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SC 29 Business Plan 2025

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Description

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JTC 1/SC 29 Business Plan

Coding of Audio, Picture, Multimedia and Hypermedia Information

Period covered: September 2024 – August 2025

Produced and submitted by

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1.0 Executive Summary

SC 29 is a very active SC that develops international standards that are basis of digital media services and applications, particularly those for efficient coding of images, audio, moving pictures, graphics, and some other types of digital data (such as genomics and haptics signals) and digital information support for media technology in systems. These standards are designed to represent, package, record, preserve and convey digital media information. The standards support functionalities such as the coding, composition, transport, and file storage of media and their control, multiplexing, interfaces, and middleware for general and/or specific applications.

SC 29 was established in 1991. Since its restructuring in mid-2020, the work of SC 29 has been organized into 8 working groups and 5 advisory groups. One of the working groups (WG 1) is known as **JPEG**, the Joint Photographic Experts Group, and the other seven working groups (WGs 2–8), together with three of the advisory groups (AGs 2, 3 and 5), are collectively known as **MPEG**, the Moving Picture Experts Group.

SC 29 and its WGs and AGs comprise a community of more than a thousand people, with about 600 people attending each of the quarterly sets of meetings of its JPEG and MPEG WGs, and roughly a thousand total registered experts. Following the COVID-19 emergency that caused all meetings to be held in virtual mode for more than three years (as with most of the rest of JTC 1), the meetings of the WGs and AGs of SC 29 have returned to primarily being held at physical locations since mid-2023, although they are generally held in hybrid mode, and many of the attendees participate remotely (often about half, with remote access provided on a best-effort basis). The shift back from exclusive use of virtual mode has been accomplished without major difficulty, while an interest in holding some meetings in fully virtual mode has persisted.

SC 29's work is well known and widely used in high-volume consumer technology as well as professional settings. SC 29 has continually served the ever-growing need for advances in digital media technology, including leading the way in the introduction of consumer technologies including digital photography, digital music, digital video broadcast and consumer disc storage in the early 1990s and through many new developments such as high-definition and ultra-high-definition television, multichannel and immersive sound experiences, high-dynamic-range video, 3D and free-viewpoint media experiences, and online streaming media. The work of SC 29 has been recognized by nine Emmy Awards. Within the last five years, this included one in 2021 for the ISO Base Media

File Format standard (ISO/BMFF, ISO/IEC 14496-12), and two in 2022 for the MPEG Dynamic Adaptive Streaming over HTTP (DASH, ISO/IEC 23009-1) and Open Font Format (ISO/IEC 14496-22) standards.

Recent advances in technology that have affected SC 29 include the emerging uses of neural network technology for many applications including media content production and many areas of signal processing. Examples of recent standards developed in SC 29 that relate to neural networks include ISO/IEC 15938-17 (Compression of Neural Networks for Multimedia Description and Analysis) and ISO/IEC 6048-1 (JPEG AI Learning-Based Image Coding System – Core Coding System), and many other related efforts and exploration studies are under way in SC 29.

A key area of recent focus in the work of SC 29 that is important to consumer use of media is media authentication and provenance, a timely need with the emerging prevalence and societal recognition of deep fake media content such as that recently demonstrated by generative AI technology. The WG 1 JPEG working group has led the way in recent efforts with its JPEG Trust family of standards (ISO/IEC 21617). The first edition of the core foundation standard for JPEG Trust was published in January 2025, a second edition is currently at the DIS stage, and related other Parts are approved work items. A statement issued by Prof. Touradj Ebrahimi, the Convenor of the JPEG working group said “JPEG Trust will bring trustworthiness back to imaging with specifications under the governance of the entire International community and stakeholders as opposed to a small number of companies or countries.” JPEG Trust has been developed in collaboration with the Coalition for Content Provenance and Authenticity (C2PA). Standardization of digitally signed authentication metadata for video and audio streams is under development in the WG 5 Joint Video Experts Team with ITU-T SG 21 and WG 6 MPEG Audio. Closely related work and studies are also under way in WG 2 MPEG Requirements and WG 3 MPEG Systems, and further dialog on the subject is under way with ITU-T SG 21 (formerly SG 16). These recent efforts add to related prior technologies such as those specified in MPEG 21 (ISO/IEC 21000), MPEG DASH (ISO/IEC 23009), MPEG-4 (ISO/IEC 14496), JPSec (ISO/IEC 15444-8), and JPEG Systems (ISO/IEC 19566).

Other recent areas of new innovation in SC 29 for emerging consumer applications include recent work on 1) “coding for machines” to address machine analysis requirements for media coding including imaging, audio and video content, 2) point cloud coding, e.g. for LiDAR and volumetric scanners, and 3) event-based vision technology for new imaging applications with very-high time resolution for rapid detection and machine analysis of visual events.

As of August 2025, SC 29 has 30 P-member national bodies and 18 O-members, 627 published standards under its direct responsibility, and 85 standards currently under development.

2.0 Environment

Recent advances in technology that have affected SC 29 include the emerging uses of neural network technology for many applications including media content production and many areas of signal processing. Neural network technology advances have driven increased interest in media authentication and media provenance tracking as well as new government regulatory initiatives. Immersive media applications and technologies have continued to expand, including more types of immersive video and audio, virtual, augmented and extended reality, and “metaverse” use cases.

See section 4 for a discussion of collaboration relationships and joint projects in SC 29.

SC 29 and its WGs are open to welcoming new members and seeking opportunities to collaborate with new liaison partners, and it is well recognized that this field of work requires rapid progress and has the potential to bring about new initiatives and new competitors. SC 29 and its WGs strive to always communicate with the stakeholders in the industry and recruit appropriate members in order to maintain relevance and competitiveness.

In the area of video coding, other organizations have also been recently developed their own video coding specifications. The AOM (Alliance for Open Media) consortium (a project of the Joint Development Foundation, which became a PAS submitter to JTC 1 in 2020) produced the AV1 video coding specification in 2018 and has been working on future video coding technology. AVS (Audio Video coding Standard Workgroup of China), working recently together with a working group in IEEE, has developed AVS3 video coding technology. The Society of Motion Picture and Television Engineers (SMPTE) has also published various video coding standards. SC29 will continue to monitor and respond to such outside developments.

The Khronos Group consortium is also highly relevant to SC 29 in several areas, recently especially in regard to SC 29/WG 7 (MPEG 3D Graphics and Haptics Coding) and SC 29/WG 3 (MPEG Systems). In mid-2021, Khronos is a PAS submitter for JTC 1 and has completed the PAS transposition process for the glTF Specification (ISO/IEC 12113:2022). SC 29 members have had a keen interest in these developments, and liaison communication has been conducted between SC 29 and Khronos.

Two other subcommittees within JTC 1 have recently been considered especially relevant to the work of SC 29:

- SC 24 (*Computer graphics, image processing and environmental data representation*) works on closely related technology, and is especially relevant to SC 29 WG 7 (MPEG 3D Graphics and Haptics Coding).
- SC 42 (*Artificial intelligence*) is chartered with work on technology that is emerging very rapidly with many applications, particularly including the coding and analysis of audio-visual media.

See also the discussion of cooperation and collaboration relationships in section 4.

3.0 Achievements and benefits

SC 29 is a very active SC that develops international standards that are basis of digital media services and applications, particularly those for efficient coding of images, audio, moving pictures, graphics, and some other types of digital data (such as genomics and haptics signals) and digital information support for media technology in systems. These standards are designed to represent, package, record, preserve and convey digital media information. The standards support functionalities such as the coding, composition, transport, and file storage of media and their control, multiplexing, interfaces, and middleware for general and/or specific applications.

SC 29's work is well known and widely used in high-volume consumer technology as well as professional settings. SC 29 has continually served the ever-growing need for advances in digital media technology, including leading the way in the introduction of digital photography, digital music, digital video broadcast and consumer disc storage in the early 1990s and through many new developments such as high-definition and ultra-high-definition television, multichannel and

immersive sound experiences, high-dynamic-range video, 3D and free-viewpoint media experiences, and online streaming media. The work of SC 29 has been recognized by nine Emmy Awards. Within the last five years, this included one in 2019 for the JPEG standard (ISO/IEC 10918-1), one in 2021 for the ISO Base Media File Format standard (ISO/BMFF, ISO/IEC 14496-12), and two in 2022 for the MPEG Dynamic Adaptive Streaming over HTTP (DASH, ISO/IEC 23009-1) and Open Font Format (ISO/IEC 14496-22) standards.

Most of SC 29's standards contribute to Sustainable Development Goals 9 (Industry, Innovation and Infrastructure) and/or 12 (Responsible Consumption and Production).

4.0 Participation and cooperation/collaboration.

As of August 2024, SC 29 has 30 P-member national bodies and 18 O-members, 627 published standards under its direct responsibility, and 85 standards currently under development.

Approximately 50 people attended each of the last two plenary meetings of SC 29, including representatives of about 25 P-members. SC 29 typically meets twice per year, and its WGs meet four times per year. Most meetings of SC 29 and its WGs are held in hybrid mode (with remote access provided on a best-effort basis), and some meetings are also held in virtual-only mode. Altogether about 600 people attend each set of quarterly meetings of the WGs.

Internal and external liaison relationships with SC 29 are listed at <https://www.iso.org/committee/45316.html>.

SC 29 maintains many liaison relationships with other organizations to meet the requirements and expectations of the standards users from other communities. SC 29 has, in particular, been continuing its productive collaborations with ITU-T. SC 29's Joint Photographic Experts Group (JPEG) and the Joint Video Experts Team (JVET) have continued joint activities that SC 29 shares with ITU-T SG 21 (the ITU-T Study Group on Multimedia), and the MPEG-2 Systems standard (ISO/IEC 13818-1, a.k.a. ITU-T H.222.0) maintained by SC 29 WG 3 (MPEG Systems) is also maintained as common text with ITU-T SG 21. Another joint standardization activity is under consideration for the compression of biomedical and general waveform signals.

JVET, reporting as WG 5 to SC 29, is a major ongoing joint activity with ITU-T. JVET was originally formed in October 2017, and it completed the development of the first edition of *Versatile Video Coding* (VVC, ISO/IEC 23090-3, a.k.a. ITU-T H.266) in 2020, to provide a significant improvement in compression performance over the prior High Efficiency Video Coding standard (HEVC, ISO/IEC 23008-2, a.k.a. ITU-T H.265). Together with VVC, JVET also produced a standard on *Versatile supplemental enhancement information messages for coded video bitstreams* (VSEI, ISO/IEC 23002-7 | ITU-T H.274). JVET has also been standardizing minor extensions for VVC, additional supplemental enhancement information for VSEI, a conformance testing standard, and reference software. JVET is also responsible for maintenance and minor enhancement of other jointly developed standards of SC 29 and ITU-T that are related to video coding, and is conducting further exploration studies of the potential for additional future joint developments in this area. This particularly includes exploration studies of the potential for neural-network based video coding and enhanced compression capabilities using more classical signal processing technology, which may soon lead to a Call for Proposals to develop a next generation video coding standard beyond the capabilities of VVC.

A number of standards developed in SC 29/WG 1 (JPEG) are also developed jointly with ITU-T SG 21. Most recently, this has included the JPEG AI standard (ISO/IEC 29170-1, a.k.a. ITU-T T.840.1) and a new collaboration on JPEG XE event-based image coding. Other WG 1 standards that were jointly developed and have been subsequently maintained and extended with ITU-T SG 21 include the original 1992 JPEG standard, the JPEG 2000 family, and JPEG XR. Some other recent WG 1 offers for potential ITU-T joint standardization projects around JPEG XS, JPEG XL, and JPEG Trust, to mention a few, did not encounter sufficient interest from the ITU-T side. WG 1 has successfully coordinated and collaborated with the Coalition for Content Provenance and Authenticity (C2PA), resulting in a fully interoperable JPEG Trust standard, currently at the DIS stage for its second edition, to address the growing challenge of authenticity in multimedia.

Several WGs of SC 29 have been actively and continuously collaborating with 3GPP SA4 through liaison relationships and the participation of key experts in both organizations. MPEG Systems (WG 3), in particular, successfully developed the MPEG DASH standard through this collaboration and continuously working together to develop further improvements.

See also the discussion of related organizations in the environment description in section 2.

5.0 Objectives and strategies to achieve them

SC 29 is acknowledged worldwide as the primary center of excellence in media coding and media communication systems for a very broad range of applications, continually serving the needs of the industry at large and cooperating with other SDOs and consortia to apply its expertise to many application-specific communities.

The standards produced in SC 29 are designed to represent, package, record, preserve and convey digital media information. These standards support functionalities such as the coding, composition, transport, and file storage of media and their control, multiplexing, interfaces, and middleware for general and/or specific applications.

Compression technology, expressed in the SC 29 scope description as “efficient coding” is a major focus in SC 29, spanning across images, audio, moving pictures / video, graphics, haptics, genomic data, etc.

SC 29 has a structure with 8 working groups and 5 advisory groups to cover the specializations across this domain and to coordinate between them. Digital information support for media technology in systems is also standardized in SC 29 and is one of its most active areas (especially in WG 3, which is the most active WG in SC 29 in terms of the number of work items under development).

The structure of SC 29 has been stable since a restructuring in 2020 that increased the number of working groups to strengthen the topic-specific expertise by establishing corresponding groups while also establishing an advisory structure to ensure cooperation between them. No significant changes to that structure have been proposed by NBs since this restructuring.

6.0 Factors affecting completion and adoption of the work program

SC 29 has sufficient participation of experts to proceed with the development of its work programme, including the JPEG, JPEG 2000, AIC, JPEG XR, JPEG XT, JPEG Systems, JPEG AIC, JPEG XS,

JPEG XL, JPEG Pleno, JPEG AI, JPEG Trust, JPEG XE, MPEG-2, MPEG-4, MPEG-5, MPEG-7, MPEG-21, MPEG-A to MPEG-E, MPEG-G, MPEG-H, MPEG-I, MPEG-M, MPEG-V, MPEG-U, MPEG-CICP, MPEG-DASH and MPEG-IoMT projects in addition to other standards being developed and additional topics under investigation. SC 29 and its WGs comprise a community of more than a thousand people, with about 600 people attending each quarterly set of the meetings of its WGs and roughly a thousand total registered experts.

Risks noted in the work of SC 29 include the following:

- **Succession planning:** As with the rest of JTC 1, SC 29 has been considering succession planning and how that planning can be conducted. Having been recently renewed, the terms of most SC 29 convenorships as well as the term of the chair will end at the end of 2026.
- **Identifying new opportunities for standardization and attracting stakeholders:** For ensuring the development of relevant standards to address industry needs, a strong collaborative atmosphere must be maintained, and continuing outreach is needed to attract the widest possible range of stakeholders. Studies of requirements for the development of standards are critical, and SC 29 has established both a requirements subgroup within its WG 1 and also an MPEG Technical Requirements working group (WG 2) where such activities take place. Coordination on these matters is further facilitated by the JPEG and MPEG coordination advisory group (AG 4), and outreach is assisted by the JPEG liaison subgroup and the MPEG liaison and communications advisory group (AG 3). Stakeholder engagement, e.g., including consumer stakeholder involvement, is needed.
- **Keeping the work plan aligned with industry and consumer needs:** Any standardization effort must be aligned with the actual needs of industry and consumers, and stakeholder requirements must be fulfilled. This includes technical capabilities, the timing of the development process, and the quality of the provided solution, along with sufficient outreach, evangelism and educational material. These require a critical mass of competent experts and continual attention from the management of the groups involved.
- **Vulnerability to key adoption decisions:** While we may strive to develop standards that are appropriate for a broad application environment, in some cases the breadth of adoption of a standard is vulnerable to the decisions of key high-volume product makers. In such cases, the early signs of momentum toward deployment that arose during development of a standard can dissipate, limiting the prospects for widespread adoption. While this phenomenon may be partly unavoidable, it can potentially be minimized by ensuring that the key stakeholders are engaged in the process of developing the standards.
- **Risk related to patents:** In order to meet the requirements of industry and to cope with competition, SC 29's standards should incorporate new technologies and ideas, which may be associated with patent rights that require licensing. The number of relevant patents and patent holders corresponding to the advanced features of complex technology standards can grow so large as to make one-by-one licensing negotiations difficult and can include parties that have not participated in the development process of the standard. Issues can arise that delay or cause suspension of the standards development process. Hesitance to

adopt some recent standards produced by SC 29 has been evident due to perceived high costs and the complexity and business risk associated with patent rights licensing. Substantial disputes have arisen over SC 29 projects and standards in the past. SC 29 and its WGs continue to encourage their members to submit patent rights declarations and abide by the ISO/IEC patent rights policy. Meanwhile, some competitive efforts in industry consortia have developed specifications and software implementations under different policies which are promoted as having “open and royalty free” or “one-stop shopping” licensing. Such developments present challenges to the successful development and adoption of SC 29 standards.

- **Lack of free public availability of publications:** Industry practices are changing, and standard developments have become more open public activities. Several SDOs developing standards for similar areas, such as 3GPP, IETF, ITU, W3C, and Khronos, make their published standards and other publications (e.g., technical reports) available to the public for free. Some such SDOs also do this for non-final drafts. Potential participants may choose not to do their work in SDOs that do not follow this increasingly common practice. Restrictions on the ability to exchange information, invite participation and solicit input and feedback from non-members can also discourage participation and put at risk the quality and relevance of the standards that are produced. Greater flexibility for making the published texts and the work under development externally available (and available without cost) would improve alignment with this new industry practice. SC 29 welcomes the recent developments in JTC 1 that have improved the ability to make some deliverables available to the public without cost and to make this availability more clear and discoverable to the public.
- **Delays and problems in preparation for final publication of standards:** As the technology development cycle has continued to shorten, industry demands access to standards in a timely fashion. However, there have been cases in which the publication of standards has been delayed for quite some time, even up to a year, to resolve minor editorial issues and produce the final published text. Requirements for extensive editorial changes to be made to unchanged parts of existing standards that are being revised have aggravated the problem and risk the inadvertent introduction of technical errors. House Style and publication workflow requirements that are rigid and different from conventions followed elsewhere can be a source of significant frustration without necessarily contributing to the quality or relevance of the published result. Some parts of the publication workflow do harm to the ability to use the result as the basis of further work – e.g., by removing automatic numbering and automatically updated cross-reference links. SC 29 welcomes the recent efforts in JTC 1 and ISO to address this ongoing problem. Accelerating the standards publication process and making technically mature texts rapidly available to industry would serve the users of standards and strengthen the relevance of the standards to the real-world applications where standards are needed.

7.0 Structure, current projects, and publications

SC 29 was established in 1991. Since its restructuring in mid-2020, the work of SC 29 has been organized into 8 working groups and 5 advisory groups. One of the working groups (WG 1) is known as **JPEG**, the Joint Photographic Experts Group, and the other seven working groups (WGs 2–8), together with three of the advisory groups (AGs 2, 3 and 5), are collectively known as **MPEG**, the Moving Picture Experts Group. The SC 29 structure is illustrated in Figure 1Error: Reference source not found, and the current work programme of the more than 100 standards and amendments under development in SC 29 is found at <https://www.iso.org/committee/45316/x/catalogue/p/0/u/1/w/0/d/0>.

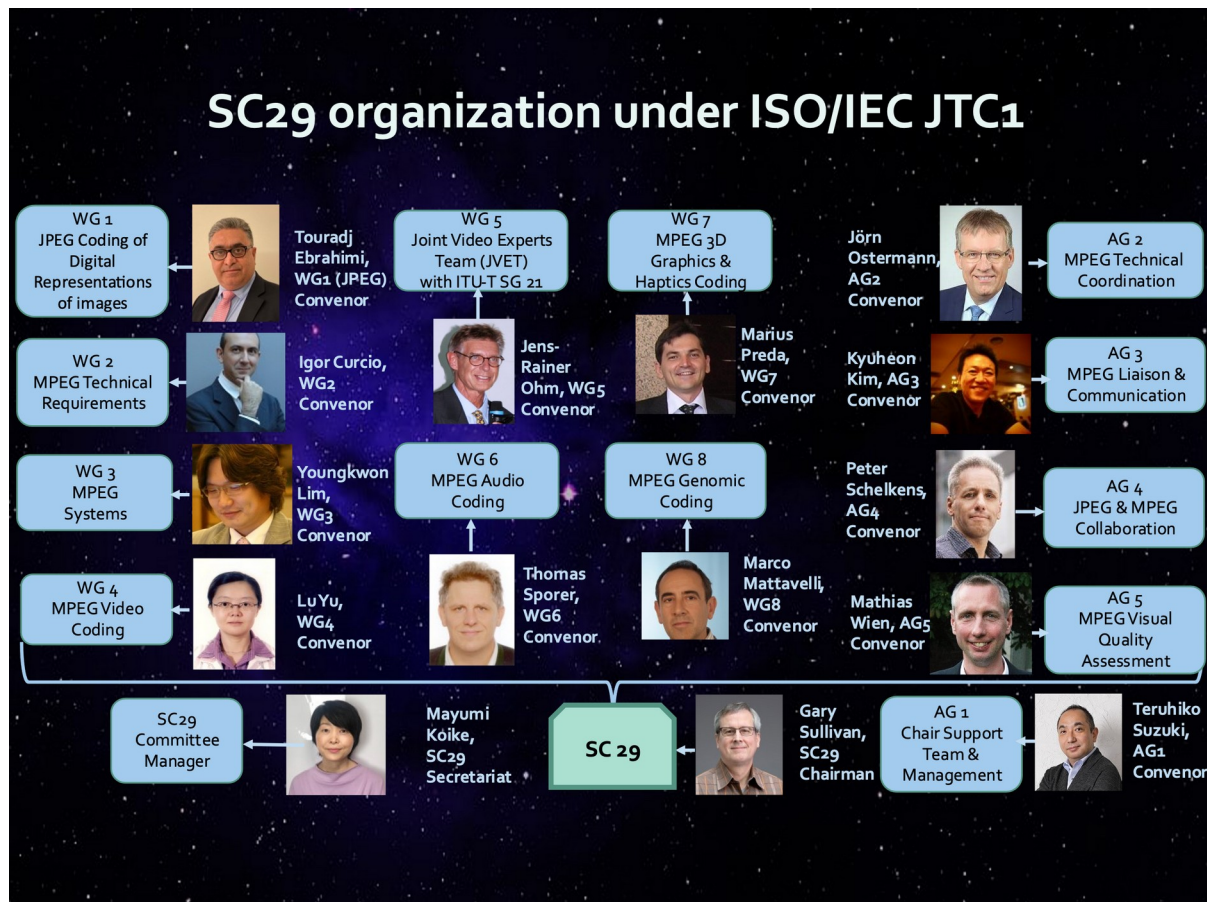


Figure 1: Structure of ISO/IEC JTC 1/SC 29

The terms of service for the Chair of SC 29 and all but one of the convenorships within it expired at the end of 2023, and the remaining convenorship expired at the end of 2024. The Convenor of WG 6 MPEG Audio, Schuyler Quackenbush of the United States, retired with distinction at the end of his term and was replaced by Thomas Sporer of Germany, and the Convenor of AG 1 Chair Support Team and Management, Andrew G. Tescher, retired with distinction at the end of his term and was replaced by Teruhiko Suzuki of Japan (who is also a former Chair of SC 29). The Convenors and the Chair of SC 29 were each appointed to three-year terms starting at the beginning of 2024 or 2025. SC 29 recently agreed to issue an early call for volunteers for the convenorship on the ISO/IEC side in

the WG 5 Joint Video Experts Team with ITU-T SG 21 due to the anticipated retirement of Jens-Rainer Ohm of Germany at the end of 2026. It is hoped that early identification of candidates will provide an opportunity for a smooth transition in the management of this critically important joint WG.

WG 1 (JPEG) has a long tradition of creating image coding standards, dating back nearly four decades. WG 1 (JPEG) is responsible for the popular JPEG, JPEG 2000, JPEG XR, JPSearch, JPEG XT, and, more recently, the JPEG XS, JPEG Systems, JPEG AIC, JPEG Pleno, JPEG XL, JPEG AI, and JPEG Trust families of imaging standards.

WG 1 (JPEG) is organized around six subgroups, Communication, Requirements, Systems & Integration, Plenoptic Coding & Quality, Image Coding & Quality and Coding and Performance for Machines. It is furthermore coordinated by a JPEG Executive Team (JET), composed of Subgroup chairs and the webmaster, and is chaired by the WG 1 Convenor.

JPEG meets usually four times a year, with some of these meetings held in hybrid mode. It actively manages the time zones and locations of its meetings to avoid routinely penalizing the experts in particular regions worldwide. Typical WG 1 meetings have about 100 registered experts, of which around 80 actually participate, among which about 50 are in-person when meetings are in hybrid mode.

The roadmap of current projects in the JPEG WG is presented in Figure 2, excluding those regularly under maintenance.

Public-facing information about JPEG can be found at <http://www.jpeg.org/>.

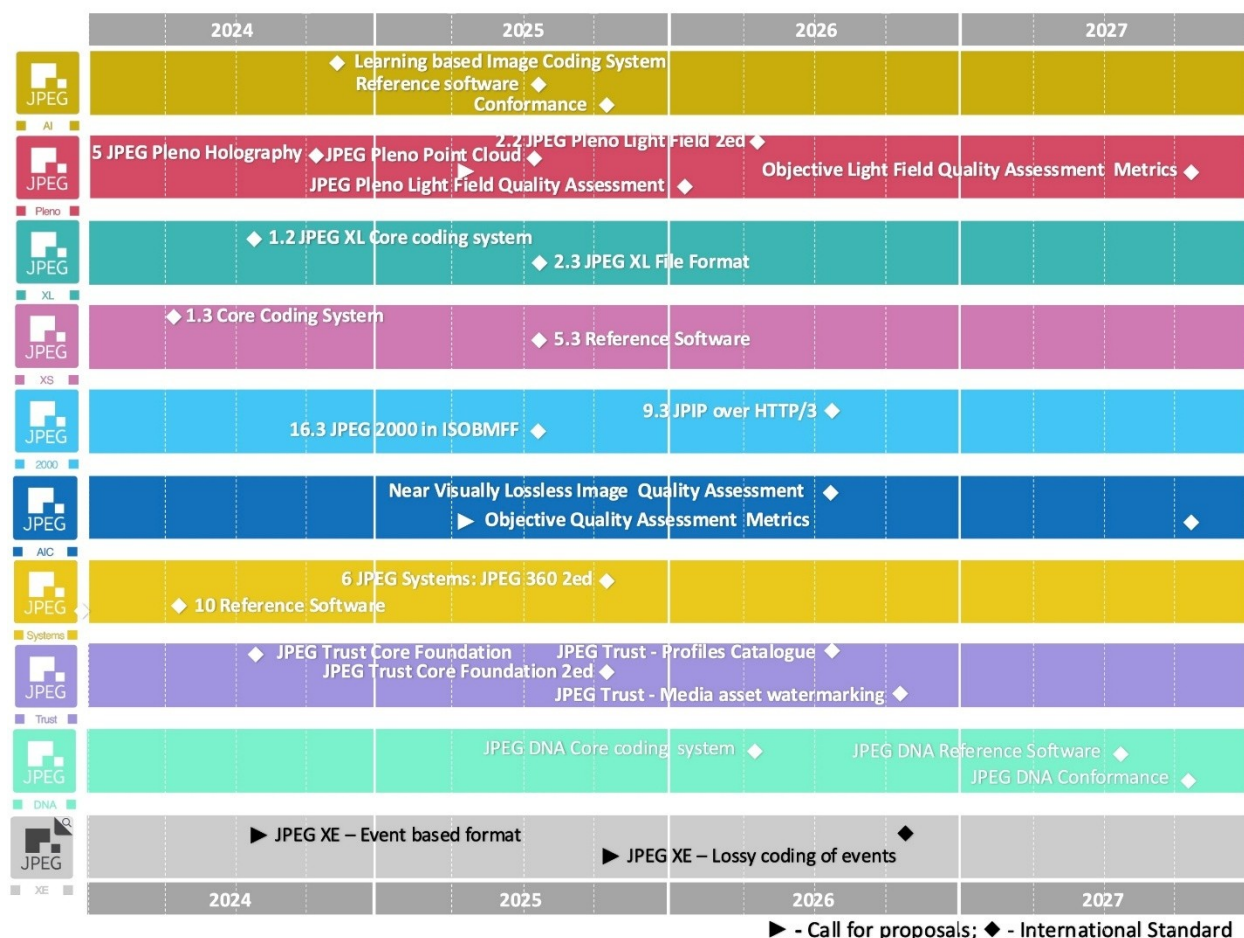


Figure 2: Roadmap of standards development in the JPEG WG (WG 1), as of August 2025

WGs 2-8 and AGs 2, 3 and 5 constitute the “MPEG” working groups. Over a span of 35 years since its founding in 1988, MPEG has become a center of expertise for the development of successful digital media standards that have changed the industry and improved the lives of billions of people. Since its reorganization in 2020, the coherence and coordination of the MPEG community was preserved in its character and coherence by a particular *modus-operandi* including a common meeting calendar, coordination of meeting plans including collocation of physical meeting locations, regular joint meetings between the WGs, an advisory group (SC 29/AG 2) for technical coordination among all the MPEG WG convenors and meeting planning, a common advisory group (SC 29/AG 3) for liaison and communication coordination, a common advisory group (SC 29/AG 5) for visual quality assessment of the capabilities of MPEG visual coding standards and technology proposals, and common work on Requirements coordinated by SC 29/WG 2.

The meetings of the MPEG WGs are collectively referred to as MPEG meetings, with the October 2023 meetings called the 144th MPEG meeting, the January 2024 meetings called the 145th MPEG meeting, etc. At each of these meetings, more than 400 participants have continued to work efficiently on standards for the future needs of the industry. The MPEG groups have also

collaborated with each other on continued exploration of new application areas that will benefit from standardization of efficient coding methods and related systems technologies in the future.

A roadmap of projects under recent and current development by the MPEG WGs is shown in Figure 3, and explorations for potential future standardization are shown in Figure 4 along with major maintenance items for enhancements of existing standards.

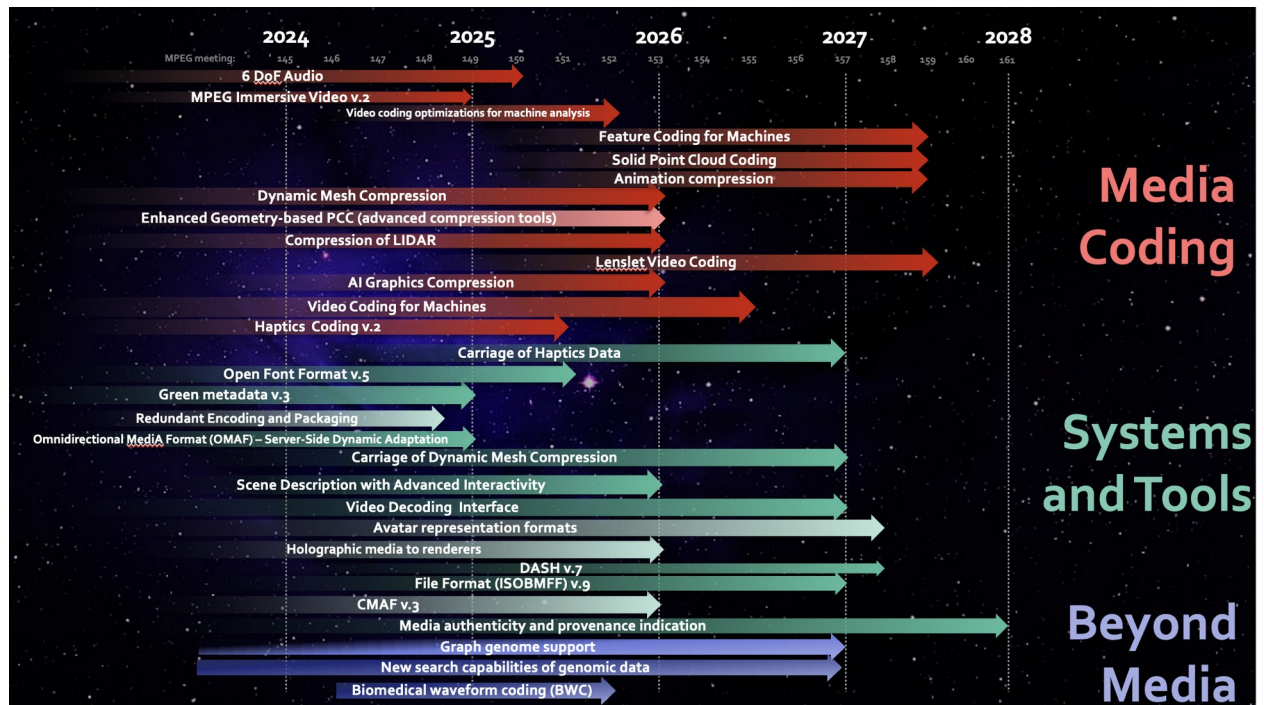


Figure 3: Roadmap of standards development in the MPEG WGs (WGs 2-8), as of August 2025

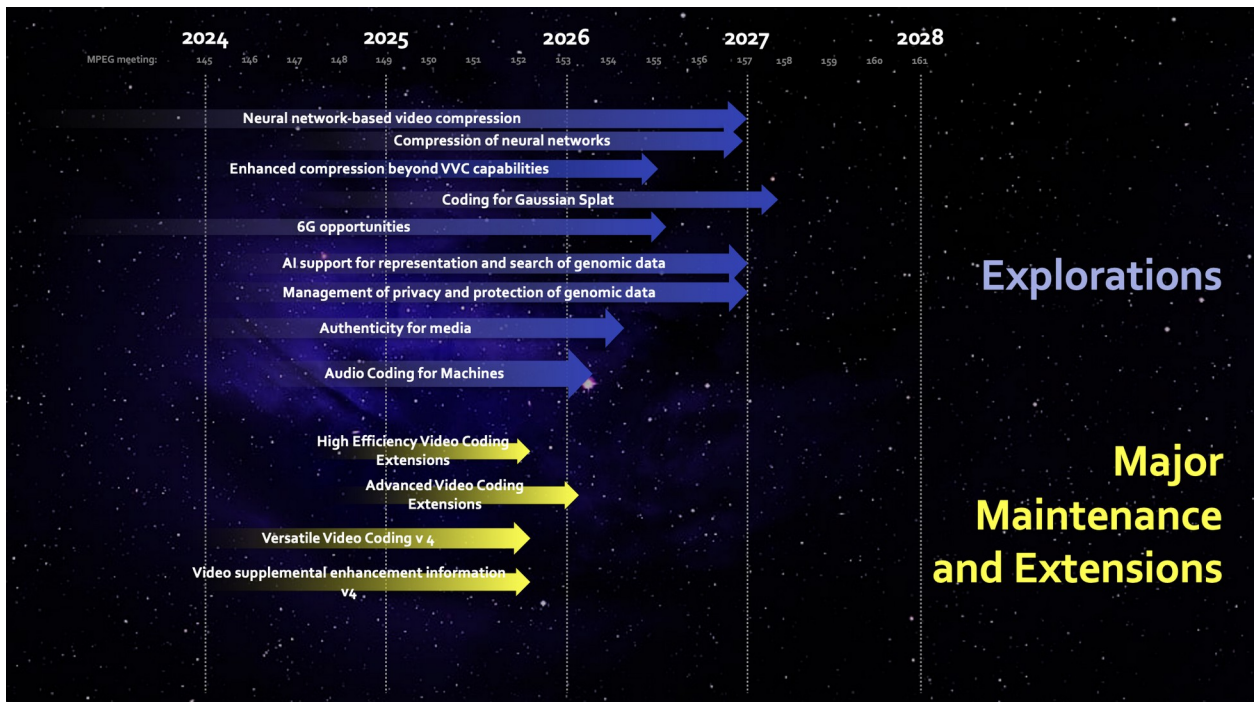


Figure 4: Exploration activities and major maintenance items in the MPEG WGs (WGs 2-8), as of August 2025

More specifically, the MPEG community consists of AG 2 MPEG Technical Coordination (for overall MPEG work coordination), WG 2 MPEG Technical Requirements, WG 3 MPEG Systems, WG 4 MPEG Video Coding, WG 5 MPEG Joint Video Experts Team with ITU-T SG 21, WG 6 MPEG Audio Coding, WG 7 MPEG 3D Graphics and Haptics Coding, WG 8 MPEG Genomic Coding, AG 3 MPEG Liaison and Communication, and AG 5 MPEG Visual Quality Assessment. Within these WGs, about 600 participants have continued to work efficiently on standards for the future needs of the industry.

Public-facing information about MPEG can be found at <http://www.mpeg.org/>.

Two additional advisory groups assist in SC 29 coordination. AG 1 assists the chair on various SC 29 matters and particularly provides advice on management issues, and AG 4 is constituted for coordination between the JPEG and MPEG communities. AG 4 has particularly been active in organizing workshops for exchange of information and outreach on JPEG and MPEG projects in related areas.

There has been an ongoing and rapid expansion of the use of artificial intelligence / machine learning / neural network technology across a broad range of applications, including media coding, coordination and analysis. Such developments have increasingly appeared in multiple projects within SC 29, and a large amount of further future impact of such technology is anticipated.

For WGs 1 to 7, immersive applications, including virtual and augmented reality, 360° image/video, 3D and immersive audio and 3D representations (e.g. point clouds, radiance fields and Gaussian

splatting), are continuing to emerge. To avoid fragmentation in the market and to ensure interoperability, standards are required for such applications.

Media data is expected to be more machine- or system-friendly as rich sensory data with the development of Cyber Physical Systems and IoT-type applications. There is also a rapid expansion of multimedia content generation for security and monitoring applications, and increased use of machine-based consumption and analysis of multimedia content. The coordinated use of content from multiple sources is also rapidly expanding, as contrasted with the traditional model of linear content generation, storage and playout. Having standardized mechanisms to support such systems and applications is needed.

Workshop organization and participation

In this reporting period, for outreach, coordination and education, several workshops were held in SC 29, including the following:

- JPEG Pleno Workshop on Future Challenges in Data Compression for Holographic Metrology Applications Announcement on 2 July 2025
- JPEG Pleno Workshop on Future Challenges in Compression of Holograms for XR Applications Announcement on 16 April 2025
- Joint JPEG/MPEG Workshop on Radiance Fields on 31 January 2025
- JPEG Emerging Technologies Workshop on 27 January 2024
- Joint SC 29 and ITU-T SG 21 Workshop on Future video coding –advanced signal processing, AI and standards on 17 January 2025

Calls for contribution

To encourage broad participation and call attention to new work, calls for contributions to new projects are routinely issued in SC 29, including calls for proposals, calls for evidence, and calls for other encouraged contributions (such as contributions of test material for testing activities).

Meeting press releases

Major accomplishments in the WGs are highlighted in press releases issued on a per-meeting basis. The press releases are posted to websites and LinkedIn accounts.

Newcomers' introduction presentation

A new feature introduced at the July 2025 meetings of SC 29 and its WGs was a presentation given by the SC 29 Chair to introduce newcomers to the organization, its areas of activity, and its working methods. Similar introductory sessions are planned to be held at future meetings.

Meeting arrangements

Most meetings are held in hybrid mode, and careful attention is given to the connectivity to enable effective remote participation, which helps bring in those who would have difficulty with travelling

or with dedicating a large commitment of calendar days to participating. Meetings not held in hybrid mode are fully virtual.

White papers for educational outreach

An example of the outreach and educational activities of SC 29 is the production of the following informally publicly released white papers. Within this reporting period, a white paper was released on the following topics.

- Energy-Efficient Media Consumption using Green Metadata (updated)
- High Efficiency Video Coding (updated)
- MPEG-D Dynamic range control (updated)

Verification testing

In this reporting period, the following verification test of standardized capabilities was completed:

- Subjective quality testing of film grain synthesis using the film grain characteristics supplemental enhancement information message. The results reveal a superior subjective performance at all tested bitrates, providing bitrate savings of up to a factor of 10 for some test points.

Future project explorations

Explorations toward potential additional new projects within SC 29 include various topics such as:

- Authorship and ownership signalling mechanisms in imaging ecosystems
- Watermarking of images for authenticity verification and copyright protection
- Objective image quality assessment
- Multimedia content tokenization
- Audio Coding for Machines (ACoM) to enable machine analysis of audio signal fields
- Coding of immersive content represented using Gaussian Splatting and Neural Radiance Fields (NeRFs)
- DNA-based image coding for storage and archival
- Coding of point clouds generated by advanced LiDAR and volumetric scanners
- Implicit neural visual representation
- Neural-network based video coding
- Video coding with compression capability beyond that of the Versatile Video Coding (VVC) standard
- Video coding using generative face rendering technology with neural networks
- Avatar coding for visual communication

- Lenslet-view video coding for dense light fields
- Processing and coding of immersive video
- Quality of immersive visual media
- Advance signalling of media system container content
- Smart contracts for medio
- Technologies for graphics, animation, mesh and point cloud compression