

Final Report

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14. ABSTRACT
The funded symposiums were vastly attended, and discussions among participants were fruitful. The funded symposiums granted visibility to the funded institution, and grantees. The funded attendees delivered contributed talks and presented posters. Discussions and meetings with ONR and other US Army Research Offices took place. From common interests, white papers will be written to ensure further scientific collaborations.

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Executive Summary

The International Materials Research Congress (IMRC) held its twenty eighth edition in August 2018. The IMRC annual series are organized by Materials Research Society (MRS) and the Sociedad Mexicana de Materiales (SMM), offering a wide range of symposium topics of interest to the whole of the materials research community. The grantees of this proposal organized two symposium sessions: A1. Nanostructured plasmonic materials; and B1. Emerging 2D Materials and 2D Heterostructures: Synthesis, Characterization and Collective Phenomena. Both symposiums were vastly attended and counted with a group of leading invited speakers that ensured the success of the events. In addition, the IMRC plenary sessions featured distinguished speakers from different areas of materials science and technology. As symposium organizers, the funded symposiums granted visibility to the funded institution. The funded attendees delivered contributed talks and presented posters. Discussions and meetings with ONR and other US Army Research Offices. From common interests, white papers will be written to ensure further scientific collaborations.

Introduction

The IMRC is a renowned event that gathers scientists from around the world to display, discuss and disseminate the latest research in materials science and engineering. Its twenty eighth edition was held from 18th to 23rd august 2019. The IMRC annual series are organized by Materials Research Society (MRS) and the Sociedad Mexicana de Materiales (SMM), offering a wide range of symposium topics of interest to the whole of the materials research community.

This event and its related outcomes contribute/support U.S. Naval/Marine Corp Framework priorities by providing an environment for the discussion of topic areas that impact ONR Codes 31, 33, and 35 at ONR, and addresses specifically the Integrated Research Portfolios of Information, Cyber, and Spectrum Superiority and Mission Capable, Persistent & Survivable Sea Platforms.

In particular, this project was instrumental for the organization of two symposium sessions: A1. Nanostructured plasmonic materials; and B1. Emerging 2D Materials and 2D Heterostructures: Synthesis, Characterization and Collective Phenomena. Through the development of Nanostructured Plasmonic Materials, novel technologies that impact Enduring Research Responsibilities such as Sensors and Sensor Processing using novel 2D materials, Communications and Networking, and Advanced Naval Materials can be explored. Further, the participation of NRE staff ensured the discussions aimed at the incorporation of novel technologies for further development up the TRL scale.

Activities and Achievements

Activities

Date	Activities	Comments
18 August, 2019	Tutorial: Computational modeling of the electron transport in nanostructures	

Date	Activities	Comments
19 August, 2019	Symposium B1. Emerging 2D Materials and 2D Heterostructures: Synthesis, Characterization and Collective Phenomena	There were three sessions, with five invited speakers and 8 contributed oral presentations

Date	Activities	Comments
20 August, 2019	Symposium B1. Emerging 2D Materials and 2D Heterostructures: Synthesis, Characterization and Collective Phenomena	There were three sessions, with five invited speakers and 8 contributed oral presentations plus a poster session.

Date	Activities	Comments
21 August, 2019	Symposium A1. Nanostructured Plasmonic Materials	There were three sessions, with six invited speakers and 8 contributed oral presentations

Date	Activities	Comments
22 August, 2019	Symposium A1. Nanostructured Plasmonic Materials	There were three sessions, with six invited speakers and 8 contributed oral presentations

Outcomes

The funded symposiums were vastly attended, and discussions with were fruitful. As symposium organizers, the funded symposiums granted visibility to the funded institution The funded attendees delivered contributed talks, and presented posters. Discussions and meetings with ONR and other US Army Research Offices.

Impact of the project

The students and young researchers funded through this grant had the opportunity of attending a well known International Congress, and interact with leading scientists of their respective fields. In addition, they had the occasion to present their results to a specialized audience. Moreover, they were invited to participate in the discussions with ONR and other US Army Research Offices' Representatives.

Follow up

From the discussions with ONR Representatives, common interests were identified, and it was agreed that at least three white papers will be submitted to start active collaborations. In particular, the areas of nanoscale plasmonics, thermoelectricity and two-dimensional materials were highlighted as the ones with greatest potential for close interaction with benefits to both parties.

Key communication activities

In addition to the support of the general organization of the symposiums A1 and B1, the following specific contributions in the XXVIII International Materials Research Congress were possible through this grant:

SA1-P017. Mendoza-Sandoval. Modified fluorescence of light of light-emitting layers weakly coupled to plasmonic lattices

SA1-P018. Mendoza-Sandoval. Modified fluorescence of light-emitting layers weakly coupled to plasmonic lattice

SA1-O015. Becerril Rodríguez. Optical properties of monolayer and bilayer particle arrays

SA1-O022. Márquez-Hernández. Terahertz response of insb nanoparticles in external magnetic fields

SA1-O024. Pirruccio. Extended chiro-optical near-field response of achiral plasmonic lattices

SB1-O006. Serkovic. Graphene field effect transistors

SB1-O014. Sánchez-Ochoa. Electronic hybridization of dirac-cones and saddle-points in twisted-bilayer graphene

SB2-O013. Botello-Méndez. Ab-initio based models for van der waals heterostructure spectroscopies