University of South Florida Nexus Initiative (UNI)
2018 Mid-Term Executive Progress Report

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UNIVERSITY OF SOUTH FLORIDA
A PREEMINENT RESEARCH UNIVERSITY

Executive Summary

The University of South Florida Nexus Initiative (UNI) offers tenured/tenure-track and full-time research faculty members the opportunity to collaborate with global and national community partners in scholarly and innovative projects; develop sustained research and scholarship programs with high-impact researchers at other institutions; and create opportunities for exceptional graduate students to expand the breadth of their research and scholarly experience. UNI has enhanced research activities of faculty members by strengthening a variety of partnerships, resulting in efforts with the potential to significantly advance current human understanding and address pressing societal needs.

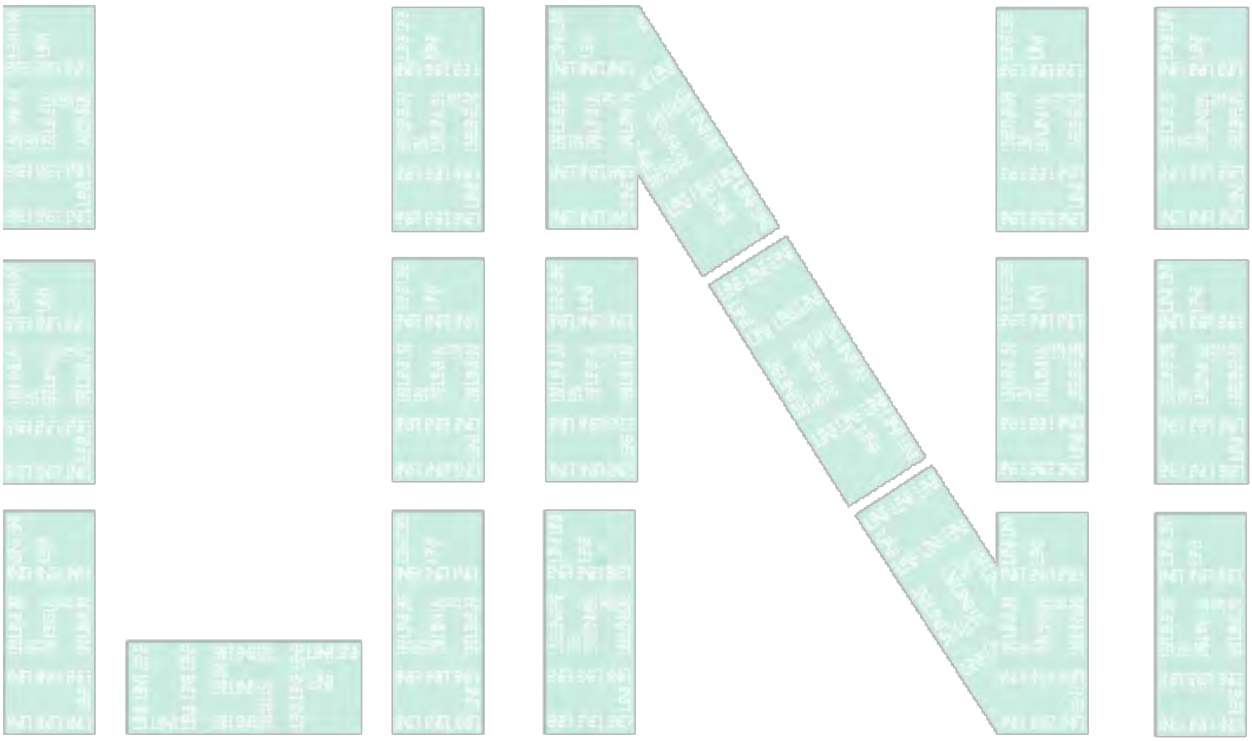
Faculty responded overwhelmingly to the solicitation for proposals in spring 2018, submitting a total of sixty-five applications. After competitive review by a panel of Distinguished University Professors, thirty-three projects were selected for funding. Eight Colleges and twenty-three Departments including a diversity of disciplines are represented in this cohort. Through joint research and scholarship, our faculty and their partners are shaping the future of their local communities, their countries, and the world by engaging in interdisciplinary collaborations. These span the range from the molecular regime investigating surface self-assembly of giant supramolecules to studies of zonal jets related to the dynamics of polar vortices on Jupiter and Saturn as well as Earth. Spanning the lifespan of humans, UNI researchers have focused their activities on inquiry project investigations in early childhood classrooms to examining genetic markers for Alzheimer's Disease. Through their efforts we are learning more about paleo-contents of Roman amphorae from Sicilian underwater shipwrecks, examining cross-influences between Chinese and Western music in the twenty-first century, and addressing portable power generation in rural Africa.

Partnerships between USF faculty and their collaborators at other global or national universities, national laboratories or research centers are at the heart of UNI. USF's Institute for Remote Sensing is the only institution in the state of Florida and one of only three U.S. organizations to join over twenty universities, government agencies, and research institutes in the Marine Biodiversity Observation Network Pole to Pole Network of the Americas. USF Physics faculty and graduate students are collaborating with researchers at the University of Cambridge to discover new methods for advanced spintronics applications, while USF Psychology faculty and graduate students explore enhanced peripheral processing in deaf individuals using state-of-the-art technologies at Boston University. These are just a few of the multitude of exciting projects featured in this report outlining the work initiated and sustained by our faculty members and their national and global collaborators. In total, UNI has supported partnerships spanning nineteen countries and eight U.S. states, cultivating an invaluable network of opportunity and impact.

Faculty have been increasingly productive in conducting, presenting, and publishing research supported by their UNI awards. Three publications, six manuscripts in press, and sixteen international and national conference presentations illustrate the scholarly impact and activity of faculty. A National Science Foundation (NSF) International Research Experience for Students (IRES) grant ($299K) was awarded for the UNI project, *USF-Botswana Collaborative Research Towards Portable Power Generation in Rural Africa*.

Seven other faculty submitted or plan to submit additional proposals for the NSF IRES, CAREER, Materials Innovation Platforms, and Accelerating Research through International Network-to-Network Collaborations grant programs. The majority of these projects are ongoing, and the tangible, anticipated outcomes will only add to the extensive list of works already accomplished. The report that follows details the contributions UNI has proudly made to enhancing USF institutional impact across the nation and world.

Pritish Mukherjee, Ph.D.
Vice Provost and Associate Vice President
Strategic Talent Recruitment, University Reputation and Impact



UNI Awardee Updates

The following narratives provide more information about each UNI project.

Ross Andel, College of Behavioral and Community Sciences (School of Aging Studies)
Examination of Biological and Genetic Markers for Alzheimer's Disease in the Czech Republic

Dr. Ross Andel and other researchers and doctoral students at the USF School of Aging Studies partnered with researchers and students at Charles University in Prague, the home of the Czech Brain Aging Study (CBAS) – the largest epidemiological study of Alzheimer's disease in Eastern Europe. Since the inception of the UNI award, one study has been published on the effects of blood glucose on cognition among older adults, which was published in the *Journal of Alzheimer's Disease.* This journal is one of the top ranked journals in the field with an impact factor of 3.5 based on most recent release by the Journal Citation Reports. This study was led by Colleen Pappas, a doctoral student from the USF School of Aging studies, and included two other USF researchers, Drs. Small and Andel; two researchers from Charles University in Prague, Drs. Hort and Laczo; and two doctoral students from the same university, Martina Parizkova and Ondrej Lerch.

The published study brings attention to the possibility that high levels of glycosylated hemoglobin A1c, a particularly stable indicator of blood sugar levels, may be damaging to the performance on one specific cognitive domain – executive function – among individuals with pre-existing cognitive impairment. Executive functioning is a set of cognitive skills that help us get things done in a desirable manner. People with cognitive impairment in general have difficulties with some basic daily activities that are taken for granted. This published study suggests that controlling sugar levels in older adults with cognitive impairment may reduce the rate of decline among those with cognitive impairment to the point when they become dependent on others to perform basic tasks such as preparing a meal, balancing a check book, or writing a letter to a friend.

Three other projects are currently under way as part of this collaboration. First, a manuscript is in final preparation for publication that examines which cognitive tests are best indicators of conversion from mild cognitive impairment to a full-blown dementia. This is important because only a relatively small proportion of those with mild cognitive impairment actually develop dementia. Being able to identify these individuals reliably is one of the crucial goals in combating this disease. Second, a dataset is being compiled to study the association between indicators of psychological well-being and changes in cognitive function among older adults, led by Dylan Jester, a Ph.D. student in Aging Studies. Finally, data analysis is ongoing to examine the role of practice effects in outcomes of repeated cognitive testing.

Dr. Hort, the principal investigator of the CBAS, is visiting USF in April 2019. The USF team is scheduled to travel to Prague thereafter to facilitate the completion of the studies under preparation, as well as to exchange ideas and develop new relationships between the two institutions.

Ilene R. Berson and Michael Berson, College of Education (Teaching and Learning)
Integrating Digital Play with Tangible Technologies into Inquiry Project Investigations in Early Childhood Classrooms

This collaboration has led to a grant submission, several presentations, a publication in press (with others under development), and a signed General Agreement with Hubei University of Arts and Science to facilitate academic and research cooperation between the USF College of Education Department of Teaching & Learning and Hubei University of Arts and Science College of Education located in Xiangyang City, Hubei Province, China. Areas of collaboration include: joint educational and research activities; exchange of visiting scholars for the purpose of conducting research; discussion for the exchange of undergraduate and graduate students for collaborative or independent research based on the policies of both institutions; exchange of scholarly information, including research papers, indices to theses, books and magazines on relevant subjects and potential joint projects where possible and appropriate; and to extend invitations for attending scholarly meetings and national and international conferences.

Drs. Berson and Berson are Partner Investigators on a grant submission to the Australian Research Council Discovery Projects Initiative. This proposal, "How young children learn to code through play with digital technology," is currently under review. The aim of this international research is to document and compare across countries (Australia, UK, U.S., and China), how young children develop computational thinking while coding tangible technologies or "robots" in a play-based emergent STEM curriculum. Themes from video vignettes of young children's learning and multimodal analysis will provide evidence needed to generate a "DigiTech" framework for understanding young children's development of important foundation digital technology capabilities. Effective strategies for developing young children's computational thinking through coding will be captured, refined, and shared.

Alisha Braun, College of Education (Educational and Psychological Studies)
Inclusive Teacher Education in Tanzania: Exploring Primary School Teacher Preparedness

The UNI award period was extended to summer 2020.

Stephanie L. Carey, College of Engineering (Mechanical and Medical Engineering)
Robotic Framework for Bipedal Locomotion Benchmarking

In October 2018, Dr. Carey and her graduate student, Ashleigh Fults, attended the International Conference on Intelligent Robots (IROS) in Madrid, Spain. The project collaborators, Dr. Diego Torricelli and Dr. Jose Pons, were on the local organizing committee for this conference. Dr. Carey and Ashleigh Fults presented their research.

The USF team then visited the Neural Rehabilitation Group at the Cajal Institute, Spanish Research Council (CSIC) and met with Dr. Toricelli and Dr. Pons as well as their research team. They observed data collection protocols regarding neuromuscular control of exoskeletons. In addition, the USF team and collaborators discussed collaborative funding opportunities, such as the NSF Office of International Science and Engineering, and are exploring a proposal for the Accelerating Research through International Network-to Network Collaborations. The researchers discussed the possibility of testing the exoskeleton developed at CSIC on the CAREN virtual reality system at USF. This may involve the USF team traveling to Madrid again to learn to operate the exoskeleton prior to testing. During this time there is also an opportunity to attend and present at the Summer School on Neurorehabilitation in Spain.

Gary Daughdrill, College of Arts and Sciences (Biology)
Structure and Dynamics of the Adenovirus E1A Protein Binding to the Human Retinoblastoma Protein, Rb

Dr. Daughdrill plans to visit his project collaborator in Argentina this summer. Meanwhile, a manuscript is in preparation to be submitted by the end of February 2019.

Eric S. Davis, College of Education (LCACHE)
The Examination of Child Teacher Relationship Therapy Training for Speech-Language Pathology Students Working with Preschool Children with Language Disorders and Behavioral Issues

Over 1.3 million school children in the U.S. have speech and language disorders (LD) with co-occurring emotional/behavioral problems to the extent that specialized services are necessary. Many of these children struggle to communicate effectively with their peers resulting in difficulties with loneliness, low self-esteem, and increased aggression. A collaborative model of intervention utilizing play therapy components and speech-language interventions can be employed to ensure maximal outcomes for these children. The purpose of this project is to conduct a pilot study combining Child Teacher Relationship Therapy (CTRT) with child-oriented language intervention with preschool children with language disorders and behavior issues.

Initial training and data collection has been completed. Data analysis is forthcoming with the goals of at least two publications and presentations from the project experience. Initial results seem positive, so prospects for future funding options on a larger scale are also being considered.

McArthur Freeman II, College of The Arts (Art and Art History)
Multimodal Strategies for Visual Storytelling in VR

Professor McArthur Freeman is collaborating with Scott Swearingen and Kyoung Swearingen from The Ohio State University on a creative project that explores visual storytelling in the virtual reality (VR) environment. They have been holding weekly Skype meetings to discuss and document narrative strategies, game mechanics, and opportunities for leveraging VR for narrative storytelling. The subject of their VR experience focuses on the exploration of identity construction and shares aesthetic and conceptual linkages between these three creative researchers. As part of the grant, Scott and Kyoung Swearingen are scheduled to visit USF in February 2019. This visit will allow for initial testing and solidifying design goals for the VR experience. Professor Freeman and MFA candidate Jezebeth Gonzalez are scheduled to visit Ohio State in April 2019.

Boris Galperin, College of Marine Science

Experimental Investigation of the Momentum and Mass Transfer by Zonal Jets

As planned, Professor Boris Galperin and co-PI, Dr. Greg King, visited Professor Stefania Espa at the DICEA, Sapienza University of Rome in July 2018. Those were productive meetings to assess progress and plan for future experiments. Of particular significance was a meeting with Professor Luciano Iess from the Sapienza University of Rome and a member of the Juno Science Team of the Juno mission to Jupiter. He directed the researchers' attention to the hexagon and other polar vortex structures on Jupiter and Saturn, and the researchers are now planning new experiments to investigate them. This issue became particularly important after the episode of the polar vortex disturbance that caused a very cold weather here on Earth several weeks ago.

As planned, simulations have been conducted with eastward zonal jets to compare results with the westward jets conducted previously. The results have been analyzed using the Finite Scale Lyapunov Exponent (FSLE) method and are currently in the process of quantification. Results from new experiments include mean velocity and vorticity fields, instantaneous zonal (azimuthal in the cylindrical geometry of the experiment) velocity, mean zonal velocity, and mean stream function. There are discernable strong zonal current and disturbances appearing as large vortices that render the jet's shape irregular. By varying forcing's magnitude locally, the researchers investigate undulations of the jet. This will help to understand the dynamics of the polar vortices on outer planets and, hopefully, on Earth as well. The progress on these experiments will be reported at the meeting in Cargese, Corsica, in July 2019.

A book on zonal jets in various planetary environments co-edited by Dr. Galperin has advanced through the proofreading stages and is currently in print at the Cambridge University Press. Professor Espa was one of the contributors to the book. Some of the effort during the past year was dedicated to the proofreading of Professors Galperin and Espa's contributions.

Elizabeth Hordge-Freeman, College of Arts and Sciences (Sociology)

Color Matters: The Impact of Colorism on Affective Relationships and Financial Transfers in U.S. Families

In September 2018, Dr. Elizabeth Hordge-Freeman and Sociology Ph.D. student Edlin Veras traveled to Pitzer College to collaborate with Dr. Jessica Kizer on their project, "Color Matters: The Impact of Colorism on Affective Relationships and Financial Transfers in Families." Their visit entailed research meetings to discuss the data analysis and conceptual mapping for their collaborative research, which they hope to present at a national conference in 2019.

In addition to the meetings, Dr. Hordge-Freeman and Edlin Veras presented a joint formal research talk on findings from their recently completed research on colorism. Dr. Hordge-Freeman and Edlin Veras each separately presented interactive lectures to engaged undergraduates in two classes related to racism and colorism in the U.S. and Brazil as well. Some of the most memorable experiences from the visit include their tour of all five Claremont colleges, interactions with Pitzer faculty and students, and discussions with Pitzer College administrators about collaborative study abroad opportunities. As part of the grant, they hosted Dr. Kizer at USF from January 15-19, 2019.

Maayan Lawental, College of Behavioral and Community Sciences (School of Social Work)
Stigma towards Persons with Dual Diagnosis of Substance Use Disorders and Mental Health

Dr. Tal Araten-Bergman (La-Trobe University, Australia) and Dr. Lawtenal have been speaking weekly and are working on analyzing and combining their datasets as well as writing two publications. The first, "Professional stigma towards individuals with dual diagnosis: Application of the Attribution Theory," will be submitted in a few months. They are also working to coordinate virtual introductions with Dr. Araten-Bergman's collaborators at La Trobe University's Living with Disabilities (LIDS) research center as well as drug and alcohol researchers in the School of Allied Health.

John Lennon, College of Arts and Sciences (English)
Working-Class Literature from a Global Perspective

Drs. John Lennon and Magnus Nilsson (Assistant Dean in the Humanities, Malmo University) have sent a proposal to Stockholm University Press for a collection on Working-Class Literature(s) from a historical and global perspective. There are nine contributors from Asia, Latin America, Europe and Africa, and Drs. Lennon and Nilsson are co-writing a thorough introduction and conclusion. They are confident the proposal will be accepted are working to get this collection finished and published by the end of the year.

Dr. Lennon has also been working with Dr. Nilsson to implement an integrated, cross-university collection of courses on working-class literature. The goal is to have undergraduate- and graduate-level courses where faculty teach via the web and learning platforms the same courses on working-class literature. Undergraduate students from each university will work collaboratively on projects, while on the graduate level, Drs. Lennon and Nilsson will work on research projects with the other's students. During the fall semester, Drs. Lennon and Nilsson have been laying the ground work for meetings with various administrators to discuss opportunities.

In March 2019, Dr. Lennon will visit Malmo for a week to work on the chapters for the collection and sketch out future writing plans. Dr. Lennon will also meet with various administrators to discuss how to accomplish the integrated courses.

In May 2019, Dr. Lennon will again visit Malmo to finish the organization of the collection for publication as well as to conduct research on working-class writers in two different archives in Sweden for future publication. Drs. Lennon and Nilsson will also meet with colleagues at Lund University in Sweden and various administrators in universities in Denmark to discuss expanding the undergraduate and graduate working-class literature course offerings in these universities. The goal is to submit a grant to have this course (and university) connection among numerous universities throughout the Nordic countries.

Xiaopeng Li, College of Arts and Sciences (Chemistry)
Investigation of Surface Self-Assembly of Giant Supramolecules by Scanning Tunneling Microscope (STM) and Atomic Force Microscopy (AFM)

In collaboration with Prof. Bingqian Xu at University of Georgia, another new type of helical structures assembled by metallo-supramolecules with non-parastichy pattern was discovered. Parastichy, the complex helical packing of leaves, florets, and bracts of plants, provides an aesthetic challenge that has proved difficult to reproduce using completely synthetic constructs. However, the use of non-natural approaches may allow for molecular-scale control over the underlying arrangement processes and access to structures that are not routinely found in the biological world. Parastichy, as embodied in the present system, is expected to advance our understanding of the design inputs needed to create complex, but precisely-controlled, hierarchical materials. It may also provide experimental support for studies of packing theory.

Drs. Li and Xu submitted a manuscript to Nature Chemistry and are currently working on the revision. Meanwhile, they plan to submit a joint proposal for the NSF Designing Materials to Revolutionize and Engineer our Future (DMREF) program on February 4th. The total budget is $1.7 million for four years.

Lisa Meloncon, College of Arts and Sciences (English)
Testing the Attention Comprehension Gap through Innovative Usability Methods

Every day, we are bombarded with a range of stimulus we must review in order to engage with the world around us. To this end, communication materials are often designed to either catch our attention (i.e., make us use them) and convey an idea (i.e., foster comprehension). The researchers used a three-part method, the Plus-Minus-Check, to gather qualitative and quantitative data needed to assess how well different approaches to information design address aspects of attention *and* comprehension. Their findings contribute to a number of fields – health communication, technical communication, patient education, and document design – that focus on conveying specialized information to non-expert audiences.

At this time, a manuscript that outlines the Plus-Check-Minus method for user experience and usability is in progress and will be submitted to *Communication Design Quarterly.* Dr. Meloncon is also working on new partnerships within the U.S. (MSU, UTEP, TTU, ASU) to be able to visit usability labs at their campuses to test the Plus-Check-Minus method with more diverse users. In May 2019, Dr. Meloncon will present these findings at the *Society of Technical Communication Annual Summit* in Denver, CO.

Frank Muller-Karger, College of Marine Science and Enrique Montes, Institute for Remote Sensing
Marine Biodiversity Workshop: from the Sea to the Cloud - Laying the Foundations of the Pole-to-Pole Marine Biodiversity Observation Network of the Americas

The Marine Biodiversity Observation Network Pole to Pole of the Americas (MBON Pole to Pole) gathered researchers and managers from Canada to Patagonia and experts from other parts of the world to discuss and converge on strategies for biodiversity monitoring and conservation in rocky intertidal areas and sandy beaches. The MBON Pole to Pole workshop took place at the Centro de Biologia Marinha da Universidade de São Paulo (CEBIMar/USP) during

the 2018 AmeriGEOSS Week. This activity focused on capacity building and applied science for conservation and management of marine living resources emphasizing on four key areas: 1) field data collection using existing, standardized protocols; 2) manipulation of tabular and spatial data for standardized data formats, such as Darwin Core; 3) publish datasets to the Ocean Biogeographic Information System (OBIS, IOC) using established tools for data sharing; and 4) training on data science tools (R, Rmarkdown, Github) to mine data, conduct data discovery and analysis, and produce reproducible research documents with interactive visualizations on the web.

A core goal of the workshop was to develop a framework for biodiversity monitoring of sandy beaches and rocky shore intertidal areas. Eighteen MBON Pole to Pole members formalized their commitment to start (or continue) a monitoring program aimed at detecting changes biodiversity at their study sites following this set of essential principles: 1) use of common methods, 2) repeated sampling at the same sites, 3) similar seasonal and temporal sampling resolution, 4) data formatting following DwC schema, and 5) open data sharing via OBIS. Participating countries include Canada, USA (mainland and U.S. Virgin Islands), Costa Rica, Colombia, Brazil, Ecuador (mainland and Galapagos Islands), Chile, Brazil, Uruguay and Argentina. The first step will be for MBON Pole to Pole members to carry out at least one biodiversity survey at three sites in selected localities before the end of 2018. All data will be uploaded to the MBON Pole to Pole Repository by the end of February 2019 and made publicly available through OBIS during an upcoming workshop in spring 2019.

The MBON Pole to Pole activity was led by the Institute for Marine Remote Sensing (ImaRS; University of South Florida), CEBIMar and Instituto de Biociências (IB) of the University of São Paulo in coordination with OBIS, the Global Ocean Observing System for Biology and Ecosystems (GOOS Bio Eco), and EcoQuants. This workshop was a first step for the implementation of a global MBON Pole to Pole network. MBON Pole to Pole will hold annual workshops focused on the advancement of the network's objectives and output production. A list of specific partnerships and collaborations established with international researchers under this program is available here.

David Murphy, College of Engineering (Mechanical Engineering)
Sea Butterfly Swimming: Bio-Inspiration for Aquatic Micro Aerial Vehicles

Dr. David Murphy and doctoral student Ferhat Karakas traveled to Bermuda for six days in October 2018 to work with UNI collaborator Dr. Amy Maas, a biological oceanographer at the Bermuda Institute of Ocean Sciences. They successfully collected high speed video and flow measurements of the swimming of sea butterflies (pteropods) taken from the field to the laboratory. Ferhat Karakas is currently processing and analyzing the data to write a paper on the results. Dr. Maas is scheduled to visit USF in March 2019 to attend Ferhat Karakas' proposal defense as a committee member. She will also give a seminar at the USF College of Marine Science, where it is anticipated that she will make contact with potential collaborators. Planning is underway for a second trip to Bermuda in mid-May 2019.

Dr. Murphy submitted his CAREER proposal in summer 2018 on the same topic as the UNI award. Though it is too early to say definitely whether it will be awarded, the program manager requested an abstract and revised budget from Dr. Murphy in late 2018. No further news has been forthcoming due to the government shutdown.

In addition, data gathered from this project supported by the UNI award contributed to two presentations at the January 2019 Microscale Ocean Biophysics meeting in Whistler, Canada.

Cecilia Nunes, College of Arts and Sciences (CMMB)
Identifying Potential Abiotic Stress-Associated Biomarkers in Strawberry Fruit Using Advanced Mass-Spectrometry-Based Proteomics and Classical Biochemical Approaches

In August 2018, graduate student Alyssa Smith and Dr. Nunes visited collaborator Dr. Stanley Stevens at the University of Albany, Vermont campus. While there, Alyssa was trained on specific analytical procedures, and preliminary mass-spectrometry proteomic analysis of the project's strawberry samples was conducted. Based on the data collected in August, Dr. Nunes submitted an abstract to be presented at the Annual Meeting of the Institute of Food Technologists which will take place in New Orleans on June 2019. Data analysis of the strawberry samples will continue in summer 2019 to obtain more robust results, which will ultimately provide a base to the forthcoming grant proposal to the USDA NIFA Foundational Program in summer 2019.

Hua Pan, Morsani College of Medicine (Cardiovascular Sciences)
Developing Novel RNA Alteration Strategies for Neurological Disorders by Targeting TMEM16 Family Protein

The UNI Award supported solidified research collaborations with Dr. Huanghe Yang, an Assistant Professor at Duke University and recipient of the NIH Director's New Innovator Award funds. Dr. Yang's works are well recognized in the field and published in top journals, such as *Cell*, *Science*, *Neuron*, *Nature Medicine*, *Nature Genetics*, *Nature Structure Molecular Biology*, *PNAS*, and *eLife*.

Through the collaboration efforts, one co-authored manuscript submitted will be submitted soon with UNI award acknowledgement, and, for the first time, the gene delivery platform developed by Drs. Pan and Yang was implemented in mRNA delivery in mouse brain at Dr. Yang's lab. This gene delivery platform is non-viral based, well-characterized, and proven with superior safety profile. In collaboration with Dr. Yang, this technology will be developed to apply to neurological disorders for potential commercialization to clinical applications.

Sanghoon Park, College of Education (Teaching and Learning)
Design and Validation of Culturally-Contextualized Virtual Teaching Scenarios for Immersive Virtual Teaching Simulations

Dr. Jeeheon Ryu (Associate Professor, Chonnam National University) visited USF for a week in January and delivered an invited talk on Virtual Reality teaching simulations and medical simulations in South Korea. Dr. Sanghoon Park and co-authors Dr. Ryu and Kristen McChesney submitted a research manuscript entitled "Collaborative studio design between South Korea and American pre-service teachers: A case study of designing culturally-responsive virtual classroom simulation." The paper passed the review process and was accepted. It will appear in the next special issue of *TechTrends*, one of the official research journals published by the Association of Educational Communications and Technology (AECT).

Future activities include a visit to Chonnam National University in Gwangju, South Korea in March to conduct scenario development and testing. During this visit, Dr. Park was invited to present at the Virtual Teaching Simulation Forum hosted by Chonnam National University. Finally, the study experiences, findings, and artifacts will be analyzed and used to support Dr. Park's grant proposal writing efforts in the summer/fall of 2019.

Manh-Huong Phan, College of Arts and Sciences (Physics)
Novel Multicaloric Heterostructures for Advanced Spintronics Applications

This project aims to establish and promote an international collaborative research program between Dr. Manh-Huong Phan's group of the USF Department of Physics and Dr. Xavier Moya's group of the Department of Materials Science at University of Cambridge, UK. The UNI Award funded travel to the UK for Dr. Phan and PhD student, Eleanor Clements, to perform advanced caloric experiments in Dr. Moya's laboratory, as well as supported Dr. Moya's travel to the U.S. to perform transverse susceptibility and spin Seebeck experiments in Dr. Phan's laboratory. Since exploitation of multicaloric properties of materials opens doors for development of new energy-efficient materials and multifunctional devices, this proposed research program positions USF Physics as one of the top research groups in the world to explore this exciting area.

Eleanor Clements visited and performed experiments at the University of Cambridge (UC), hosted by Dr. Xavier Moya, for two weeks in September 2018. During her visit, the student visited laboratories with advanced facilities at UC. The student learned how to grow magnetic oxide films ($La_{0.7}Ca_{0.3}MnO_3$ and $La_{0.7}Sr_{0.3}MnO_3$ films) using advanced pulse laser deposition (PLD) and sputtering systems available at Dr. Moya's laboratory. The student was also trained to perform electrocaloric, barocaloric, and multicaloric experiments on multicaloric samples (e.g. Y_2CoMnO_6) brought from USF. The student discussed preliminary results with Dr. Moya and future experiments that would be performed at UC and USF. Multicaloric measurements were discussed on a newly discovered multiferroic Skyrmion material GaV_4S_8. Ms. Clements also gave a Physics seminar on "*Magnetocaloric effect as a probe of the phase evolution of noncollinear spin textures: An analysis of* $Cr_{1/3}NbS_2$*"* in the Department of Materials Science and Metallurgy at UC during her September visit. The seminar was well received by the UC students and colleagues, promoting the excellent research activities at USF Physics.

Dr. Xavier Moya visited USF in December 2018 and performed transverse susceptibility and spin Seebeck effect experiments in Dr. Phan's laboratory. During his visit, Dr. Moya discussed with Dr. Phan and the students about new, exciting research results obtained at UC, as well as new results obtained at USF. Dr. Moya also gave a special Physics seminar on "*Cooling under pressure"* for USF Physics. The seminar was well received by the USF colleagues and opened up new opportunities for collaboration between his group and the research groups at USF. Dr. Phan, USF postdoctoral researcher Dr. Vijaysankar Kalappattil, Ms. Clements and Dr. Moya are involved in writing two joint papers which highlight the new and important findings from this joint project.

The researchers have developed a new method for creating a giant, reversible laser-induced resistive switching effect in epitaxial oxide thin films using strain from the structural transition of a substrate. Magnetic and transport experiments were performed in Dr. Phan's laboratory at USF. A manuscript featuring these new and important findings is completed and will be submitted to *Nature: Scientific Reports* within a couple of weeks. Additionally, in collaboration with Dr. Moya's group, Dr. Phan's group has conducted magnetic anisotropy investigations on LSMO and LCMO films grown on BTO and STO substrates, using the RF transverse susceptibility (TS) technique. The high quality thin films were grown by the PLD method and provided by Dr. Moya's group. The TS data collected at USF, coupled with the magnetometry performed at UC, provide for the first experimental demonstration for the giant enhancement of magnetic anisotropy due to extrinsic strain as a result of the structural transition of BTO. A manuscript featuring these new and important findings is being written for publication in *Physical Review B*.

Dr. Phan's group has been continuing experiments (magneto-resistance, magnetocaloric, and spin Seebeck effect) on new oxide films provided by Dr. Moya. At the same time, Dr. Moya's group has been performing caloric experiments

on samples grown and provided by Dr. Phan's group. Dr. Phan is planning to visit the University of Cambridge in the first week of June 2019. He will discuss with Dr. Moya and his group about new results, new samples and new experiments. During his visit, Dr. Phan will give a special physics seminar at UC, featuring excellent outcomes of this UNI-funded project. He will also visit UC laboratories to discuss and initiate new collaborations with other groups at UC. He will discuss with Dr. Moya and write joint research proposals based on the obtained results. These proposals will be submitted in fall 2019.

Clint Randles, College of The Arts (Music Studies)
Exploring the Dispositions of Highly Effective Teachers in Contemporary Ensemble Settings

Clint Randles is studying musical creativity as it pertains to the preparation of music teachers. Innovative teaching practice starts with teachers thinking differently with and through music. USF is a leader in curricular innovation as it pertains to training future music teachers to teach musical creativity. Dr. Randles' research focus, demonstrated by recent presentations and publications supported by the UNI award, reflects this leadership. Specifically, the UNI award has contributed to research resulting in three presentations since August 2018 and two upcoming presentations in March 2019. A total of three publications have also resulted: one manuscript has been published in *The Oxford Handbook of Assessment Policy and Practice in Music Education* (ed. Brophy, 2018); another manuscript is in press, and another is in review.

John Robison, College of The Arts (Music)
Chinese and Chinese-Influenced Music in the Twenty-First Century

This project includes a book of essays exhibiting cross-influences between Chinese and Western music in the twenty-first century, co-edited by professors Yu Hui (Yunnan University) and John Robison (USF). The emphasis is on Chinese composers influenced by Chinese music, Western composers impacted by their studies of Chinese traditional music, and Western influences upon modern Chinese composers. Selected papers read at the *Composition in Asia Symposia* (USF 2015, 2018) will be included, and additional scholars have been invited to submit essays to ensure that the topics discussed in the book will be attractive to a wider circulation of international readers. Drs. Yu and Robison have agreed that the book will include the following essays:

- Dr. Chen Hongduo (Professor of Musicology, Shanghai Conservatory of Music): *Analysis of Bidirectional Rhetoric of Chinese and Western Elements in Chen Musheng's 'A Dream in the Peony Garden'*
  - Chen Musheng is one of the most important middle-aged Chinese composers
- Ye Yu (PhD Musicology Student, University of Texas, writing about his uncle Ye Guohui's music) *Ancient Melody and New Sound in 'Music from the Tang Court'*
- Yang Huibing (Graduate Student, Central Conservatory of Music, Beijing): *Resonating the Charm of Chinese Ink Painting: About Creation of Mr. Chang Ping's Oriental Wash Painting*
  - Chang Ping is one of the most well-established composition professors at the CCoM
- Dr. Yang TingTing (Professor at Nantong University, post-doctoral researcher at Shanghai Conservatory, on a famous Chinese composer in France): *The Collision Between Musical Thoughts of Chinese Guqin and Contemporary Orchestra: An Analysis of Chen Qigang's composition* 'Reflet d'un temps disparu'

- Dr. Jeffrey Roberts (Professor, University of Alberta; studied guqin extensively in China): *Intercultural Improvisation and Composition Practices on Guqin*
- Dr. John O. Robison (Professor, USF): *Wang Xilin, Human Suffering, and Compositional Trends in Post-Cultural Revolution China*
- Dr. Wang Zheng-Ting (Professor, University of Melbourne, Australia): *Cross-Cultural Elements in Paul Rudy's* 'Fantasie' *Composition*
- Dr. Nicholas Ng (Professor, Sydney Conservatorium of Music, Australia): *Fallen Leaves, New Roots*
- Dr. Frederick Lau (Professor, Hong Kong University): *Compositions of Chou Wen-Choung*
  - Chou, b. 1923, is a famous Chinese-American composer
  - Dr. Lau is one of the best writers on Chinese composers
- Loo Fung Ying (Professor, University of Malaya): *The Compositions of Zhao Xiaosheng*
  - This is an excerpt from a PhD dissertation

The last 2-3 essays on this list await final revisions, and Dr. Robison's work on Wang Xilin (only the parts that are not related to controversial topics such as the Tiananmen Square Massacre, etc.) will also be included. Several additional composers from China or the U.S. are expected to contribute additional essays, and the edited book is anticipated to be ready to send to the tentative publisher (Zhejiang University Press) in August 2019. Additionally, Dr. Robison and Yu's collaborative meeting at Yunnan University in November 2018 was quite productive, with the introduction of the new USF PhD students in Ethnomusicology to intercultural composers from China, India, and South Korea. Dr. Yu also arranged for Dr. Robison's lecture-recital for 1,000 people at Kunming Tech University.

Jeffrey G. Ryan, College of Arts and Sciences (Geosciences)
Characterizing Slab-to-Mantle Chemical Fluxes during Subduction: Isotopic and Abundance Systematics of Fluid-Mobile Elements in Subduction-Related Igneous and Metamorphic Rock Suites

Dr. Hong-Yan Li of the Guangzhou Institute of Geochemistry (GIC) visited USF from August 17-September 3, 2018 to work with Dr. Ryan on several papers and meet with USF Geology graduate students who will visit GIC in spring 2019. At the invitation of Dr. Yigang Xu, Director General of the GIC, Dr. Ryan presented a Keynote Lecture at the 2018 International Symposium on Deep Earth Processes and Practices in Beijing, PRC. Dr. Ryan also discussed plans for upcoming work on his IODP Expedition 366 recovered materials; student exchange activities in the Spring; and establishing additional collaborative connections with Dr. Xiao-Long Huang of GIC, a Shipboard Scientist on IODP Expedition 367 (Dr. Huang sailed on that Expedition with Dr. Ryan's graduate student, Antonio Luna).

Other summer-fall project activities involved the completion and submission of two manuscripts and progress on several others, as well as presentations at the 2018 Goldschmidt Conference in Boston, MA. One paper, on which Dr. Ryan and a GIC graduate student worked, has now been published. Another paper, on which Dr. Li and Dr. Ryan were co-authors, has also been published.

Current and ongoing activities involve the completion of an NSF proposal to support Dr. Ryan's part in collaborative planned work on IODP Expedition 366 recovered materials as well as preparing for spring visits to GIC by Dr. Ryan and one or more USF Geoscience graduate students.

Stephen E. Saddow, College of Engineering (Electrical Engineering)
Brain Implantable Electrode Array Based on SiC Nanowire Networks

The first of two planned visits to the host laboratory FORTH in Heraklion, Crete (Greece) was made in June 2018. During this time, several meetings were held to plan the collaborative research activities for the rest of the project:

- Continue on-going nano-patterning of silicon carbide (SiC) in Grenoble, FR where Dr. Konstantinos Zekentes (host) is also working. This work began in 2017 during Dr. Saddow's Visiting Professor research stage (paid by the French government).
- Plan for additional etching experiments during the next visit to FORTH, including a tour of the fabrication facilities, etc. Etch methods, chemistry, masking materials, etc. were discussed and a plan for future experiments drafted.
- Bio experiments were discussed, both in-vitro and in-vivo, involving Dr. Saddow's novel all-SiC neural implants that are being developed in Tampa. Some of these experiments will be conducted by colleagues in Athens, Greece (Panagiotis Dimitrakis, PhD, Nanotechnology and Microsystems Lab at the Institute of Nanoscience and Nanotechnology of the Demokritos, the National Center for Scientific Research Center).

Based on the preliminary visit, some progress has occurred in Grenoble, and Dr. Saddow will visit the laboratory in February to continue this work. During this visit, he will participate in a PhD defense as an examiner of the dissertation of Romain Bange, electrical engineering PhD candidate at Université Grenoble Alpes. In addition to this activity, a paper was presented at the 2018 European SiC Conference based on this research.

Elizabeth Schotter, College of Arts and Sciences (Psychology)
Investigating Enhanced Peripheral Processing in Deaf Individuals: Purely Perceptual or Linguistically Driven?

Reading ability in deaf individuals is a critical topic of study, as average reading scores of deaf adults tend to lag behind that of their hearing peers. Interestingly, among deaf individuals who have high reading ability, evidence suggests that they actually read more efficiently than their reading-level matched hearing counterparts because a wider perceptual span allows them to allocate more attention to peripheral areas of text. With support of the UNI award, Dr. Elizabeth Schotter's project investigates whether deaf readers' enhanced peripheral attention results from auditory deprivation or experience with a visual language such as American Sign Language (ASL).

Preliminary work (Experiment 1) suggested that both deafness and language experience contribute to an ability to recognize static linguistic information (i.e., briefly presented images of ASL fingerspelled letters) in the periphery because deaf signers outperformed hearing signers and, among hearing signers, ASL proficiency was related to recognition accuracy. In subsequent experiments, deaf signers and hearing non-signers observe videos and identify fingerspelling letters within word or non-word sequences (Experiment 2) or identify handshapes of signs or non-signs (Experiment 3) in the near and far periphery. The hypotheses are: that linguistically meaningful stimuli (when compared to random letter strings or non-words) facilitate perceptual recognition and mitigate the decrease in accuracy of perceptual discrimination at far eccentricities; and that deafness enhances peripheral processing such that deaf signers perform peripheral tasks better than hearing non-signers.

Since receiving the UNI award, USF researchers have taken two brief research visits to meet with partners at Boston University. USF researchers attended a lab meeting, presented their research to other scientists in the field, and made contacts with potential future collaborators at Boston University. In addition to working on the UNI funded

collaboration, USF researchers discussed and observed the data collection procedures unique to research labs at Boston University, which conduct studies on the special population of deaf individuals, the focus of this collaboration. The second trip involved use of the equipment and resources available in Boston to create stimuli for the UNI funded project and to begin creating the computer program to execute the study.

Since returning to USF, study preparation has concluded and data collection is underway for Experiments 2 & 3. During a data collection period in December 2018, 34 deaf/hard-of-hearing participants were recruited (and compensated with funds from the UNI grant) by the Boston University research team. Recruiting this many individuals represents a significant effort given the low-incidence in the population (i.e., about 2 to 3 out of every 1,000 children in the United States are born with a detectable level of hearing loss in one or both ears). Data collection has begun from a control group of hearing participants at USF this semester, and it is anticipated that data collection will be completed by the middle of March 2019. The results/findings of the first experiment were presented at the *Annual Meeting of the Psychonomics Society* in New Orleans, LA in November 2018 and the *Workshop on Reading, Language, and Deafness* (*WoRLD*) in San Sebastian, Spain in October 2018. Preliminary data from Experiments 2 & 3 will be presented at the *CUNY Conference on Human Sentence Processing* in Boulder, CO in March 2019, which has a special topics emphasis on "Variation in the Mechanisms of Human Language Processing" and a focus on deafness, highlighting the importance and timeliness of this research project.

The results of this project will strengthen a proposal for a NIH R21 grant to the National Institute of Deafness and Other Communication Disorders (NIDCD) to be submitted in June 2019. The proposal will be drafted with the help of the collaborators at Boston University, who will be making a UNI-funded research visit to USF in February 2019. At that time, analysis of the results comparing the data from deaf and hearing individuals will take place, and the collaborators plan to solidify a series of future studies for the NIH R21 grant proposal.

Glen Gordon Smith, College of Education (Educational and Psychological Studies)
Teen Text and Talk Games in Web eBooks for Plurilingualism

Receiving the UNI Nexus grant gave a boost to Dr. Smith's research group, IMapBooks, which is making great strides in establishing an active joint research program between the University of Ljubljana, Slovenia (U-Ljb): and USF. Dr. Smith has spent several months in Ljubljana, Slovenia to jump-start the research. The research partnership involves IMapBooks, a new form of book created by Dr. Smith. To address the decline in children's recreational reading and reading motivation, the IMapBooks research team develops books that add games and social interaction into web-based eBooks. Students read pages of text, come to a game that can only be won by comprehending the previous text, and read on.

IMapBooks has been tested in the U.S. and is now on track to be tested in Europe. Dr. Smith is working with two colleges/departments at U-Ljb: the College of Education (Pedagoska Fakulteta, PeF) and the Computer Science Department (Fakulteta Racunalistvo in Informatiko, FRI); and the Artificial Intelligence and Linguistics Laboratory at the Institute Jožef Stefan (IJS).

Work with the PeF so far has involved preparation for two studies: a small study in March in two fourth grade classrooms in Ljubljana, and a full study in May involving 300 participants. Both studies will investigate how (a) social interaction (small group discussions within eBooks stories) and games involving text conversations with characters designed around comprehension, versus (b) business as usual, differentially improve: (i) general reading

comprehension, and (ii) motivation to read. Four PeF professors and ten students PeF are involved with developing the materials. Dr. Smith has taught classes related to his research and created materials for the first study as well. This started with converting four stories in the Slovenian language into the IMapBook form, setting up small group texting discussions and conversations with virtual characters in the stories, and including artwork and avatars. Dr. Smith has identified a cooperating school with two fourth grade teachers onboard for the first study. Drs. Tomaž Petek and Smith have also applied for a small grant from PeF to pay student researchers and artists who are working with IMapBook in Slovenia.

Work with the FRI and Dr. Slavko Žitnik has also rapidly progressed. In the spring of 2018, the IMapBook group supplied Dr. Žitnik data for Natural Language Processing (NLP), specifically, answers to open-ended inference questions obtained from an IMapBook novel, with each answer graded on a scale from 0.0 to 1.0 as to the correctness of answers. Dr. Žitnik used this data in his Masters level course in NLP as an assignment for student teams to develop algorithms for automatic question response grading, to be used in the IMapBook game-like conversations with characters. The students have developed the algorithms and tested the performance using data generated and graded in the U.S.

Additionally, Dr. Smith established a relationship with Dr. Simon Krek (Linguistics), the Director of the Artificial Intelligence & Linguistics laboratory (AIL) at the Institute Jožef Stefan in Ljubljana. The major goal of the AIL is to further NLP of the Slovenian language. Since the IMapBook project with PeF and elementary schools in Slovenia promises to generate data for Slovenian NLP (AIL & FRI) and use NLP algorithms, Dr. Krek regards this as a synergistic relationship and has earmarked funds to hire an IMapBook programmer in Slovenia and set up a local IMapBook server.

Hariharan Srikanth, College of Arts and Sciences (Physics)
Garnet Thin Films with Tunable Anisotropy for Spin Caloritronics

Functional Materials Laboratory and PhD student Eleanor Clements visited Professor Manfred Albrecht's group in University of Augsburg, Germany for initiating collaborative research on spin caloritronics and transport studies on highly anisotropic thin films. Spin caloritronics is an emerging research field which involves manipulating the spin degree of freedom via heat gradient for realizing highly efficient thermal to electrical energy conversion. Generation of a thermal gradient across the ferromagnetic material (longitudinal measurement set up) in the presence of magnetic field creates propagation of collective magnetic excitations (spin waves) which can carry spins, or spin current (as opposed to an electronic current in conventional thermoelectrics). Upon depositing a thin layer of highly spin-orbit coupled material like Platinum (Pt), this spin current can be efficiently converted into voltage due to spin Hall effect (SHE). This is called Spin Seebeck effect (SSE).

Recently, researchers in the USF Physics department have discovered that interfacial anisotropy has a strong influence in manipulating the spin transport across the interfaces in magnetic insulators. To explore these significant findings, Ms. Clements has successfully deposited highly anisotropic thin films of $Tm_3Fe_5O_{12}$ (TmIG) on $Gd_3Ga_5O_{12}$ (GGG) substrate using pulsed Laser deposition during her visit to the University of Augsburg. Further, with the help of collaborators, she has deposited ~ 10nm thick Pt strips on top of TmIG using magnetron sputtering. Currently, SSE and other spin transport studies on TmIG/Pt heterostructures are ongoing at USF.

The Functional Materials Laboratory (FML) at USF is equipped with several unique and sophisticated measurement facilities. Researchers at USF have developed a custom-designed cryogenic probe station for different measurements including longitudinal and transverse geometry measurements for SSE and several spin-dependent transport measurements, such as spin hall magnetoresistance (SMR), Anomalous Nernst effect (ANE), Anomalous Hall effect (AHE), etc. Also, the FML has also developed and calibrated different probes for similar spin transport measurements, which can be inserted into the physical property measurement system (PPMS) that provides the capability to perform measurements from 2 K to 400 K under an applied magnetic field up to 9T. Moreover, with the unique transverse susceptibility (TS) measurement probe at the FML using a self-resonant tunnel diode oscillator, researchers can explore the temperature-dependent evolution of the magnetic anisotropy in single crystals, nanoparticles, and thin films. The high-quality TmIG films that are being fabricated at the University of Augsburg are currently under investigation with these probes. With the expertise of sample fabrication of Professor Albrecht's group in University of Augsburg and characterization and measurement expertise of the FML, this project examines the tunability of perpendicular magnetic anisotropy of these thin films and its effective influence in controlling spin-dependent transport to advance understanding of the underlying phenomena governing these important effects.

James R. Stock, Muma College of Business (Marketing)
Identification of Best Practices in Supply Chain Sustainability in South African Manufacturers and Retain/Service Firms

Dr. Stock and first-year MBA student Bharat Tejwani will be traveling to South Africa in March 2019.

Helena K. Szepe, College of The Arts (Art and Art History)
Renaissance Manuscripts and Modern Memory

The UNI award has already greatly benefited the research collaboration undertaken by Dr. Szepe and scholars from the University of Padua. In June, Dr. Szepe travelled with USF MA candidate Karla Aguayo to meet with Dr. Federica Toniolo, Dr. Ponchia, and PhD candidate Margherita Zibordi at the University of Padua to plan and begin the research project. The group spent part of the trip examining manuscripts, which were created for nuns and are now in the Biblioteca del Seminario Vescovile, Padua, and in the Correr Museum Library, Venice. During this visit, among other significant finds, the researchers discovered a number of uncatalogued, and therefore unknown, 14th and 15th-century painted manuscripts for the nuns of the Benedictine monastery of Santa Croce della Giudecca, Venice. These were examined and photographed, and arrangements were made with the Director of the Library for further photography and study.

During this June visit, MA student Karla Aguayo also examined manuscripts made for Venetian nuns to provide a broader context and comparison for her arguments about an illuminated manuscript, now in the Walters Art Museum, Baltimore, made for nuns in Tuscany. She will complete that qualifying paper in Fall 2019.

In September, Dr. Szepe returned to Venice and examined documents in the Archivio Patriarcale of Venice (Patriarchal Archives) and the Archivio di Stato (State Archives) relevant to female religious orders. In the Archivio Patriarcale, Dr. Szepe focused on the pastoral visits in which sometimes the locations and numbers of manuscripts are listed. In the Archivio di Stato, Dr. Szepe examined the records of the dissolution of the monasteries and the inventories and dispersion of their goods, especially of the manuscripts. Together, this research on the manuscripts themselves, on

evidence of their location and numbers, and finally on evidence of what was left of them in the early nineteenth century before their dispersal, gives a new perspective on the changing meaning and significance of these illuminated works.

In October, Dr. Szepe presented a paper titled "Manuscripts for Augustinian Canonesses in Venice," at the *The Colors of Paradise: Painting Miniatures in Italian Convents* conference, organized by The Medici Archive Project and Museo Nazionale di San Marco, in Florence, Italy. In this talk, Dr. Szepe included some of the new discoveries, and the conference organizers have asked to publish the talk as a paper in their forthcoming volume of the same title as the conference to be published by the academic press, Brepols.

In addition, Drs. Szepe and Toniolo are currently writing an article, at the request of the editors, to be submitted June 30, 2019, to the peer-reviewed journal *Artibus et Historiae* and published in 2020, in which we discuss reconstruction of illuminated manuscripts for the nuns of Santa Croce della Giudecca and their dispersion in the early nineteenth century. Additionally, Dr. Szepe has been invited to give a talk at the St. Louis Annual Symposium on Medieval and Renaissance Studies Manuscript (June 17-19) related to this material.

Dr. Toniolo and her team are coming to USF February 18-25. During this time, the researchers will continue to discuss joint research and develop the first article stemming from it as well as future publications, including an edited collection of essays. In addition, on February 21, the team will present a seminar on the dispersal and collecting of liturgical manuscripts; a public lecture on these manuscripts; and the transmission of artistic culture via monastic houses.

Tony Tan, College of Education (Educational and Psychological Studies)
Role of Collectivism, Individualism, and Social Sensitivity Alleles in the Etiology of Anxiety-Related Behaviors

Dr. Tan traveled to China in October 2018 to meet with Dr. Jun Li, Professor at Beijing Normal University. While there, Dr. Tan formed another partnership with two schools. The researchers at the collaborating institutions have submitted one manuscript and collected behavioral data from four sites – with a total of 1100 participants and DNA data from one site with about 600 participants. Data analysis and genotyping are current and ongoing. Dr. Tan is confident that more manuscripts will come out of this project. The ongoing data collection will be used to strengthen a grant proposal in progress to submit.

Davide Tanasi, College of Arts and Sciences (History)
American French Collaborative Research of Paleo-Contents of Roman Amphorae from Sicilian Underwater Contexts

This project aims to characterize the content of Roman and Late Roman amphorae coming from several different shipwrecks identified off the coasts of Marsala, in Western Sicily. Marsala (Lilybaeum in Latin) was a major Roman port and trading post between Tunisia and Italy. The high number of amphorae recovered underwater from shipwrecks of various periods testifies to a consistent flux of goods moving from north Africa to Sicily and possibly vice versa. To identify the content of those containers and consequently to characterize an entire cargo would be extremely helpful to shed light on the commercial and economic dynamics of the Sicily-North Africa system in the Late Roman period.

Using Gas-Chromatography and Liquid-Chromatography Mass Spectrometry (GC-MS and LC-MS) analytical techniques, it will be possible to identify the chemical signatures of organic residue imbued in the ceramic body of the amphorae and define contexts such as grape wine and olive oil. To such extent, a collaborative research project has been undertaken with Dr. Michel Bonifay and Dr. Filippo Pisciotta, (Centre Camille Jullian, CNRS and Aix-Marseille University, Aix-en-Provence, France) to characterize the contents of a group of amphorae held at the Archaeological Museum "Baglio Anselmi" of Marsala.

Thirty-three vessels ranging in chronology between the 2nd and the 7th century C.E., were sampled over summer 2018 and samples were subsequently submitted first for Gas-Chromatography Mass Spectrometry (GC-MS) analyses. The preliminary results showed the presence on seven amphorae of palmitic, stearic and linoleic acids which are the markers of olive oil. Further analyses are ongoing.

Sylvia W. Thomas, College of Engineering (Electrical Engineering)
Bio and Electronic Advanced Material Systems (USF BEAMS)

Dr. Thomas and PhD student William Serrano-Garcia completed a trip to Naples and Milan to meet with collaborators Drs. Vincenzo Guarino and Mario Caironi, who will be visiting USF in spring 2019. With support from the UNI award, Dr. Thomas contributed to a special issue of *Journal of Functional Biomaterials* and authored a forthcoming book chapter in Conductive Polymers and Metal Oxide Polymeric Composites for Nanostructures in Nanodevices. Dr. Thomas plans to submit a NSF IRES proposal in September 2019.

Arjan van der Vaart, College of Arts and Sciences (Chemistry)
Elucidating the Structure and Dynamics of Intrinsically Disordered Spider Silk Proteins by NMR and Modeling Approaches

The UNI award sponsors the elucidation of the structure and dynamics of spider silk proteins. This project aims to characterize the intrinsically disordered state as well as the first aggregation steps in the fiber formation process through collaborative approaches that involve NMR experiments in the Yarger lab at Arizona State University (ASU) and modeling techniques in the van der Vaart lab. Elucidating details about the initially intrinsically disordered state of the proteins in the gland and the initial steps in the aggregation process is not only important for the biology of spiders and other insects that rely on silk for crucial life tasks, but also for the advancement of understanding the structure and dynamics of intrinsically disordered proteins and the self-assembly of complex hierarchical biochemical structures.

USF researchers visited the Yarger group in October 2018. By careful financial planning, two graduate students, Paul Orndorff and Seyedmahmoudreza (Iman) Keshavaraz, were able to join and engage with the Yarger group during this very fruitful visit. To elucidate the structural properties of silk under dope and fiber conditions, multiple replica exchange with solute tempering simulations were performed on model peptides extracted from the *N. clavipes* gene. Results indicate that both the unidirectional extension experienced during the spinning process and the low dielectric of the fiber facilitate the unique secondary structure identified in silk. The researchers are composing an article detailing these important findings and plan to submit the manuscript this semester.

The USF researchers, Yarger group, and collaborators at Utah State University and San Diego State University are collaborating to submit a NSF Materials Innovation Platforms proposal on spider silk. This large award ($12M-$15M over 5 years) focuses on the convergence of materials research with biological sciences for developing new materials, and is due in April (due to the government shutdown).

While visiting the Yarger group in October, the USF team also visited another ASU collaborator, Professor Marcia Levitus, to discuss a separate project on DNA dynamics and plan the resubmission of their joint NSF proposal. This proposal, "Collaborative research: Role of DNA sequence and deformability on lesion recognition and excision in the base excision repair pathway," with $199,993 requested for Dr. van der Vaart, was submitted in January 2019.

Sarath Witanachchi, College of Arts and Sciences (Physics)

USF-Botswana Collaborative Research towards Portable Power Generation in Rural Africa

The UNI Award led to receiving a research grant from NSF for International Research Experience for Students (IRES). Dr. Witanachchi traveled to Botswana International University of Science and Technology (BIUST) in November 2018 to initiate the research project and to arrange logistics for seven USF undergraduate and graduate students arriving in summer 2019. This summer group will also include a social science student who will study the cultural norms of the tribes to understand the social structure and effect of technology on the tribal society. Dr. Witanachchi also gave a research presentation at BIUST. Long-term goals for the collaboration were discussed in meetings with VP for Research and other BIUST administrators.

UNI Outcomes

The scholarly impact of UNI-supported projects can be seen in the resultant publications, presentations, strengthened partnerships, and grant proposals.

Publications

Galperin, B. & Read, P. L. (Eds.). (2019). *Zonal jets: Phenomenology, genesis, and physics.* New York: Cambridge University Press.

Li, X., Li H-Y., **Ryan, J. G.**, Wei G-J., Zhang, L., & Xu, Y-G. (2018). High-precision measurement of B isotopes on low-boron oceanic volcanic rock samples via MC-ICPMS: Evaluating leaching effects on boron isotope compositions. *Chemical Geology,* 505, 76-85.

Randles, C. (2018). Assessing musical compositions. In T. Brophy (Ed.), *The Oxford Handbook of Assessment Policy and Practice in Music Education, Volume 2: Practice* (pp. 611-628). New York: Oxford University Press.

Shervais, J.W., Reagan, M. Haugen, E., Almeev, R., Pearce, J., Prytulak, J., **Ryan, J. G.**, … Vetter, S. K. (2018). Magmatic response to subduction initiation, part 1: Fore-arc basalts for the Izu-Bonin Arc from IODP Expedition 352. *Geochemistry Geophysics Geosystems*, DOI: 10.1029/2018GC007731.

Publications – In Press

Berson, I. R., Murcia, K., **Berson, M. J.**, McSporran, V., & Damjanovic, V. (in press). Exploring young children's play and creativity with tangible technologies in early childhood classrooms in Australia and the United States. *Kappa Delta Pi Record*.

Pappas, C., Small, B. J., **Andel, R.**, Laczó, J., Parizkova, M., Ondrej, L., & Hort, J. (in press). Blood glucose levels may exacerbate executive function deficits in older adults with cognitive impairment. *Journal of Alzheimer's Disease*, 1-9.

Park, S., Ryu, J., & McChesney, K. (in press). Collaborative studio experiences between South Korean and American pre-service teachers: A case study of designing culturally-responsive virtual classroom simulation. *TechTrends: Linking Research and Practice to Improve Learning*.

Randles, C. (in press). Modern band, songwriting, and innovation. In C. Conway, K. Pellegrino, A. Stanley, & C. West (Eds.), *Oxford Handbook of Preservice Music Teacher Education in the United States*. New York: Oxford University Press.

Thomas, S. W. (in press). Conductive polymers and metal oxide polymeric composites for nanostructures in nanodevices. In Guarino, V., Focarete, M. L., & Pisignano, D. (Eds.), *Advances in Nanostructured Materials and Nanopatterning Technologies*.

Publications – Manuscripts Submitted

Kalappattil, V., Das, R., Moya, X., Srikanth, H., & **Phan, M. H.** *Giant laser-induced resistive switching effect in $La_{0.7}Sr_{0.3}MnO_3$ films due to extrinsic strain from $BaTiO_3$ substrates*. Manuscript submitted for publication.

Li, H-Y., Taylor, R., Prytulak, J., Shervais, J., **Ryan, J. G.**, Godard, M., … & Pearce J. A. *Radiogenic isotopes document the start of subduction in the Western Pacific.* Manuscript submitted for publication.

Li, H-Y., Li, X., **Ryan J. G.**, Jie, L., & Xu, Y-G. *Molybdenum and boron isotope evidence for fluid-fluxed melting of intraplate upper mantle*. Manuscript submitted for publication.

Mukherjee, P., Stern-Taulats, E., **Phan, M. H.**, Mathur, N. D., & Moya, X. *Multicaloric perovskite oxides.* Manuscript submitted for publication.

Randles, C. Using maschine jam to set the groove for classroom improvisation. In A.P. Bell (Ed.), *The Music Production Cookbook: Ready-Made Recipes for the Classroom*. Manuscript submitted for publication.

Publications – Manuscripts In Preparation

Kalappattil, V., Das, R., Moya, X., Srikanth, H., & **Phan, M. H.** *Probing strain-induced magnetic anisotropy in $La_{0.7}R_{0.3}MnO_3/BaTiO_3$ (R = Sr, Ca) heterostructures*. Manuscript in preparation.

Li, H-Y., Li, X., **Ryan, J. G.**, & Xu, Y. *The origins of slab-derived fluids during the earliest stages of subduction: Boron abundance and isotopic systematics through a stratigraphic section of Izu-Bonin boninites, IODP Expedition 352*. Manuscript in preparation.

Presentations

Berson, I. R., & **Berson, M. J.** (2018, June). *Creative coding*. Sixth Digital Literacy and Multimodal Practices of Young Children DigiLitEY Meeting, Riga, Latvia.

Berson, I. R., & **Berson, M. J.** (2018, July). *Tangible technologies in early childhood*. Hubei University of Arts and Science, Xiangyang, China.

Li, H-Y, *Li, X.*, **Ryan, J. G**., and Xu, Y-G. (2018a, August). *Boron isotopes in boninites record evolving input from a cooling slab during subduction initiation*. Goldschmidt Conference, Boston, MA.

Li, H-Y., *Li, X.*, **Ryan, J. G.**, Li, J., and Xu Y-G. (2018b, August). *Tracing fluids from the stagnant Pacific slab in the mantle transition zone beneath the eastern north China craton using molybdenum isotopes*. Goldschmidt Conference, Boston, MA.

Randles, C. (2018, August). *Pathways from the hero's journey: A tribute to Joseph Campbell and the 30th anniversary of his death*. Panel at the Creativity Conference, Ashland, OR.

Randles, C. (2018, August). *Music and animation: A perfect pairing for students with autism*. Creativity Conference, Ashland, OR.

Bange, R., Bano, E., Rapenne, L., Mantoux, A., **Saddow, S. E.**, & Stambouli, V. (2018, September). *Development of SOI FETs based on core-shell Si/SiC nanowires for sensing in liquid environments*. European Conference on Silicon Carbide and Related Materials (ECSCRM), Birmingham, United Kingdom.

Berson, I. R., Luo, W., **Berson, M. J.**, & Damjanovic, V. (2018, October). *Misappropriation of Children's Digital Play? Cross-National Perspectives from U.S. and China*. 26th International Reconceptualizing Early Childhood Education Conference, Copenhagen, Denmark.

Johnson, E., **Schotter, E. R.**, & Lieberman, A. (2018a, October). *Peripheral attention and American Sign Language*. Workshop on Reading, Language, and Deafness, San-Sebastian, Spain.

Ryan, J. G., Johnston, R., Fryer, P., Wheat, C. G., Williams, T., and the Expedition 366 Science Team. (2018, October). *The development of the subduction channel and 'turning on' of slab-to-mantle material exchanges at the start of subduction: insights from eruptive serpentinites (IODP Exp 366) from the forearc of the Mariana subduction system*. Keynote presentation at the International Symposium on Deep Earth Exploration and Practices, Beijing, China.

Szepe, H. K. (2018, October). *Manuscripts for Augustinian Canonesses in Venice*. The Colors of Paradise: Painting Miniatures in Italian Convents, Florence, Italy.

Johnson, E., **Schotter, E. R.**, & Lieberman, A. (2018b, November). *Investigating the sources of deaf signers' enhanced peripheral attention: ASL experience and deafness*. Annual Meeting of the Psychonomic Society, New Orleans, LA.

Luo, W., **Berson, I. R., & Berson, M. J.** (2018, November). *Early childhood teacher preparation with tangible technologies: A cross-national study in China and the U.S.* NAEYC 良好開端 Good Start, Washington, DC.

Karakas, F., Maas, A., **Murphy, D.** (2019, January). *Low Reynolds number swimming of sea butterflies with differently shaped shells.* Microscale Ocean Biophysics, Whistler, Canada.

Murphy, D., *Karakas, F.*, Maas, A. (2019, January). *Swimming of a pteropod with a conical shell.* Microscale Ocean Biophysics, Whistler, Canada.

Randles, C. (2019, January). *Leadership in music education.* Summit 2.0: 21st Century Music School Design, Columbia, SC.

Future Presentations

Johnson, E., **Schotter, E. R.**, & Lieberman, A. (2019, March). *Enhanced peripheral lexical processing in deaf individuals: perceptual or linguistically driven?* CUNY Conference on Human Sentence Processing0, Boulder, CO.

Randles, C. (2019a, March). *Music and animation: Connecting students with Autism to viable careers in the arts.* Enacting Curricular Change through Vernacular Music Conference, Cleveland, OH.

Randles, C. (2019, March). *Change in music teacher education: Lessons from Tampa, FL.* Enacting Curricular Change through Vernacular Music Conference, Cleveland, OH.

Berson, I. R., **Berson, M. J.**, Murcia, K., Luo, W., & Damjanovic, V. (2019, April). *Digital play with tangible technologies in Australian and American preschools.* Paper presentation at the 100th American Educational Research Association Meeting, Toronto, Canada.

Meloncon, L. (2019, May). *Introducing a new UX approach for health communication: Plus-Minus-Check.* Society of Technical Communication Summit, Denver, CO.

Seminars

Clements, E. (2018, September). *Magnetocaloric effect as a probe of the phase evolution of noncollinear spin textures: An analysis of* $Cr_{1/3}NbS_2$. Physics seminar at University of Cambridge, Cambridge, UK.

Partnerships

USF Faculty Name	College	Country/State of Collaboration	Project Title	Partnerships through UNI
Ross Andel	Behavioral and Community Sciences	Czech Republic	Examination of Biological and Genetic Markers for Alzheimer's Disease in the Czech Republic	Jakub Hort, M.D., Ph.D. Charles University
Ilene R. Berson & Michael Berson	Education	China	Integrating Digital Play with Tangible Technologies into Inquiry Project Investigations in Early Childhood Classrooms	Tiane Liu, Ph.D., Professor Hubei University of Arts and Science Jiabao Wang, M.Ed., Dean College of Education Hubei University of Arts and Science School of Education, Curtin University (Australia) School of Education, University of Sheffield (UK)
Alisha Braun	Education	Tanzania	Inclusive Education in Tanzania: Exploring Primary School Teacher Preparedness	Joachim Tamba Institute for Educational Development East Africa Aga Khan University
Stephanie L. Carey	Engineering	Spain	Robotic Framework for Bipedal Locomotion Benchmarking	Diego Torricelli, Ph.D. Neural Rehabilitation Group Cajal Institute Spanish Research Council Jose Pons, Ph.D. Neural Rehabilitation Group Cajal Institute Spanish Research Council
Gary W. Daughdrill	Arts and Sciences	Argentina	Structure and Dynamics of the Adenovirus E1A Protein Binding to the Human Retinoblastoma Protein, Rb	Lucia B. Chemes, Ph.D, Group Leader and Professor Institute for Biotechnological Investigations - CONICET National University of San Martín
Eric S. Davis	Education	Texas	The Examination of Child Teacher Relationship Therapy Training for Speech-Language Pathology Students Working with Preschool Children with Language Disorders and Behavioral Issues	Diane Loeb, Ph.D., CCC-SLP Martin Family Endowed Chair Baylor University
McArthur Freeman, II	The Arts	Ohio	Multimodal Strategies for Visual Storytelling in VR	Kyoung Lee Swearingen, Professor The Ohio State University Scott Swearingen, Professor The Ohio State University
Boris Galperin	Marine Science	Italy	Experimental Investigation of the Momentum and Mass Transfer by Zonal Jets	Stefania Espa, Ph.D., Assistant Professor Sapienza University of Rome Gregory King, Ph.D., Research Associate University of South Florida
Elizabeth Hordge-Freeman	Arts and Sciences	California	Color Matters: The Impact of Colorism on Affective Relationships and Financial Transfers in U.S. Families	Jessica Kizer, Ph.D., Assistant Professor Pitzer College
Maayan Lawental	Behavioral and Community Sciences	Australia	Stigma towards Persons with Dual Diagnosis of Substance Use Disorders and Mental Health	Tal Araten-Bergman, Ph.D. La-Trobe University
John Lennon	Arts and Sciences	Sweden	Working-Class Literature from a Global Perspective	Magnus Nilsson, Ph.D., Professor Malmö University

Xiaopeng Li	Arts and Sciences	Georgia	Investigation of Surface Self-Assembly of Giant Supramolecules by Scanning Tunneling Microscope (STM) and Atomic Force Microscopy (AFM)	Bingqian Xu, Ph.D., Professor University of Georgia
Lisa Meloncon	Arts and Sciences	Netherlands	Testing the Attention Comprehension Gap through Innovative Usability Methods	Menno de Jong, Ph.D., Professor University of Twente
Frank Muller-Karger and Enrique Montes	Marine Science	Brazil	Marine Biodiversity Workshop: from the Sea to the Cloud - Laying the Foundations of the Pole-to-Pole Marine Biodiversity Observation Network of the Americas	Enrique Montes, Ph.D., Research Faculty Institute for Marine Remote Sensing University of South Florida Antonio C. Marques, Ph.D., Professor Institute of Biosciences University of Sao Paulo Eduardo Klein, Associate Professor Chair of OBIS Steering Group Remote Sensing and Geo-Spatial Analysis Laboratory Simón Bolívar University Tina Dohna, Ph.D. Center for Marine Environmental Research University of Bremen Kristin Kaschner, Ph.D., Research Associate Albert-Ludwigs University Kirsi Kostamo, Ph.D., Leading Research Scientist SYKE Marine Research Center University of Helsinki Benjamin D. Best, Ph.D., Environmental Data Scientist EcoQuants (CA)
David W. Murphy	Engineering	Bermuda	Sea Butterfly Swimming: Bio-Inspiration for Aquatic Micro Aerial Vehicles	Amy Maas, Ph.D. Bermuda Institute of Ocean Sciences
Cecilia Nunes	Arts and Sciences	Vermont	Identifying Potential Abiotic Stress-Associated Biomarkers in Strawberry Fruit Using Advanced Mass-Spectrometry-Based Proteomics and Classical Biochemical Approaches	Stanley N. Stevens Jr., Ph.D., Associate Professor Albany College of Pharmacy and Health Sciences
Hua Pan	Medicine	North Carolina	Developing Novel RNA Alteration Strategies for Neurological Disorders by Targeting TMEM16 Family Protein	Huanghe Yang, Ph.D., Professor Duke University
Sanghoon Park	Education	South Korea	Design and Validation of Culturally-Contextualized Virtual Teaching Scenarios for Immersive Virtual Teaching Simulations	Jeeheon Ryu, Ph.D., Associate Professor Chonnam National University
Manh-Huong Phan	Arts and Sciences	UK	Novel Multicaloric Heterostructures for Advanced Spintronics Applications	Xavier Moya, Ph.D., Senior Research Fellow University of Cambridge
Clint Randles	The Arts	California	Exploring the Dispositions of Highly Effective Teachers in Contemporary Ensemble Settings	Peter Webster, Ph.D., Vice Dean of Scholarly and Professional Studies University of Southern California
John Robison	The Arts	China	Chinese and Chinese-Influenced Music in the Twenty-First Century	Hui Yu, Ph.D., Professor Yunnan University
Jeffrey G. Ryan	Arts and Sciences	China	Characterizing Slab-to-Mantle Chemical Fluxes during Subduction: Isotopic and Abundance Systematics of Fluid-Mobile Elements in Subduction-Related Igneous and Metamorphic Rock Suites	Hong Yan Li, Ph.D., Research Associate Professor Guangzhou Institute of Geochemistry Chinese Academy of Sciences

Stephen E. Saddow	Engineering	Greece	Brain Implantable Electrode Array Based on SiC Nanowire Networks	Konstantinos Zekentes, Ph.D., Senior Researcher Foundation for Research & Technology University of Crete
Elizabeth Schotter	Arts and Sciences	Massachusetts	Investigating Enhanced Peripheral Processing in Deaf Individuals: Purely Perceptual or Linguistically Driven	Amy Lieberman, Ph.D., Assistant Professor Boston University
Glen Gordon Smith	Education	Slovenia	Teen Text and Talk Games in Web eBooks for Plurilingualism	Slavko Zitnik, Ph.D., Research/Teaching Faculty University of Ljublyana
Hariharan Srikanth	Arts and Sciences	Germany	Garnet Thin Films with Tunable Anisotropy for Spin Caloritronics	Manfred Albrecht, Ph.D., Professor Institute of Experimental Physics University of Augsburg
James R. Stock	Muma	South Africa	Identification of Best Practices in Supply Chain Sustainability in South African Manufacturers and Retain/Service Firms	Frank Harvey, Ph.D., Endowed Professor of Marketing University of South Florida Jan Havenga, Ph.D., Professor Stellenbosch University Mrs. Anneke De Bod Stellenbosch University
Helena K. Szepe	The Arts	Italy	Renaissance Manuscripts and Modern Memory	Frederica Toniolo, Ph.D., Professor University of Padua Chiara Ponchia, Ph.D., Assistant Professor University of Padua
Tony Tan	Education	China	Role of Collectivism, Individualism, and Social Sensitivity Alleles in the Etiology of Anxiety-Related Behaviors	Jun Li, M.D., Ph.D., Professor State Key Laboratory of Cognitive Neuroscience and Learning Beijing Normal University
Davide Tanasi	Arts and Sciences	France	American French Collaborative Research of Paleo-Contents of Roman Amphorae from Sicilian Underwater Contexts	Michel Bonifay, Ph.D., Director of Research Centre Camille Jullian, CNRS Aix-Marseille University
Sylvia W. Thomas	Engineering	Italy	Bio and Electronic Advanced Material Systems (USF BEAMS)	Vincenzo Guarino, Ph.D., Research Scientist and Scientific Lead Institute for Polymers, Composites, and Biomaterials National Research Council of Italy Mario Caironi, Ph.D., Tenure-Track Researcher Center for Nano Science and Technology Italian Institute of Technology
Arjan van der Vaart	Arts and Sciences	Arizona	Elucidating the Structure and Dynamics of Intrinsically Disordered Spider Silk Proteins by NMR and Modeling Approaches	Jeffery L. Yarger, Ph.D., Professor Arizona State University
Sarath Witanachchi	Arts and Sciences	Botswana	USF-Botswana Collaborative Research Towards Portable Power Generation in Rural Africa	Gregory Hillhouse, Ph.D., Professor Botswana International University of Science and Technology Davison Murape, Ph.D. Botswana International University of Science and Technology

New Partnerships through UNI Award

- Dr. Arjan van der Vaart and colleagues at **Utah State University**, **San Diego State University**, and Arizona State University are collaborating on a NSF Materials Innovation Platforms proposal to be submitted by the April 2019 deadline.
- The following **organizations and universities** across the globe have joined USF to support MBON Pole to Pole (Muller-Karger and Montes):
  - Charles Darwin Foundation (Ecuador-Galapagos)
  - DFO (Fisheries and Oceans Canada)
  - Ministry of Environment and Sustainable Development – INVEMAR (Marine and Coastal Research Institute José Benito Vives de Andréis, Colombia)
  - Museo Argentino de Ciencias Naturalies (Argentina)
  - National Institute of Oceanography (Israel)
  - Northeastern University (USA)
  - Smithsonian Institute (USA)
  - Universidad de Concepción (Chile)
  - Universidad del Ecuador – ESPOL (Escuela Superior Politécnica del Litoral, Ecuador)
  - Universidade Estadual de Campinas (Brazil)
  - Universidades Federales (Brazil)
    - Espirito Santo
    - Fluminense
    - Paran
    - Rede Abrolhos
    - Rio de Janeiro – NUPEM
    - Santa Catarina
  - Universidad de Guayaquil (Ecuador)
  - University of Porto (Portugal)
  - Universidad de la República – UNDECIMAR (La Unidad de Ciencias del Mar, Uruguay)
  - University of Tasmania (Australia)
  - Universidad del Valle (Colombia)
  - Universidad de Valparaíso (Chile)
  - University of the Virgin Islands (U.S.-VI)
- Through Glen Gordon Smith's UNI project, the Director of the **Artificial Intelligence & Linguistics Laboratory (AIL)** at the Institute Jožef Stefan in Ljubljana, Slovenia dedicated funding for an IMapBook programmer in Slovenia and designated a local IMapBook server to further Natural Language Processing of the Slovenian language.
- John Lennon is working with Dr. Magnus Nilsson (Malmo University, Sweden), **Lund University** (Sweden), and administration at **universities in Denmark** to expand undergraduate and graduate working-class literature course offerings at each respective university. At the undergraduate level, students would collaborate on projects via web and leaming platforms. At the graduate level, students would work with professors from the partner universities on research projects.
- Lisa Meloncon is working on new partnerships with **MSU, UTEP, TTU, and ASU** to be able to visit usability labs at each campus to test the Plus-Check-Minus method with more diverse users.

Grant Proposals

Arjan van der Vaart

- **NSF Materials Innovation Platforms** grant submission with Utah State University and San Diego State University – April 2019 ($12M-$15M over five years)
- **NSF** grant with ASU, "Collaborative research: Role of DNA sequence and deformability on lesion recognition and excision in the base excision repair pathway" ($199,993 requested)

David Murphy

- **CAREER** proposal – submitted Summer 2018

Elizabeth Schotter

- **NIH Exploratory/Developmental Research Grant Award (R21)** to the National Institute on Deafness and Other Communication Disorders (NIDCD) submission – June 2019

Ilene Berson and Michael Berson

- **Australian Research Council Discovery Projects Initiative**, "How young children learn to code through play with digital technology," submission – February 2019

Jeffrey G. Ryan

- **NSF** proposal on recovering materials from IODP Expedition 366

John Lennon

- **Proposal to Stockholm University Press** submitted for a collection on working-class literature(s)from a historical and global perspective

Cecilia Nunes

- **USDA NIFA, Agriculture and Food Research Initiative (AFRI) Foundational Program** grant submission – Summer 2019

Sarath Witanachchi

- **NSF International Research Experience for Students (IRES)** grant recipient (August 2018)
  - $299,969 awarded

Stephanie Carey

- **NSF Accelerating Research through International Network-to-Network Collaborations (AccelNet)** grant submission – October 2019

Sylvia Thomas

- **NSF International Research Experience for Students (IRES)** grant submission – September 2019

Xiaopeng Li

- **NSF Designing Materials to Revolutionize and Engineer our Future (DMREF)** grant submission – February 2019 ($1.7M over four years)


Researchers and Scholars
UNIted
Across the World
United, we Shape the Future

Integrating Digital Play with Tangible Technologies into Inquiry Project Investigations in Early Childhood Classrooms

Ilene Berson, Ph.D. and Michael Berson, Ph.D.

Partners:

Tiane Liu, Ph.D., Professor
Hubei University of Arts and Science

School of Education, Curtin University (Australia)

Jiabao Wang, M.Ed., Dean, College of Education
Hubei University of Arts and Science

School of Education, University of Sheffield (UK)

Drs. Ilene and Michael Berson present to preschool teachers in Hubei Province on approaches to use tangible technologies in early childhood classrooms.

Drs. Ilene and Michael Berson meet with the Early Childhood faculty of Hubei University of Arts and Science to discuss collaborative research initiatives and faculty/ student exchange.

Marine Biodiversity Workshop: from the Sea to the Cloud – Laying the Foundations of the Pole-to-Pole Marine Biodiversity Observation Network of the Americas

Frank Muller-Karger, Ph.D. and Enrique Montes, Ph.D.

Partners:

Antonio C. Marques, Ph.D., Professor
Institute of Biosciences, University of Sao Paulo

Eduardo Klein, Associate Professor, Chair of OBIS Steering Group
Remote Sensing and Geo-Spatial Analysis Laboratory, Simón Bolívar University

Tina Dohna, Ph.D., Center for Marine Environmental Research
University of Bremen

Kristin Kaschner, Ph.D., Research Associate
Albert-Ludwigs University

Kirsi Kostamo, Ph.D., Leading Research Scientist
SYKE Marine Research Center
University of Helsinki

Benjamin D. Best, Ph.D., Environmental Data Scientist
EcoQuants (CA)

Participants of the Pole-to-Pole Marine Biodiversity Observation Network of the Americas (P2P MBON) August 2018 workshop in São Sebastião, Brazil.

P2P MBON workshop participants on a field expedition.

Field demonstration of macrofaunal biodiversity sampling in sandy beaches.

A deployed robolimpet in the rocky intertidal zone around CEBIMar (Centro de Biologia Marinha).

USF-Botswana Collaborative Research towards Portable Power Generation in Rural Africa

Sarath Witanachchi, Ph.D.

Partners:

Gregory Hillhouse, Ph.D., Professor
Botswana International University of Science and Technology

Davison Murape, Ph.D.
Botswana International University of Science and Technology

Dr. Sarath Witanachchi (second from right) and Botswana International University of Science and Technology (BIUST) faculty traveling to the tribal village.

Dwellings in the tribal village of Majwanaadipitse, where portable renewable energy source devices will be tested.

Meeting with the tribal leader and the community of Majwanaadipitse.

Botswana International University of Science and Technology (BIUST) campus.

Color Matters: The Impact of Colorism on Affective Relationships and Financial Transfers in U.S. Families

Elizabeth Hordge-Freeman, Ph.D.

Partner:
Jessica Kizer, Ph.D., Assistant Professor
Pitzer College

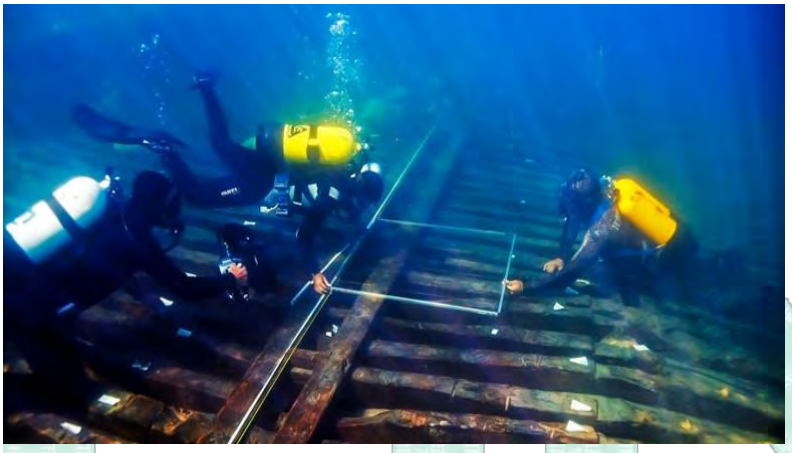
Dr. Hordge-Freeman and Edlin Veras (Ph.D. student, USF Sociology) presenting their joint research talk entitled, "Being and Becoming Afro-Latinx: Colorism, Socialization, and Identity Formation among Afro-Latinxs" at Pitzer College.

Edlin Veras, Dr. Hordge-Freeman, and Dr. Kizer after the research talk at Pitzer College.

American French Collaborative Research of Paleo-Contents of Roman Amphorae from Sicilian Underwater Contexts

Davide Tanasi, Ph.D.

Partner:
Michel Bonifay, Ph.D., Director of Research
Centre Camille Juillan, CNRS
Aix-Marseille University



Shipwreck of a Roman merchant ship dated to 3rd century CE found 150 meters off the beach of Marausa (Trapani, Sicily). The shipwreck, which had been wrecked at a depth of a little more than two meters, was identified in 1999 and then excavated in 2011. The ship had a well-preserved cargo and was around 27 meters long and 9 meters wide, making it the largest wreck from the period ever recovered from Italian waters. Its cargo was mainly composed by amphorae.

Shipwreck 'A' of an Arab-Norman ship dated to the half of the 12th century CE, found 30 meters off the beach of Lido Signorino (Marsala, Sicily). The shipwreck, which had been wrecked at a depth of about two meters, was identified in 1983 and gradually excavated between 1983 and 1986. During the investigation, another smaller shipwreck was located and named 'B'. The majority of the cargo was composed by amphorae and other types of transport jars.

Roman and Late Antique amphorae recovered from the shipwrecks off Trapani and Marsala, from donations and judicial forfeiture, exhibited at the Archaeological Museum "Baglio Anselmi" of Marsala (Sicily).

Dr. Filippo Pisciotta (Centre Camille Jullian, Aix-en-Provence, France and University of Palermo, Italy), Co-P.I. of the research project "American French Collaborative Research of Paleo-Contents of Roman Amphorae from Sicilian Underwater Contexts" financed by the USF Nexus Initiative, presenting the preliminary results of the project to USF students in Tampa in November 2018.

Bio and Electronic Advanced Material Systems (USF BEAMS)

Sylvia Thomas, Ph.D.

Partners:

Vincenzo Guarino, Ph.D., Research Scientist and Scientific Lead
Institute for Polymers, Composites, and Biomaterials (iPCB), National Research Council of Italy

Mario Caironi, Ph.D., Tenure-Track Researcher
Center for Nano Science and Technology (CNST)
Instituto Italiano di Technologia (IIT)

(L-R) Michele Giorgio, William Serrano Garcia, Sylvia Thomas, and Mario Caironi at the Instituto Italiano di Technologia (IIT), Center for Nano Science and Technology (CNST). Milan, Italy

(L-R) Sylvia Thomas, Irene Bonadies, William Serrano Garcia, and Vincenzo Guarino at the Institute for Polymers, Composites, and Biomaterials (iPCB). Naples, Italy.

The Examination of Child Teacher Relationship Therapy Training for Speech-Language Pathology Students Working with Preschool Children with Language Disorders and Behavioral Issues

Eric Davis, Ph.D., NCC, SB-RPT

Partner:
Diane Loeb, Ph.D., CCC-SLP, Martin Family Endowed Chair
Baylor University

Graduate students at the Baylor University Speech-Language and Hearing Clinic attend PAL training with Dr. Eric Davis in June 2018.

Dr. Eric Davis and Dr. Diane Loeb facilitate PAL training for graduate students at the Baylor University Speech-Language and Hearing Clinic in June 2018.

USF graduate student Tara Lee, Dr. Eric Davis, and Dr. Diane Loeb at the Speech-Language and Hearing Clinic at Baylor University.

Investigating Enhanced Peripheral Processing in Deaf Individuals: Purely Perceptual or Linguistically Driven?

Elizabeth Schotter, Ph.D.

Partner:
Amy Lieberman, Ph.D., Assistant Professor
Boston University

USF researchers Dr. Liz Schotter and Emily Johnson (center, bottom) pose for a group photo with their collaborator Dr. Amy Lieberman (center, top) and her colleagues outside Boston University's School of Deaf Studies in the College of Education.

A participant in the UNI-funded research project attempts to identify a sign language handshape while her eye movements are monitored by an eye tracker.

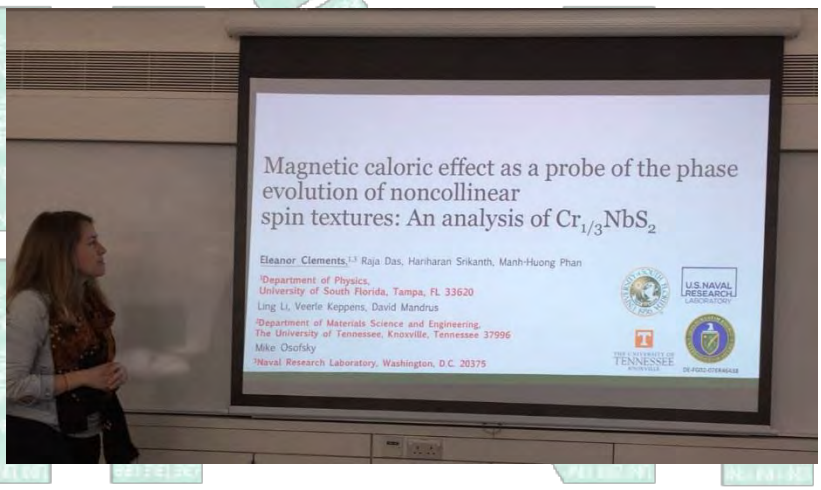
Novel Multicaloric Heterostructures for Advanced Spintronics Applications

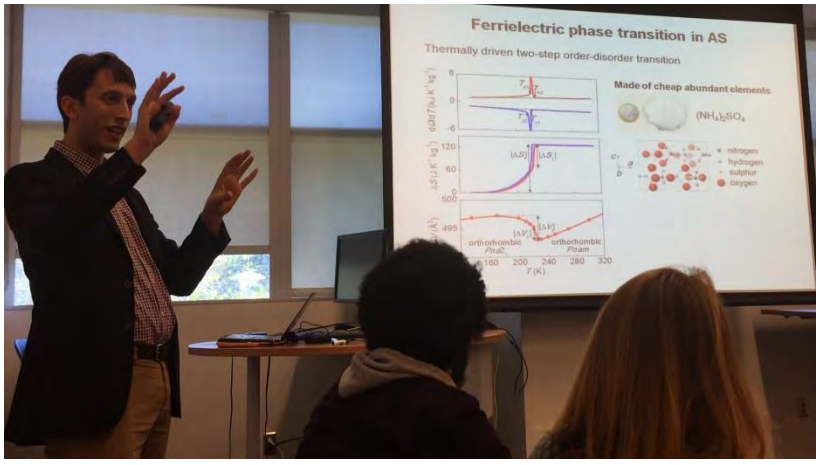
Manh-Huong Phan, Ph.D.

Partner:
Xavier Moya, Ph.D., Senior Research Fellow
University of Cambridge

USF Physics Ph.D. student Eleanor Clements performs caloric experiments in Dr. Xavier Moya's laboratory at University of Cambridge.

USF Physics Ph.D. student Eleanor Clements delivers a physics seminar to the Department of Materials Science and Metallurgy at University of Cambridge.



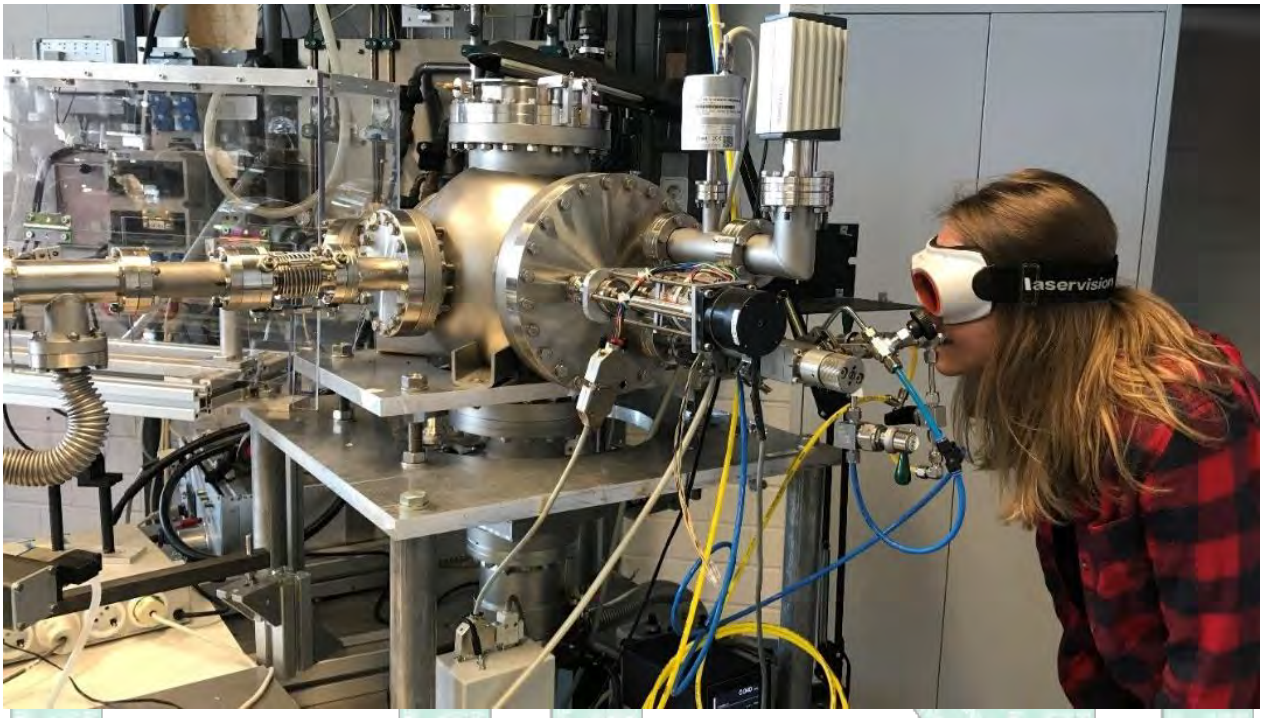


Dr. Xavier Moya from University of Cambridge delivers a special physics seminar at USF.

Garnet Thin Films with Tunable Anisotropy for Spin Caloritronics

Hariharan Srikanth, Ph.D.

Partner:
Manfred Albrecht, Ph.D., Professor
Institute of Experimental Physics
University of Augsburg



USF Physics Ph.D. student Eleanor Clements during deposition of TmIG thin films using pulsed laser deposition (PLD) at University of Augsburg.