WISCONSIN - PUERTO RICO PARTNERSHIP FOR RESEARCH AND EDUCATION IN MATERIALS - PREM

The Official UPRM - PREM Newsletter

WHO WE ARE?

By: Yaleika Acevedo García

Administrative Officer & Project Manager

This proposal partners the University of Puerto Rico-Mayagüez (UPRM) and the University of Wisconsin-Madison (UW) to create richer educational and research opportunities for Hispanic students in Materials Science and Engineering and, thereby, increase their representation in the Materials & STEM community.

This is a University of Puerto Rico Project Award #1827894 from the National Science Foundation.

This proposal brings together 26 researchers in the areas of soft materials, catalysis and adsorption, crystallization and pharmaceuticals. We have divided the approaches into three interdisciplinary research teams that will address fundamental problems in these materials, and we also have a group focused on education.

We are a community dedicated in motivating students into pursuing careers in STEM. We have many undergraduate and graduate students working with PI's from our team. Our goal is to grow our community by exposing students to the different disciplines in the STEM

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prem
wisconsin puerto rico
Award #1827894

MEET OUR LEADERS!

"Leadership is the ability to transform the vision into reality".

https://www.entrepreneur.com/article/269008

Principal Investigator

Dr. Ubaldo Córdova Figueroa works as the principal investigator of PREM, also serves as an Associate Professor in the Department of Chemical Engineering of the University of Puerto Rico at Mayagüez and actively participates in IRT 3.

Co - Principal Investigator

Dr. Paul Voyles works as the Co principal investigator of the PREM, also serves as Professor in the Department of Materials, Sciences & Engineering of the University of Wisconsin and actively participates in IRT 2.

Education and Outreach Leaders

The leaders of Education and Outreach are Dr. Nelson Cardona-Martínez from the University of Puerto Rico on the left, Dr. AnneLynn Gillian from the Univeristy of Wisconsin in the center, both of them also worked as Co PI of PREM. At the right side we have Dr. Juan López Garriga Director of Sciences on Wheel from the UPRM and also an EOT Leader.

Administrative Support

On the left we have Dr. Carmen Bellido Rodríguez, who works with everything related to the evaluation of the project and is Professor of the Teacher Preparation Program of the University of Puerto Rico in Mayagüez. On the right side we have Ms. Yaleika Acevedo García, MBA, who works as an Administrative Officer, Project Manager and who has a master's degree in Human Resources.

IRT's - Leaders

IRT's Leaders - From left to right you will have; Dr. Yomaira Pagán Torres, lead leader of IRT1 and Associate Professor of the University of Puerto Rico at Mayagüez. In the middle, Dr. Torsten Stelzer, principal leader of IRT2 and Professor of Medical Sciences and on the right side, Dr. Claribel Vélez Acevedo, principal leader of IRT3 and Associate Professor at the University of Puerto Rico at Mayagüez.

MEET OUR IRT'S!

IRT 1: Atomic-Level Control in Materials Development for Catalysis and Adsorption

IRT 1, is a project directed by Dr. Yomaira Pagán from the University of Puerto Rico Mayagüez Campus (UPRM) and Paul Evans from the University of Wisconsin (UW).

The goal is to combine computational chemistry, advanced synthesis, state-of-the art characterization techniques, adsorption studies, and reaction kinetics to understand the impact of controllable-subnanometer surface modifications for the creation of materials with advanced catalitic and absorption properties Using Atomic Layer Deposition (ALD), a synthesis technique that allows precise creation of atomic-scale chemically active sites.

IRT 1 is divided in two groups:
Design of catalytic materials with controlled sites by ALD

Team: Dr. Pagán, Dr. Kuech, Dr. Mavrikakis, Dr. Babock and Dr. Cardona.

Flexible Porous Coordination Polymers for Gas Capture

Team: Dr. Hernández, Dr. Evans, Dr. Kuech, and Dr. Curet

Development of materials with exceptional catalytic and adsorption activity
through the use of synthesis methods based on atomic layer deposition (ALD) that allows
the precise creation of atomic-scale chemically active sites.

MEET OUR IRT'S

IRT 2: Controlling Crystallization of Organic Molecules in Polymer-Based Formulations

IRT 2, is a project directed by Torsten Stelzer, professor at the University of Puerto Rico Medical Sciences , focused on studying crystallization, polymorphism, and molecular mobility of active pharmaceutical ingredients (APIs) in polymer matrices to develop polymer-based formulation strategies. Experiments and simulations will be performed to characterize the crystallization, dynamics, and structure of APS.

IRT2 is composed by three projects:
Crystallization and Polymorphism of APS:
Team: Dr. Stelzer, Dr. López, Yu. and Dr. Zhang.

Dynamics in APS:
Team: Yu, Dr. Voyles, Dr. Santiago, Acevedo and Ediger.

Structures of APS:
Team: Dr. López, Dr. Stelzer, Yu, Dr. Voyles, and Dr. Benmore.

The goal of the IRT 2 is to understand the mechanism by which API-polymer interactions control the crystallization during the processing of solid dispersions to enable polymer-based formulation strategies (e.g. additive manufacturing, hot melt extrusion) of high-quality pharmaceuticals (e.g. drug delivery, personalized medication).

The mechanism leading to the generation of polymorphs (single phase or concomitantly) in melt crystallization processes is poorly understood.

MEET OUR IRT'S

IRT3: Active and Reconfigurable Colloidal Soft Matter Interfaces

IRT3, focuses on the issues of formation of nonequilibrium colloidal materials based on anisotropic and structured fluids. This IRT has taken the challenge of understanding the non-equilibrium behaviors of active colloids in complex fluids such as LCs has the potential to yield new approaches for the design of hierarchically structured and multifunctional colloidal materials for separations and catalysis. IRT 3 is divided in three groups:

Dynamics of Active Particles in Anisotropic Media
Team: Dr. Córdova, Dr. Abbott, Dr. Acevedo, Dr. Spagnolie and Dr. Graham

Scalable Synthesis of Active Colloids Templated from Liquid Crystals
Team: Dr. Córdova, Dr. Abbott, Dr. Acevedo and Dr. Graham

Emergent Collective Behaviors of Active Colloids
Team: Dr. Spagnolie and Dr. Graham

The focus of this IRT is addressing fundamental questions related to equilibrium and dynamic properties of colloidal systems dispersed in anisotropic structured fluids, specifically liquid crystals.

GET IN TOUCH!

Be a member of our community and learn about all the programs and activities we have to offer!

We are looking forward to start a project with you!

Wisconsin Puerto Rico
Partnership – PREM
Chemical Engineering
Call Box 9000
Mayagüez, PR 00681-9000

Contact
Phone: 787-832-4040; Ext. 5859
Fax: 787-265-3818
Email: wiprem@uprm.edu

Also, remember to follow us on our official social networks:
Facebook: @prem.uprm
Instagram: @prem_uprm
Twitter: @prem_uprm
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