CHIPS Metrology Community Charter Outline

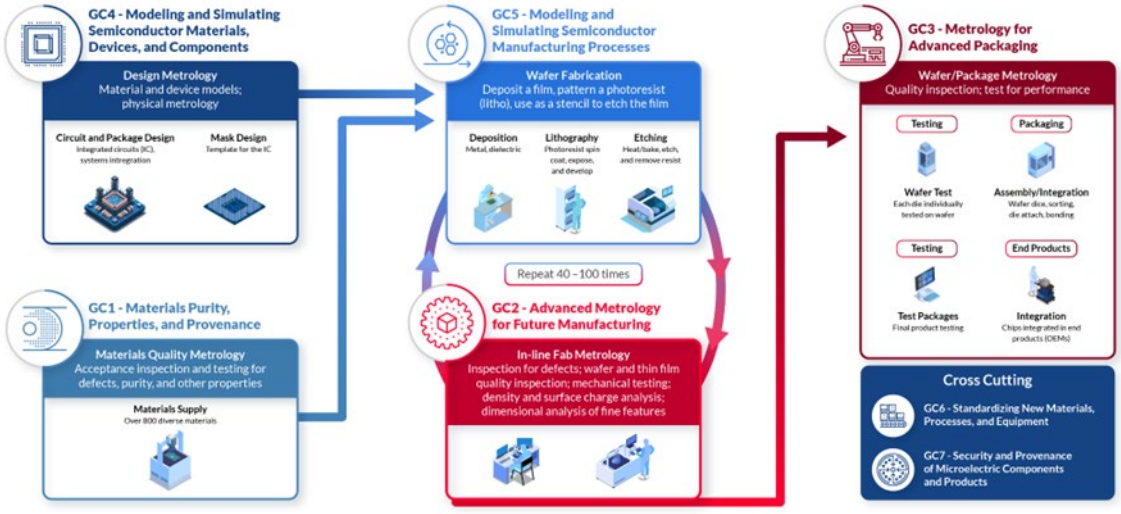
Background

The United States remains a global leader in chip design as well as research and development (R&D), however, has fallen behind in manufacturing and, as of June 2023, accounts for only about 10% of commercial global production. While the U.S. produces few semiconductors, our country remains one of the world's largest users of chips—for entertainment and consumer electronics, for cars and public transportation systems, and for critical systems like utilities and national defense. This makes us vulnerable to supply chain disruptions from far-off events over which we have little control.

In response, the CHIPS Act of 2022 appropriated $50 billion to the Department of Commerce to implement the CHIPS for America program, $11 billion of which will be invested through CHIPS Research and Development Office (CHIPS R&D) programs to create a robust domestic R&D ecosystem to strengthen and revitalize the U.S. position in semiconductor research, development, and manufacturing.

Metrology plays a key role in semiconductor manufacturing. As devices become more complex, smaller, and multi-layered, the ability to measure, monitor, predict, and ensure quality in manufacturing becomes much more difficult and uncertain.

The CHIPS Metrology Program, one of the four initiatives within the CRDO, emphasizes measurements that are accurate, precise, and fit-for-purpose for the production of microelectronic materials, devices, circuits, and systems. In its work, it aligns its research and development portfolios based on the identified metrology needs of seven Grand Challenges (GCs):



The CHIPS Metrology Program is establishing a community of practice to foster collaboration to help improve data and knowledge sharing across initiatives within the domain of these Grand Challenges, as well as to help stakeholders inform the industry standards that are critical for enhancing U.S. economic or national security competitiveness. **The purpose of this charter is to define the community's scope,**

goals, roles and responsibilities, member overview and expectations, engagement opportunities, and Community digital domain.

Scope

The CHIPS Metrology Community will work to advance breakthrough measurements that are accurate, precise, and fit-for-purpose to produce microelectronic materials, devices, circuits, and systems. Within this broad scope, the CHIPS Metrology Community will coordinate engagement opportunities to align with the focus areas of the seven Grand Challenges.

Goals

The CHIPS Metrology Community aims to create a new 'go to' place for industry to work collaboratively on and develop solutions to metrology problems shared across industry. Specifically, the goals of the CHIPS Metrology Community include the following:

1. Serve as a cross-company and cross-organization networking forum where matches between interests and skills can be more efficient.
2. Bring together individuals and organizations from across the semiconductor industry ecosystem in pursuit of working collaboratively to advance metrology research and development.
3. Nurture high-impact partnerships with stakeholders, government agencies, and academia to further industry engagement and collect insight for enhanced capabilities.
4. Provide professional development opportunities for participants to advance their expertise through access to webinars, equipment, facility use, conference registrations, data management plans, training, and other benefits.
5. Provide a source of shared knowledge regarding development of new measurement capabilities and scaling resources to reduce barriers.
6. Provide a strategic forum to connect subject matter experts and problem solvers with stakeholder's shared measurement challenges and emerging technology needs.

Community Structure and Roles and Responsibilities

As a stakeholder-driven community, **all members will play a part in shaping the strategy and facilitation of the CHIPS Metrology Community**. To ensure the Community has the foundational structure and guidance necessary to flourish, the following community members will play additional roles as outlined in the table below:

Member Overview

The CHIPS Metrology Community welcomes participation from stakeholders across the semiconductor industry spanning the seven Grand Challenges:

- Materials used in semiconductor and microelectronics and their processing
- Measurement instrument manufacturers

- Component integration and packaging
- Electronic design automation and semiconductor modelling
- Digital twins and other models of the semiconductor manufacturing processes
- Standards setting and standards development organizations
- Development of enhanced security and provenance of microelectronic components and products
- Participation is open and available to members across all stages of career levels, from engineers to executives. Participation in the Community is voluntary and members will be required to sign a Memorandum of Understanding (MOU) with CHIPS Metrology prior to being eligible to participate in Community activities.

Member Expectations

The CHIPS Metrology Community will provide interactive opportunities for stakeholders across the semiconductor and microelectronics industry to engage with one another. The Community is a forum for collaboration, where researchers, industry members, data producers, and data consumers are provided an arena to engage and work collectively on the seven Grand Challenges. While participation in the Community is voluntary, active members will be encouraged and expected to:

Participate in recurring Community engagements aligned with their respective Grand Challenge area;

- Participate in panel sessions, presentations, question and answer sessions, or other speaking opportunities where expertise and capacity are available;
- Provide feedback into CHIPS Metrology research priorities and project performance;
- Provide feedback or guidance on CHIPS Metrology training, education and / or outreach activities;
- Directly engage with other members in collaborative efforts that are developed through and fostered by the Community;
- Promote the existence of the CHIPS Metrology Community across stakeholder networks to increase awareness and participation; and
- Provide feedback to the Community Chair, Grand Challenge leads, and support staff on Community operations to continuously improve the community.

Leaders of the CHIPS Metrology Community recognize and respect the commitment that members make to these efforts. In return, the Community Chair, Grand Challenge leads from the CHIPS Metrology Program Managers, and support staff commit to:

- Developing a strategy for the Community to ensure specific areas of focus are industry relevant and reflective of member interests and needs;
- Proactively gathering member feedback to shape Community engagement topics and structure and to identify ways to improve community collaboration;
- Inviting experts to present on areas of interest and convening related panels for discussion;
- Coordinating with speakers and collecting presentation materials, as needed;

- Supporting smaller collaborative efforts between members that arise as a result of involvement in the Community;
- Managing logistics for Community events, which may involve virtual or in-person presentations, panel discussions, Q&A sessions, workshops, and other forms of engagement;
- Documenting and maintaining Community materials on the public and member-accessible online domains;
- Communicating with stakeholders, including responding to questions about materials and events, distributing event information to current members, providing answers to stakeholders interested in joining, and ensuring all current and potential members have the information needed relevant to active Community participation;
- Promoting the Community to new potential members, including through email, website updates, and other means of communication.

Engagement Opportunities

The CHIPS Metrology Community will convene and facilitate recurring engagements, which may consist of expert presentations, panel discussions, Q&A sessions, or other structured events. Details about upcoming engagement opportunities will be posted on the online Community website accessible to members and will be distributed via email. To allow for the broadest range of participation, many of the future events will be virtual; however, the Community may facilitate in-person engagements, depending on member interest. When available, a full schedule of upcoming Community events will be posted to the website when available.

As a stakeholder-driven entity, the engagement opportunities of the Community will be informed and guided by member needs, and the Community leadership will identify methods through which to gather member input, such as through surveys, questionnaires, or other means. All members are encouraged to provide direct feedback to the Community Chair, Grand Challenge leads, and support staff to help improve the operations and effectiveness of the community.

Digital Presence (Website) and Administration

The CHIPS Metrology Community will provide general information about the Community on the main website https://nist.gov/chips/metrology-community, including an overview of the application process, points of contact, and other relevant Community-related news.

Any materials developed within the Community or as a result of community collaboration will be posted on the Community's subdomain, a repository accessible to Community members with a signed MOU on file who are active community participants. Materials that may be included in this repository include meeting recordings, presentation slides, meeting minutes, and other documentation produced by the Community or smaller working groups that develop as a result.

Materials not directly belonging to or developed by CHIPS Metrology will be posted to this repository only with the consent of the authors. Under the Freedom of Information Act (FOIA), federal agencies are required to disclose agency records requested by a member of the public, including information

received from outside parties, unless FOIA exempts the information from disclosure. FOIA Exemption 4 (5 U.S.C § 552(b)(4)) exempts trade secrets and privileged or confidential commercial and financial information from disclosure. Furthermore, FOIA Exemption 3 (5 U.S.C § 552(b)(3)) protects information exempted from release by statute, such as the exemption described in the next section.

For questions about materials available on the website, reach out to the Community support staff at askchips@chips.gov.