檔　　號：
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國家科學及技術委員會　函

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主旨：本會公開徵求114年度「尖端晶體材料開發及製作計畫」，自即日起受理申請，請於2月27日前函送本會，逾期不予受理，請查照轉知。

說明：

一、旨揭計畫依本會補助專題研究計畫作業要點規定辦理，申請機構及計畫主持人務必先行詳閱本計畫徵求公告說明。

二、本計畫徵求公告詳閱附件，或至本會網站「動態資訊」之「計畫徵求專區」網頁下載。

三、申請人請循本會學術研發服務網登入「線上申請/隨到隨審計畫計畫類別/一般型導向研究計畫」方式作業，並依計畫屬性點選相對應學門代碼(如徵求公告說明)。

四、本計畫之執行期程自114年8月1日開始，計畫性質為專案型研究計畫，未獲補助案件恕不受理申覆。

五、相關計畫內容疑問，請洽本會自然處，電話：(02)2737-7022。有關系統操作問題，請洽本會資訊處服務專線，電話：0800-212-058，(02)2737-7590、7591、7592。

正本：專題研究計畫受補助單位（共296單位）
副本：本會綜合規劃處、自然處(均含附件) 114/01/24 08:23:05

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國立成功大學
1149901876 114/1/24

主任委員吳誠文

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114年國科會尖端晶體材料開發及製作計畫徵求公告

一、計畫目標：為提昇國內新穎材料設計，如量子材料開發、單晶合成、磊晶成長、尖端元件製作，並提升國內相關基礎科學研究之品質與競爭力，期部份關鍵性材料研發可以達到國際間領先地位，更能密切與產業應用接軌，從而為前瞻科技產業尋找新的契機，開創國內科技研究的長期經濟價值。

二、計畫性質：計畫徵求分四種性質：

(一)**材料服務計畫**，旨在建立或維持尖端晶體、量子材料及單晶與磊晶成長所需之關鍵性核心設施、技術、研究及服務實驗室，以期發展出具關鍵功能性材料或關鍵長晶技術；

(二)**學術型研究計畫**，旨在研究材料服務計畫產出晶體材料之相關學術型研究；

(三)**應用型研究計畫**，旨在發展材料服務計畫產出晶體材料之相關應用性研究；

(四)**卓越研究群計畫**，旨在連結前三類型，以長晶關鍵技術為核心，整合學術與應用之計畫。

三、申請機構：

(一)公私立大專院校及公立研究機構。 (二)經國科會(以下簡稱本會)認可之行政法人學術研究機構、財團法人學術研究機構及醫療社團法人學術研究機構。

四、計畫主持人資格：符合本會「補助專題研究計畫作業要點」第三點資格者。

五、計畫徵求重點說明： 本次徵求將以下列四種性質之計畫為重點，各項目列舉如下：

(一)材料服務計畫

- 發展學術、產業應用上具創新性及關鍵性之新穎尖端晶體材料或關鍵長晶技術
- 鼓勵新穎具前瞻應用價值之材料發展，例如量子技術應用材料或次世代半導體元件之關鍵低維材料
- 強化與發展具國際水準之尖端晶體材料製備
- 提供國內外學界、產業界及各項應用具價值之單晶與磊晶樣品服務
- 建立尖端晶體材料製備成果之資料庫
- 申請書內容應包含下列要件，請在 CM03 表中敘明：

(1) 如曾獲本案補助者，請說明計畫執行現況及成果。未曾獲補助者，請說明未來規劃，規劃內容須符合本計畫重點。但以具既有尖端晶體材料成長設備與成長能力以及具體合作成果的申請案，優先考量。

(2) 服務計畫之行政管理規劃、設施維護和操作計畫、對外提供服務及收費標準辦法等。

(3) 該設施建置後對學界或業界可能帶來之顯著影響。

(4) 訂定使用本計畫設施成效指標，如樣品使用於學術或應用成果。

(5) 主持人服務機構之配合措施，含技術人員、空間、經費、現行設施之使用權等，及服務機構對此計畫所提之後續維護承諾。

(二)學術型研究計畫

- 以「材料服務計畫」所產出之材料為核心，配合關鍵檢測技術、理論模 型及計算模擬，對於特殊物性之學術研究及其他相關學術研究。
- 申請書請依本會個別型或整合型計畫書格式詳細填列，亦請說明：

(1) 近五年在晶體材料之相關研究成果。

(2) 說明擬研究晶體材料之特性及來源與合作實驗室，以及計畫中關鍵技術在相關研究之國際競爭優勢。

(三)應用型研究計畫

➢ 鼓勵以「材料服務計畫」所產出材料為基礎的元件發展、應用或相關產業研究，以預期達成技術準備度 (TRL) 4-7 的結果。

➢ 申請書除依本會個別型或整合型計畫書格式詳細填列，請特別說明以下事項：

(1) 與「材料服務計畫」中現有團隊之合作規劃；或若無，請說明材料來源或長晶相關技術說明。

(2) 材料相關技術在產業應用上之潛力及可能價值，並鼓勵產業界共同參與研發。

(3) 申請團隊之技術準備度現況、預期發展目標及時程(參考以下表格填寫)、國內外之研發概況、及既有國內外智慧財產權布局分析。

(4) 申請團隊已獲證和申請中之智慧財產權現況。

(5) 該材料技術技轉至產業界之可行性。

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												

(四)卓越研究群計畫

除前述三類型計畫(材料服務、學術型研究、應用型研究)，亦可跨類型組成卓越研究群(excellent clustering)，提出以關鍵長晶技術為核心，連結基礎學術研究與產業應用技術之單一整合型計畫，並鼓勵與產業聯盟或國際合作，以促進培育國際領先研究群與促進產業升級之自主技術能力。

六、申請注意事項：

(1) 申請方式：

即日起接受申請，申請機構須完成線上申請作業，彙整送出並造具申請名冊經有關人員核章後，於 114 年 2 月 27 日（星期四）前備函提出申請，逾期不予受理。

(2)計畫執行期限程：自 114 年 8 月 1 日開始。

(3)研究計畫類型： 本計畫建議申請多年期研究計畫，其中「學術型研究計畫」或「應用型研究計畫」與主持人個人一般計畫一併考量擇優補助。

(4)申請學門代碼請填 M140101（尖端晶體服務）、M140103（尖端晶體學術研究）、M140104（尖端晶體應用研究）、M140105（尖端晶體卓越研究群）。

(5)計畫主持人與共同主持人有義務參加尖端晶體材料研究計畫之相關學術應用推動活動以及成果發表會。

成果發表時，主持人需通知尖端晶體材料服務計畫辦公室及國科會承辦，以利成果詳實記錄備查。發表期刊論文或其他形式之成果發表時，主持人與共同主持人之作者機構需加上 TCECM*單位名稱， 並加註標準期刊論文致謝詞。

(*註：Taiwan Consortium of Emergent Crystalline Materials, TCECM)

七、審查：

依本會專題研究計畫審查方式，辦理書面初審及會議複審。必要時，將邀請計畫主持人簡報。

八、本計畫之所有服務或研究成果須配合尖端晶體材料聯合實驗室推動辦公室整體推動規劃，特別是網頁資訊提供。

九、成果考核：

（一）期中考評:

計畫主持人應於分年計畫執行期滿前二個月繳交進度報告(內容包含：計畫執行進度、初步研究成果、未來執行重點等)，由國科會自然處邀請學者專家擔任審查委員 進行書面審查，並視需要得邀請主持人赴本會簡報或由審查委員進行實地考評，據以核定下一年度經費，未能達到預期進度成果之計畫，得由補助機關終止補助。

（二）全程計畫考評：

計畫主持人於全程計畫結束後三個月內繳交研究成果報告，由本處邀請學者專家進行書面審查，並召開成果評鑑會議；必要時，得進行實地查訪。

（三）本計畫成果報告將會於各計畫主持人申請本會下一次研究計畫補助時，自動於線上系統提供審查人瀏覽審閱，並列入申請人研究表現與執行計畫能力之評分項目之一。

十、計畫核定通知、簽約、撥款與經費報銷等，均依本會補助專題研究計畫作業要點、本會補助專題研究計畫經費處理原則、專題研究計畫補助合約書與執行同意書及其他相關規定辦理。

十一、**聯絡窗口**

(1) 國科會自然處

劉芳君研發管理師，電話：02-2737-7022，Email: fcliu@nstc.gov.tw

(2) 有關系統操作問題，請洽本會資訊系統服務專線，電話：0800-212-058，(02)27377590、27377591、27377592

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 **February 27, 2025 (Thursday)**. Late submissions will not be accepted.

(2) Project Duration:

The project will begin on August 1, 2025.

(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.

Contact Information:

- NSTC, Department of Natural Sciences and Sustainable Development
  Dr. Fang-Chun Liu, Project Manager
  Phone: 02-2737-7022
  Email: fcliu@nstc.gov.tw
- For System Operation Inquiries:
  Please contact the NSTC Information System Service Hotline:
  Phone: 0800-212-058, (02) 2737-7590, (02) 2737-7591, (02) 2737-7592