up to receive automatic updates when amendments to a funding opportunity are posted.

Disclaimer. This NOI does not constitute a solicitation. No applications may be submitted in response to this NOI. Any inconsistency between information within this NOI and the eventual NOFO announcing the CHIPS Manufacturing USA Institute award competition shall be resolved in favor of the NOFO.

Authority: DOC CHIPS activities were authorized by Title XCIX—Creating Helpful Incentives to Produce Semiconductors for America of the William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021 (Pub. L. 116–283, often referred to as the CHIPS Act).

Tamiko Ford,

NIST Executive Secretariat.

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DEPARTMENT OF COMMERCE

National Institute of Standards and Technology

CHIPS National Advanced Packaging Manufacturing Program (NAPMP) Materials and Substrates Research and Development

AGENCY: National Institute of Standards and Technology, Department of Commerce.

ACTION: Notice of Intent (NOI).

SUMMARY: The CHIPS Research and Development Office (CHIPS R&D) intends to announce, via a Notice of Funding Opportunity (NOFO), an open competition for new research and development (R&D) activities to establish and accelerate domestic capacity for advanced packaging substrates and substrate materials, a key technology for manufacturing semiconductors. CHIPS R&D anticipates making available up to approximately $300,000,000 for multiple awards in amounts up to approximately $100,000,000 per award, not including voluntary co-investment, over up to 5 years and made through cooperative agreements or other transactions. The purpose of this NOI is to offer preliminary information to potential applicants, facilitating the development of meaningful partnerships and strong, responsive proposals.

FOR FURTHER INFORMATION CONTACT: All inquiries may be directed to Chris Greer (301–975–2000) via email to *research@chips.gov,* with a subject line stating: '2024–NIST–CHIPS–NAPMP–01 Questions.' All answers, which will be provided at the sole discretion of CHIPS R&D, will be posted on the NIST competition website at *https://www.nist.gov/chips/chips-RD-funding-opportunities.*

SUPPLEMENTARY INFORMATION:

Purpose. The CHIPS Research and Development Office (CHIPS R&D) intends to announce, via a Notice of Funding Opportunity (NOFO), an open competition for new research and development (R&D) activities to establish and accelerate domestic capacity for advanced packaging substrates and substrate materials, a key technology for manufacturing semiconductors. CHIPS R&D anticipates making available up to approximately $300,000,000 for multiple awards in amounts up to approximately $100,000,000 per award, not including voluntary co-investment, over up to 5 years and made through cooperative agreements or other transactions. Co-investment (cost share) is not required in this program. CHIPS R&D will, however, give preference to applications that demonstrate committed co-investment in their application.

The purpose of this NOI is to offer preliminary information to potential applicants, facilitating the development of meaningful partnerships and strong, responsive proposals. CHIPS R&D intends to announce the competition no later than March 2024 by posting the NOFO on *Grants.gov* at *https://www.grants.gov.* More information about the expected CHIPS R&D NAPMP Materials and Substrates competition will then be available at the CHIPS for America website at *https://www.nist.gov/chips/chips-RD-funding-opportunities.*

Background. Emerging technologies like artificial intelligence, advanced telecommunications, biomedical devices, and autonomous vehicles require leap-ahead advances in microelectronics capabilities. Improving all aspects of system performance to support the breadth of new semiconductor applications will require advanced packaging and related capabilities, such as heterogeneous integration, to address the need to integrate multi-component-assemblies with large numbers of interconnects to achieve a degree of integration that blurs the line between chip and package.

In particular, the ability to ''scale-down and scale-out'' will be critical, where ''scale-down'' refers to shrinking the size of the features on the package and ''scale-out'' refers to increasing the number of chips assembled on the substrate.

Materials and substrates are foundational to achieving the necessary advancements. Moreover, materials and substrates R&D, particularly applied R&D, is critical to expanding the U.S. packaging ecosystem.

CHIPS R&D Mission and Goals: The CHIPS and Science Act appropriated approximately $50 billion to the Department of Commerce—$39 billion in incentives to onshore semiconductor manufacturing and $11 billion to advance U.S. leadership in semiconductor R&D. Within CHIPS for America, the mission of CHIPS R&D is to accelerate the development and commercial deployment of foundational semiconductor technologies by establishing, connecting, and providing access to domestic research efforts, tools, resources, workers, and facilities. NAPMP, one of multiple CHIPS R&D initiatives, seeks to drive U.S. leadership in advanced packaging and provide the technology and skilled workforce needed for packaging manufacturing in the United States.

Within a decade, NAPMP-funded activities, coupled with CHIPS manufacturing incentives, will establish a vibrant, self-sustaining, profitable, onshore packaging industry where advanced node chips manufactured in the United States and abroad can be packaged in appropriate volumes within the United States and innovative designs and architectures are enabled through leading-edge packaging capabilities. In combination with other CHIPS for America education and workforce efforts, NAPMP-funded activities produce the diverse and capable workforce needed for the success of the domestic packaging sector.

Materials and Substrates NOFO Objectives: Three major R&D areas have the potential to make a significant impact on domestic advanced packaging capabilities: organic materials and substrates (including fan-out); glass materials and substrates; and semiconductor-based substrates. Within these areas, CHIPS R&D intends to fund R&D activities that establish and promote relevant domestic capability and capacity, with the following objectives:

1. Accelerate domestic R&D and innovation in advanced packaging materials and substrates;

2. Transition domestic materials and substrate innovation into U.S. manufacturing, such that these technologies are available to U.S. manufacturers and customers, including to significantly benefit U.S. economic and national security;

3. Support the establishment of a robust, sustainable, domestic capacity for advanced packaging materials and substrate R&D, prototyping, commercialization, and manufacturing; and

4. Promote a skilled and diverse pipeline of workers for a sustainable domestic advanced packaging industry.

Funded activities are expected to include, but not necessarily be limited to, basic and applied research, substrate and demonstration device development and production, commercial viability and domestic manufacturing preparation, integrated workforce education and training, and pilot-level substrate production.

To ensure that funded R&D meets the above objectives, CHIPS R&D expects to define aggressive technical targets (*e.g.,* substrate wiring, via pitches, and number of levels on both sides of the substrate) for applicants to achieve. CHIPS R&D will also encourage proposals for advanced substrates that incorporate one or more passive or active components embedded in the substrate for enhanced functionality. Whereas traditional boards, silicon or glass interposers and small area substrates are not expected to be in scope for this NOFO, composite substrates using fan-out wafer-level packaging, including flexible and biocompatible substrates, are expected to be entertained. CHIPS R&D will further expect that substrates be compatible with direct attach at fine pitch of advanced node CMOS, legacy nodes, and non-silicon dielets. Substrate proposals will be strongly encouraged to incorporate embedded substrate features and active and passive devices and through substrate vias. CHIPS R&D will further expect applicants to define non-technical targets related to advanced packaging education and workforce development and to demonstrating both the commercial viability and the potential for the domestic production of innovations funded under the NOFO.

Eligibility: CHIPS R&D expects eligible applicants and subrecipients will include for-profit organizations; non-profit organizations; accredited institutions of higher education including community and technical colleges; state, local, territorial, and Indian tribal governments.

Applicants must be incorporated in the United States (including U.S. territories). Eligible applicants may only submit one concept paper and one full application under this NOFO. Full applications will only be accepted from applicants invited after the concept paper stage. Entities may not be included as subrecipients on more than two applications.

Entities that operate Federally Funded Research and Development Centers (FFRDCs) may be eligible to receive this funding as sub-subrecipients to an eligible applicant to the extent allowed by law, based on the unique and specific needs of the project.

Foreign organizations may participate as members of a project team, as sub-subrecipients or contractors, subject to CHIPS R&D approval based on a written justification that the foreign partner's involvement is essential to advancing program objectives, among other considerations.

R&D Collaboration: CHIPS R&D expects that applicants assembling teams comprising one or more subrecipients may be best suited to collectively provide the full range of expertise and capabilities needed to achieve the program objectives and to successfully strengthen U.S. materials and substrates innovation. Equally important, these types of partnerships can promote inventiveness, clarify future demand, improve transparency and security, solidify business and domestic manufacturing plans (including plans for technology adoption by defense and commercial partners), help educate the future workforce, mitigate the risk of future chip shortages or oversupply, and support a more productive, efficient, and self-sustaining semiconductor ecosystem.

CHIPS R&D therefore encourages applications that demonstrate collaboration across the innovation, manufacturing, supply chain, and customer landscape.

Application Process and Award Information: The envisioned application process consists of a mandatory concept paper and a required full application. CHIPS R&D anticipates a due date for concept papers of approximately 35 days after the date of NOFO publication. Full applications will only be accepted from applicants invited to apply after the concept paper stage. Submissions from entities other than those specifically invited to submit a full application will not be reviewed or considered in any way.

To provide the public with an opportunity to learn more about the NOFO before the concept paper deadline, CHIPS R&D expects to host a Proposers Day after NOFO release to familiarize potential applicants with the NOFO objectives and program structure. CHIPS R&D will announce details regarding the date and location of the Proposers Day via the CHIPS R&D website at *https://www.nist.gov/chips/chips-RD-funding-opportunities.* This event will be for informational purposes only. Attendance is not a prerequisite for submitting a concept paper or application.

Competition Information: Once the open competition has been announced, further information may be found at *https://www.nist.gov/chips/chips-RD-funding-opportunities.*

System for Award Management: In anticipation of the NOFO, CHIPS R&D encourages potential applicants to complete the following steps, which are required to submit applications for Federal assistance:

- Register with the System for Award Management (SAM) at *https://www.sam.gov.* CHIPS R&D strongly encourages applicants to register for *SAM.gov* as early as possible. While this process ordinarily takes between three days and two weeks, in some circumstances it can take six or more months to complete due to information verification requirements. Recipients will be required to maintain an active registration in SAM and re-validate registration annually.
- Register for a *Grants.gov* (*https://www.grants.gov/*) account. It is advisable also to go to ''manage subscriptions'' on *Grants.gov* and sign up to receive automatic updates when amendments to a funding opportunity are posted.

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Tamiko Ford,

NIST Executive Secretariat.

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COMMODITY FUTURES TRADING COMMISSION

Agency Information Collection Activities Under OMB Review

AGENCY: Commodity Futures Trading Commission.

ACTION: Notice.