便簽　日期：
　　　單位：研究發展處
速別：普通件
密等及解密條件或保密期限：

一、公告於電子布告欄、學校首頁、本處及本組最新消息，
　　另e-mail副知全校教師。

二、申請人請於108年9月17日中午12時前將紙本申請資料送
　　達研發處學術發展組楊小姐(校內分機550轉303)，俾利
　　學校彙送科技部申請。另於規定時間內將申請資料電子
　　檔e-mail至科技部承辦人。

三、文存查。

會辦單位：

第二層決行		
承辦單位	會辦單位	決行
行政組員 楊麗螢 0807 1000 教授兼研究發展長 周濟眾㊞ 0807 1359		教授兼研究發展長 周濟眾㊞ 0807 1359

國立中興大學

研究發展處　　　1080014633

科技部　書函

機關地址：台北市和平東路二段106號
聯絡人：李佩育　科長
電話：02-2737-7810
傳真：02-2737-7607
電子信箱：pylee@most.gov.tw

受文者：國立中興大學

發文日期：中華民國108年8月2日
發文字號：科部科字第1080053117號
速別：普通件
密等及解密條件或保密期限：
附件：如文(附件1 108U0P012182_108D2021455-01.pdf、附件2 108U0P012182_
108D2021456-01.pdf、附件3 108U0P012182_108D2021457-01.pdf、附件4
108U0P012182_108D2021458-01.pdf、附件5 108U0P012182_108D2021459-01.
pdf、附件6 108U0P012182_108D2021460-01.pdf、附件7 108U0P012182_
108D2021461-01.pdf、附件8 108U0P012182_108D2021462-01.pdf、附件9
108U0P012182_108D2021463-01.pdf、附件10 108U0P012182_108D2021464-01.
pdf)

主旨：本部「2019/2020年國內博士生赴西班牙高等教育科學研
究委員會(CSIC)實驗室研習」案，自即日起受理申請，
請於108年9月20日(五)前函送本部，逾期不予受理，請查
照。

說明：

一、旨揭計畫由本部與西班牙高等科學研究委員會(CSIC)共
同辦理，藉以提供臺灣在學之博士生赴西班牙高等科學
研究委員會轄下各領域研究機構進行2個月以上之研習機
會，並由雙方補助部分培訓費用。

二、2019/2020年計有6個單位開放接受我國博士候選人前往
實習，申請文件請至本部網站計畫徵求專區下載:https://
www.most.gov.tw/folksonomy/rfpList。

三、本案聯絡人：

(一)計畫內容疑問，請洽本部科教國合司李佩育科長或馬
婉馨助理，電話：(02)27377810、27377125。

(二)有關系統操作問題，請洽本部資訊系統服務專線，電
話：0800212058，（02）27377590、7591、7592。

正本：專題研究計畫受補助單位 （共307單位）
副本：駐法國代表處科技組　108/08/05
　　　　　　　　　　　　　　08:36:39

科技部
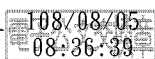
2019/2020 年科技部補助博士生赴西班牙研習計畫

2019 Internship Program in Spain for Taiwanese PhD. Students

2019/07/30

為促進臺灣與西班牙之合作研究交流，科技部與西班牙高等科學研究委員會自 2014 年起共同辦理台灣博士班研究生赴西班牙研習計畫。西班牙該委員會旗下各領域研究機構提供研習機會，臺灣在學之博士生請依下列規定向科技部提出申請，經兩單位共同審議通過之申請人，可獲得經費補助赴西班牙研習。

【目標】

透過本項暑期研習活動，瞭解西班牙之文化，吸取其研究經驗及態度，協同雙方指導教授/研究人員討論及定位未來兩國可能合作之主題及方向，促進雙方團隊實質合作研究。

【申請人資格】

1. 具中華民國國籍
2. 在臺灣地區大學修習博士學位且已取得博士候選人資格之在學學生
3. 具良好英語書寫與口語之溝通能力
4. 已取得西班牙研習單位計畫主持人前往研習之同意文件

【補助項目及內容】

1. 國際交通費：自臺灣至西班牙研習單位往返經濟艙機票(得含內陸長途大眾運輸交通費)一張，新臺幣 60,000 元
2. 手續費：簽證及出國研習期間保額 400 萬之因公赴國外出差人員綜合保險費
3. 生活零用津貼：1,000 歐元 (本項補助由西班牙研習單位提供)

【作業時程】

受理申請：即日起~2019 年 09 月 20 日
公告結果：2019 年 10 月底前
研習期間：2 個月(含)以上，應於 2019 年 11 月~2020 年 5 月間執行完畢；研習日期應徵得西班牙研習單位同意。

【研習單位】

西班牙高等科學研究委員會轄下各領域研究機構 2019 年計有 6 個單位開放接受我國博士候選人前往實習，各研習單位、研究主題及計畫主持人名單，詳如附件。

申請人應評估表列研究主題與自身研究論文之相關性，並主動與表列計畫主持人聯繫，以瞭解該研習單位之特別要求及相關規定。倘有 2 項以上適合之研習

機會，申請人應列出個人優先序，一次僅聯繫一個單位。

部份研習單位可安排免費或價位合宜之住宿，申請人與計畫主持人聯繫時，可同時洽問或請其協助。

【申請方式及文件】

1. <u>申請人</u>須於 2019 年 9 月 20 日前將下列申請文件依序集合為一電子檔案（請用 PDF 格式，檔名：2019/2020 CSIC Internship_xxx【申請人姓名】）先以<u>電子郵件</u>寄送科技部承辦人(pylee@most.gov.tw；whma@most.gov.tw)，信件主旨為：申請 2019/2020 CSIC Internship_xxx。

    (1) 計畫申請表（中、英文各一份；依附件格式但以中文及英文分別填具）
    (2) 英文推薦函二份（得含指導教授推薦函；信函格式請參用附件）
    (3) 研習單位計畫主持人同意函
    (4) 學生證正反面影本
    (5) 身分證正反面及護照核發頁影本
    (6) 其他參考資料：包括個人已發表論文目錄、英語(或西班牙語)能力證明、修讀博士期間修課英文成績單等

2. 申請人應於 2019 年 9 月 20 日前經由<u>就讀學校以公文</u>並檢附所有申請資料一式二份向本部提出書面申請

【注意事項】

有關獲得補助之經費撥付、結報與報告繳交等事宜，將依本部核定公文內容辦理，<u>獲補助者應於計畫結束後三個月內繳交結案報告書並辦理經費結報</u>。另，申請人於本部通知獲補助後：

1. 應自行聯繫及安排在西班牙期間之住宿。
2. 於確認研習期間後，自行購買機票及旅遊平安保險。
3. 應與研習單位簽妥研習期間之學習及生活規範合約。
4. 應與研習單位商洽及確認所需簽證種類，逕行申辦。

【附件】

1. 2019/2020 年西班牙高等科學研究委員會研習單位一覽表
2. 計畫申請表
3. 推薦信(格式)

【遞件資訊】

承辦人：科技部科教國合司李佩育科長、馬婉馨助理

電子信箱：pylee@most.gov.tw；whma@most.gov.tw

郵寄地址：10622 臺北市和平東路二段 106 號 22 樓 2209 室

2019/2020 Internship Program in Spain for Taiwanese Students

List of the Receiving Labs

Institute/Centre	principal investigator (PI)	Number of students	Knowledge area	e-mail
Instituto de Óptica "Daza de Valdés"	Joaquín Campos Acosta	1	GIMRO	joaquin.campos@csic.es
Insitut de Robòtica i Informàtica Industrial (CSIC-UPC)	Mariella Dimiccoli	1	Python	mdimiccoli@iri.upc.edu
Spanish National Centre for Metals Research(CENIM-CSIC)	Francisca Garcia Caballero	1	Physics / Materials Science / Mechanical engineering	fgc@cenim.csic.es
Institute for Materials Science of Barcelona ICMAB-CSIC	Gervasi Herranz	1~2	Physics / Materials Science	gherranz@icmab.cat
Centro de Astrobiología (CAB, CSIC-INTA)	Muñoz Caro, Guillermo M.	1	Atomic / Molecular spectroscopy	munozcg@cab.inta-csic.es
Institut de Robòtica I Informàtica Undustrial (IRI)	Javier Segovia Aguas	1	computer science MSc	jsegovia@iri.upc.edu

2019/2020 年科技部補助國內博士生赴西班牙研習計畫
中文申請表

姓　名			
性　別	□ 男　□ 女	出生日期(西元)	(yyyy/mm/dd)
電話/手機		研究室電話	
E-mail1/E-mail2			
通訊地址			
就讀學校	(請寫全名)		
系所/年級	(請寫全名)；博生班第____年		
指導教授	姓名(中/英)： 服務單位／系所： 聯絡電話： E-mail:		
第一位推薦人	姓名(中/英)： 服務單位／系所： 聯絡電話： E-mail:		
第二位推薦人	姓名(中/英)： 服務單位／系所： 聯絡電話： E-mail:		
預訂之博士論文題目			
近三年獲獎事蹟			
研究成果	參與或執行學術研究之個人論文發表情形？ □ 國際學術期刊　已發表____篇；期刊審稿中 ____篇 □ 國際會議____篇　□ 國內會議____篇　□ 其他：_____		

第6頁，共24頁
線上簽核文件列印－第7頁/共25頁

語言能力	英語：
	1. 是否曾在歐美國家留學一年以上? ☐ 是 ☐ 否
	2. 提供之英語能力證明文件名稱及分數(或等級)
	_____
	3. 若 1 及 2 均無，請自評個人在聽、說、讀及寫之程度 (如：流利、佳、普通、少許、不會)
	西班牙語：(請參考英語欄位自評個人在聽、說、讀及寫之程度)

擬申請在西班牙 CSIC 研習之資訊

研習單位簡稱	
研習主題	
計畫主持人姓名	
預訂研習期間	(起迄日期)yyyy/mm/dd ~ yyyy/mm/dd (計 X 個月)
住宿	☐ 由研習單位協助安排　　☐ 自行安排
研習動機	(請說明參與此研習計畫之適合性、預期效益及未來發展合作研究的可能性。說明請勿超過 1 頁。請用標楷體或新細明體字型，12 號字，單行間距。)

	(請提供目前學習或研究之興趣、主題及參與計畫之簡要說明,包括廣義之研究興趣及深入研究主題。說明請勿超過1頁。請用標楷體或新細明體字型,12號字,單行間距。)
學習及研究現況	

申請人簽名:_____ 日期:

臺灣指導教授簽名:_____ 日期:

2019/2020 Internship Program in Spain for Taiwanese PhD. Students
Application Form

Name	Last Name:		First Name:	
Sex	☐ Male ☐ Female		Birthday	(yyyy/mm/dd)
Telephone/Mobile			Lab Telephone	
E-mail1/E-mail2				
Mailing Address				
University	(Please provide the full name, not using abbreviations)			
Institute/year	(Please provide the full name, not using abbreviations); / Enrolled Year __			
Taiwanese Supervisor	Name (Chinese and English)： Uni/Institute: Telephone: E-mail:			
Recommender 1	Name (Chinese and English)： Uni/Institute: Telephone: E-mail:			
Recommender 2	Name (Chinese and English)： Uni/Institute: Telephone: E-mail:			
Tentative Title of Thesis				
Awards in the last 3 years				
Research Papers	Journal: ☐ Published _____ ; ☐ Under review_____ International Conference: ☐ Published _____ ; ☐ Under review_____ Local academic conference: ☐ Published ____ ; ☐ Under review____ ☐ Others:_____			

Language	English (listening/speaking/reading/writing)： Spanish (listening/speaking/reading/writing)：
Hosting Laboratory/Unit in CSIC	
Name of CENTRO	
Topic of Study	
Name of PI	
Duration	from (yyyy/mm/dd) to (yyyy/mm/dd), for the period of ___ months
Housing	Housing arranged by PI：☐Yes／☐No
Statement of Purpose	(Explain your unique qualifications for participation in the Summer Program and list the benefits the program will provide to your professional development. May not be exceeding one page.　Please type in single space in size 12.)

	(Provide a summary of your current studies and/or research projects, and interests. Please write the summary for a technical audience and identify both a general field of study and specific research interests. May not be exceeding one page. Please type in single space in size 12.)
Description of Current Studies	

Signature of Applicant: _____ Date:_____

Signature of Supervisor: _____ Date:_____

2019/2020年科技部補助國內博士生赴西班牙研習計畫推薦信
Recommendation Letter for MOST-CSIC Internship Program in Spain for Taiwanese PhD.

申請人(學生)姓名 Name of Applicant	中文: 英文: (Last name), (First name)
推薦人姓名 Recommender	中文: 英文: (Last name), (First name)
服務單位/系所 Uni /Institute	中文: (請寫完整名稱) 英文:
推薦人聯絡電話 Telephone	
推薦人 E-mail	

1. How long, and in what capacity, have you known the applicant?

2. In specific terms, explain how the Internship Program will benefit to the applicant. What unique approaches, opportunities, or skills will the applicant obtain in Spain?

1

3. Briefly describe the applicant's research contributions, the quality of the research, and the potential significance of the research to your discipline or field.

4. I rank this applicant in the top_____(one-ten) among ten of PhD students I have supervised over the last three years.

5. Please check one of the two statements below.
   a. _____My identity and this report must be held in confidence.
   b. _____This report may be released to the applicant upon request.

   I have read and understood the terms and conditions of the Practice Program in Taiwan, and I endorse this applicant's full participation in the program.

Signature：

Date：

Note:
1. Please give your comments in English for student in items 1-3.
2. The completed recommendation letters are necessary for applicants' submission. Failure to return this form in a timely fashion will jeopardize the application.

2

TAIWAN PROGRAM 2019
EXPRESSIONS OF INTEREST

CSIC SCIENTIFIC SUPERVISOR: Joaquín Campos Acosta	
EMAIL: joaquin.campos@csic.es	**PHONE NUMBER:** +34 915616800

INSTITUTE/CENTER NAME: Instituto de Óptica "Daza de Valdés"

ADDRESS: C/. Serrano, 121. 28006 Madrid

BRIEF DESCRITION OF THE RESEARCH GROUP:

Research Group on optical radiation measurements (GIMRO). The activity of this group is concerned with the experimental and theoretical knowledge about optical radiation measurement, from the ultraviolet to the near-infrared, and its interaction with matter, developing methods and absolute standards without the need to external reference or calibration. This activity includes a basic aspect (metrology) and an applied one dealing with the development of measurement systems, detectors and optical radiation sources.

At present one of the group objectives is to improve the measurement capabilities of linear optical properties of materials. To expand the capabilities of the current gonio-reflectometer, the only one in the world capable of measuring real retro-reflectance, by: extending the interval of spectral analysis in the near infrared up to approximately 1700 nm; completing the 2D detection system to study the appearance of materials (gonio-chromatism, texture, "sparkle" and graininess); improving the fluorescence measurement capacity; and developing multi-variant processing techniques and algorithms to improve the analysis of information.

CENTER/RESEARCH GROUP'S WEBSITE: https://www.io.csic.es/

NUMBER OF STUDENTS WILLING TO WELCOME: One

BRIEF DESCRITION OF THE STUDENT ACADEMIC BACKGROUND:

1. PhD students are welcome. It is not necessary for the student to have passed a PhD qualifying exam.
2. The student should have an academic background related to activities of GIMRO, such as light and lighting, colour and imaging, or electro-optical engineering.

BRIEF DESCRIPTION OF THE STUDENTS TASK:

The tasks for the student during the 8 weeks stay at GIMRO will include the following:

1. Familiarization with the operation and control of the gonio-spectrophotometer GEFE.
2. Study on the presence of speckle patterns in the measurement of the BRDF of materials when they are spectrally illuminated using quasi-collimated beams. Broad band illumination could be tested too.

Some authors have recently suggested that the speckle patterns produced by illumination on the surface of the samples could be limiting the uncertainty of spatial uniformity measurements when measuring the BRDF. As a first step in that investigation, this task is proposed to determine whether that speckle pattern is observable or not, and to what degree.

€1000 FOR LIVING EXPENSES WILL BE THE FINANCIAL CONTRIBUTION FROM THE CSIC CENTER TO THE STUDENTS

Responsible Researcher: Joaquin Campos Acosta

CAMPOS ACOSTA JOAQUIN - DNI 24898315X

Firmado digitalmente por CAMPOS ACOSTA JOAQUIN - DNI 24898315X. Nombre de reconocimiento (DN): c=ES, o=CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS, ou=CERTIFICADO ELECTRONICO DE EMPLEADO PUBLICO, óu=IO, ou=24898315, serialNumber=IDCES-24898315X, sn=CAMPOS ACOSTA, givenName=JOAQUIN, cn=CAMPOS ACOSTA JOAQUIN - DNI 24898315X Fecha: 2019.07.01 15:06:34 +02'00'

Center Director: Juan Diego Ania Castañón

Digitally signed by ANIA CASTAÑON JUAN DIEGO - DNI 09416206Y DN: c=ES, o=CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS, ou=CERTIFICADO ELECTRONICO DE EMPLEADO PUBLICO, ou=IO, ou=09416206, serialNumber=IDCES-09416206Y, sn=ANIA CASTAÑON, givenName=JUAN DIEGO, cn=ANIA CASTAÑON JUAN DIEGO - DNI 09416206Y Date: 2019.07.01 14:39:38 +01'00'

ICU Manager: Eloy Belda San Mateo

BELDA SAN MATEO ELOY - DNI 50800226B

Firmado digitalmente por BELDA SAN MATEO ELOY - DNI 50800226B Nombre de reconocimiento (DN): c=ES, o=CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS, ou=CERTIFICADO ELECTRONICO DE EMPLEADO PUBLICO, ou=IO, ou=50800226, serialNumber=IDCES-50800226B, sn=BELDA SAN MATEO, givenName=ELOY, cn=BELDA SAN MATEO ELOY - DNI 50800226B Fecha: 2019.07.02 10:32:05 +02'00'

TAIWAN PROGRAM 2019
EXPRESSIONS OF INTEREST

CSIC SCIENTIFIC SUPERVISOR: Mariella Dimiccoli	
EMAIL: mdimiccoli@iri.upc.edu	**PHONE NUMBER:** +34 93 4015786

INSTITUTE/CENTER NAME: Institut de Robòtica i Informàtica Industrial (CSIC-UPC)

ADDRESS: Parc Tecnològic de Barcelona. C/ Llorens i Artigas 4-6, 08028, Barcelona, Spain.

BRIEF DESCRIION OF THE RESEARCH GROUP:

The research of PERCEPTION AND MANIPULATION group focuses on enhancing the perception, learning, and planning capabilities of robots to achieve higher degrees of autonomy and user-friendliness during everyday manipulation tasks. Some topics addressed are the geometric interpretation of perceptual and semantic information, construction of 3D object models, action selection and planning, reinforcement learning, and teaching by demonstration.

CENTER/RESEARCH GROUP'S WEBSITE:

https://www.iri.upc.edu/research/perception

NUMBER OF STUDENTS WILLING TO WELCOME: 1

BRIEF DESCRIION OF THE STUDENT ACADEMIC BACKGROUND:

Excellent programming skills in Python. Background on machine learning and computer vision. Knowledge of deep learning theory and frameworks is a plus.

BRIEF DESCRIPTION OF THE STUDENTS TASK:

Recently, the computer vision community is showing an increasing interest in the automatic discovery, quantification and analysis of social interactions from images and videos [1,2].

Wearable cameras such as the popular GoPro offer the opportunity to capture naturally-occurring interactions from an egocentric perspective (i.e. from the subject's own point of view). This egocentric paradigm is particularly useful for analyzing social interactions since the camera wearer naturally move to provide a clear view of the people he/she is interacting with, so that face occlusions are naturally minimized.

The student's task will be to develop a deep learning based model for automatically determining the engagement of a wearable video camera user in social interactions captured in a variety of environments and in presence of multiple people. This work has direct applications to assistive robotics, allowing to equip assistive Robots with the ability to understand social signals and to behave in a socially acceptable manner.

[1] Q. Sun, B. Schiele, and M. Fritz, "A domain based approach to social relation recognition," in Proceedings of IEEE Computer Vision and Pattern Recognition (CVPR),

2017, pp. 21–26.

[2] M. Aghaei, M, Dimiccoli, C. CantonFerrer, and P. Radeva, *"Towards social pattern char-acterization in egocentric photo-streams"* Computer Vision and Image Understanding (CVIU), vol. 171, pp. 104–117,2018

€1000 FOR LIVING EXPENSES WILL BE THE FINANCIAL CONTRIBUTION FROM THE CSIC CENTER TO THE STUDENTS

Responsible   **Researcher:**   Mariella   Dimiccoli

Center Director:

ICU Manager:

TAIWAN PROGRAM 2019

EXPRESSIONS OF INTEREST

CSIC SCIENTIFIC SUPERVISOR:
Francisca Garcia Caballero

EMAIL: fgc@cenim.csic.es	PHONE NUMBER: +34 915538900

INSTITUTE/CENTER NAME: Spanish National Centre for Metals Research (CENIM-CSIC)

ADDRESS: Avda Gregorio del Amo, 8. E-28040 Madrid (Spain)

BRIEF DESCRITION OF THE RESEARCH GROUP:
Name of the Group: Phase Transformation in Steels-MATERALIA Currently, the MATERALIA Group maintains a leadership position at the Spanish level and an important international visibility in the field of phase transformations in steels. Its main objective is to understand the relationship among the steel processing, its structure and its mechanical properties. In this regard, they investigate the transformation mechanisms, characterize the structure of the material from the micro to the nano-scale and develop simulation tools that allow describing the physics and chemistry that govern the processes of transformation of steel and its properties under real conditions of use. In addition, this Group maintains a close relationship with the metallurgical industry for the design and development of steels for highly demanding applications. This relationship with industry, especially successful in the development of nanostructured bainitic steels, has allowed them to validate many of their computational design tools and techniques.

CENTER/RESEARCH GROUP'S WEBSITE:
http://www.cenim.csic.es/index.php/presentacion-materalia

NUMBER OF STUDENTS WILLING TO WELCOME: 1

BRIEF DESCRITION OF THE STUDENT ACADEMIC BACKGROUND:

Students should have a Master's degree and/or Bachelor's degree with a strong background in applied physics/ materials science/ mechanical engineering or closely related subjects. Candidates with research experience or Master degree in physical metallurgy and/or phase transformation in steels materials are strongly encouraged to apply. Effective English speaking and writing skills are essential.

BRIEF DESCRIPTION OF THE STUDENTS TASK:

Project Title: Microstructures of steels manufactured by SLM printing (Selective Laser Melting)

Selective laser melting, known as SLM printing, is an additive manufacturing method specially developed for 3D printing of metal alloys. This process allows manufacturing pieces with complex shapes from the successive printing of layers of material starting from a digital model. It is a technique increasingly used in fields such as power generation, the aerospace industry, healthcare and the automotive transport sector. However, to enhance its progress it is necessary to study its viability in different types of alloys. In this work we propose the study of the effect of additive printing parameters by SLM in new steels. A study of phase transformations and microstructural characterization will be carried out, paying special attention to the morphological characteristics of the different phases. High-resolution dilatometry will be used for this study, along with X-ray diffraction and optical and scanning electron microscopy

The student will carry out the following research activities:

• Characterization by optical and scanning electron microscopy of steels manufactured by SLM printing.

• Quantification of phases and micro-constituents by X-ray diffraction analysis and stereological methods.

• Study of the relationship between the microstructure and the properties of these steels.

• Dissemination of research results.

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Responsible Researcher:

GARCIA CABALLERO FRANCISCA - DNI 05659845M

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Jose Luis Gonzalez Carrasco

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Marta del Moral

TAIWAN PROGRAM 2019

EXPRESSIONS OF INTEREST

CSIC SCIENTIFIC SUPERVISOR: GERVASI HERRANZ	
EMAIL: gherranz@icmab.cat	**PHONE NUMBER:** +34 93 580 18 53
INSTITUTE/CENTER NAME: Institute for Materials Science of Barcelona ICMAB-CSIC	
ADDRESS: Campus UAB, Bellaterra, 08193, Spain	

BRIEF DESCRITION OF THE RESEARCH GROUP:

The Laboratory of Multifunctional Thin Films and Complex Structures (MULFOX)) is composed of about 20 people, including master's and PhD students, postdocs, technicians and several staff researchers. The MULFOX group focuses its research on developing new oxide-based materials with enhanced or emerging properties with especial focus on their electric, magnetic and optical properties, and to establish the links between their structure, morphology and functional properties (see more info at the website https://departments.icmab.es/mulfox/). The MULFOX member that will be involved in this project is Dr. Gervasi Herranz (https://publons.com/researcher/G-2770-2014/ ; ORCID: https://orcid.org/0000-0003-4633-4367, see also https://gervasi-herranz.blog/).

CENTER/RESEARCH GROUP'S WEBSITE: https://departments.icmab.es/mulfox/

NUMBER OF STUDENTS WILLING TO WELCOME: 1-2

BRIEF DESCRITION OF THE STUDENT ACADEMIC BACKGROUND:

The candidate should hold a degree in Physics, Materials Science or similar, and speak English fluently. Background in solid-state physics and optics/photonics is recommended.

BRIEF DESCRIPTION OF THE STUDENTS TASK:

The main task is to perform photolithography of electronic devices for neuromorphic computation. Neuromorphic computation aims at replicating in physical systems the fundamental features of biological neurons and synapses. Recently, we have demonstrated that optical artificial synapses can be synthesized using the photoresponse of some materials. To exploit these properties, optical and e-beam lithography is required to define the electronic devices that are used as elements of neuromorphic computation to create eventually artificial neural networks. With this in mind, we need a good electrical isolation between the different artificial synapses to have an optimal operation. The student will be in charge of defining an efficient photolithographic process involving chemical and solvents that can define an optimal route towards the synthesis of devices with dimensions in the scale of microns or even smaller. The successful candidate will learn the methods used in optical and electron beam lithography, and also will be acquainted with the optical and transport methods that we use to characterize the optical artificial synapses.

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Ministry of Science and Technology

Responsible Researcher:

Center Director:

ICU Manager:

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EXPRESSIONS OF INTEREST

CSIC SCIENTIFIC SUPERVISOR: Muñoz Caro, Guillermo M.	
EMAIL: munozcg@cab.inta-csic.es	PHONE NUMBER: (+34) 915206354
INSTITUTE/CENTER NAME: Centro de Astrobiología (CAB, CSIC-INTA)	
ADDRESS: Ctra. de Ajalvir km 4, 28850 Torrejón de Ardoz (Madrid)	
BRIEF DESCRITION OF THE RESEARCH GROUP: The scientific supervisor is the coordinator of the Interstellar and Circumstellar Medium group that performs research with about 15 experts in observational, theoretical and experimental aspects of Astrochemistry. He is also coordinator of the laboratory LSAIP at CAB, where the ISAC chamber for simulation of ice processes is located. The Experimental Astrochemistry unit is composed of a senior researcher, a postdoc, a technician, and a PhD student. Since 2010, this unit has published more than 40 articles in astrophysics journals (ApJ, A&A, MNRAS) and broader scope journals (Science, PNAS, Phys. Rev. Let., Chem. Soc. Rev.); a good number of these works were joint research with the National Central University group led by Dr. Y.-J. Chen. In 2018, we co-edited the book ¨Laboratory Astrophysics¨ (Springer).	
CENTER/RESEARCH GROUP'S WEBSITE: http://www.cab.inta.es/es/inicio	
NUMBER OF STUDENTS WILLING TO WELCOME: 1	
BRIEF DESCRIPTION OF THE STUDENT ACADEMIC BACKGROUND: Graduate student with a good knowledge of atomic and molecular spectroscopy and experience in the use of ultra-high vacuum chambers for the simulation of interstellar ice processes. The student will work on the photon-induced desorption of interstellar ices, experience in this field is a benefit for this application. Our collaborator, Dr. Yu-Jung Chen from the Department of Physics, National Central University, Taiwan, shares our specific field of research and supports our application.	

BRIEF DESCRIPTION OF THE STUDENTS TASK:

The aim is to study the processes taking place in icy grain mantles in space. Dust grains were likely the first surfaces available in the Universe to allow chemical reactions leading to the formation of, e.g., water and other simple molecules, but also the synthesis of more complex molecules of prebiotic interest including carboxylic acids, amino acids, N- and O-bearing heterocycles, sugars, etc., as we found experimentally. These species are detected in comets, their impact with the early Earth likely paved the way toward prebiotic chemistry.

The student will focus on the irradiation of interstellar ice analogs covering dust grains to simulate the photodesorption during UV irradiation, a process that accounts for the ejection of ice molecules to the gas phase in very cold environments like dense interstellar clouds, thus serving to explain their observed abundances using radiotelescopes. This approach will be both experimental and theoretical, involving quantum calculations in collaboration with Dr. O Roncero to simulate exciton propagation in the ice and its effect on the measured photodesorption yield.

€1000 FOR LIVING EXPENSES WILL BE THE FINANCIAL CONTRIBUTION FROM THE CSIC CENTER TO THE STUDENTS

Responsible Researcher: Guillermo M. Muñoz Caro Center

Director: J. Miguel Mas Hesse

ICU Manager: Sagrario Salado