

# Accellera Federated Simulation Standard (FSS) Proposed Working Group

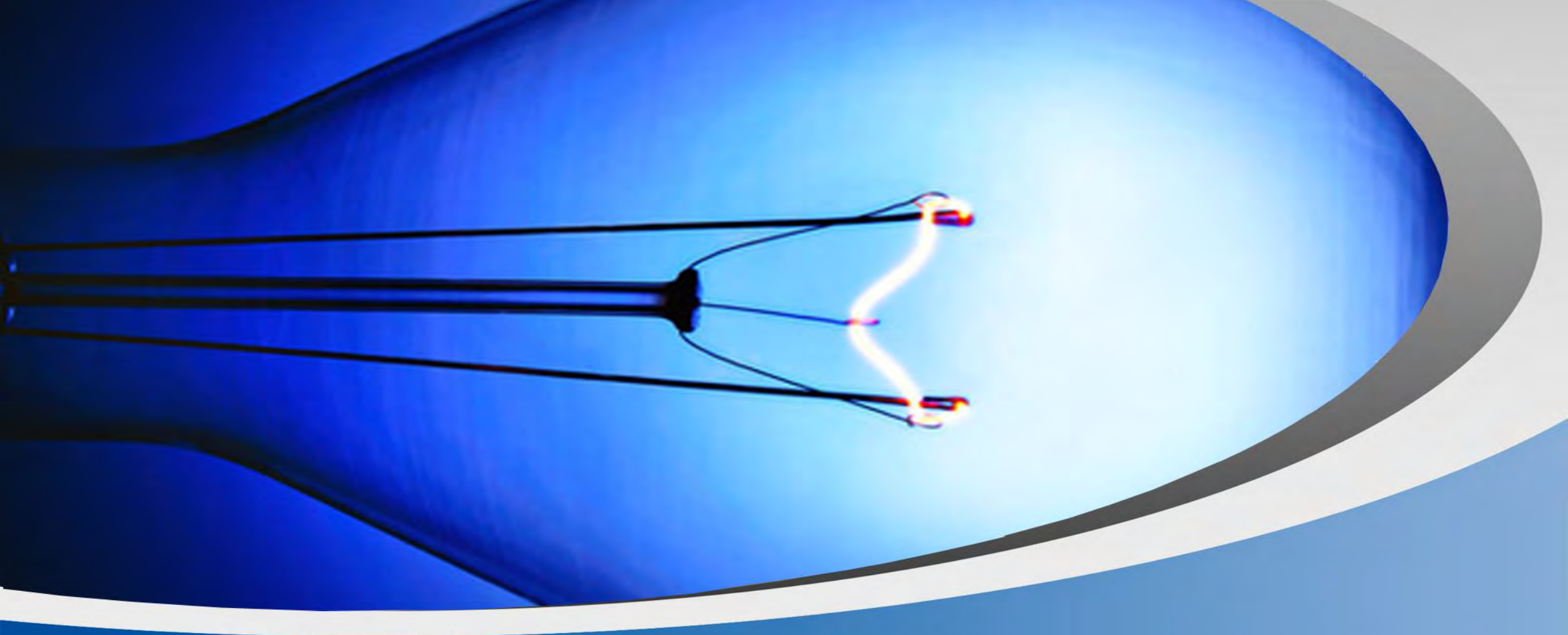
July 2023

Martin Barnasconi | Accellera Technical Committee Chair



# Outline

- **Introduction to Accellera Systems Initiative**
- **Federated Simulation Standard - Proposed Working Group**
- **Standardization Development Cycle & Timeline**
- **Q&A**



# Introduction to Accellera Systems Initiative



# Accellera Systems Initiative

## Our Mission

To provide a platform in which the electronics industry can collaborate to innovate and deliver global Electronic Design Automation and IP standards that improve design and verification productivity for today's advanced integrated circuits and embedded systems.

In addition, we strive to promote the widespread adoption of these standards.



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

# Broad Industry Support

## Corporate Members



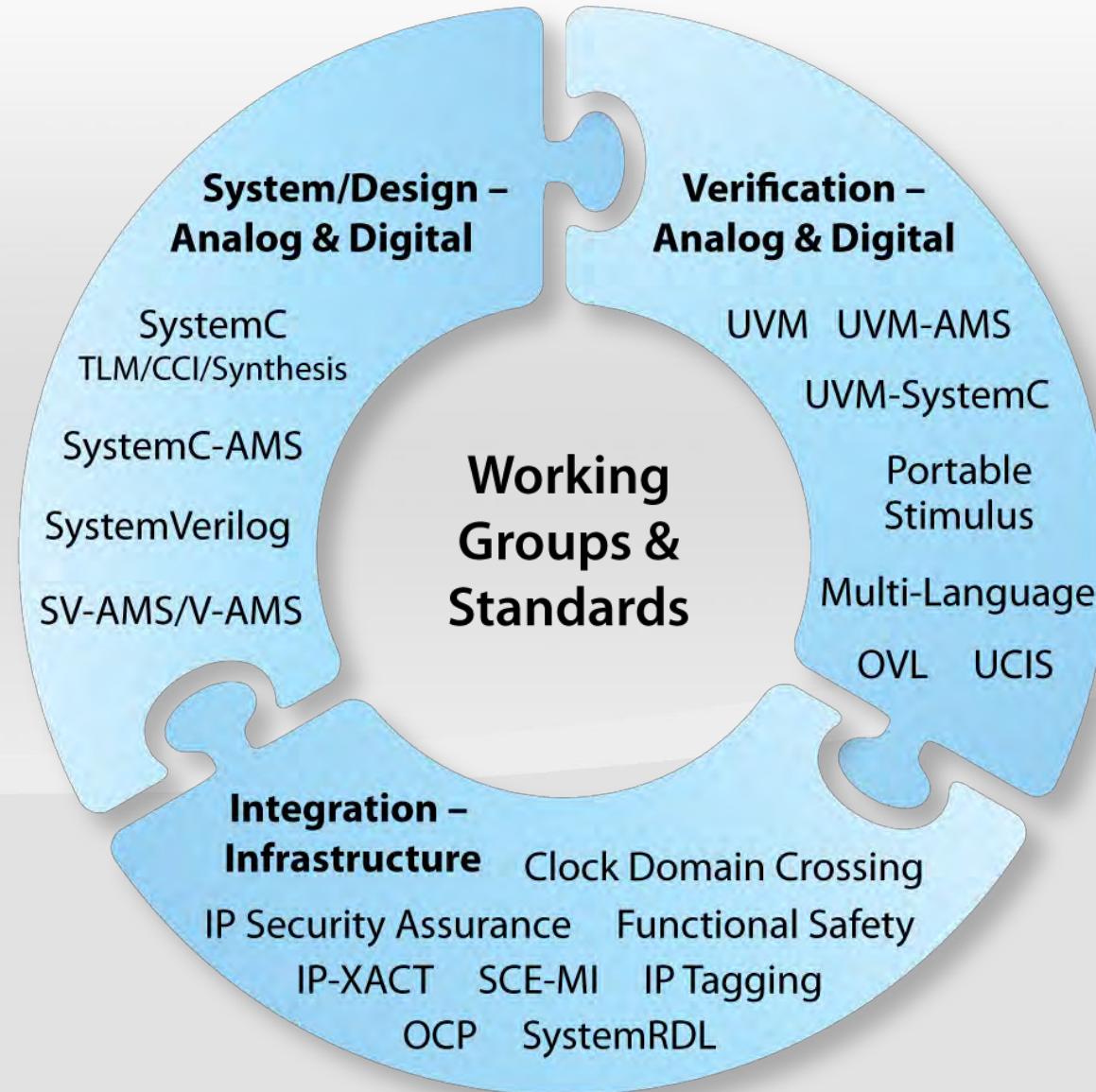
## Start-Up and University



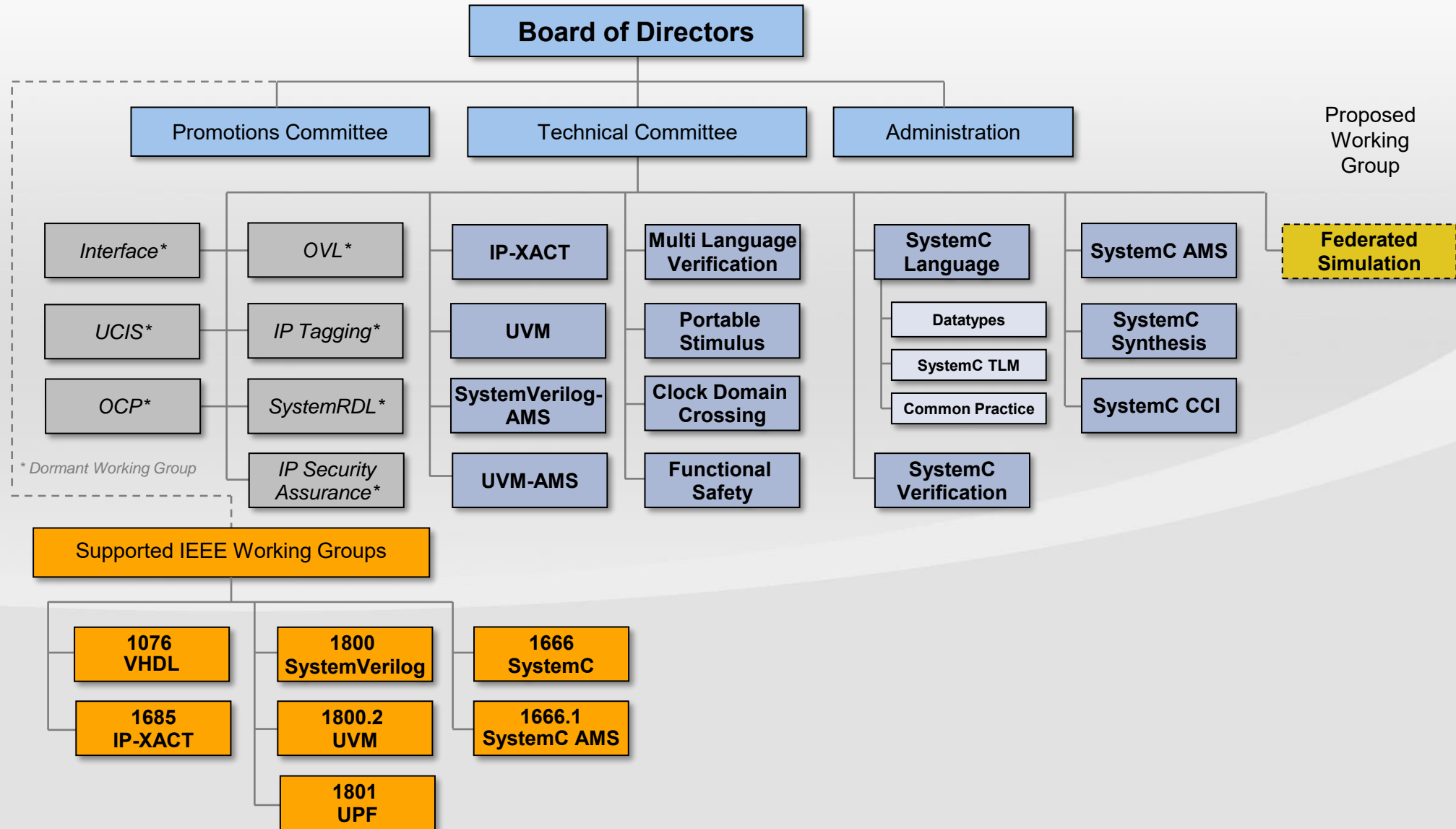
## Associate Members



# The Accellera Ecosystem



# Accellera Systems Initiative



# Accellera Standards and Activities

## Current Standards and Supplemental Material

### Standards

- Intellectual Property (IP) Tagging 1.0
- IP-XACT – IEEE Std. 1685-2022
- Multi-Language (ongoing)
- Open Verification Library (OVL) 2.8.1
- Portable Stimulus 2.0
- Security Annotation for Electronic Design Integration 1.0
- Standard Co-Emulation Modeling Interface (SCE-MI) 2.3
- SystemVerilog-AMS (ongoing)
- SystemRDL 2.0
- SystemC – IEEE Std. 1666-2011
- SystemC Analog Mixed-Signal (AMS) – IEEE Std. 1666.1-2016
- SystemC Configuration, Control & Inspection (CCI) 1.0
- SystemC Synthesis 1.4.7
- Unified Coverage Interoperability Standard (UCIS) 1.0
- Universal Verification Methodology – IEEE 1800.2-2020
- Verilog-AMS (V-AMS) 2.4

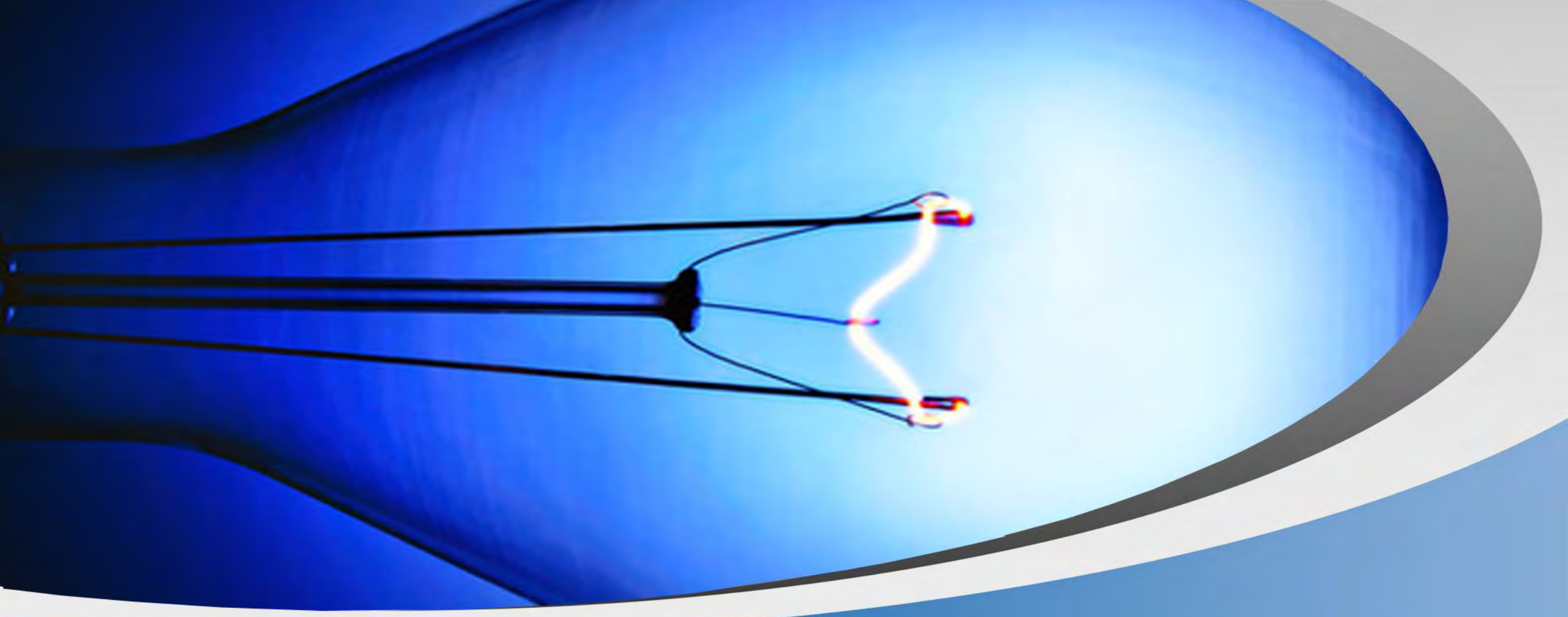
### Supplemental material

- IP-XACT 1685-2022 XML Schema, Vendor extensions and Release Notes
- IP-XACT Users Guide
- SystemC 2.3.4 Core Language and Examples, Regression suite
- SystemC AMS 2.3.4 Users Guide, Regression suite and Application Examples
- SystemC CCI 1.0 Proof-of-Concept
- SystemC Verification Library (SCV) 2.0.1
- UVM 2020-2.0 Reference Implementation
- UVM-SystemC Library 1.0-beta5

### Whitepapers

- IP Security Assurance
- Functional Safety





# Federated Simulation Standard (FSS) Proposed Working Group



# Problem Statement

Different simulation approaches and standards...



**Avionics**

VISTAS /  
VHTNG



**Space**

SMP2



**Semi's**

SystemC  
TLM  
IP-XACT



**Automotive**

openADx  
openDRIVE  
openSCENARIO  
openCRG  
openPASS



**Mechatronics**

FMI / FMU

How to bring these industries and simulation approaches together?

# Context: Cross-Industry Collaboration Initiative

- **A “Core Team” has been established in 2019 to exchange knowledge and best-practices**
  - Inventorize existing simulation standards, its usage and coverage
  - Understand requirements, potential overlaps, and points of interaction
- **Foster and initiate actions to improve and co-ordinate standards development and integration of simulation technologies**
  - Collaborative action to make standards evolve according to our needs (e.g., interoperability, scalability, ...)
  - Explore cross-industry collaboration between Standards Developing Organizations and Consortia supporting open innovation and collaboration

## Core Team members\*

Airbus  
Aptiv  
AVL  
Bosch  
Collins Aerospace  
IRT Saint-Exupery  
NXP  
Qualcomm  
Shokubai  
Spacebel

# Towards a Federated Simulation Standard (FSS)

- **Objective is to form an ‘official’ working group to drive standardization and development of an open API and federated simulation framework**
  - Standard development proposed in Accellera Systems Initiative
  - Development of the simulation framework and/or reference implementation in close collaboration with other entities (e.g., WGs affiliated to Eclipse Foundation or Linux Foundation)
  - Explore opportunities for sponsored projects to support development of the standard or its implementation
- **Initiate Accellera Proposed Working Group (PWG)**
  - Identify industry interest and consolidate requirements to develop a standard
  - Proposed Working Group is open for anyone, Accellera member companies and non-members
  - The PWG will not develop the standard, it will prepare the scope and development plan
- **In parallel, an industry funded project is under definition by IRT Saint-Exupery in France**
  - Explore co-funding by ANR (Agence Nationale de la Recherche) in France
  - Objective to assign resources to support the study and implementation aligned with Accellera PWG plans

# Federated Simulation Standard – Proposed WG

## ■ Charter

- Cross-industry collaboration to improve the interoperability of product and environment simulation using existing and new open standards

## ■ Scope

- Develop a standard (API) and open infrastructure to enable cross-industry interoperability of simulation frameworks

## ■ Purpose the Proposed Working Group

- Identify industry interest and requirements for a standard / API covering addressing interoperability of simulation

## ■ Leadership

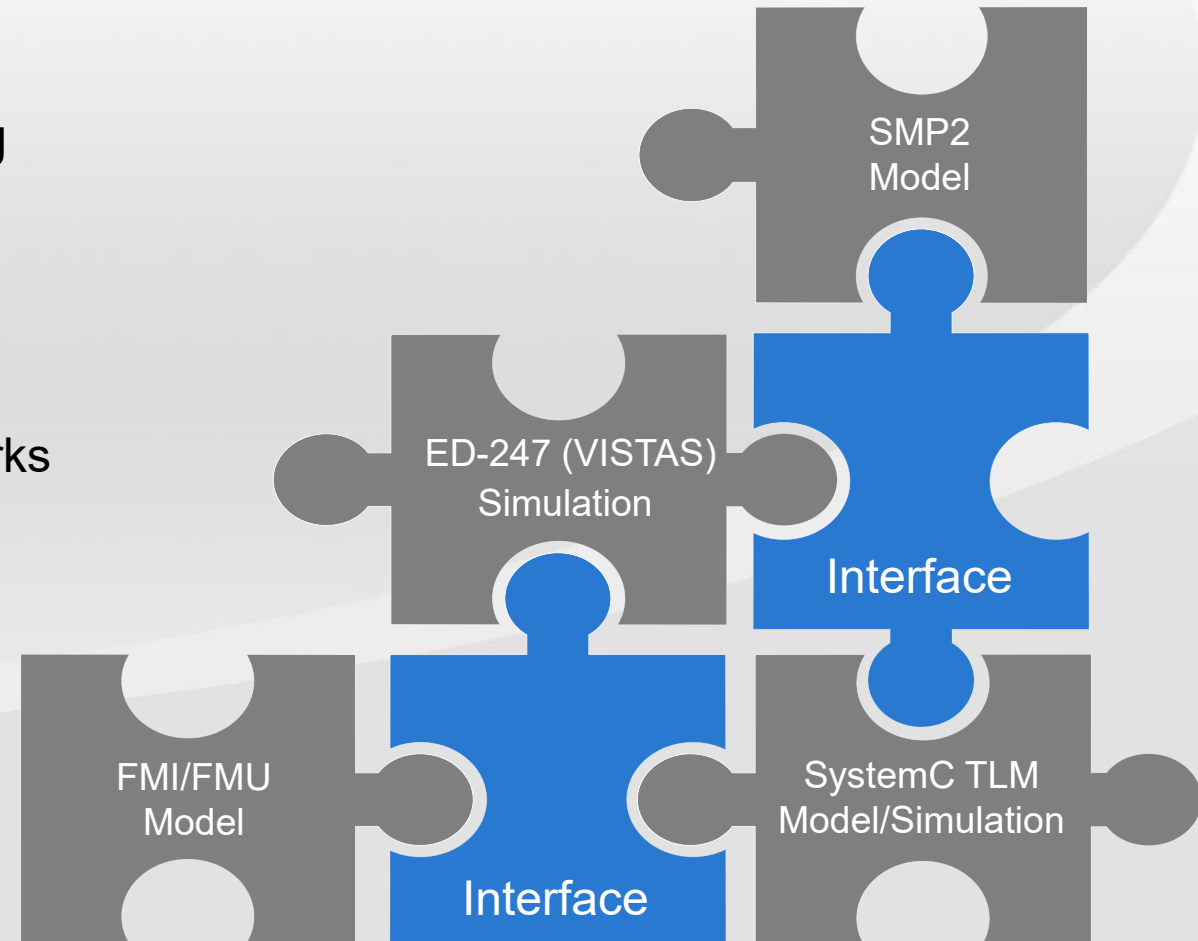
- Chair: Martin Barnasconi (NXP), vice-chair: Mark Burton (Qualcomm)

## ■ Envisioned Stakeholders

- Companies active in different industry segments (e.g., Semiconductors, Automotive, Avionics, Space, ... )
- Companies active in different stages of the value chain (Tier2, Tier1, OEM)

# FSS: Enabling cross-industry interoperability of simulation frameworks

- **Approach: Leveraging and connecting existing standards and industry formats**
  - Not re-invent wheels
- **Introduce standardized interfaces**
  - Enabling interoperability between simulation frameworks
- **Targeting a scalable simulation and modeling ecosystem**
  - Support models and simulation domains used at different levels of the 'OSI stack'



# PWG activities and reporting topics

- Potential industry acceptance of the proposed standard, including technical feasibility.
- Relationship to existing standards, if known, including its distinct identity from other standards development initiatives within Accellera and outside of Accellera.
- Recommendation for liaisons to other organizations, if needed.
- Viable leadership and participation estimates.
- WG scope and objectives.
- Opportunity to establish new areas of expertise for Accellera.
- Draft budget and resource requirements.
- Estimated standards development schedule and outline of possible path to IEEE.
- Supplemental materials such as examples, user guide, or reference implementation.
- Potential need for adding Allied Members.

# Federated Simulation Standard – Industry Interest

- **Accellera members**

- AMD, Bosch, Cadence, NXP, Qualcomm

- **Federated Simulation “Core Team”**

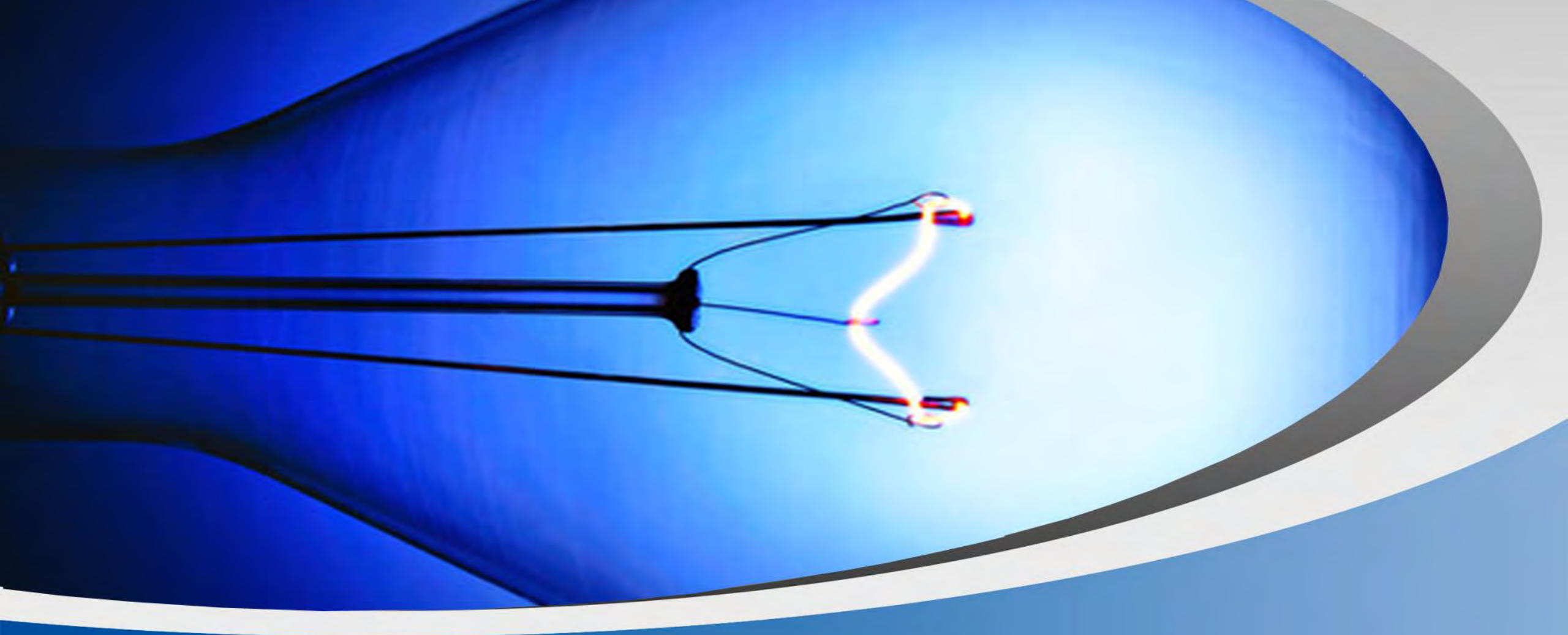
- Airbus, Aptiv, AVL, Bosch, Collins Aerospace, IRT Saint-Exupery, NXP, Qualcomm, Shokubai, Spacebel

- **Discussions with Automotive OEMs ongoing**

- **Expected collaboration with other Consortia and Standards Developing Organizations**  
(as part of ecosystem development)

- Eclipse Foundation (e.g., SDV)
- Linux Foundation (e.g., KVM)
- Software Freedom Conservancy (e.g., QEMU)
- Linaro (e.g., Arm ecosystem)
- ASAM (e.g., OSI, openPASS, openDRIVE, ...)

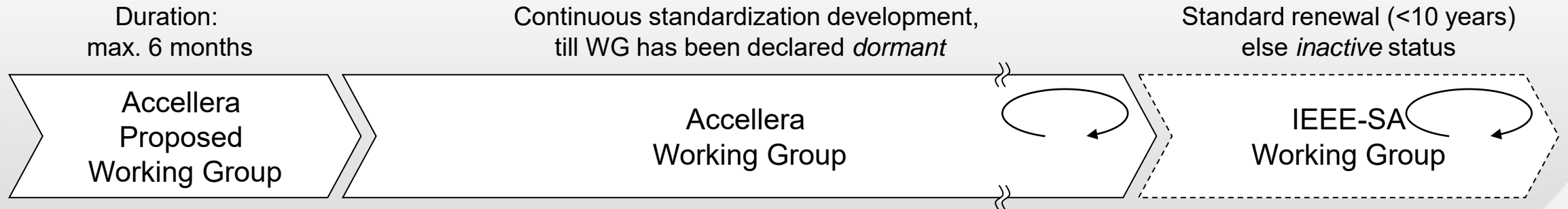




# Standardization Development Cycle & Timeline



# Accellera Standardization Development Cycle



- Identify industry interest & participants
- Collect requirements
- Feasibility study
- Reporting evaluation of proposed standard developments
- Consolidate technical requirements in a Design Objective Document (DOD)
- Standards development in the form of a Language Reference Manual (LRM)
- Development of “supplemental material” (e.g., reference implementation, XML schema, etc.)
- Call for Contributions: Participants are encouraged to contribute technology, API proposals, etc.
- Promotion and deployment of standardization activities at conferences (e.g. DVCon, DAC)
- Transfer of standards document after Accellera Board approval to IEEE-SA (excl supplemental material)
- Standards development under the responsibility of an IEEE-SA Working Group
- Objective to release as IEEE standard

# Federated Simulation Standard – Timeline

## ■ Call for Participation, July – Aug 2023

- Proposed Working Group announced in Accellera Newsletter and Design Automation Conference
- Industries or organizations interested can [contact Accellera](#) or directly contact Martin or Mark

## ■ Accellera PWG Kickoff meeting - September 2023

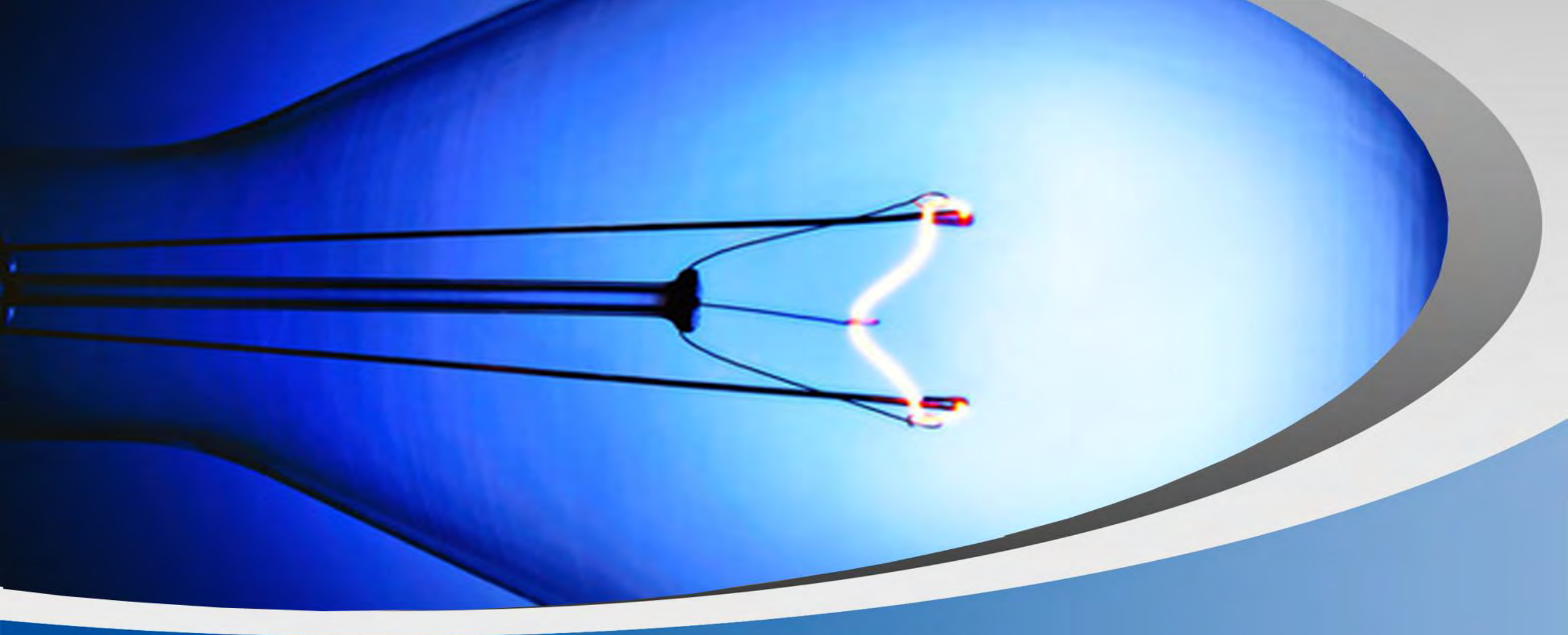
- Targeting 1-day F2F meeting. Location depending on industries involved
- Followed by (bi)weekly virtual / online meetings
- PWG is open to everyone – no Accellera membership required
- Alignment with potential industry project driven by IRT Saint-Exupery in France

## ■ PWG report-out to Accellera Board – Q1 2024

- Finalize proposal and recommendation to Accellera Board

## ■ Accellera Working Group formation – Q1/Q2 2024

- Actual standards development
- Accellera membership required



Q & A



SYSTEMS INITIATIVE

# Contact us

- **General queries:** <https://www.accellera.org/about/contact-us>
- **Federated Simulation Standard - Proposed Working Group**
  - Martin Barnasconi (NXP) - [martin.barnasconi@nxp.com](mailto:martin.barnasconi@nxp.com)
  - Mark Burton (Qualcomm) - [mburton@qti.qualcomm.com](mailto:mburton@qti.qualcomm.com)