material II (StEM2), Animal Logic's ALab Phase 2, Intel's Volumetric Clouds Library and AWS character Noa.



[dpel.aswf.io](http://dpel.aswf.io)

Providing a vendor-neutral hosting platform and a uniform license agreement, to encourage, curate and publish production-grade sample assets for developers, researchers and educators, Digital Production Example Library is the conclusion of an Academy Software Foundation working group on assets.



ftrack



# OPENASSETIO

[openassetio.org](http://openassetio.org)



OpenAssetIO is an early stage open source interoperability standard between tools and asset management systems, developed by Foundry with proofs of concept and design input from 15 companies including DNEG, Pixar, Amazon Web Services, Animal Logic, Blizzard, and Blender. OpenAssetIO was the first project to join the Academy Software Foundation in sandbox stage.



DNEG's xSTUDIO



Autodesk's RV Player



[openreviewinitiative.org](http://openreviewinitiative.org)

An open source project with the mission to build a unified toolset for playback, review and approval of motion picture and related professional media, with Autodesk contributing RV, Dneg contributing xSTUDIO, Imageworks contributing parts of itView, and the three companies providing lead architects and maintainers for the project Technical Steering Committee.



Miles Morales (Shameik Moore) and Gwen Stacy (Hailee Steinfeld) take on The Spot (Jason Schwartzman) in Columbia Pictures and Sony Pictures Animation's *SPIDER-MAN™: ACROSS THE SPIDER-VERSE*.



# OpenImageIO

[openimageio.org](http://openimageio.org)

OpenImageIO is a library for reading and writing images, and a bunch of related classes, utilities, and applications. There is a particular emphasis on formats and functionality used in professional, large-scale animation and visual effects work for film. OpenImageIO is used extensively in animation and VFX studios all over the world, and is also incorporated into several commercial products.

# Working Groups

- CI
- Diversity and Inclusion
- Language Interop
- USD
- Zero Trust

# How to contribute

 Search Academy Software Foundation Need help or have a question? Contact us here

## Contribute to an existing project:

- Submit a PR with a bugfix or new feature
- Pick existing GitHub issue as a sample project
- Integrate with a new app / contribute plugin
- Help improve project documentation
- Submit additional test cases
- Join the TSC discussion: dev mailing list, conf calls

## Get involved with the TAC or Working Group:

- DevOps / CI expertise always useful
- Interest / expertise in security especially welcome
- Join the TAC discussions: mailing list, conf calls, working groups

More information at [tac.aswf.io/engagement](https://tac.aswf.io/engagement)

## Getting Involved in Projects

All of the projects hosted at the Academy Software Foundation are open and transparent, and welcome participation from anyone interested in the technology areas. Each project publishes their governance processes within their project repo ( typically in the README.md file or in a GOVERNANCE.md file within the primary project repo or TSC repo ) on roles within the community and how decision making is made.

### TAC Meetings

Learn more about joining the public meetings of the Technical Advisory Council (TAC) on [the Meetings page](#)

### Mailing Lists and Slack channels for hosted projects

Each project hosted at the Academy Software Foundation collaborates on open channels that are welcome for anyone in the community to participate in. See the below list of channels for each project.

All Slack channels referenced below are part of the [Academy Software Foundation Slack organization](#) unless otherwise noted.



Website: <https://opencolorio.org/>  
Dev Mailing List: <https://lists.aswf.io/g/ocio-dev>  
User Mailing List: <https://lists.aswf.io/g/ocio-user>  
Slack: [slack.opencolorio.org](https://slack.opencolorio.org)  
Leads: Carol Payne - Imaging Technologist at Netflix, Inc



Website: <https://www.openexr.io/>

# How to participate

Developers can join our mailing lists to stay informed about the code and our projects at [lists.aswf.io](https://lists.aswf.io).

Learn how your organization can support the Academy Software Foundation community at [aswf.io/join](https://aswf.io/join).

Stay connected to us on Twitter at @AcademySWF and #ASWF

/\* ACADEMY  
SOFTWARE  
FOUNDATION

#ASWF

**THANK YOU!**  
Learn more at [aswf.io](https://aswf.io)

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