# Descargas otorgadas

*Segundo Semestre 2023-2024*

**Dr. Sergiy Lysenko**
**Departamento de Física**

*Electron-phonon coupling in iron-based superconductors*

The main activities of the proposed research are focused on ultrafast probe of iron-based materials in their superconducting state, to observe signatures of electronic correlations, lattice vibrations, and mesoscale structural dynamics far from their equilibrium. Iron-based superconductors, with their intriguing electronic and structural properties, have attracted significant attention in the condensed matter physics. Specifically, FeSe0.8Te0.2 stands out due to its pressure- and doping-dependent properties, which show a fascinating relationship between suppressed nematicity and enhanced superconductivity. Remarkably, superconducting transition temperature Tc surpassing 100 K for single-layer FeSe films, primarily attributed to interface-enhanced electron-phonon coupling. Another a 122-type superconductor Ba(Fe0.92Co0.08)2As2 with a Tc above 15 K gives the opportunity to observe suppressed antiferromagnetism. While theoretical models and Allen's theory offer possibilities for understanding electron-phonon coupling and estimating Tc, the divergence of calculated Tc values from experimental data indicates the unconventional nature of these materials. Our previous and current studies are focused on study general stages of the relaxation processes and nematicity in FeSe0.8Te0.2 and Ba(Fe0.92Co0.08)2As2. However, a comprehensive understanding of how the electron-phonon coupling strength interplays with sample temperature is yet to be achieved.

The proposed research for the II semester 2023-2024 is aimed to obtain information about the electron-phonon coupling strength and nematic phonon dynamics for materials with unconventional superconductivity in nonequilibrium state, placing special emphasis on the exploration of anisotropy, or nematicity, of their physical properties. To enable this study, a series of cutting-edge femtosecond laser spectroscopy methods will be applied, including pump-probe ultrafast angle-resolved light scattering technique, transient reflection and transmission with light polarization control. These methods promise unparalleled sensitivity and resolution across spatial and temporal dimensions. The proposed methods will shed light on the formation and control of exotic quantum phases, quasiparticle relaxation mechanisms, and complex electron-boson interplays. Project will be conducted in the in the group of Advanced Materials Dynamics, Laboratory of Ultrafast Spectroscopy https://fisica.uprm.edu/light/

**Dra. Noemí Maldonado**
**Departamento de Humanidades**

*La vigencia y relevancia de prácticas culturales ancestrales en beneficio de prácticas artísticas y pedagógicas actuales*

Esta etapa del proyecto creativo estará enfocada en el estudio de materiales de construcción de marionetas, objetos y máscaras. Se enfatizará tanto en el uso de materiales tradicionales como materiales alternativos, incluyendo material reciclado y también materiales "modernos" o sintéticos. Este estudio me proveerá del conocimiento requerido para la creación de por lo menos dos cursos adicionales a los ya creados; XXXX: Taller de diseño, creación y construcción de títeres. En este curso se hará énfasis en la creación de diseños originales, con mezcla de técnicas de construcción. Un segundo curso será, XXXX: Taller de estudio y creación de máscaras. En este curso se le dará atención a la historia de las máscaras desde un enfoque antropológico y se dará espacio tanto para la creación de réplicas como creaciones originales. Estos dos cursos completarían 5 nuevos, de temas especiales relacionados con el teatro de títeres. Dichos cursos estarían diversificando la oferta académica en el RUM (Recinto Universitario de Mayagüez), como propuesto al inicio de este proyecto en agosto de 2022

**Dr. Eric Lamore**
**Departamento de Inglés**

*False Memoirs: Rewriting Phillis Wheatley*

I respectfully request a research release for the Spring 2024 semester to continue work on the early Black Atlantic. Year 2023 marks the 250th anniversary of Phillis Wheatley's Poems on Various Subjects, first published in London in 1773, yet much remains to be learned about this book. By examining Margaretta Matilda Odell's and B. B. Thatcher's memoirs on Wheatley, which also contain her poems, I will rectify an error that scholars have perpetuated by neglecting to examine the publishing and reception histories of Poems in the nineteenth-century US. I will identify how these white editors offered problematic information on Wheatley and her husband; map how this information on these individuals circulated throughout the US via reviews of the books; articulate how Odell's and Thatcher's books can be linked to schemes endorsed by members of the American Colonization Society, an organization that encouraged African Americans to abandon the US and move to Liberia; and establish how Odell and Thatcher contributed to the unstable nature of Wheatley's book by altering the poems from one of the 1773 London editions. This work forms part of my monograph, "Unstable as Water": Early Black Atlantic Literature and Textual Fluidity, in which I utilize methodologies from the fields of book history and print cultures to examine books related or written by individuals of African descent first printed before 1800. For this scholarship, I have been awarded numerous fellowships, including one funded by the National Endowment for the Humanities, and appointed Remote Scholar at New York University.

**Dr. Gregory Stephens**
**Departamento de Inglés**

*Ethnographic Writing, Pt. II: Publications and Course Design*

As noted in the application for the Fall 2023 Descarga, this Project grew out of 1) my work on the Strategic Planning Committee; 2) a 5000-level "Ethnographic Writing" proposal (which is being taken up by the English Department Curriculum Committee on Oct. 20), and 3) my work on Learning Outcomes, which procedes the current GE committee directives, but has also contributed to that process.

Ethnographic approaches help us to see repeating patterns, and write communicatively. This has pragmatic value in the present conjuncture in which UPRM Arts & Sciences is overhauling its GE courses through Learning Outcomes.

Fall 2023 research time has been used to research and write a monograph: "Ethnographic Writing and Situated Rhetoric: A Survey." I've drawn on this both for publications and class lectures, which I'll detail below.

**Dr. Arnaldo Carrasquillo**
**Departamento de Química**

*Molecularly Directed Deposition of Cooper at Bead Type Pt Catalytic Surfaces*

This Release Time proposal deals with the subject of Electrochemical Surface Science (ECSS) and the fields of Material Science and Electrocatalysis. The release time, requested through this proposal will enable the PI to continue on-going ECSS research efforts, to submit for publication the results of those efforts, and to seek external funding for the efforts. Objective 1: At least one manuscript will be submitted/reviewed and/or published during the semester. Written evidence of submission to review pertaining this first objective will serve as a measure of completion of the proposed work. Objective 2: Additionally, one externally funded research proposal will be planed for submission to the appropriate NSF -Chemistry Disciplinary Research Programs (CHE-DRP) by either the September 1 2024 - September 30, 2024 Window or by the October 1 2024 - October 31, 2024 – Window. A decision as to which specific CHE-DRP will be informed in the final release time report, after consultation with the cognizant Project Managers. Finally, as Objective 3: we will continue development of on-going collaborations, which have been made possible in the past through the support of the Dean of Science, (i) with the University of Alicante (Spain) regarding Electrocatalysis, (ii) with the University of Oviedo (Spain) regarding Analytical Sensor Design*, (iii) with the Pontifical Catholic University (Ponce) on both subjects, and (iv) with the Material Characterization Center (MCC) in UPR Rio Piedras.

PROPOSED WORK/PUBLICATIONS: The emphasis of the activities will be to publish and disseminate new results and findings obtained collaboratively with the above universities. Specifically, we propose to report on the Molecularly Directed Deposition of Cooper at Pt Catalytic

Surfaces treated with a Quinoidal molecule, Catechol, using single crystal surfaces prepared at our research facilities.

PROPOSAL FOR EXTERNAL FUNDED: Additionally we propose to seek external funding to extend the studies, with emphasis in nanoparticle and ultrathin film nanostructuring and characterization, exploiting our newly gained understanding of the electrochemical reactivity of aromatic surface modifiers described above. Funds will be sought from NSF (and/or a similar agency such as DOE).

The proposed work is timely and state of the art. During the period one (1) PhD Student and at least one (1) undergraduate student will participate. The information/knowledge created is needed to make progress in several technologically relevant fields such as nanotechnology, electrocatalysis at supported noble-metal nanoparticles, and to develop novel sensor designs. Additional expected institutional and national benefits include: promoting the international projection of the University of Puerto Rico, expanding Puerto Rico's recognition in the field of electrochemical surface science, promoting a long-term international collaborative project, promoting the establishment of new collaborations.