**Request for Information (RFI)**

Co-packaged Optical Engine Development for AI Infrastructure Scale-up

|  |  |  |
| --- | --- | --- |
| **1** | **Background** | |
|  | Organization Name | Click or tap here to enter text. |
|  | Type of Organization | Choose an item. |
|  | Number of Employees | Click or tap here to enter text. |
|  | Annual Revenue ($) | Click or tap here to enter text. |
|  | Primary Contact Name | Click or tap here to enter text. |
|  | Primary Contact Email | Click or tap here to enter text. |
|  |  | |
| 1a | Briefly describe your current organization in a paragraph. Feel free to include web links for further information. | |
|  | Click or tap here to enter text. | |
| 1b | Have you participated in, or do you plan to participate in other CHIPS Act programs? | |
|  | Click or tap here to enter text. | |
| 1c | Describe your prior and current interests and work in co-packaged optics (CPO) for advanced AI Infrastructure applications and provide examples including, but not limited to, publications, presentations, patents, etc. | |
|  | Click or tap here to enter text. | |
|  |  | |
| **2** | **Technical Performance and Roadmap** | |
| 2a | What system architecture should be explored that incorporates hybrid electrical-optical processing and communications technologies? | |
|  | Click or tap here to enter text. | |
| 2b | What key performance indicators (KPIs), e.g. bandwidth density, energy efficiency, latency, etc., should co-packaged optical engines hit by 2030 and 2035 to stay ahead of projected AI demand? What top two areas have the highest risk/reward for advancing end system KPIs? | |
|  | Click or tap here to enter text. | |
| 2c | Which optical I/O technologies and light sources (e.g., comb lasers, QD lasers, VCSEL, micro-LED, etc.) are promising for scalable deployment? | |
|  | Click or tap here to enter text. | |
| 2d | How should optical connectors and cables evolve to support high-density, cost-effective deployment? | |
|  | Click or tap here to enter text. | |
|  |  | |
| **3.** | **Standards, Interfaces, and Interoperability** | |
| 3a | Do existing standard bodies address the needs for CPO engine development sufficiently? Please cite specific gaps and areas NSTC can enable improvements. | |
|  | Click or tap here to enter text. | |
| 3b | What level of standardization would be most helpful for facilitating broader innovation in photonic integrated circuit (PIC) to electronic integrated circuit (EIC) integration? | |
|  | Click or tap here to enter text. | |
| 3c | What are the bottlenecks in PIC, EIC and PIC-to-EIC co-design, fabrication, assembly, test, and integration? | |
|  | Click or tap here to enter text. | |
| 3d | Rank the importance of electrical, optical, mechanical, and thermal interface specs for first-generation deployment. | |
|  | Click or tap here to enter text. | |
| 3e | What process or packaging standards would best enable scalable and cost-effective wafer-scale manufacturing for CPO? | |
|  | Click or tap here to enter text. | |
| 3f | How should energy consumption per bit be defined and measured to ensure consistent benchmarking? | |
|  | Click or tap here to enter text. | |
|  |  | |
| **4.** | **Prototyping, Test, & Metrology** | |
| 4a | What are the most critical manufacturing challenges currently hindering the high-volume cost-effective production of CPO modules (e.g. fiber to PIC alignment, thermal management, optical testing, heterogeneous integration, etc)? | |
|  | Click or tap here to enter text. | |
| 4b | What are the critical process modules currently lacking high-volume manufacturing (HVM) capacity? | |
|  | Click or tap here to enter text. | |
| 4c | Which key materials systems and substrates are most critical and require improved access for R&D? | |
|  | Click or tap here to enter text. | |
| 4d | What test capabilities should be prioritized for R&D? | |
|  | Click or tap here to enter text. | |
| 4e | What metrology capabilities should be prioritized the most for R&D? | |
|  | Click or tap here to enter text. | |
| 4f | What are the key reliability gaps when moving from lab to fab? | |
|  | Click or tap here to enter text. | |
|  |  | |
| **5** | **Collaboration Mechanisms & Ecosystem Development** | |
| 5a | Where is the most suitable place to conduct this research and what capabilities are currently missing? | |
|  | Click or tap here to enter text. | |
| 5b | Which shared assets should NSTC prioritize – such as multi-project PIC shuttles, a neutral photonics process development kit (PDK), open reference designs, or a pilot packaging line? | |
|  | Click or tap here to enter text. | |
| 5c | How can a manufacturing ecosystem be structured to facilitate collaboration among foundries, OSATs, and system integrators? | |
|  | Click or tap here to enter text. | |
| 5d | What actions would most effectively support ecosystem development, such as open access to foundry flows, shared packaging infrastructure, and modular “Lego block” components? | |
|  | Click or tap here to enter text. | |
|  |  | |
| **6** | **To advance domestic optical interconnect technology, which is more critical: enablement infrastructure, targeted research funding, or a combination of both? Please elaborate with specifics.** | |
|  | Click or tap here to enter text. | |
|  |  | |
| **7** | **Considering previous research initiatives such as DARPA PIPES, NSF’s Research on Integrated Photonics Utilizing AIM Photonics, what opportunities exist to extend or build upon these funded R&D programs?** | |
|  | Click or tap here to enter text. | |
|  |  | |
| **8** | **What role should NSTC play in driving standards, access, and investment for CPO, and how can your organization contribute?** | |
|  | Click or tap here to enter text. | |
|  |  | |
| **9** | **Please suggest anything else that we should consider formulating this potential research program.** | |
|  | Click or tap here to enter text. | |

**Please attach any references, figures, tables of acronyms on final page of the form.**

Click or tap here to enter text.



**Disclaimer:** This RFI is not a solicitation for concept papers or proposals, but an information-gathering effort to shape effective, impactful next steps. Any costs incurred by interested parties in response to this announcement will not be reimbursed. Respondents acknowledge that by participating in this RFI, they grant Natcast permission to use the contact details provided in the response for direct communication concerning this RFI and any subsequent collaborations.