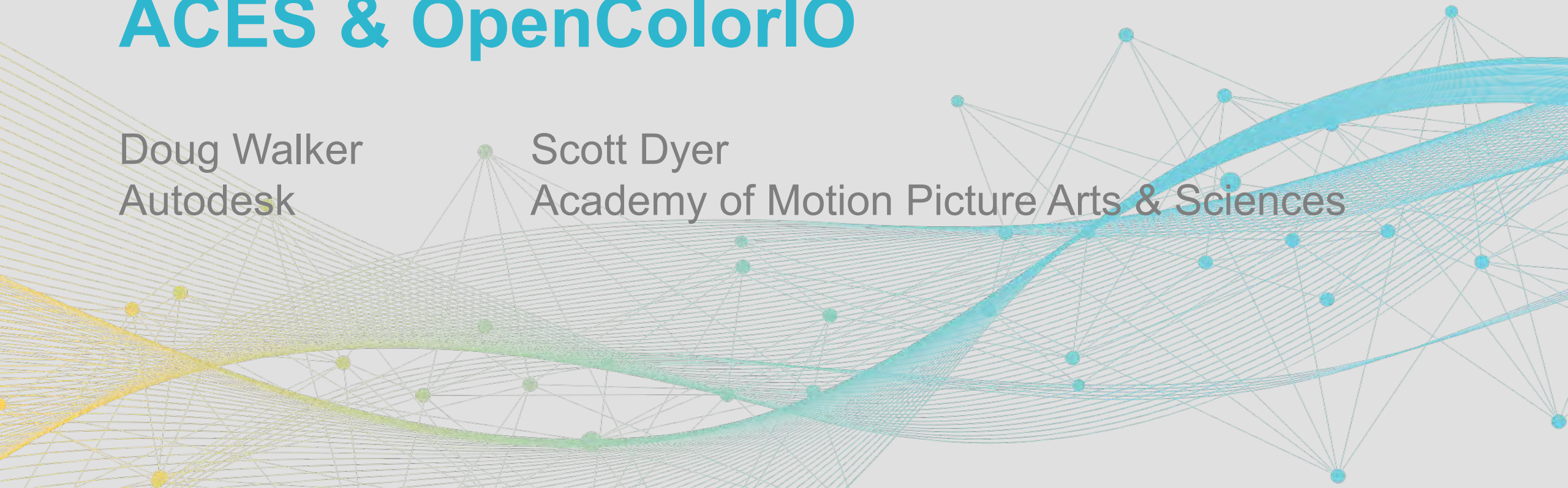


ASWF /* ACADEMY
SOFTWARE
FOUNDATION

ACES & OpenColorIO

Doug Walker
Autodesk

Scott Dyer
Academy of Motion Picture Arts & Sciences



Agenda

- ACES updates
- OpenColorIO updates
- New Look Modification Transform collaboration





ACADEMY COLOR ENCODING SYSTEM

Defining color workflows & archiving

- Color space encodings
- Transforms for input & output devices
- File formats



OpenColorIO

Open source color management system

- High-performance CPU & GPU processing
- Application configuration format
- LUT file I/O

ASWF Projects



Contributed By
Academy of Motion Picture Arts
and Sciences
Chairperson(s)
Scott Dyer

Dailies
Notes
Assistant

Contributed By
Industrial Light & Magic (ILM)
Chairperson(s)
Tommy Burnette



Contributed By
Academy Software Foundation
Chairperson(s)
Matthew Low



Contributed By
Academy Software Foundation
Chairperson(s)
Carol Payne, Rachel Rose



Contributed By
Lucasfilm
Chairperson(s)
Jonathan Stone



Contributed By
Academy Software Foundation
Chairperson(s)
Erik Strauss



Contributed By
Sony Pictures Imageworks
Chairperson(s)
Chris Kulla



Contributed By
Samsung Electronics
Chairperson(s)
Youngkwon Lim



Contributed By
Foundry
Chairperson(s)
Steven Shapiro



Contributed By
Sony Pictures Imageworks
Chairperson(s)
Carol Payne



Contributed By
Sony Pictures Imageworks and
Google Cloud
Chairperson(s)
Diego Tavares Da Silva



Contributed By
Lucasfilm
Chairperson(s)
Cary Phillips



Contributed By
Open Effects Association
Chairperson(s)
Gary Oberbrunner



OpenImageIO

Contributed By
Larry Gritz
Chairperson(s)
Daniel Greenstein



Contributed By
Framestore
Chairperson(s)
Josh Bainbridge



Contributed By
Pixar Animation Studios
Chairperson(s)
Eric Reinecke



Contributed By
Dreamworks Animation
Chairperson(s)
Ken Museth



Contributed By
The Academy of Motion Picture
Arts and Sciences
Chairperson(s)
Anton Dukhovnikov



Contributed By
Allan Johns
Chairperson(s)
Jean-Christophe Morin, Stephen
Mackenzie

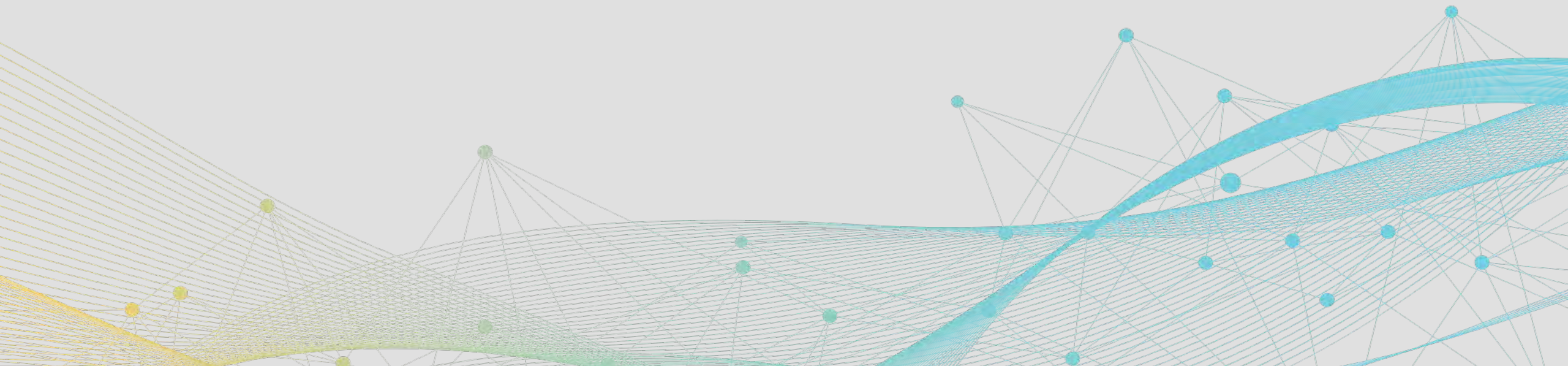


Contributed By
Wētā FX
Chairperson(s)
John McCarten



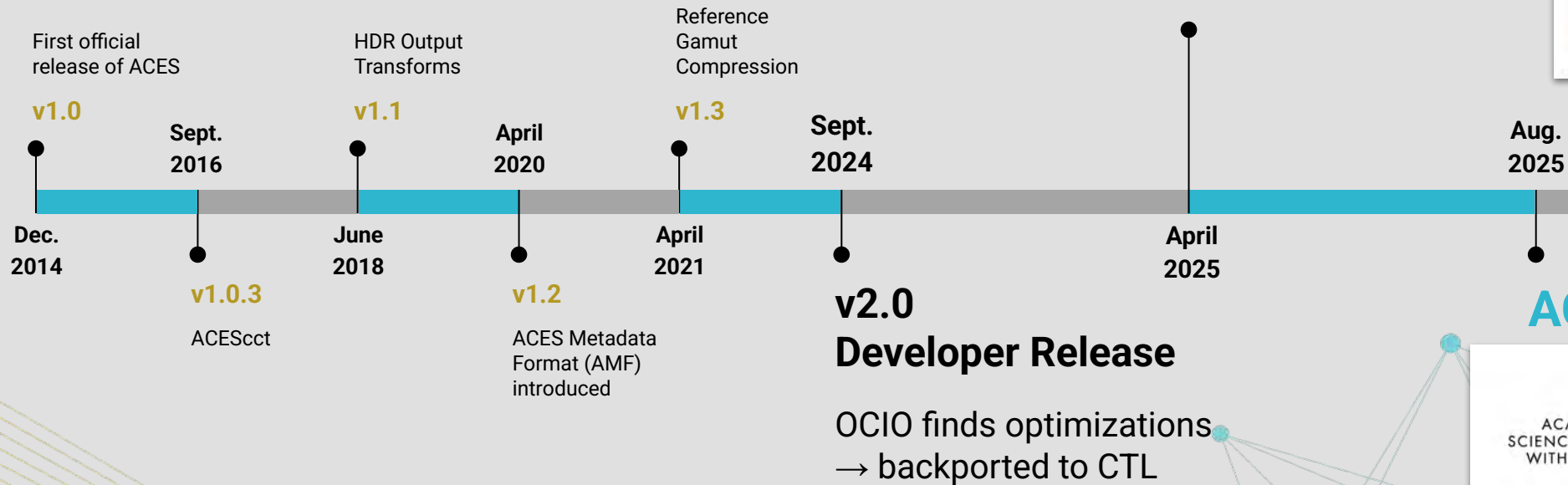
Contributed By
Pixar
Chairperson(s)
Alexander Schwank, Nick Porcino

ACES Update



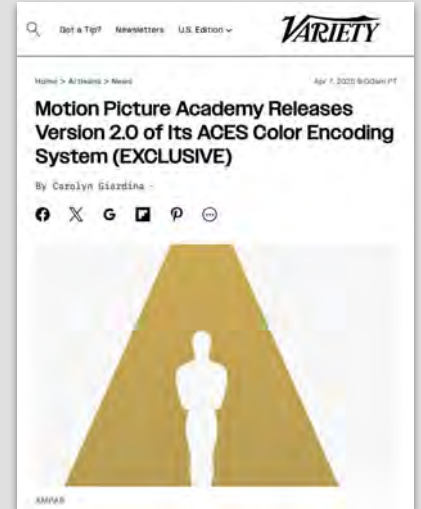
Timeline

ACES Update



Several major products provide day one support for ACES 2.0

v2.0 End-User Release



ACES joins ASWF



ACES Technical Steering Committee

ACES Update

Chair: Scott Dyer (Academy of Motion Picture Arts and Sciences)

TSC Members

Bill Baggelaar (Rocketfrog Consulting)

Annie Chang (NBCUniversal)

Chris Clark (Netflix)

Sean Cooper (Skydance Animation)

J Schulte (Industrial Light & Magic)

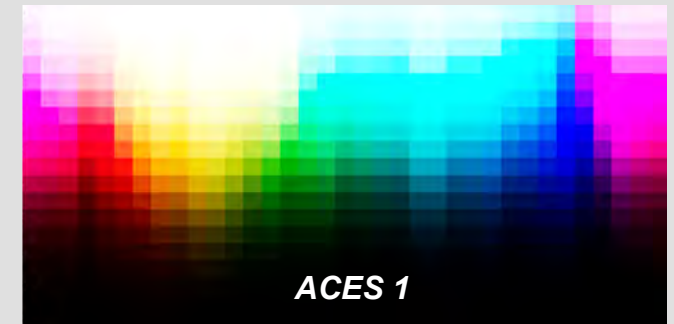
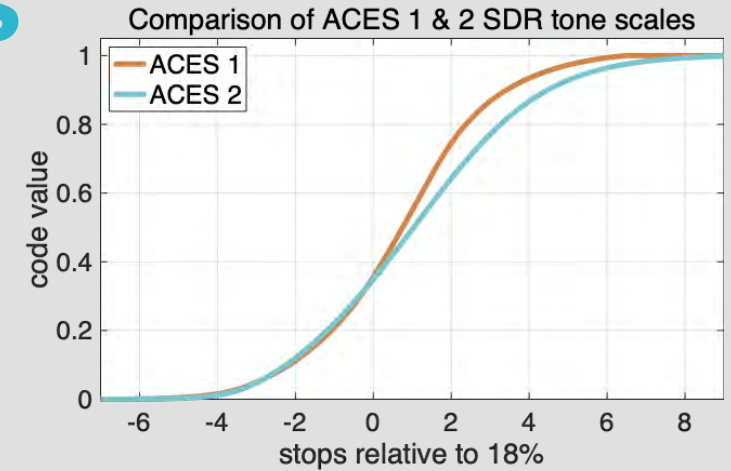
Nick Shaw (Antler Post)



ACES 2 Output Transforms

ACES Update

- Designed to address top user requests
 - *Tone scale:*
 - Lower mid-scale contrast
 - Softer highlight shoulder
 - *Color:*
 - Hue constancy
 - Gamut mapping
 - SDR/HDR “match”
- Unified & consistent structure
- Improved accuracy of inverse direction



Evolving the Project

ACES Update

■ Usability

- Improve implementation experience
- Broaden who ACES works for

■ Clarity

- Public roadmap and goals
- Clear, practical guidance for users & implementers

■ Sustainability

- Open-source best practices (where applicable)
- Transparency and predictability



Features & Initiatives

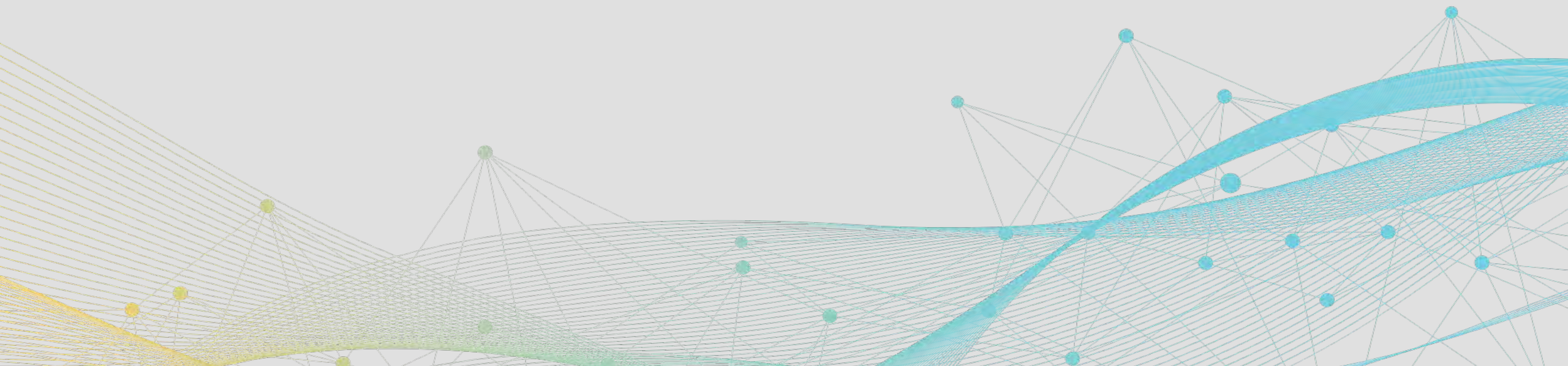
ACES Update

Key focus areas:

- Technical Look Transforms
- AMF Toolset
- Updated Implementer Program
- IDT Calculator Toolset
- Film Scanning Procedures
- Testing and Validation Framework
- Creative Look Transforms & Look Library
- Expanded User Documentation



SMPTE Common LUT Format Update



Common LUT Format (CLF)

SMPTE Update

- Modern LUT format developed by the ASC and AMPAS
 - Now going through SMPTE standardization
- Meets the needs of ACES workflows:
 - Supports scene-linear inputs and outputs
 - Losslessly represent ASC CDLs and most ACES Input Transforms
 - Extensive metadata
 - Detailed specification / implementation guide / sample files
 - Open source reference implementation
 - Designed to be an archival element
- Supported in dozens of applications



Common LUT Format (CLF)

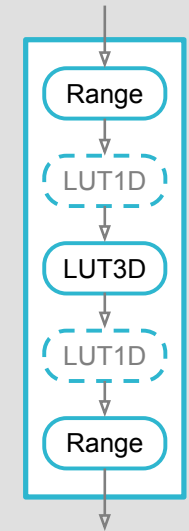
SMPTE Update

SMPTE ST 2136-1

- Standardizes the Academy/ASC format
- Minor metadata changes
- Processing model is identical
- Expected to publish in a few months

SMPTE ST 2136-10

- "Broadcast Profile"
- Simplified for hardware LUT boxes
- Still in drafting phase



Example of a Broadcast Profile

Now available for testing in the OCIO main branch on GitHub!

The **ociomakeclf** app will convert other LUT formats into SMPTE CLF

OpenColorIO Update



OCIO Technical Steering Committee

OpenColorIO Update

Chair: Carol Payne (formerly Apple)

Chief Architect: Doug Walker (Autodesk)

TSC Members

Remi Achard (DNEG)

Mark Boorer (ILM)

Mei Chu (Sony Imageworks)

Sean Cooper (Skydance Animation)

Michael Dolan (Epic Games)

Zach Lewis (formerly Method Studios)

Thomas Mansencal (Epic Games)

Cuneyt Ozdas (Autodesk)

Mark Reid (Netflix Animation)

Mark Titchener (Foundry)

Kevin Wheatley (Framestore)



OCIO Annual Release Cadence

OpenColorIO Update

v2.4.1

ABI compatible features and fixes

v2.4.2

ABI compatible release

ACES 2.0 Optimization

v2.5.0

CY 2026 VFX platform release

v2.6.0

Planned CY 2027 VFX platform release

Sept 30, 2024

March 14, 2025

September 19, 2025

January 16, 2026

December 12, 2024

March 18, 2025

September 30, 2025

September 30, 2026

v2.4.0

CY 2025 VFX platform release

Config Release

V3.0.0 ACES 2.0 Configs

Config Release

v4.0.0 ACES 2.0 Configs (Reference, CG, Studio)

v2.5.1

Bug fixes and small features

Aligned with the VFX Reference Platform

vfxplatform.com

roadmap.opencolorio.org

ACES 2.0 Support

OpenColorIO Update

ACES 2.0 is fully supported!

- OCIO 2.4.2 (March, 2025)
 - ACES Output Transforms – CPU and GPU implementations
- OCIO 2.5.0 (September, 2025)
 - Built-in ACES 2.0 D65 config files ("Studio" and "CG" config)
- Both D65 and D60 configs available on GitHub
 - <https://github.com/AcademySoftwareFoundation/OpenColorIO-Config-ACES/releases/tag/v4.0.0>



Hue Curves

OpenColorIO Update

- Completes the set of basic color correction transforms
- Adjust hue / sat / luma as a function of hue & etc.
 - Eight spline-based curves
 - Adjusts for linear, log, or video color spaces
 - Invertible



Vulkan Support on the GPU

OpenColorIO Update

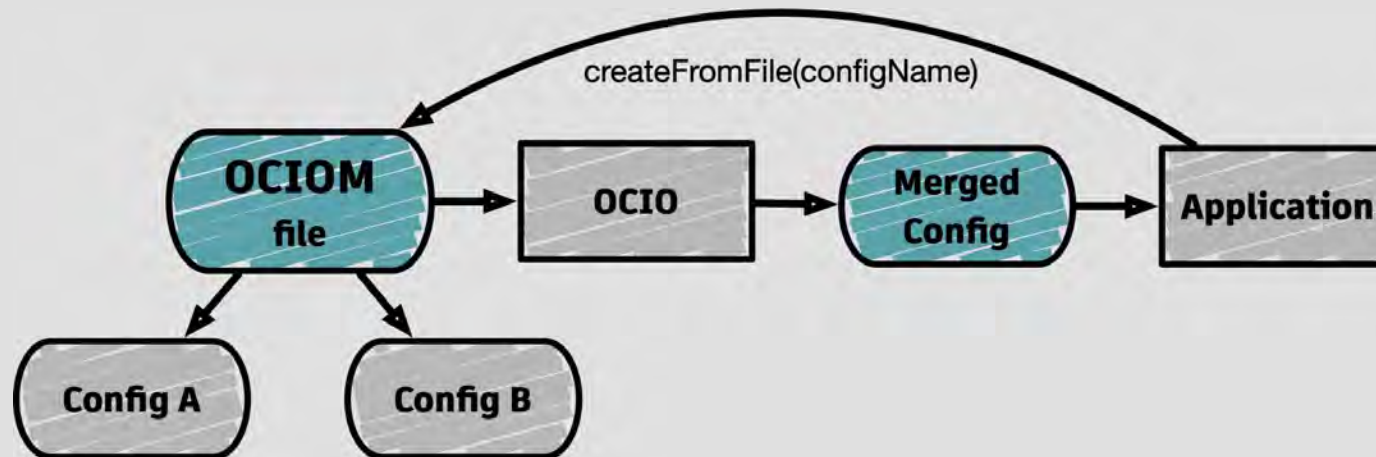
- OCIO GPU renderer now supports Khronos Vulkan
- High-performance GPU processing standard API
- Used in Autodesk Flame, VRED, and other GPU-centric apps



Color Config Merging

OpenColorIO Update

- Feature: Merge one OCIO config file into another
- Common use-cases:
 - Enable configs to be built up from components
 - Allow applications to transparently add required color spaces
 - Make it simpler to add a LUT to an existing config



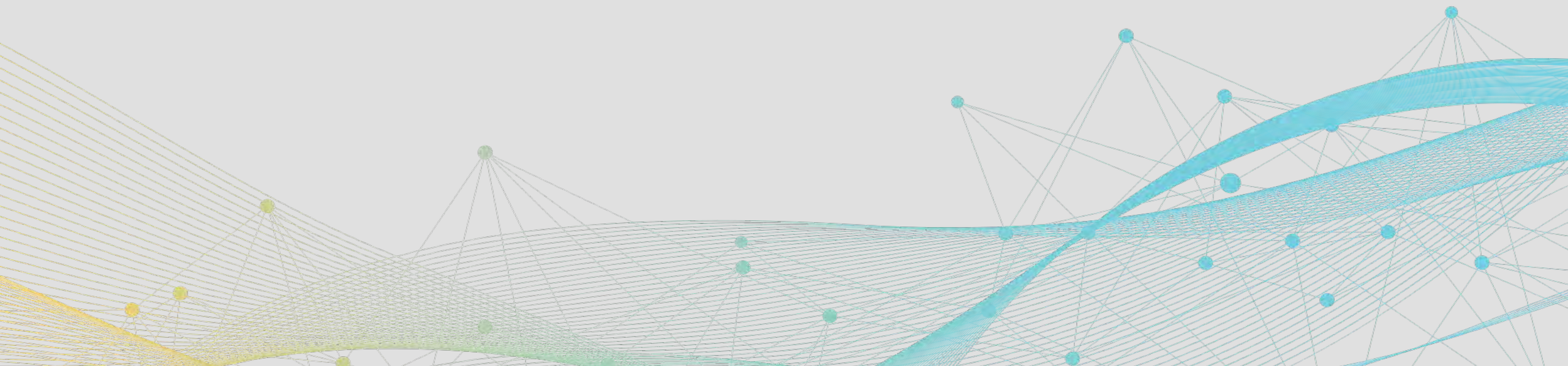
OCIO support in FFmpeg

OpenColorIO Update

- Convert scene-referred OpenEXR frames for use in movie files
- Supports:
 - OCIO ColorSpaceTransform
 - OCIO DisplayViewTransform
 - OCIO FileTransform
- Currently in FFmpeg master branch for an upcoming release



ASWF Color Interop Forum Update



Standardizing Color Space Metadata

Color Interop Forum Update

Color Space Encodings for Texture Assets & CG Rendering

- Scene-referred color spaces
- Used in OpenUSD, MaterialX, OpenColorIO, OpenImageIO

Color Space Encodings for Displays

- Display-referred color spaces
- Used in OpenColorIO, OpenImageIO, upcoming Khronos specification

These are now published recommendations!

<https://github.com/AcademySoftwareFoundation/ColorInterop>



Draft Recommendations

Color Interop Forum Update

An ID for Color Interop

- A mechanism for defining a color space name string for interoperability
- Used in OpenUSD, MaterialX, OpenColorIO, OpenImageIO



Identifying the Color Space of OpenEXR Files

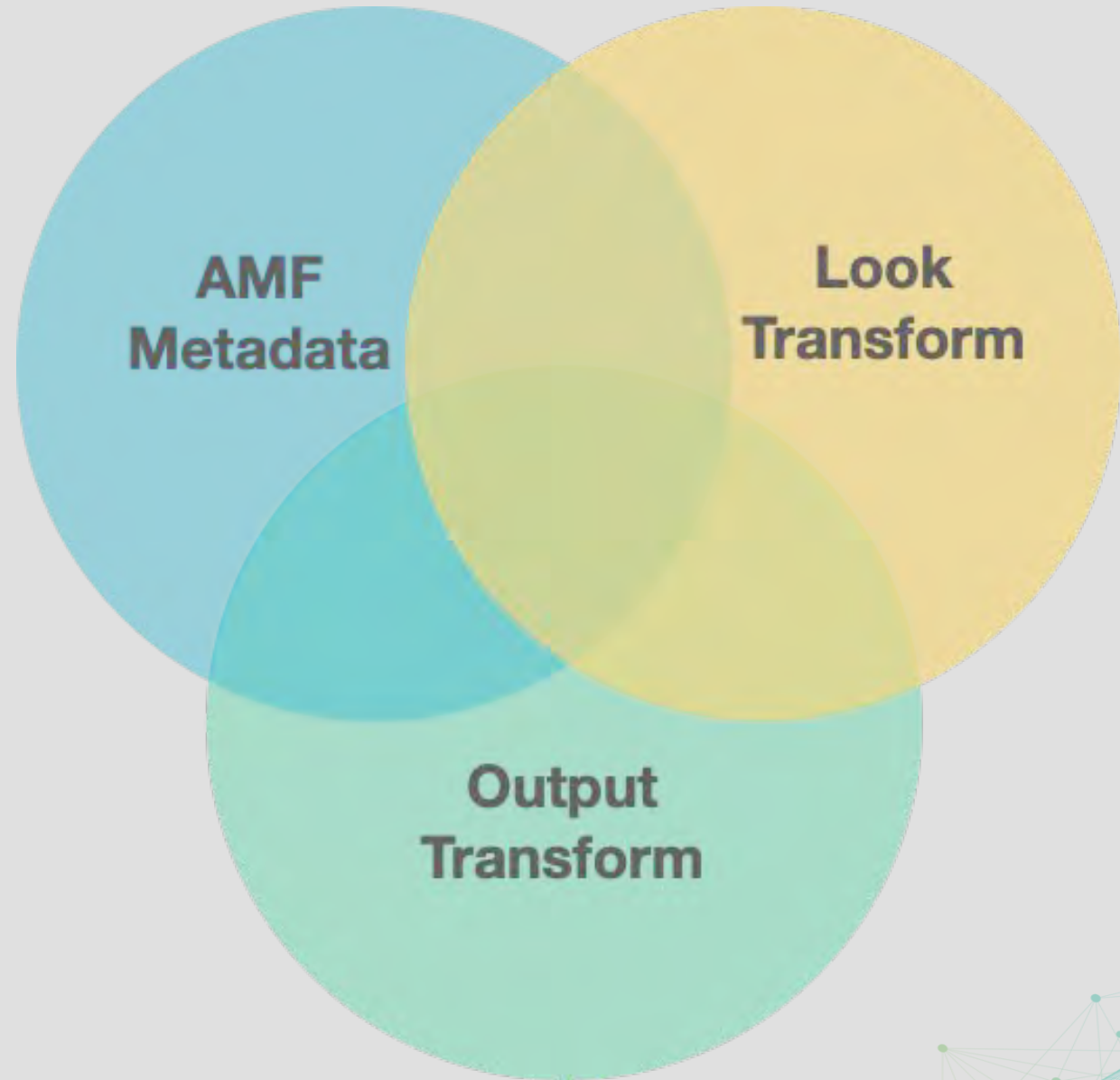
- Guidelines for reading / writing / using the Interop ID in OpenEXR files
- Used in OpenEXR and OpenImageIO



ACES Look Modification Transform collaboration

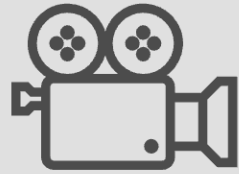


Started a small project at the
intersection of three key
ACES system components



Adapting to Different ACES Users

New Look Modification Transform

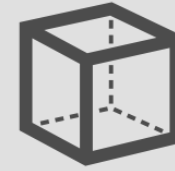


Cinematographers & Colorists



ACES Output Transform is a starting point

- Photographing real scenes
- Want a lower-contrast starting point
- Always doing a grading pass
- Easier to add contrast than remove it



Computer graphics content creators

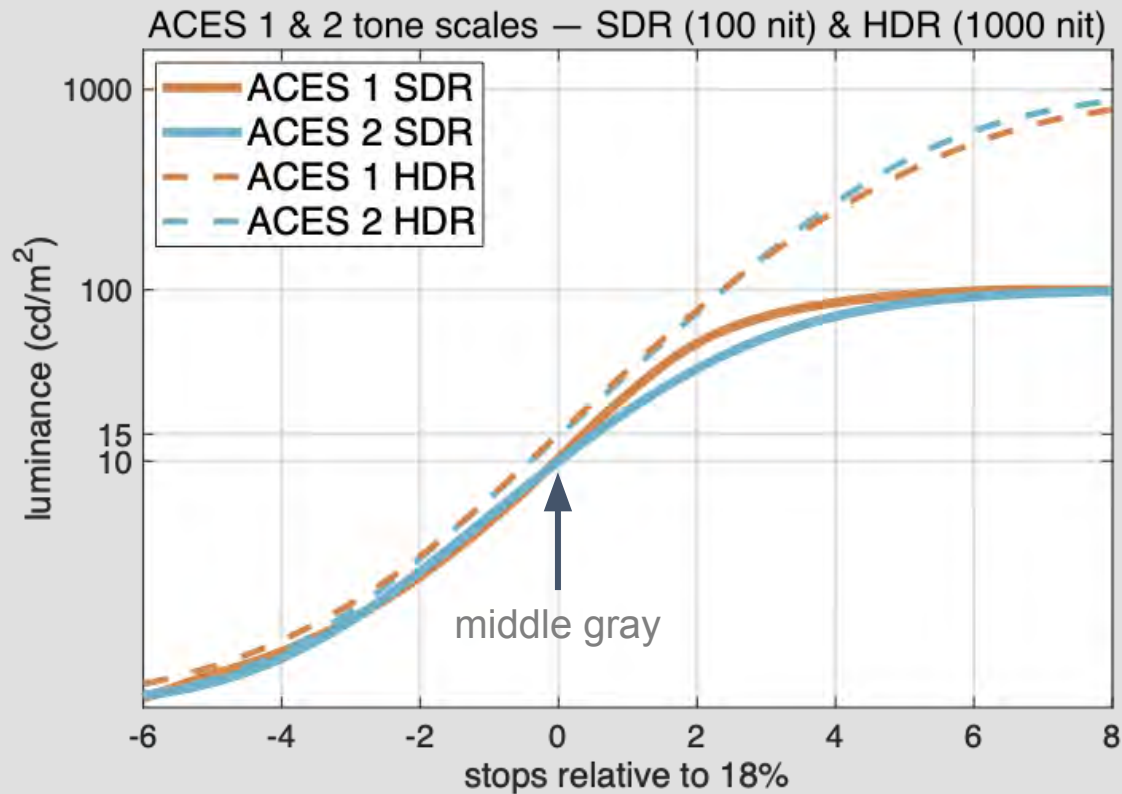


ACES Output Transform is a finished product

- Adjusting CG attributes underneath the viewing transform
- Want a final level of contrast to set lighting
- Grading is optional
- Need to easily get to pure white

Tone scale Comparison – ACES 1 & 2

New Look Modification Transform



Similarities:

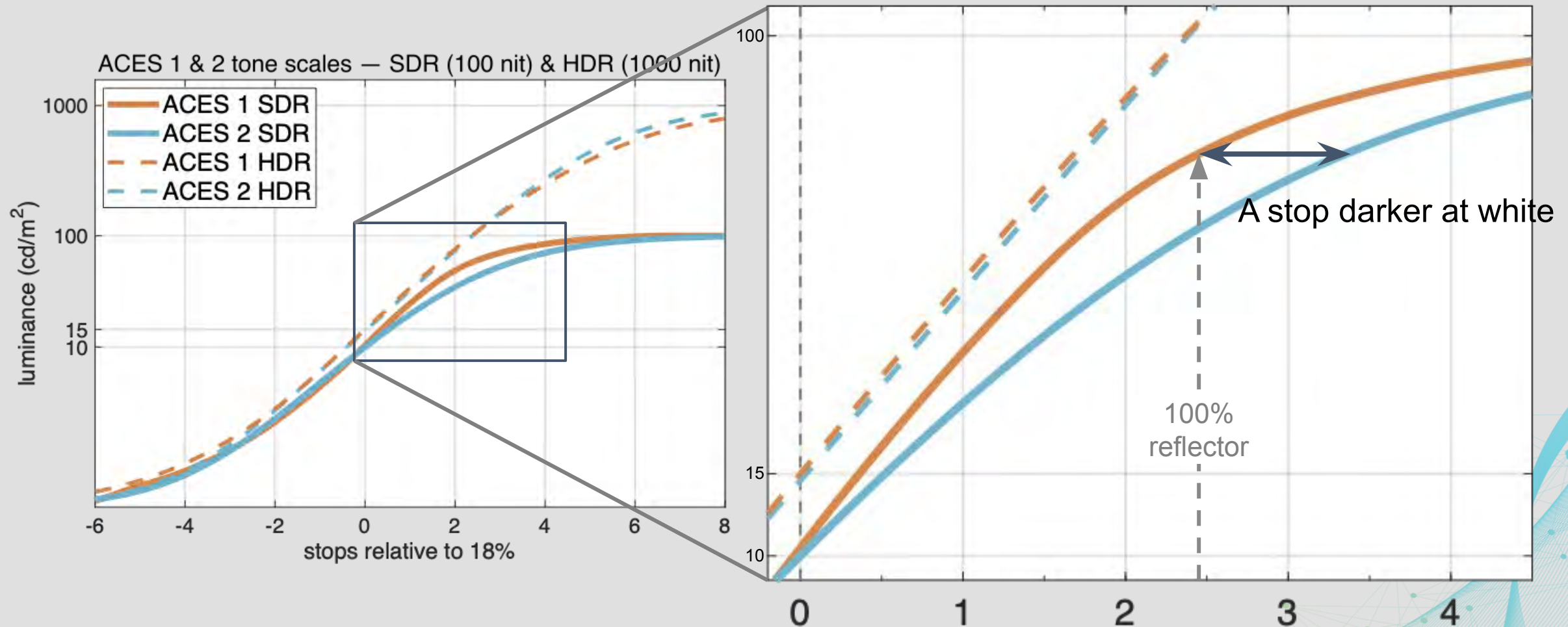
- 18% gray match for SDR & HDR
 - 10 nits for (100 nit) SDR
 - ~15 nits for HDR
- HDR is fairly close *above* gray
- SDR is fairly close *below* gray

Main difference:

- *SDR above gray is now about a stop darker at diffuse white*

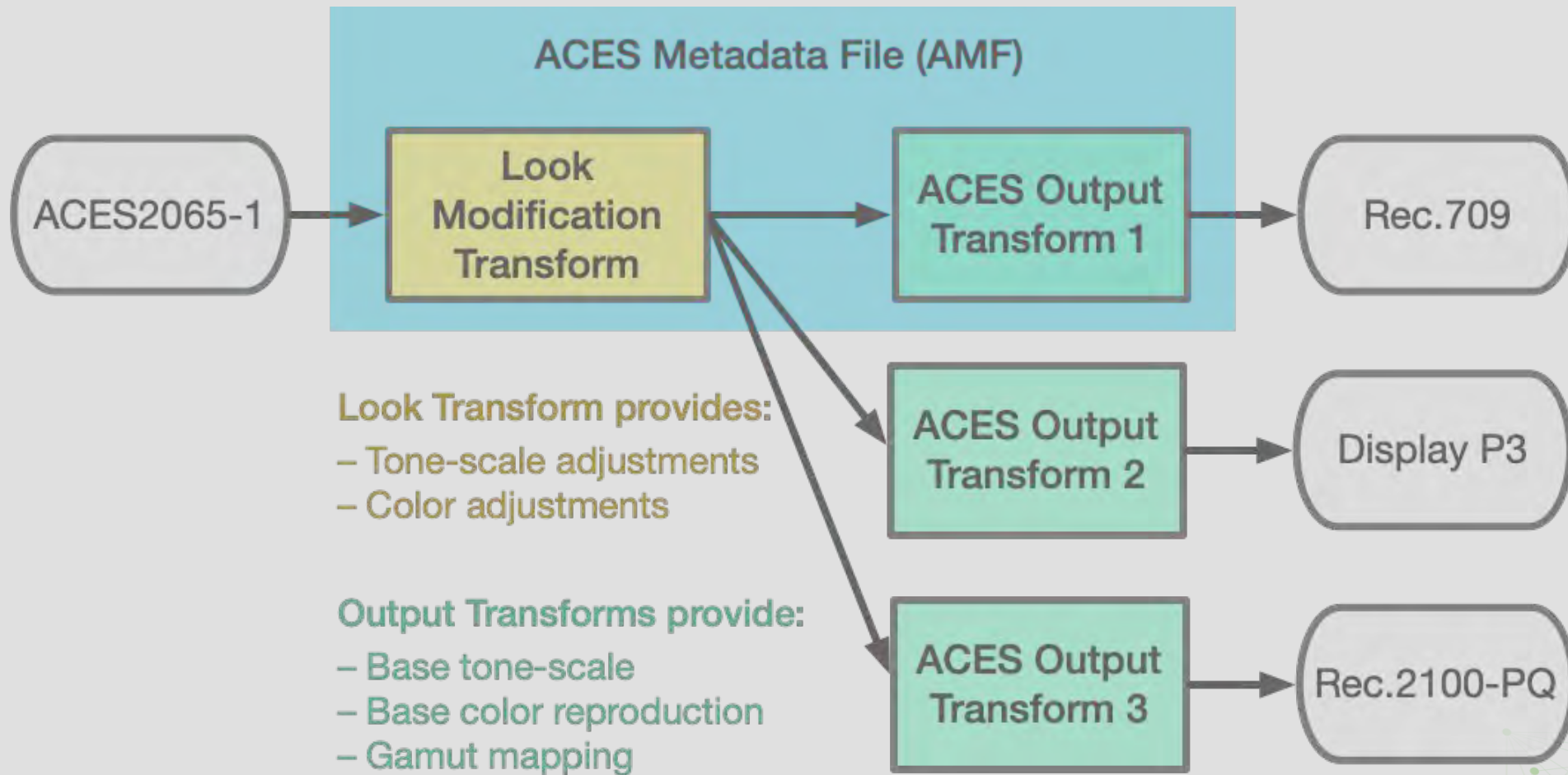
Tone scale Comparison – ACES 1 & 2

New Look Modification Transform



ACES Output Pipeline

New Look Modification Transform



Goals & Non-goals

New Look Modification Transform

Goals

- Provide a tone-scale similar to ACES 1 (as an optional LMT)
- Adjust saturation accordingly
- Use simple, invertible math

Non-goals

- Not changing the ACES 2.0 Output Transforms
- Not altering basic color reproduction
- Focusing more on SDR than HDR

Side-goal

- *Establish more robust LMT workflows*



Next Steps

New Look Modification Transform

1. Collect feedback on a candidate look transform
2. Determine metadata, UX, and workflow strategy
3. Document and release the transform on ACES GitHub
4. Include as part of OCIO 2.6 in Q3

Please get involved if you're interested!



Opportunities to Learn More



OPEN SOURCE FORUM

hosted by Academy
Software Foundation

FEBRUARY 26, 2026

LOS ANGELES, CA + VIRTUAL

#ASWF

REGISTER

SPONSOR

VIEW THE SCHEDULE

3

Weeks

2

Days

12

Hours

55

Minutes

22

Seconds

Open Source and New Technologies Impacting Studios

The Academy Software Foundation (ASWF) Open Source Forum is an exclusive event, hosted at Netflix, for Foundation members and invited guests to share ideas, insights and experiences to drive the future of open source software across the motion picture and media industries.

The Open Source Forum provides an intimate setting for business and technical leaders to have an open dialogue about new technologies impacting studios and discuss the challenges and opportunities for open source software across the industry.

The event is open to anyone currently working at an [ASWF member organization](#).

If you are a business or technical leader interested in using or contributing to open source software, or an open source project leader interested in learning more about the Foundation, please contact events@aswf.io to find out how to attend.



Thank You!

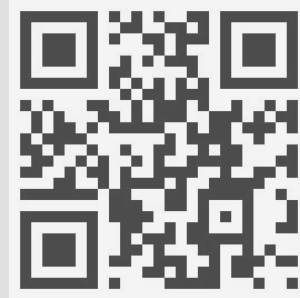


ACADEMY COLOR ENCODING SYSTEM



<https://acescentral.com/get-involved/>

/* ACADEMY
SOFTWARE
FOUNDATION



<https://aswf.io>



OpenColorIO



<https://opencolorio.readthedocs.io/en/latest/index.html>

Technical Steering Committee Meeting:

- Every other Tuesday @ 10am PT

Technical Steering Committee Meeting:

- Every other Monday @ noon PT