RUTGERS
Centers for Global Advancement and International Affairs

Centers for Global Advancement and International Affairs
(GAIA Centers)
Rutgers, The State University of New Jersey
30 College Avenue
New Brunswick, NJ 08901

info@gaiacenters.rutgers.edu
Phone: 848-932-1777
Fax: 732-932-1979

http://global.rutgers.edu

Recipients of the 2016-2017 GAIA Grants

Internationalizing the Curriculum

- **Dr. Adrienne Eaton, School of Management and Labor Relations**
  Improving Study Abroad Opportunities and Take Up in the School of Management and Labor Relations
  This project seeks to increase the number of SMLR students, at both the undergraduate and master's level, engaging in study abroad opportunities in programs that we have either identified or developed with specific institutional partners. We seek funds 1) to encourage attendance at student events which will inform and attract students to study abroad opportunities and 2) for travel of SMLR faculty to partner institutions to either set up new programs or accompany students with the purpose of enriching a short trip and travel of faculty from partner institutions to Rutgers to develop programs. SMLR has already done quite a bit of work to internationalize the curriculum in terms of courses and course content but has identified study abroad as an area that needs improvement and attention. We intend to increase opportunities that are particularly appropriate for our students and the "take up" of those opportunities by students.

- **Dr. Jacquelyn Litt, Douglass Residential College**
  Douglass Global/STEM Initiative
  The Global-STEM initiative will international the curriculum primarily through a lecture series and promotion of study abroad. This project is directly in line with two of the initiatives from Douglass Residential College's 2016 -2023 Strategic Plan as shown by the published strategic goals below.
  - Advance the globalization of the Douglass experience by increasing the number of students and variety of programs in the Global Village and strengthening the partnership with the GAIA Center and relevant faculty."
  - Increasing the number of Douglas students who study abroad, including expansion of Global Village travel and the development of new STEM international service learning opportunities.

- **Dr. Barbara Madsen, Dept. of Visual Arts, Mason Gross School of the Arts**
  Internationalizing Printmaking Curriculum at Mason Gross School of the Arts Visual Arts Department through the Brodsky Center
  The Brodsky Center designed a pilot study-abroad two-way exchange program with China for Rutgers studio art students interested in deepening their exposure to printmaking, contemporary art practices and Asian culture, and for Chinese master printers to teach seminars in the Visual Arts Department of Mason Gross School of the Arts. The program would be a partnership with Guanlan Printmaking Base, Shenzhen, China, where Rutgers Professor in Print Barbara Madsen was an artist in residence in the summer of 2016. It would represent the first systematic cross-cultural platform of Mason Gross School of the Arts Visual Arts Department. It would be managed through Brodsky Center, a division of Mason Gross School of the Arts, because of its established experience in cross-cultural perspectives through a hands-on pedagogical environment and artist's residencies.

- **Dr. Xenia Morin, Dept. of Plant Biology, School of Environmental and Biological Sciences**
  Building New Opportunities for International Experiences in Agriculture and Food Systems
  Currently there are limited opportunities in the Agriculture and Food Systems (AFS) Program for international experiences beyond the "virtual field trips" taken through documentary films used in the Introduction to Agriculture and Food Systems class (11:020:210). This needs to change as agriculture and food systems are inherently international. The AFS Program is currently undergoing review and renewal, and this application reflects our priority in adding international opportunities for undergraduate students in the major or minor, as well as non-majors. This proposal seeks to expand international travel experiences by building two new embedded classes with international experience and study abroad options. Our work will begin by performing a feasibility study and site visits followed by the development of a business and implementation plan using a faculty engagement model within the Agriculture and Food Systems Undergraduate Program at the School of Environmental and Biological Sciences.

- **Dr. Raymond Sanchez-Mayers, School of Social Work**
  Planning and Implementing an Exchange Program with the Beatriz Lassalle Graduate School of Social Work at the University of Puerto Rico
  This project proposes to develop a student exchange between the School of Social Work at Rutgers and the Beatriz Lassalle Graduate School of Social Work at the University of Puerto Rico, College of Social Sciences. In order to develop this project we are asking for funds for planning and implementing this exchange. Models of such exchanges will be examined in order to determine the best fit between the two Schools. In addition to planning for an exchange, additional planning tasks will involve exploring the feasibility of a joint course in both English and Spanish.

- **Dr. Ziad Sifri, Dept. of Surgery, New Jersey Medical School**
  Rutgers NJMS Global Surgery Fellowship
  This program is designed to expand global surgery experience for Rutgers New Jersey Medical School (NJMS) surgical residents that will help groom the next generation of global surgeons and put Rutgers at the forefront of a blossoming field. A combined clinical and research fellowship in Global Surgery will train one PGY3 or PGY4 surgical resident per year to be an academic global surgeon. The fellow will assist in leading surgical missions and their associated capacity building projects as well as perform Global Surgery research. The fellow will obtain a certificate in global health topics as well as act as a mentor and lecturer to medical students from NJMS and host institutions abroad. Required research will be presented at Rutgers venues as well as national and international conferences. The fellowship will blaze a trail for future Global Surgery opportunities for all residents and students at NJMS.

- **Dr. Michael Simmons, Joseph C. Cornwall Center for Metropolitan Studies**
  Education and After School Activities
  The Education and After School Opportunities project will engage Rutgers graduate students in the building of a bi-national network for the development of on-going professional development opportunities for educators, with a particular emphasis on educators and staff working in after school programs in South Africa. Further, Education and After School Opportunities will develop study-abroad and internship opportunities for graduate students to work in the areas of education, nongovernmental infrastructural development, and the enhancement of human

infrastructure related to educational initiatives, particularly as related to after school programmatic initiatives.

International Collaborative Research Grants for Tenure-Track Faculty

- **Dr. Ashutosh Goel, Dept. of Materials Science and Engineering, School of Engineering**
  Structural Design of Third Generation Bioactive Glasses for Tissue Engineering Applications
  The fundamental understanding of the dissolution behavior of bioactive glasses is of paramount importance to design next generation, gene activating, bioactive glasses with controlled release of functional ions tailored for specific patient and disease states. The proposal is aimed at understanding the fundamental science governing corrosion (in aqueous solutions and body fluids) of B2O3- and P2O5 - based glasses comprising multiple network forming oxides (B2O3, Al2O3, SiO2, P2O5). The project will enable creation of an international team between participants from Rutgers University, University of North Texas (UNT), and University of Sao Paulo, Brazil (USP) with the goal to lay the foundation of new fundamental knowledge that will be crucial for the design of next generation bioactive glasses. The collaboration established in the framework of this project will be further used to attract additional funding for undergraduate and graduate research in the field of bioactive glasses.

- **Dr. Sonia Tikoo-Schantz, Dept. of Earth and Planetary Science, School of Arts and Sciences**
  Magnetism of Chicxulub Crater and Implications for Impact Environments
  The extinction of the dinosaurs (and 75% of all species on Earth) 66 million years ago is directly linked to the asteroid impact that formed the 180-km diameter Chicxulub crater (Yucatan, Mexico). We propose to utilize rock magnetism as a tool to understand how rocks within Chicxulub crater experienced impact-related shock and heating effects, and to search for impact-induced hydrothermal pockets within the International Ocean Discovery Program Expedition 364 drill core that sampled the crater's peak ring. Warm hydrothermal pockets within rocks may be a great reservoir for hardy microorganisms that thrive in extreme environments. Thermophilic (heat-loving) bacteria may have been some of the first life forms to inhabit the Chicxulub crater region after the impact. Because similar microorganisms could have inhabited post-impact hydrothermal systems on the early Earth and on Mars in the past, it is important to learn about these environments as may have nurtured early life.

- **Dr. Hao Wang, Dept. of Civil and Environmental Engineering, School of Engineering**
  Energy Harvesting in Transportation Infrastructure: Collaborative Research between Brazil, China, and US
  This research will focus on developing self-sustained roadway through piezoelectric and solar energy harvesting. The long-term goal is to develop next generation of transportation infrastructure through innovations. New knowledge in areas such as materials science, mechanics, energy harvesting, and sensor systems will be discussed and shared during this collaboration. We hope to strengthen the collaboration between three institutions through research activities and data sharing, visits by faculty and graduate students, pursuit of external

grant funding, and student exchanges. These activities will help to enhance the global reputation of Rutgers University.

- **Dr. Desheng Zhang, Dept. of Computer Science, School of Arts and Sciences**
  Fleet-Oriented Charging for Commercial Electric Vehicles
  Commercial Electric Vehicles (CEVs) have the potential to alleviate energy concerns and reduce city pollution due to their large volumes and long-term daily operation. However, the state-of-the-art research on EV charging is typically targeted at private EVs with limited daily ranges and no strict schedules, and existing CEV charging strategies are based on individual drivers' experiences. Such fleet-oblivious strategies ignore rich fleet-oriented knowledge, thus resulting in low efficiency for CEV applications. To address this issue, we propose to investigate fleet-oriented CEV charging strategies based 5-year offline data and streaming online data from one of the largest CEV fleets in the world, i.e., Shenzhen Transit EV Fleet with 1,054 electric taxis and 3,130 electric buses, built on our previous work for regular fleets with 50 thousand vehicles in Shenzhen. To our knowledge, this proposal is the first attempt to a systematic study on large-scale CEV fleets based on real-world data.

International Collaborative Research Grants for Tenured Faculty

- **Dr. Arash Azadegan, Dept. of Supply Chain Management, Rutgers Business School – Newark and New Brunswick**
  International Humanitarian Relief Supply Chains: On the Formation and Strengthening of Organizational Collaborations
  What draws organizations to collaborate in the face of international humanitarian disasters? Every humanitarian disaster gives rise to the need to provide food, shelter and psychological support to victims on a massive scale. Such needs can only be met through effective collaboration among otherwise disparate organizations such as NGOs, government agencies and even corporations. The proposed project combines access to NGOs and other organizations in the USA and Europe to better assess how collaboration and coordination in international humanitarian relief supply chains take place. It combines qualitative and quantitative data collection to understand the phenomenon using surveys and qualitative interview techniques. The requested funds are to be used as seed money to develop a larger project with potential of long-term impact on the two universities.

- **Dr. German Drazer, Dept. of Mechanical and Aerospace Engineering, School of Engineering**
  Filtration of Fine Particulate Matter (PM2.5) using Anchored-Fluid Membranes
  We are developing a new approach to the filtration of airborne particulate matter, based on using water drops as the membrane material, thus replacing the usual solid filters, reducing cost and waste. The importance of removing fine particulate matter is critical as they are believed to pose a significant health issue, particularly in highly populated areas, as in many Chinese cities. Our collaboration will seek dedicated funding such as the US-China Collaborative Research in Environmental Sustainability, supported by NSF and the Natural Science Foundation of China (NSFC).

- **Dr. Andrey Grigoriev, Dept. of Biology, Camden College of Arts and Sciences**
  New fragments or old molecules: tRNA fragments ingene regulation
  The novel surprising functionality or tRNA fragments (tRFs) may potentially overturn what is currently known about gene regulation mechanisms. In recent publications by the PI, computational analyses have revealed striking patterns of tRF similarity to well-known cellular regulators. microRNAs. This proposal will establish a collaboration with the Institute of Biochemistry and Molecular Biology at University of Hamburg, represented in this application by the Institute Director, Prof. Zoya Ignatova. Dr. Ignatova is a world-renowned specialist in tRNAs and such interdisciplinary (computational and experimental) collaboration will be of tremendous help In advancing the emergent research area of tRF function. The work will comprise rounds or computational predictions at Rutgers followed by biochemical validation in Hamburg and is expected to result in a paper (likely in a high-profile journal) and a joint grant application.

- **Dr. Max Haggblom, Dept. of Biochemistry and Microbiology, School of Environmental and Biological Sciences**
  Bugs on Drugs: Microbial Degradation of Pharmaceuticals and Personal Care Products, Emerging Contaminants in Aquatic Ecosystems
  This project will establish a research and intellectual exchange between Rutgers University and the Institute of Urban Environment (IUE), Chinese Academy of Sciences in Xiamen, China. The proposed activities will enable development of a joint research effort to expand the investigation of microbial degradation of pharmaceuticals and personal care products (PPCPs). PPCP compounds are disseminated worldwide as environmental contaminants and their increased over the past two decades has created growing concern over the health effects resulting from environmental accumulation. The proposed study thus addresses a serious issue of importance to the environmental quality of watersheds. A strong scientific understanding of the factors affecting the fate and biological effects of PPCPs is needed to inform policies aimed at protecting aquatic ecosystems. The proposed project will leverage on-going research at Rutgers and IUE and support the development of a joint international research effort on the fate of environmental contaminants.

- **Dr. Mukund Karwe, Dept. of Food Science, School of Environmental and Biological Sciences**
  Recycling and Value Addition of Fish Skin Waste to Produce Bioactive Peptides
  In developing countries, processing of catfish and tilapia produces a huge volume of fish skin waste which is currently underutilized as a low value fish-meal or as an ingredient. Therefore, innovative processing methods to convert this waste into a value-added food ingredient is highly desired. This project explores the possibility of producing bioactive peptides from the fish skin waste protein using pressure-assisted enzymatic proteolysis. The functionalities of these peptides will be characterized and tested in selected food formulations. The proposed technology could provide a viable mean to generate novel products, add value to the fish byproducts, and aid in sustainable processing of fish in developing countries. The project will also initiate and build collaborative research activities and student exchange between Asian Institute of Technology (Thailand) and Rutgers University. More importantly, the project will prepare preliminary supporting experimental data to develop future grant proposals on value-addition of fish protein waste.

- **Dr. Suzanne Piotrowski, School of Public Affairs and Administration**
  International Perspectives on the Relationship between Transparency and Good Governance
  Transparency is often assumed to play an important role in fostering effective democratic governance. Guided by such wisdom, governments around the world have actively engaged in attempts to enhance transparency. Yet, the extent to which these efforts are contributing to improving the quality of democratic governance is unclear. Indeed, as a wealth of empirical research now suggests, the benefits of greater transparency vary considerably. Yet, the reasons for such variation remain poorly understood. As a result, many are now beginning to debate the importance of transparency and its role in fostering effective governance -is transparency worth the effort? We request funding to support the establishment of a collaborative research project between Rutgers-Newark and Utrecht University to mitigate uncertainty surrounding the implications to greater transparency. Utrecht and Rutgers-Newark are well known centers for transparency research and this funding will further enhance research synergies between the two institutions.

- **Dr. Vitaly Podzorov, Dept. of Physics and Astronomy, School of Arts and Sciences**
  Development of High-Performance Flexible Organic Transistors and Novel Methods of their Characterization.
  The proposed collaboration between Rutgers and the University of Tokyo will focus on the fundamental physics of high-performance flexible organic transistors - the important building blocks of emerging flexible electronics. By taking advantage of the complementary expertise of our groups in high-mobility single crystal organic semiconductors and high-precision measurements, we will address the pressing issues in flexible electronics, including the dependence of the intrinsic charge carrier mobility of organic semiconductors on mechanical strain. This work is expected to lead to significant further external funding. The obtained results will advance our fundamental understanding of how organic transistors perform under mechanical strain, lead to the development of highly bendable organic circuits, and thus advance flexible and wearable electronics in general. If successful, this collaborative project will ensure that Rutgers and the University of Tokyo become the strongest international collaboration on the fundamental physics of flexible electronics.

- **Dr. Nukhet Varlik, Dept. of History, Newark College of Arts and Sciences**
  Plague, Bones, and Ancient DNA: A Multidisciplinary Study of Historical Plagues in Istanbul
  This project will gather historical, archeological, and ancient DNA evidence to study past plague epidemics in Constantinople, Istanbul. As the capital of two major historical empires (the Byzantine and the Ottoman empires), the city was a major political, economic, religious, and cultural center. Its wide-ranging networks caused repeated plague epidemics during its long history. The city's importance for the history of plague and its dissemination in Eurasia has been confirmed through historical studies. This project proposes to add archeological and genetic analyses to refine those findings. We will join an existing excavation in Bathonea (20 km. west of modem-day Istanbul) to examine the historical layers of cemeteries dating from the late antique, late medieval, and early modem eras. Our goal is to obtain human and rodent skeleton remains, which will be identified and tested in the ancient DNA lab at McMaster University to detect the presence of plague and other pathogens.

RUTGERS
Centers for Global Advancement
and International Affairs

Interdisciplinary Working Groups (Special Focus: United Nations Sustainable Development Goals)

- **Dr. Radhika Balakrishnan, Center for Women's Global Leadership, School of Arts and Sciences**
  Interdisciplinary Working Group on the Intersection of Gender-based Violence (GBV) and the Political Economy
  The Center for Women's Global Leadership (Global Center) at Rutgers University proposes to convene an interdisciplinary working group to enhance the integration of gender into the implementation of the United Nations' 2030 Agenda for Sustainable Development. Focused on a human rights-based approach to gender and development, the working group will explore the intersection of gender-based violence (GBV) and the political economy with the use of CEDAW General Recommendations #19 - Violence Against Women and # 30 – Women in Armed Conflict, the UN Security Council resolution 1325, and the Sustainable Development Goals (SDGs) #5 - Gender Equality, #8 - Decent Work and Economic Growth, and #10 - Reduced Inequalities. The primary objective is to recognize and articulate the link between economic policy and gender-based discrimination through rights and the SDGs.

- **Dr. Judy Postmus, Center on Violence Against Women and Children, School of Social Work**
  Interdisciplinary GBV Working Group in Global Contexts
  The Interdisciplinary GBV Working in Global Contexts proposes to engage the Rutgers community in education and research focused on the intersection between gender based violence (GBV) and refugees. This will focus on refugees experiences, and GBV, in the refugees country of origin, transition and host country, and resettlement in host countries. This will be done through Working Group planning meetings, public Incubations, online Resource Manuals, and Interdisciplinary Research Grant applications. This Working Group will bring together interdisciplinary perspectives to this topic, which is of contemporary international and national importance and concern, and intimately tied to the United Nations Sustainable Development Goals (SDG).

- **Dr. Amy Savage, Dept. of Biology, Camden College of Arts and Sciences**
  Coupled Natural and Human Systems Research in Cuba: Establishing International Collaborations to Meet the Environmental Challenges of Rapidly Changing Ecosystems
  The Caribbean islands are ranked as the 3rd most important biodiversity hotspot in the world. It is a region with extraordinarily high biodiversity, which is also experiencing high levels of human-driven environmental challenges. The ecological dynamics in the coupled natural and human systems in Cuba are central to both the conservation of biodiversity and the mitigation of human-driven threats in the Caribbean hotspot. In October 2016, Cuban scholars visited Rutgers University and together with scientists from Rutgers, they identified areas of critical environmental concern which overlap with many of the UN's Sustainability Development Goals. For this working group, we propose a 5-day meeting in Cuba, focused on environmentally-focused UN SDGs to address these concerns. Focal topics for meeting day 1-3 will be Sustainable Cities & Communities, Life on Land, and Life under Water. We will also address 5 other UN SDGs (Climate Action, Climate Health & Well-being, Zero Hunger, Responsible Consumption & Production, and International Partnerships).