The National Science and Technology Council's Open Call for Proposals for Advanced Crystal Materials Development and Manufacturing Project

Project Objective:

The goal of this project is to enhance the design of novel materials in Taiwan, such as the development of quantum materials, single crystal synthesis, epitaxial growth, and advanced device fabrication. It aims to improve the quality and competitiveness of domestic basic scientific research. The project seeks to achieve international leadership in the development of certain key materials, while closely aligning with industry applications. This will help identify new opportunities for forward-looking technological industries and create long-term economic value for domestic scientific research.

The project call can be divided into four categories:

(1) Material Service Project (hereinafter referred to as "MSP "): This program aims to establish or maintain key core facilities, technologies, research, and service laboratories required for advanced crystals, quantum materials, and the growth of single crystals and epitaxial layers. The goal is to develop critical functional materials or key crystal growth technologies.

(2) Academic Research Project: This program focuses on academic research related to the crystal materials produced by the MSP.

(3) Applied Research Project: This program is dedicated to the development of applied research related to the crystal materials produced by the MSP.

(4) Complete Group Project: This program links the first three categories, with a focus on key crystal growth technologies, integrating academic and applied research projects.

Applicant Institutions：

(1) Public and private universities and colleges, as well as public research

institutions.

(2) Administrative corporation academic research institutions, foundation corporation academic research institutions, and medical corporation academic research institutions recognized by the National Science and Technology Council (hereinafter referred to as "NSTC").

Eligibility of Project Principal Investigator:

The principal investigator must meet the qualifications outlined in Article 3 of the " Principles for the Administration of Research Project Grants " of the NSTC.

Key Focus of the Project Call:

This call for proposals will focus on four types of projects, as outlined below:

(1) Material Service Project

◆Develop innovative and critical novel advanced crystal materials or key crystal growth technologies with academic and industrial applications. Encourage the development of materials with forward-looking application value, such as quantum technology materials or key low-dimensional materials for next-generation semiconductor devices. Strengthen the preparation of advanced crystal materials to international standards. Provide single crystal and epitaxial samples for both domestic and international academia, industry, and other value-driven applications. Establish a database for the results of advanced crystal material preparation.

◆The proposal should include the following elements, which should be clearly stated in Form CM03:

I. If the applicant has previously received funding under this program, provide an update on the current status and results of the project. If the applicant has not previously received funding, describe the future plan, ensuring it aligns with the objectives of this program. Priority will be given to proposals that already have advanced crystal growth equipment and capabilities, as well as tangible collaboration results.

II. Administrative management plans for the service program, including facility

maintenance and operation plans, external service provision, and fee standards.

III. The potential significant impact the facility could have on academia or industry after its establishment.

IV. Define performance indicators for the use of facilities under this program, such as the use of samples in academic or applied research outcomes.

V. Support measures from the institution hosting the principal investigator, including technical personnel, space, funding, and rights to use existing facilities, as well as the institution’s commitment to the continued maintenance of the project.

(2) Academic Research Project

◆Focus on academic research related to materials produced by the "Material Service Program," integrating key testing technologies, theoretical models, and computational simulations for the study of special physical properties and other related academic research.

◆The proposal should follow the format for individual or integrated research projects as specified by the NSTC and should include:

I. Research outcomes related to crystal materials over the past five years.

II. Describe the characteristics and source of the crystal materials to be studied, as well as the collaborating laboratories. Also, outline the international competitive advantages of the key technologies in the related research.

(3) Applied Research Project

◆Encourage the development, application, or related industry research of components based on the materials produced by the "Material Service Program," with the goal of achieving technology readiness levels (TRL) 4-7.

◆The proposal should follow the format for individual or integrated research projects as specified by the NSTC. In addition, the following points should be specifically addressed:

I. Collaboration plan with the existing teams in the "Material Service

Project," or if no such collaboration exists, provide an explanation of the material source or crystal growth-related technologies.

II. The potential and possible value of the material-related technologies in industrial applications, and encourage industry participation in the research and development.

III. The current status of the team's technology readiness, expected development goals, and timeline (refer to the table below), an overview of domestic and international research and development, and an analysis of existing domestic and international intellectual property layouts.

IV. The current status of intellectual property rights already obtained and those applied for by the research team.

V. The feasibility of transferring the material technology to the industry.

TRL	Year & Month / Work Item*	1st Year				2nd Year				3rd Year			
		8-10	11-1	2-4	5-7	8-10	11-1	2-4	5-7	8-10	11-1	2-4	5-7
TRL2	**Item A**												
	Sub-item A-1 (e.g., Growth of X-material)	━	━	━									
	Sub-item A-2			━	━	━	━						
	Item B												
	Sub-item B-1				━	━	━						
	Sub-item B-2						━	━					
TRL3	**Item C**												
	Sub-item C-1						━	━	━				
TRL4	**Item D**												
	Sub-item D-1								━	━	━		
	Sub-item D-2									━	━	━	━

(4) Excellence Research Group Program

In addition to the three types of projects mentioned above (Material Service, Academic Research, and Applied Research), it is also possible to form an Excellence Research Group that crosses these categories. This group would propose a single integrated project focused on key crystal growth technologies, linking fundamental academic research with industrial application technologies. The program encourages collaboration with industry alliances or international partnerships to foster the development of internationally leading research groups and to enhance the industry's technological capabilities for upgrading and self-sufficiency.

Application Instructions:

(1) Application Process:

Applications are accepted starting immediately. **The applicant's institution must complete the online application process, compile and submit the application, and have it signed by the relevant personnel.** The completed application must be submitted by **January 27th, 2027 (Wednesday)**. Late submissions will not be accepted.

(2) Project Duration:

The project will begin on August 1, 2027.

(3) Project Type:

The submission of multi-year research proposals is welcome. The Academic Research Project or Applied Research Project will be considered along with the principal investigator's personal general research projects for competitive funding.

(4) Disciplinary Codes for Application:

Applicants should use the following disciplinary codes for their proposals:

M140101: Advanced Crystal Materials Services

M140103: Advanced Crystal Academic Research

M140104: Advanced Crystal Applied Research

M140105: Advanced Crystal Excellence Research Group

(5) Obligations of the Principal Investigator and Co-Investigators:

The principal investigator and co-investigators are required to participate in academic and application promotion activities related to the advanced crystal materials research project, as well as at the results presentation sessions.

When **publishing their results** in journal or in conference, the PI **MUST notify** the Advanced Crystal Materials Service Program Office and the NSTC to ensure accurate documentation and record-keeping of the results. In addition, the PI and co-I must include the **TCECM unit name** in **their affiliations and acknowledge the relevant funding in the acknowledgements section.**

Note: TCECM refers to the Taiwan Consortium of Emergent Crystalline Materials.

Review Process:

The project proposals will be reviewed following the NSTC's standard review procedures, which include a written preliminary review and a subsequent meeting-based review. If necessary, the principal investigator may be invited to present their project proposal.

Requirements for Service or Research Outcomes:

PIs and Co-Is in this project **MUST cooperate with the promotional activities of the Advanced Crystal Materials Joint Laboratory**, especially providing needed information on the project's webpage.

Project Evaluation:

(1) Mid-term Evaluation:

The PI is required to submit a progress report two months before the end of each annual phase of the project. The report should include: Project progress, Preliminary research results, Future focus areas for execution, etc. The NSTC will invite academic experts to be reviewers to evaluate the annual report. If necessary, the principal investigator will be invited to give a presentation to the

NSTC, or the reviewers may conduct an on-site evaluation. Based on this evaluation, funding for the next year will be decided. If the project has not met expected progress or results, the funding agency may terminate the subsidy.

(2) Final Evaluation:

The principal investigator must submit a final report within three months after the project concludes. The report will be reviewed by academic experts through a written evaluation and a meeting. If needed, an on-site visit may be conducted.

The final report will be considered as part of the evaluation criteria for the PI's research performance and capabilities for the future application.

Project Approval Notification, Contract Signing, Funding Allocation, and Expense Reimbursement:

The process of project approval, contract signing, funding allocation, and reimbursement of expenses will follow the directions governing NSTC subsidies for research projects, NSTC Principles for Handling Research Project Grants, the Research Contract, and other relevant regulations.

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