



Descargas otorgadas

Primer Semestre 2023-2024

Dr. Alejandro Vélez
Departamento de Ciencias Matemáticas

Diffusion Over Bronchial Trees

The main goal of this research proposal is to investigate the well-posedness and global smoothness for solutions to a diffusion equation over a domain with ramified boundary which simulates the structure of bronchial trees in the lungs system. We plan to develop the following three main points:

1. Obtain approximation results for the Hausdorff measure of the ramified fractal boundary of the set. This will provide a correct notion of length for the surface of the borders in the bronchial trees.
2. Solve the Neumann or Robin diffusion equation over the set and obtain solvability and regularity results for the corresponding weak solutions.
3. Construct a Venttsel'-type operator over the ramified boundary of the set, to give sense to Venttsel' boundary value problems over this ramified domain.

Dr. Clark Sherman
Departamento de Ciencias Marinas

Late Holocene Shoreline Change and Shifting Environments, Southwest Puerto Rico

Recent archaeological surveys on the coast of southwestern Puerto Rico have revealed a landscape of dozens of heretofore undocumented shell mounds. While absolute dates for these sites are not yet available, several independent lines of evidence suggest cultural association with some of the earliest peoples of the island. Notably, nearly 95% of the countless millions of shells that make up the mounds are not from the types of marine habitats (mangroves, seagrass beds, and mud flats) that are, today, most proximate, instead, the overwhelming majority are from hard-bottom substrates, which lie several kilometers distant. This finding suggests that changes in local shoreline environments and habitats have occurred since formation of the shell mounds. Geologic studies in the area suggest local seaward progradation of the shoreline over this same timeframe, which may help to explain the archaeological record. This project will test the hypothesis of late Holocene shoreline progradation in southwest Puerto Rico. Cores will be collected from isolated lagoons and

tidal flats at selected locations across the study area to document recent shoreline changes in southwest Puerto Rico occurring over the last 4000-5000 years. This work is a component of a collaborative study combining archaeological excavation and paleoenvironmental reconstruction to provide novel insights into fundamental anthropological questions about the early inhabitants of Puerto Rico, their foraging behaviors and linkages to contemporaneous paleoenvironmental changes.

Dr. Eric Lamore
Departamento de Inglés

Establishing an Authorized Edition of Phillis Wheatley's Poems on Various Subjects, Religious and Moral

I respectfully request a research release to continue scholarly work on Phillis Wheatley's *Poems on Various Subjects, Religious and Moral* (1773), the first book written by an individual of African descent. Much remains to be learned about this Black writer. Scholars have determined that a London printer produced two editions of *Poems* in 1773, but they have not accounted for the fact that Wheatley signed copies of her book to ensure that North American printers did not produce unauthorized editions. My objective is to identify what 1773 edition of *Poems* Wheatley viewed as the authorized edition of her book by comparing photos of one copy containing her signature and photos of the two 1773 London editions that do not contain her signature. With this data, I will analyze how Wheatley revised the signed/authorized edition of *Poems*, in what ways the authorial revisions alter understandings of several poems in her book, and why these revisions call for the reediting of the Black poet's writings and new conceptualizations of her agency. 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 orally related or written in English by individuals of African descent that were first printed before 1800. I have been awarded numerous fellowships to support this project, including appointments at New York University and a National Endowment for the Humanities fellowship at the Library Company of Philadelphia.

Dr. Gregory Stephens
Departamento de Inglés

Ethnographic Writing: Promoting Multi-literacies and Interdisciplinarity

This proposal grew out of three forms of departmental and institutional service:

1. Strategic Planning Committee service led to a shared realization: "Strengthen[ing] creative work, research, and its · dissemination" requires interdisciplinary partnerships. Objective #2 subcommittee members noted a challenge: the common perception in STEM institutions that "creative work" is marginal, or not really research.
2. I submitted a 5000-level "Ethnographic Writing" course proposal to Dr. Hugo Rios, coordinator of the Writing and Communication track. Such a course could have a

bridge-building capacity: between undergraduate and graduate work, between English and the Film program or Media Studies program; as an interdisciplinary common ground with researchers in other departments and colleges, including Business Administration.

3. I wrote the Student Learning Objectives narrative for INGL3286, Fiction Writing, as mandated by UPRM's General Education Committee. Ethnographic methods help students see characters and socio-cultural contexts more clearly, I argued. Ethnography-based creative writing classes help fulfill several learning outcomes, including "creativity in generating new ideas" (SLO 2), to "create and explain based on context" (SLO 4), and increase vocabulary and knowledge of genres in order to facilitate "effective communication" (SLO 3).

Learning how to write communicatively out of ethnographic approaches, which helps us to see repeating patterns, has interdisciplinary value. It assists in recognizing and packaging multiple literacies ("effective communication" et al). The adaptation of ethnographic writing as a "disciplined interdisciplinarity" has pragmatic value, in the present conjuncture. For example, as theory and methodology it anchors initiatives such as employing multi-media technologies to achieve effective communication, and helping translate research in a variety of disciplinary trajectories beyond specialist bubbles. -

Dr. Jeffrey Herlihy
Departamento de Humanidades

Land Grant Universities and Cultural Dispossession

The Land-Grant University System was founded in the nineteenth century when the US government began allotting land (or selling it at a discounted rate) to states to establish a public system of higher education. In many cases the land was appropriated through military invasion, and my argument begins: What territory was granted? Why did the US government claim rights over the area? What role do land-grant universities have in cultural dispossession of communities resident in those regions? I argue that cultural dispossession was not a consequence but a motive of the land-grant education system. This argument, then, closely links the university system to governmental cultural imperialism programs.

Land Grant Universities and Cultural Dispossession examines how the US government has used higher education system as an instrument of cultural engineering to impose the imperial language (English), an industrialized schedule (5-day work week and 9-5 workday), a system of US holidays (festivals that celebrate presence of the US in that space), among other cultural directives in communities that have a variety of other languages and ways of being. The book argues that one of the principal missions of the Land-Grant system is to sponsor and project a monocultural universalism that functions as a legitimating apparatus for state power (to conscript, create borders, collect taxes, enforce law, and so on), all of which occur subsequent to military invasion or annexation of a geographic area.

Dr. Jerry Torres
Departamento de Humanidades

Cuerpo, placer y ciudad: estudio de la construcción social y física de los espacios urbanos de playa en San Juan de Puerto Rico

Esta propuesta surge de una línea de investigación abierta por medio del trabajo anterior sobre el desarrollo histórico de la relación entre naturaleza y ciudad en San Juan de Puerto Rico. El foco de la propuesta está en el límite físico entre la ciudad y el mar, lo que se conoce específicamente como la playa. Para esta investigación considero la playa urbana como un espacio tanto físico como social. Es este último aspecto el cual me interesa abordar para trazar una red de significados que una lo sociológico y lo urbanoarquitectónico. Se utilizarán fuentes nuevas que aborden la dimensión social y los procesos inherentes a la corporalidad en la playa, para determinar cómo estas construcciones mentales inciden sobre la creación de los espacios y edificios relacionados a la playa. El marco temporal se define entre la última década del siglo 19 y los años 1960. La cartografía cultural, el hilado de significados, el contextualismo, la teoría urbana y los estilos arquitectónicos, forman parte del fundamento analítico de este trabajo. Las preguntas clave que guían la investigación son: ¿Se pueden establecer paralelismos entre las concepciones sociales sobre el cuerpo con el desarrollo arquitectónico y urbano en San Juan de Puerto Rico? ¿Cómo inciden las diferentes ideas sobre el placer y la desnudez en la concepción del espacio social de la playa? ¿Qué se puede decir en cuanto a la condición de sujeción política cuando se analiza la narrativa ideológica de las playas de la capital de nuestro país?

Dr. Miguel Castro
Departamento de Química

Computer modeling chemical process associated with skin melanoma: the desphosphorylation of tyrosine by our patented nanostructures

A research proposal is presented to model the chemical process that result in regulation of focal adhesion kinase (FAK). Lack of FAK regulation is linked to failed programmed death (apoptosis) in malignant cell types which results in tumor growth and spread. FAK requires that appropriate phosphorylation and de-phosphorylation of tyrosine residues in several key sites of the protein. We will extend our experimental work with URPM patented CaS dispersions to study the role it plays in FAK regulation using traditional Gaussian software and the more popular and recently developed Alpha Fold platform. The primary outcome of this research is to establish the role of the CaS dispersion in regulating FAK- target protein to deal with cancer diseases. The results of the research will be used to submit additional research and training proposals to the NIH – including the INBRE program and R21 exploratory research proposals- and NSF and will be disseminated in peer review articles and relevant conferences.

Dra. Noemí Maldonado
Departamento de Humanidades

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

El auge que ha tomado el teatro de títeres en tiempos recientes sea como un acto de preservación cultural, reinención de medio artístico, fusión de medios que complementan un espectáculo o, como recurso pedagógico, está cobrando relevancia en entornos académicos. En esta tercera etapa del proyecto, **La vigencia y relevancia de prácticas culturales ancestrales en beneficio de prácticas artísticas y pedagógicas actuales**, el enfoque estará dirigido a la historia del performance de títeres y marionetas que se ha realizado y se realiza, de manera global. En esta parte del proyecto, se le dará énfasis a la tradición de construcción de títeres y marionetas en madera. Con dicho propósito, estaré tomando dos cursos. En la Universidad de Connecticut tomaré el curso en línea **DRAM:5617 World Puppet Theatre** de agosto a diciembre 2023 y, en **“The Academy of Wooden Puppetry”** el curso en línea de teatro de títeres en madera y, cuyo profesor tiene su estudio en Islandia. Este último curso lo he comenzado en marzo 2023 y lo completaré en mayo del 2024. En dicha academia se trabajará no solo con la historia y tradición del teatro de títeres y marionetas en madera, también se trabaja con el conocimiento de los tipos de madera utilizados alrededor del mundo con estos fines. El profesor cuenta con más de treinta y seis años de experiencia en la construcción y performance de títeres y marionetas en madera. Formo parte de una clase en la cual participamos personas de diferentes partes del mundo. Como complemento al curso ya establecí contacto con artesanos de la madera y dueños de aserraderos que se especializan en madera cultivada en Puerto Rico. Este renglón de la investigación le dará un toque más interdisciplinario al proyecto ya que además de trabajar con la historia, confección y estilo de títeres, en dicho material, también se abrirá un espacio de investigación, diálogo e intercambio de conocimiento con personas que hacen uso artesanal de la madera en Puerto Rico y colegas de la Facultad de Ciencias Agrícolas que estudian el cultivo y proliferación y extinción de árboles en suelo puertorriqueño.

Dra. Sara Gavrell
Departamento de Humanidades

Oppressive Social Institutions: Understanding Rape and Birth

I argue that to understand birth we have to look at it as a social institution with its metaphysical, ethical, epistemic, and even aesthetic rules. Borrowing from Claudia Card's work on rape as a terrorist social institution, I make an analogy between rape as an institution and birth as an institution. Both rape and birth are sexuo-political institutions: those that define acts and distribute power between the sexes. One important upshot of rape or birth as institutions is that neither experience can be understood by looking at an

individual act. I argue that birth is an oppressive (and even perhaps terrorist) institution. Recently, obstetric violence has been recognized as a gender violence problem that involves a violation of women's rights (ONU, 2019). Two upshots of birth as an institution are that obstetrical violence cannot be understood by looking at the individual act, and that ultimately women's will is separated from the definition of consent and becomes irrelevant to whether something that was done to a woman during childbirth was or wasn't obstetric violence. My analysis involves a critique of the ethical approaches that use: (1) the "maternal-fetal problems" framework; which defines the ethical problem as the "conflicting interests" of two beings (2) the risk-management framework; (3) the rights theory framework; (4) the technocratic model of birth; and (5) the obstetrical worldview.

Dr. Sergiy Lysenko
Departamento de Física

Nonequilibrium dynamics of iron-based superconductors

The primary aim of this proposed research is to enhance our understanding of fundamental processes related to superconductivity and nonequilibrium dynamics of iron-based quantum materials, with a particular emphasis on investigating light scattering at quantum phase transition and nematicity. This investigation will employ a range of advanced femtosecond laser spectroscopy techniques, including state-of-the-art pump-probe ultrafast angle-resolved light scattering with light polarization control, to study matter far from equilibrium with excellent sensitivity and resolution both in time and space domains. The research aims to create and characterize novel quantum phases, quasiparticle relaxation, and electron-boson interactions. The methods of ultrafast optics offer an opportunity to visualize multidimensional dynamics of quantum materials on the timescale of lattice vibrations, enabling new insights on the role of electronic correlations in the nonequilibrium dynamics of highly entangled states of iron-based materials in their superconducting state. Additionally, this research aims to investigate the effect of material morphology, size, and statistical distribution of domains on the mesoscale. In summary, the proposed research will provide an in-depth understanding of the nonequilibrium dynamics of superconducting iron-based quantum materials, specifically addressing transient nematicity. The application of advanced femtosecond laser spectroscopy techniques, such as pump-probe ultrafast angle-resolved light scattering with light polarization control, will enable the creation and characterization of novel quantum phases, as well as the study of quasiparticle relaxation and electron-boson interactions. This research will provide new insights into the role of electronic correlations in nonequilibrium dynamics and the effect of material morphology, size, and statistical distribution of domains on the mesoscale. Project will be conducted in the in the group of Advanced Materials Dynamics, Laboratory of Ultrafast Spectroscopy <https://fisica.uprm.edu/light/>.