ASWF Contribution Proposal

February 18th, 2026

DREAMWORKS

Open MoonRay

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Agenda

- **MoonRay**

  Overview, features, history

- **Open Source**

  Current status, resources, structure, architecture

- **Demos**

  Parallel architecture, multi-machine, multi-context, Apple, Windows

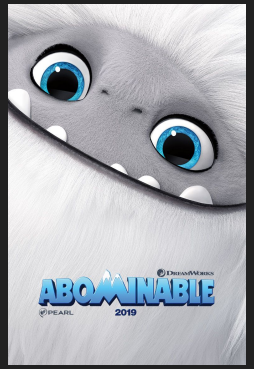
- **ASWF Alignment**

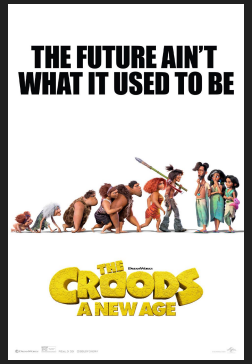
  Renderer landscape, projects ecosystem, member engagement

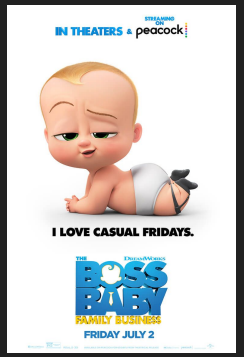
MoonRay Overview

- **MoonRay** High-end production path tracer
- **MoonShine** Collection of layerable production shaders
- **Arras** Cloud computation framework for local and distributed rendering
- **Multi-Platform** Linux, MacOS, Windows
- **OpenUSD & Hydra** Pipeline & Render Delegate
- **Utilities** Supporting tools, e.g. testing, profiling, debugging, development etc

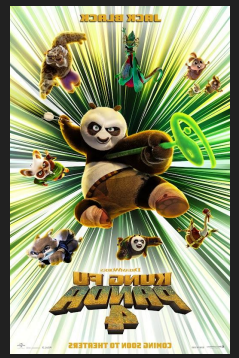
MoonRay in Production







Latest Release!



MOONRAY

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MoonRay Overview: Modern Technology

- Bundled architecture
- Scalar, vector and XPU modes
- Uniform and adaptive sampling
- Render profiling viewer
- Hydra render delegate
- Interactive GUI
- Deep Cryptomatte support
- NUMA architecture optimization
- Checkpoint & resume rendering
- Denoising
- MaterialX (in progress)
- Light Path Visualization
- Regression test suite (RATS)
- Indexed documentation website

MoonRay History

- Proof of concept of bundled, vectorized architecture in 2014
- Initially built for Rendering as a Service
- Deployed to How To Train Your Dragon: The Hidden World in 2018
- Open Sourced in 2023

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MoonRay at DreamWorks

- Used on all feature productions
- Weekly releases
- Automated CI & Build
- Automated regression testing with performance profiling visualization

- Core team: 7 engineers
- Additional contributors: 6 engineers

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MoonRay in the Community

Community Contributions

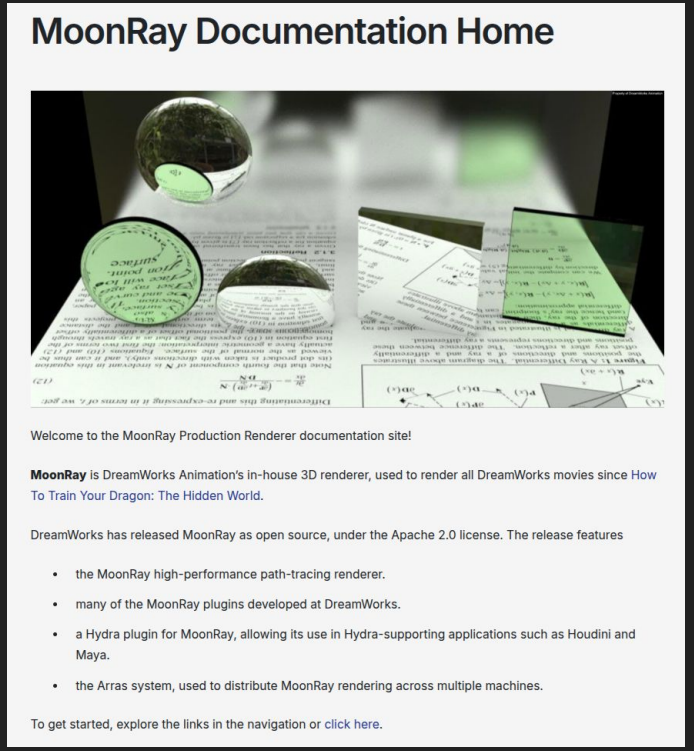
- MacOS / Metal build
- Native Windows port
- WSL support (in progress)
- Snap installer
- Support for various distros (ArchLinux, Debian, etc.)

Used by

- Production partners
- Compiler vendor
- Hardware vendor
- Academic projects

MoonRay Open Source Project

- Apache 2.0
- CLA and DCO
- C++, ISPC, Lua, Python, CMake
- GitHub and documentation website
- Super Project w/ 19 submodule repos (4.5k ⭐)
- Releases weekly internally, quarterly publicly
  - In progress to match cadence with testing & automation
- Project Governance modeled on ASWF template
- OpenSSF Best Practices: “Passing” in-progress
  - https://www.bestpractices.dev/en/projects/9998/passing



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https://openmoonray.org | https://github.com/dreamworksanimation/openmoonray

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MoonRay Architecture

“Keep all the lanes of all the cores of all the machines busy all the time with meaningful work”

SIMD vectorization with ISPC

NUMA-aware multi-threaded implementation

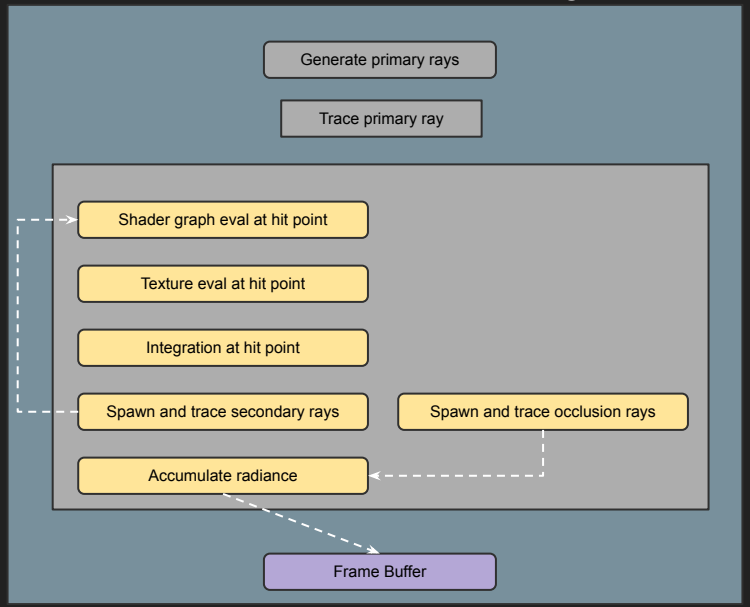
XPU mode uses GPU as coprocessor

Multi-machine rendering with ARRAS

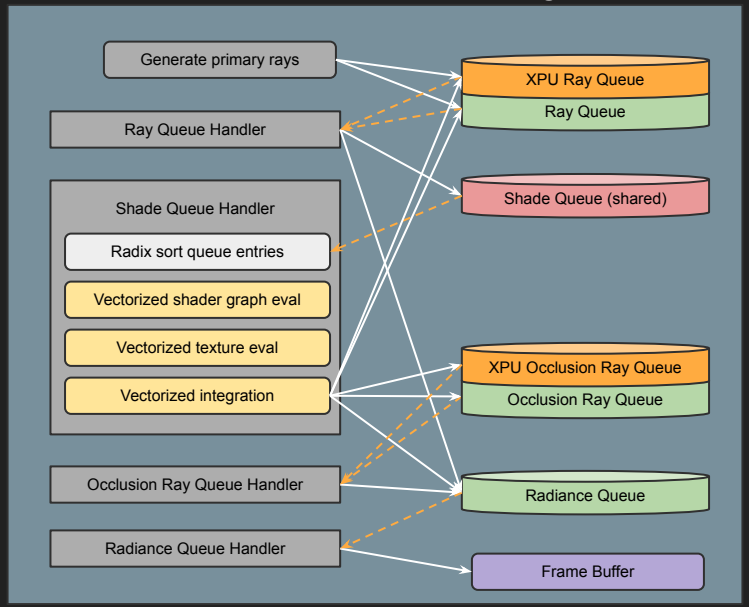
Bundled/Wavefront Architecture

Vectorization achieved using Intel's ISPC and MoonRay's wavefront architecture

Conventional Path Tracing



Wavefront Path Tracing



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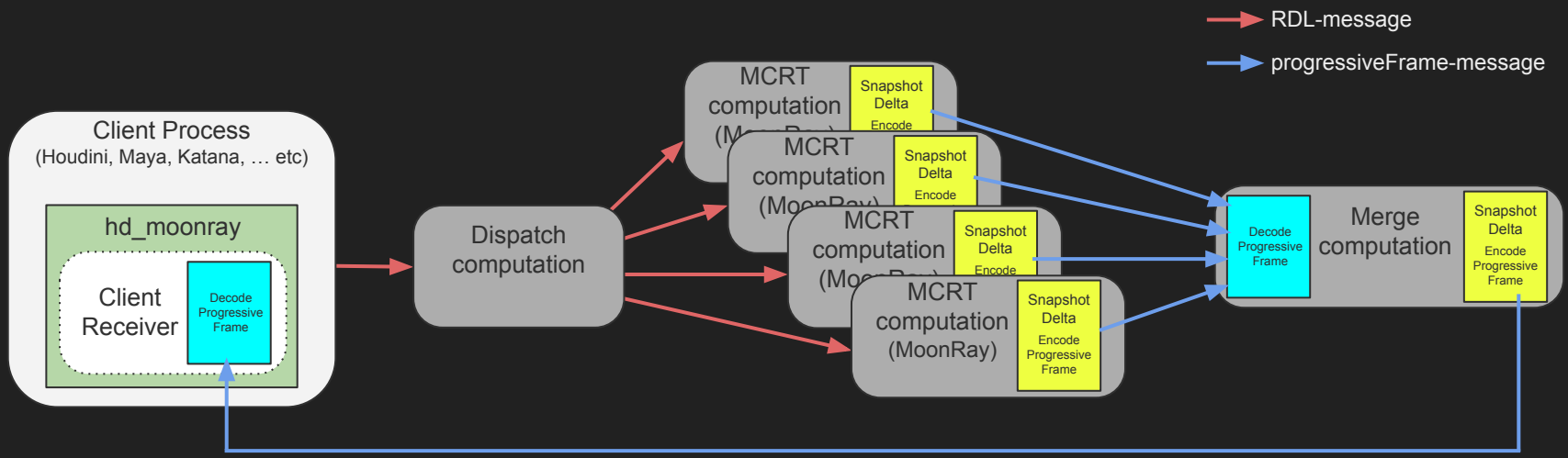
ARRAS: Distributed Multi-Machine Rendering



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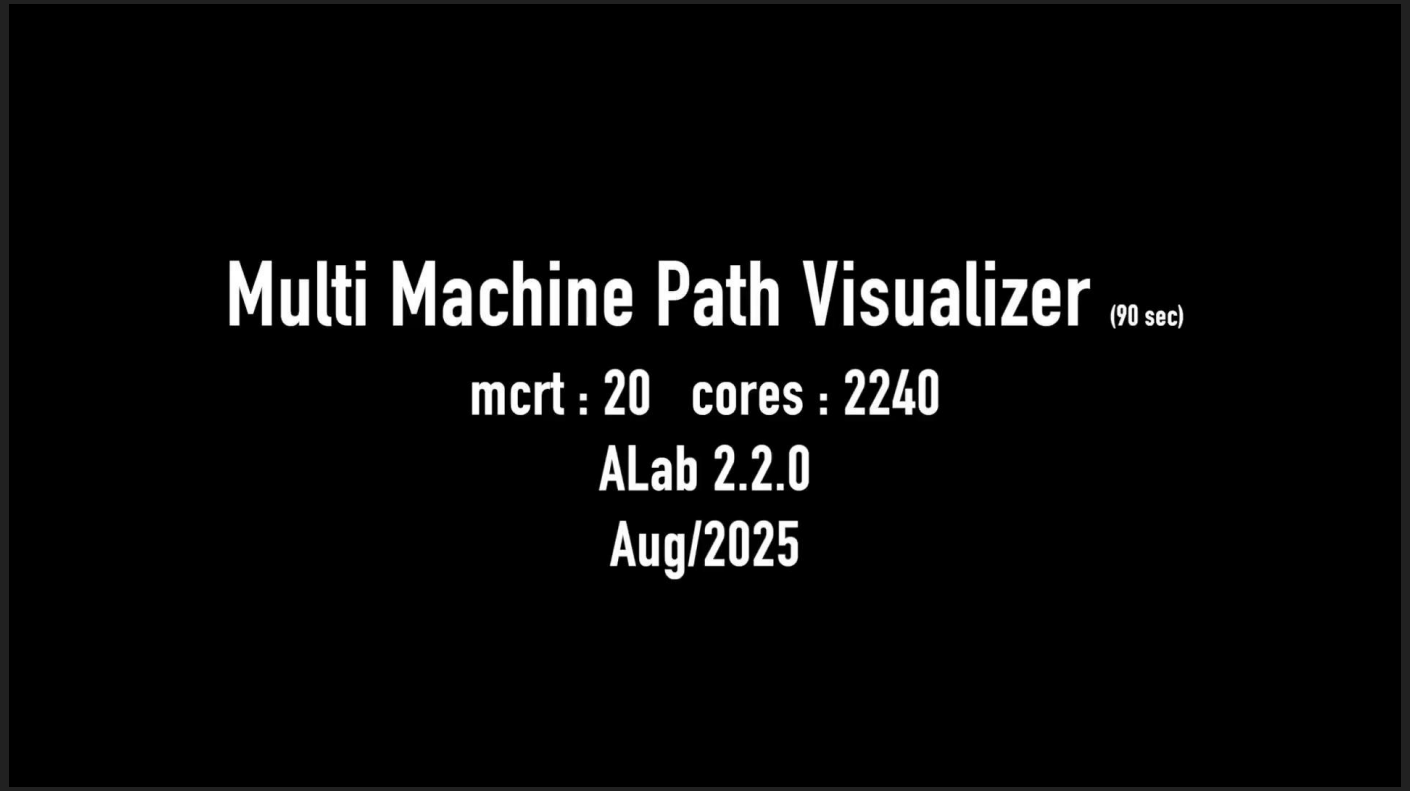
Single vs Multi-Machine Comparison

Multi-Machine with Light Path Visualization



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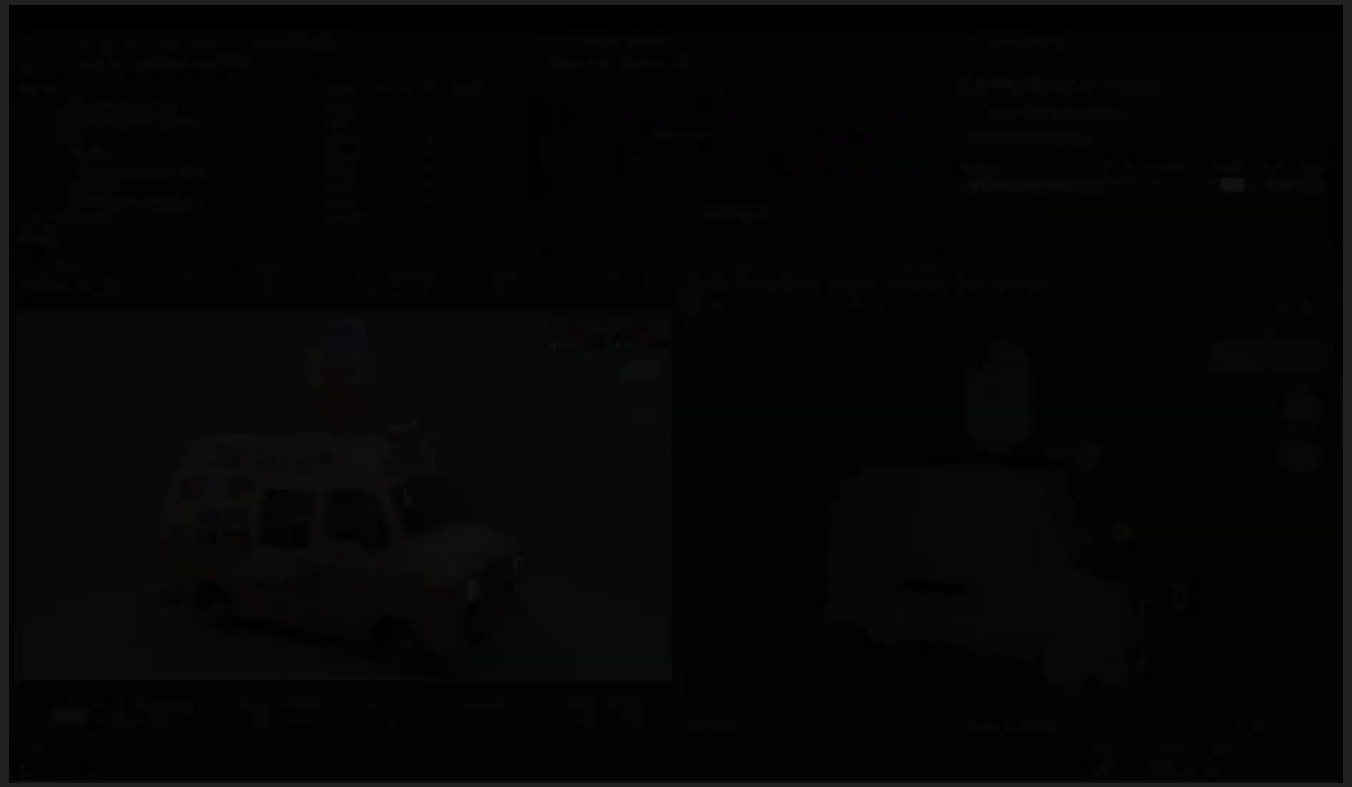
Multi-Context Distributed Rendering



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Multi-Shot Distributed Rendering

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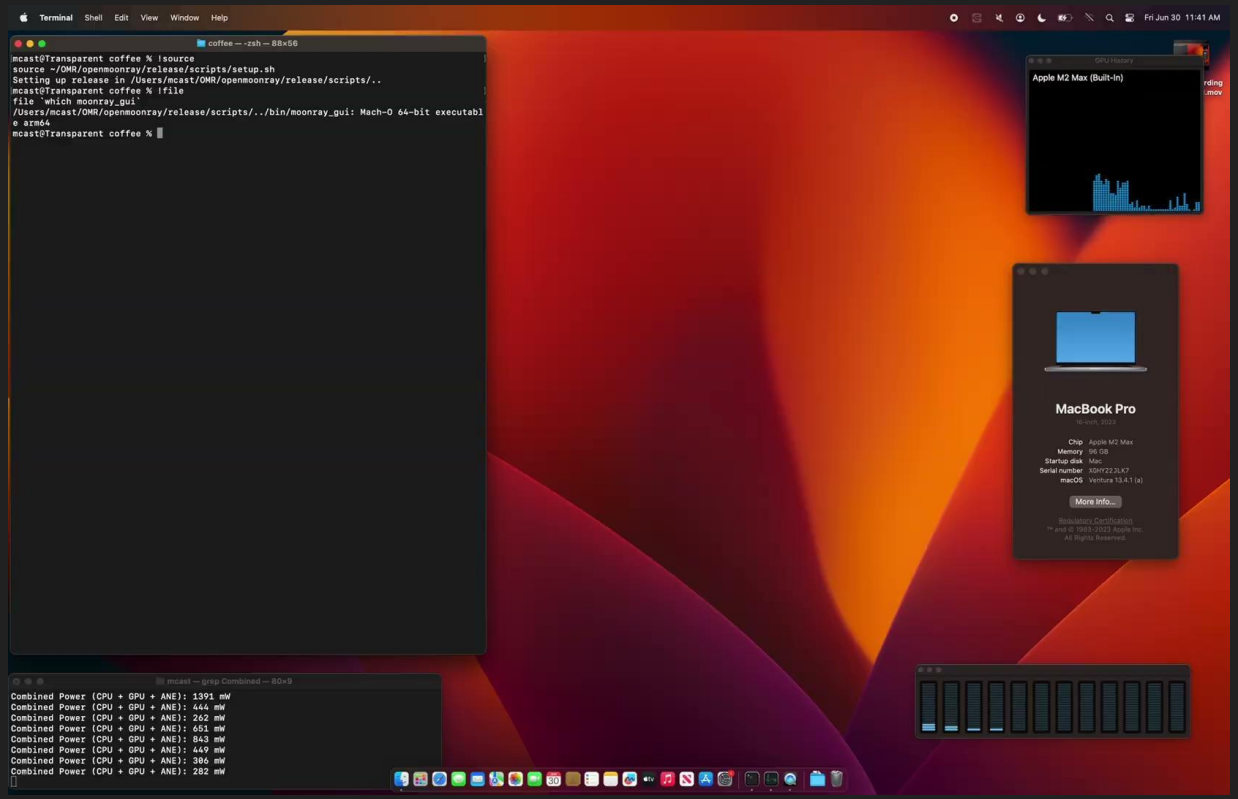
Apple Silicon / Metal



Windows

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ASWF Alignment: Renderer Landscape

Arnold

Freak

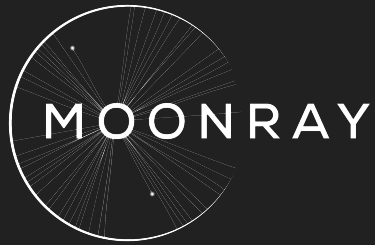
Glimpse

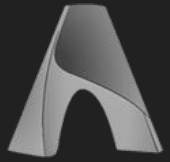
Hyperion

Manuka

Cycles

pbrt





Arnold

Octane

Redshift

ASWF Alignment: Renderer Landscape

Feature Production

Proprietary | Commercial

Arnold

Freak

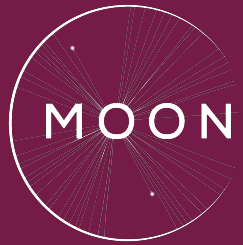
Glimpse

Hyperion

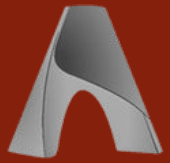
Manuka

Cycles

pbrt



Mitsuba 3
Physically Based Renderer


Arnold

Octane

Redshift

Feature Production | Open Source

ASWF Alignment: Renderer Landscape

Arnold

Freak

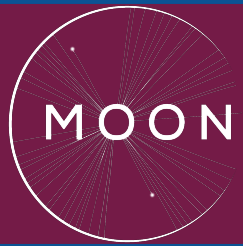
Glimpse

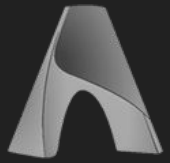
Hyperion

Manuka

Cycles

pbrt





Arnold

Octane

Redshift

Feature Production | Open Source

ASWF Alignment: Renderer Landscape

Arnold

Freak

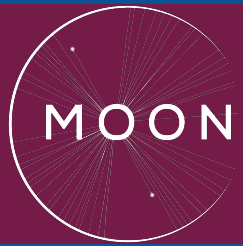
Glimpse

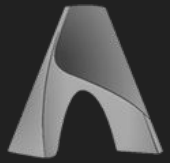
Hyperion

Manuka

Eevee*

pbrt

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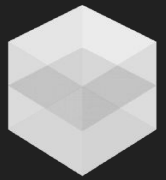
Octane


Redshift

ASWF Alignment: Renderer Landscape

Feature Production	Open Source
Proprietary	Commercial

Arnold

Freak

Glimpse

Hyperion

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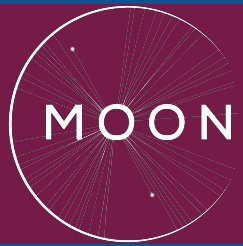
Cycles

pbrt



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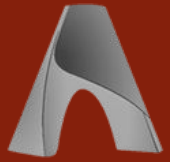
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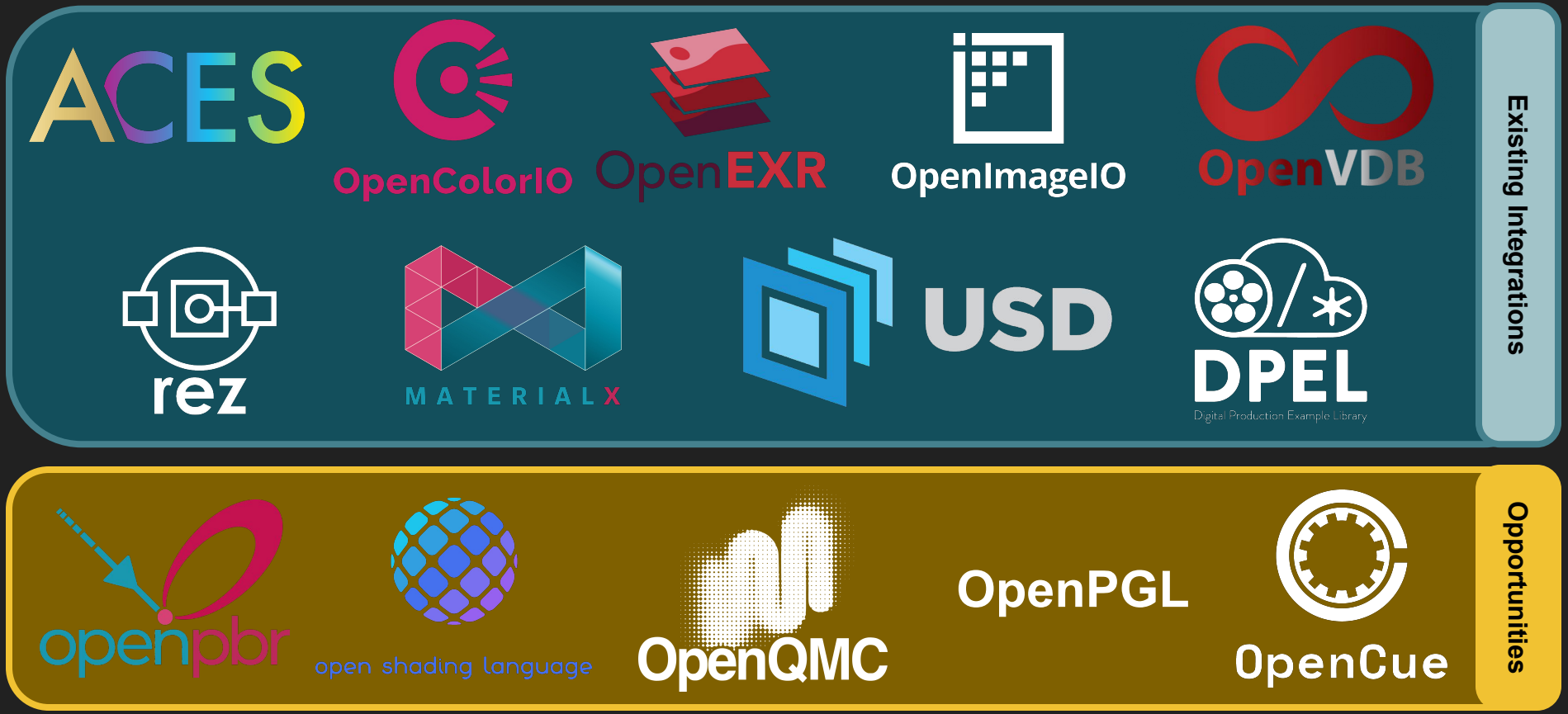
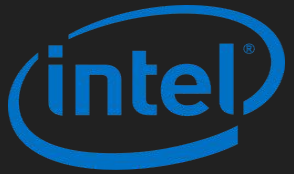
Octane

Redshift

ASWF Alignment: Project Ecosystem



ASWF Alignment: Member Engagement



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Thank You!

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