Impact Report
2018-2019
As part of the Puerto Rico Science, Technology and Research Trust ("The Trust"), the Research Grants Program is a structured, systematic, open and competitive funding mechanism to support the development of science and technology research projects in Puerto Rico.

The mission of the Research Grants Program is to provide proof-of-concept funding and incentives to advance locally developed R&D projects to become more competitive for federal and private funding and/or commercialization. The Research Grants Program represents a critical source of competitive financial support for fundamental research and commercialization activities that builds the knowledge economy, fuels innovation and empowers Puerto Rican scientists and entrepreneurs.

The funding initiatives of the Research Grants Program were developed to directly support basic research, applied research and product development through both competitive and non-competitive mechanisms. The Program launched its first competitive initiative in 2014, the Science and Technology Request for Proposals (now the Advanced Research Grant), with the aim of supporting the most innovative and relevant R&D projects on the island from researchers at academic, non-profit and for-profit institutions. In 2015, the Small Research Grants Program (now Catalyzer Research Grant) was launched with the goal of improving the likelihood of success of researchers in academic institutions and non-profit research entities to secure federal funding for their R&D activities. Finally, the SBIR/STTR Matching Fund Program for Phase I projects was implemented as a non-competitive mechanism to incentivize local technology-oriented small companies to compete for SBIR/STTR Phase I grants. Since 2019, the SBIR/STTR Matching Fund Program also includes Phase II projects.

Presently there are no other peer-reviewed funding mechanisms available to researchers in Puerto Rico that encompasses opportunities for junior, mid-level and senior researchers representing a broad range of disciplines. In total, since its inception, the Research Grants Program has awarded more than 60 research grants through its competitive and non-competitive initiatives for a total investment by The Trust of $7.79 million with a return of investment of over $21 million.

The Research Grants Program’s selection process is based on standard and recognized peer-review procedures utilized by federal agencies such as the National Institutes of Health and the National Science Foundation. By strictly adhering to a comprehensive peer review process that assesses the scientific merit of grant applications in a fair, independent, expert-driven, and free from inappropriate influences, the Trust is able to identify and fund the most promising research or development work. The Research Grants Program is continuously optimizing its internal processes, such as grants administration and management, grantee evaluations and progress monitoring, internships, collaborations with other Trust initiatives, and its policies, among others.
The Research Grants Program is empowering scientists and researchers to take Puerto Rico’s knowledge economy to a higher level of excellence. Continued expansion and investment in the Research Grants Program is among the Trust’s highest priorities with the understanding that the outputs of a robust scientific community engaged in competitive research and development are critical to the creation of meaningful jobs and economic growth in Puerto Rico.

**Strategic Sectors**

- Aerospace
- Conservation Sciences
- Agriculture
- Electronics
- Biotechnology and Natural Sciences
- Environmental Sciences
- Clean Technologies and/or Renewable Energy
- Information and communication technologies
- Medical Devices
- Clinical Trials
- Aerospace
- Conservation Sciences
- Agriculture
- Electronics
- Biotechnology and Natural Sciences
- Environmental Sciences
- Clean Technologies and/or Renewable Energy
- Information and communication technologies
- Medical Devices
- Clinical Trials
Funding Mechanisms

The Advanced Research Grant Program (ARG) provides proof-of-concept funding to advance the most innovative Research & Development (R&D) projects in Puerto Rico to a point where these will be able to be further developed through alternate sources of funding (e.g. federal R&D funding, angel and private investments, etc.) and/or commercialized. Awards up to $150,000/year.

Who is eligible:

- Startups
- Established companies
- Private and State Academic Institutions
- Other Non-Profit Research Institutions

The Catalyzer Research Grant Program (CRG) aims to help local researchers increase their probabilities of success in securing federal funding for their research and development activities. In particular, the CRG will provide bridge funding to help researchers to position their R&D proposals competitively prior to the submission, or resubmission, to private or federal agencies. Awards up to $70,000/year.
The CRG is open to researchers in public and private universities, colleges, and affiliated non-profit research institutions located in Puerto Rico. Ideal candidates fall into one of the following categories:

- Junior faculty (within their first five years of their faculty appointment) with a competitive publication record, seeking to secure their first grants*
- PI's with a successful track record of securing funding in their primary research topic, but now embarking on a new research topic and seeking to secure a grant*
- PI's that applied for highly competitive federal funding*, that had their proposal favorably reviewed, but fell short of being funded. In this case, the PI should provide a copy of the evaluated proposal and the evaluations.

**SBIR/STTR Matching Funds**

1-to-1 matching funds for **Phase I & II SBIR/STTR proposals**: to promote and increase commercialization of research. Match up to $100,000 for Phase I and $200,000 for Phase II.

Since 2014 the Trust offers a SBIR/STTR **Proposal Preparation Workshop** to assist participants to prepare competitive proposals.

**Collaboration Agreement with the Technological and Industrial Development Center of Spain**

This call allows the selection and financing of R&D projects in effective collaboration between a Puerto Rican entity (Research Center, University or Company) and a Spanish company. Prizes of up to $50,000/year.
The Scientific Revision Board was established on May 2019 and their role is to:

- Guide the mission and purpose of the Research Grants Program, articulating the goals, and means;
- Provide technical, administrative, and scientific expertise;
- Help us determine which research projects better fit our funding priorities as an organization;
- Provide program staff with fresh perspectives and paradigms on emerging scientific research trends;
- Revise proposals and provide recommendations on which research projects we should present to the Board of Trustees for funding, and
- Connect the program with potential subject matter experts that could serve as reviewers.

**Dr. Andrés García**
Executive Director, Parker H. Petit Institute for Bioengineering and Bioscience
Georgia Institute of Technology

**Eng. Olga Gónzalez**
Retired - Director of Engineering at the National Aeronautics and Space Administration’s (NASA) Glenn Research Center in Cleveland, Ohio.

**Dr. Annette Sobel**
Former Major General in the Arizona Air National Guard
Associate Professor in the Department of Medical Education, and Graduate School of Biomedical Sciences Texas Tech University
Achievements as of August 31, 2019

- 45+ Direct Jobs
- 270+ Abstracts & Presentations
- 200+ Students Impacted
- 15 Awarded SBIR/STTR Proposals
- 70+ Peer-reviewed publications
- 8 Founded Companies
- 12 Patent Submissions

Grants Awarded
$7,790,000

ROI
$21,010,230
The National Science Foundation has the Faculty Early Career Development (CAREER) Program which is a Foundation-wide activity that offers the National Science Foundation’s most prestigious awards in support of the early career-development activities of those teacher-scholars who most effectively integrate research and education within the context of the mission of their organization. Such activities should build a firm foundation for a lifetime of integrated contributions to research and education.

Thanks to the Research Grants Program funds, the following researchers were able to secure this prestigious award:

Dr. Sylvia Rodríguez-Abudo from the University of Puerto Rico at Mayaguez. She is the first Puerto Rican female that received the Career Award for her project entitled: “Scalar Transport at the Sediment Water Interface in Coastal Benthic Boundary Layers: An Integrated Plan to Advance Nearshore Processes Research and Education in Puerto Rico”.

Dr. Sean Locke from the University of Puerto Rico at Mayaguez received the Career Award for his project entitled: “Higher systematics and co-evolution in the Diplostomoidea (Platyhelminthes, Digenea)”. Dr. Locke received a $70K grant and was able to secure $798K from federal sources.

Dr. Catherine Hulshof from the University of Puerto Rico at Mayaguez received the Career Award for her project entitled: “Climate change and plants on unusual soils”.

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The Grants Program uses Zengine, a managing platform from the WizeHive company. This platform allows us to manage the grants cycle in a centralized way. Also it is a robust tool that gives access to a customizable dashboard that shows research trends, demographics, and reports.

- Centralized
- Great for reporting
- Paperless
- Customizable
2018-2019 Advanced and Catalyzer Grants Call

On September 2019 the Research Grants Program granted $3.1M to 24 researchers in Puerto Rico.
Among the institutions awarded this year are the University of Puerto Rico, Rio Piedras Campus with six winning proposals; the Mayaguez Campus with five proposals; Ana G. Méndez University with one proposal; the UPR Medical Sciences Campus with six proposals; the Arecibo Observatory with one proposal; Ponce Health Science University with four proposals; the Universidad Central del Caribe, with one proposal and two startup companies. (see appendix, for a complete list of proposals approved for funding).

Each proposal was evaluated by three subject matter experts from more than 130 institutions in the continental United States, Europe, Latin America, Asia and Africa that have academic, scientific and technological expertise.

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**2018-2019 Advanced and Catalyzer Grants Call**

- **RFP** → **55 ARG**
- **34 CRG** → **267 assignments**

89 proposals
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CATALYZER RESEARCH GRANTS PROGRAM

Aerospace 3%
Clean Technologies and Renewable Energy 9%
Environmental Sciences 3%
Biotechnology and Life Sciences 59%
Electronics 3%
Information and communication technologies 15%
Other 9%

New Submission to a Federal Grant 79%
Resubmission to a Federal Grant 21%

www.prsciencetrust.org  Email: grants@prsciencetrust.org  Phone: 787-523-1592  Fax: 787-523-5610
Postal Address: P.O. Box 363475  San Juan, Puerto Rico 00936-3475
Physical Address: Antigua Penitenciaria Estatal Carr. # 21, Bo. Monacillos, Rio Piedras, Puerto Rico 00927
Peer Review Process

The goal of peer review is to assess the scientific merit of Trust grant applications in a fair, independent, expert-driven, and free from inappropriate influences, so the Trust can fund the most promising research or development work.

Each proposal was evaluated by three subject matter experts.

For the Advanced Research Grant, the proposals were divided into 5 groups based on their topics and discussed during a panel meeting teleconference were the primary reviewers as well as other reviewers were present.

Score System

Each criteria was evaluated on a scale of 1 (best) – 9 (worst). The Average Total Score was calculated in order to rank the applications. We use the NIH Scoring System.

**Evaluation Criteria (ARG)**
- Approach and technical merit
- Innovation
- Significance
- Investigators
- Environment and collaboration
- Budget justification
- Commercialization plan for commercialization proposals

**Evaluation Criteria (CRG)**
- Innovation and relevance
- Project status and feasibility
- Approach and technical merit
- Investigators and environment
- Budget justification
Subject Matter Experts

What type of work they do?

- Research Scientists
- Engineers
- Deans
- Directors of Research
- Company Presidents
- Chief Executive Officers
- Chief Scientific Officers
- Chief Innovation Officers
- Lab Chiefs

Where are they from?

- Argentina
- Australia
- Brazil
- Canada
- Denmark
- France
- Germany
- Ireland
- Italy
- Mexico
- Portugal
- South Africa
- Spain
- United Kingdom
- United States
130+ Research Institutions

United States

- Cornell University
- Harvard University
- University of Pennsylvania
- Princeton University
- Yale University
- Stanford
- Duke
- MIT
- Purdue
- Rutgers University
- Georgia Tech
- Mayo Clinic
- MD Anderson Cancer Center
- Florida International University
- University of Florida
- University of South Florida
- Stony Brook University
- Feinstein Institution
- Syracuse University
- Tisch Research Center of New York
- University of Alaska Fairbanks
- Northwestern University
- University of Illinois
- Illinois Institute of Technology
- Toyota Technological Institute - Chicago
- New Mexico Tech
- Ohio State University
Canada
- University of Toronto
- University of Calgary
- McGill University
- University of Manitoba
- University of Alberta

Europe
- Universidad de Sevilla, Spain
- Universidad de Alcalá, Spain
- Universidad Complutense, Spain
- University of Cambridge, United Kingdom
- University of Exeter, United Kingdom
- University of Aberdeen, United Kingdom
- National University of Ireland Galway
- Pasteur Institute of Lille, France
- University of Copenhagen, Denmark
- University of Trieste, Italy

South America
- Universidad Tecnológica Nacional, Argentina
- Centro de Investigación Científica de Yucatán, México
- Federal University of Rio Grande do Sul, Brasil
- The Oswaldo Cruz Foundation, Brasil

Asia
- Delhi Technological University
- Institute of Technology, Nirma University
What our reviewers said

"Thank you very much for the opportunity to participate in the evaluation process. It was a great experience and an opportunity to learn from different areas and from the other panelists." - Centro de Investigación Científica de Yucatán, MX

It was a pleasure serving in this well-organized panel and contributing to the evaluation of scientific proposals in PR. I was raised in Mayaguez and San Juan and have been living in California for the past 36 years and is always a pleasure to help in whatever I can to advance science in the Island. Thank you again for the invitation. - Loma Linda University, CA

"Good work you folks are doing – I am happy to offer my services as a reviewer for free." - Duke University, NC

"I thought this was a great panel and I appreciate being included. I am certainly open to being involved again in the future." - Robert Wood Johnson Medical School, Rutgers Cancer Institute, NJ

"I enjoyed the review process. Clearly, there are many high level science projects at the universities in Puerto Rico and the science trust is an important organization to help the progress of these projects. I will be happy to help with the grants and other scientific issues in the future." - Marquette University, WI
On November 10, 2018 the Trust hosted the **Forward Research and Innovation Summit** with the mission to accelerate the scientific and technological activity on the Island. A selection of more than 50 renowned local and international speakers and panelists participated in the event.
The keynote speaker was Dr. Manu Prakash, born in India and professor of Bioengineering at Stanford University with a PhD in Applied Physics from MIT, will be the keynote speaker at this conference. Prakash is well known for its Paper Microscope (Foldscope), a microscope that any individual can assemble. His work focuses on frugal innovation that makes medicine, computer science and microscopy accessible to more people around the world.

Dr. Prakash visited the island with his research team. During his stay he conducted a lab retreat and trained more than 90 teachers and educators on how to use the Foldscope, an ultra-affordable, paper microscope. Designed to be portable, durable, and to give optical quality similar to conventional research microscopes (magnification of 140X and 2 micron resolution). In addition, he trained more than 100 children at different locations including the EcoExploratorio.

Also, during the event the Trust presented its first institutional recognition. The Bajarí Prize which means high distinction and represent the path that researchers follow to innovate and achieve high distinctions in their fields. Dr. Carmen Zorilla from the University of was the award winner. Thanks to Dr. Zorrilla’s efforts, Puerto Rico became the first jurisdiction in the world to eliminate mother-to-child transmission of HIV at birth. Zorrilla is internationally recognized as a dedicated and rigorous scientist with a special sense of commitment to caring for the poor.

Main Reason for Attending the Event

38.5%  Professional growth & development
30.1%  Networking
21.5%  General content & speakers
9.2%  Other (speaker, support my student, all of the above)

400 Attendees
3 TRACKS
RESEARCH
TECHNOLOGY
ENTREPRENEURSHIP
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40 Presentations

104 Posters

Sponsors

DIAMOND
Hewlett Packard Enterprise

GOLD
MERCK

COFFEE BREAK
Bionuclear
Ferraiuoli llc

WIFI
Boston Scientific

COCKTAIL
Rums of Puerto Rico

MEDIA
dia

KICK OFF DINER
Walmart

BOOTH
Mitel
The Puerto Rico Boost Grant, was an initiative under the Post Hurricane Maria Aid for Researchers program, offered by the Puerto Rico Science, Technology and Research Trust (the “TRUST”) in partnership with the AAAS Caribbean Division (“AAAS-CD”) to support the recovery efforts of graduate students and postdoctoral fellows (Puerto Rico and the U.S. Virgin Islands).

The funds were offered to buy materials, repair equipment, and/or rehabilitate spaces in order to give continuity to research projects that were impacted by the aftermath of Hurricane Maria.

A total of 64 applications were received, and 24 grants of $1,000 were awarded to the following institutions:

- 11 to the University of Puerto Rico, Mayaguez
- 4 to the University of Puerto Rico, Rio Piedras
- 3 to the University of Puerto Rico, Medical Science Campus
- 4 to the Universidad Central del Caribe
- 1 to Ponce Health Sciences University
- 1 to the Universidad Ana G. Méndez, Gurabo
Future plans

- The program will be hosting scientific communication, personal branding, grant writing workshops, among other talks and activities, for the benefit of the grantees and the scientific community in the island.
- By early 2020, the Research Grants Program will be launching a new call for the Advanced and Catalyzer Research Grants.
- On October 2020 the Forward Research and Innovation returns!
- The program will be integrating a digital platform to showcase and report the scientific activity of local researchers.

Meet the Team

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Dr. Juan Figueroa
Entrepreneurship Advisor and Associated Researcher
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Appendix

New grantees

1. Elucidation of a novel therapeutic target against HIV via solid-state NMR spectroscopy
   PI: Marvin Bayro, PhD
   Institution: University of Puerto Rico - Rio Piedras
   Strategic Sector: Biotechnology and Life Sciences

2. The molecular and chemical basis of host plant choice
   PI: Riccardo Papa, PhD
   Institution: University of Puerto Rico - Rio Piedras
   Strategic Sector: Biotechnology and Life Sciences

3. Recombinant 14.5kDa fatty acid binding protein (Fh15) from the parasitic helminth Fasciola hepatica: A promising anti-inflammatory drug against endotoxemia.
   PI: Ana A. Espino, PhD
   Institution: University of Puerto Rico - Medical Sciences
   Strategic Sector: Biotechnology and Life Sciences

4. Culebra Aerosol Research Lidar Project (CARLA)
   PI: Jens Lautenbach, PhD
   Institution: Arecibo Observatory - The University of Central Florida Board of Trustees
   Strategic Sector: Other - Atmospheric Research

5. Investigating the role of E2F-regulated mitotic kinases in hormone-receptor resistant breast cancers.
   PI: Harold I. Saavedra, PhD
   Institution: Ponce Health Sciences University
   Strategic Sector: Biotechnology and Life Sciences

6. Blood-based epigenetic markers to estimate DNA repair levels in women with breast cancer
   PI: Jaime L. Matta
   Institution: Ponce Health Sciences University
   Strategic Sector: Other - Clinical/Translational Research

   PI: Carlos A. Sariol, MD, MSc
   Institution: University of Puerto Rico - Medical Sciences
   Strategic Sector: Biotechnology and Life Sciences

8. From the University to a CMDO: Real Time Monitoring of Drug Concentration at the Feed Frame in Commercial Pharmaceutical Manufacturing
   PI: Rodolfo J Romanach, PhD
   Institution: University of Puerto Rico - Mayagüez
   Strategic Sector: Biotechnology and Life Sciences
9. Center for Computerized Experimental Mathematics, Combinatorics and Information Theory  
PI: Luis A. Medina, PhD  
Institution: University of Puerto Rico - Rio Piedras  
Strategic Sector: Information and Communications Technology

10. Defining the genetic basis of neural circuit development  
PI: Andrew Seeds, PhD  
Institution: University of Puerto Rico - Medical Sciences  
Strategic Sector: Biotechnology and Life Sciences

11. Unlocking Puerto Rico’s renewable ocean energy potential: mapping our wave energy, ocean currents and ocean thermal energy resource availability.  
PI: Miguel Canals, PhD  
Institution: University of Puerto Rico - Mayagüez  
Strategic Sector: Clean Technologies/Renewable Energy

12. Pre-clinical Development of the anti-metastatic cancer drug MBQ-167  
PI: Suranganie Dharmawardhane, PhD  
Institution: University of Puerto Rico - Medical Sciences  
Strategic Sector: Biotechnology and Life Sciences

13. Discovery of potential immune-preventative targets for ovarian cancer  
PI: Idhaliz Flores, PhD  
Institution: Ponce Health Sciences University  
Strategic Sector: Biotechnology and Life Sciences

14. Meta-Omic Approaches to Study Microbiome Dynamics for Cervical Cancer Prevention  
PI: Filipa Godoy-Vitorino, PhD  
Institution: University of Puerto Rico - Medical Sciences  
Strategic Sector: Biotechnology and Life Sciences

15. Honey Bee Genetics and Health Diagnostic Panels.  
PI: Rosanna Giordano, PhD  
Company: Know Your Bee, Inc.  
Strategic Sector: Biotechnology and Life Sciences

PI: Raúl Ríos-Díaz  
Company: ZIPDatum, Inc.

1. Assessing the extent and functioning of structural genome variation  
PI: Riccardo Papa, PhD  
Institution: University of Puerto Rico - Rio Piedras  
Strategic Sector: Biotechnology and Life Sciences

2. Metrics, Analytical Models, and Maximization of Information Availability/ Survivability on Vulnerable Stochastic Networks  
PI: José A. Santiváñez, PhD  
Institution: Universidad Ana G Mendez – Gurabo  
Strategic Sector: Information and Communications Technology
3. Rac and Cdc42 inhibitor in metastatic cancer  
PI: Suranganie Dharmawardhane, PhD  
Institution: University of Puerto Rico Medical Sciences  
Strategic Sector: Biotechnology and Life Sciences

PI: Marian Talimar Sepúlveda Orengo, PhD  
Institution: Ponce Health Sciences University  
Strategic Sector: Biotechnology and Life Sciences

5. DNA repair mechanisms and long term memory storage in the social brain  
PI: Tugrul Giray, PhD  
Institution: University of Puerto Rico - Río Piedras  
Strategic Sector: Biotechnology and Life Sciences

6. New Honeycomb Geometries for Impact Energy Absorption in Aerospace Applications  
PI: Marco Menegozzo, PhD  
Institution: University of Puerto Rico- Mayagüez  
Strategic Sector: Aerospace

7. Associative Emotional Control in Artificial Systems  
PI: José Meléndez, PhD.  
Institution: University of Puerto Rico-Mayagüez  
Strategic Sector: Information and Communications Technology

8. Approaches to Establishing Research Practice Partnerships for the Teaching of Computer Science in Rural Economically Challenged Communities  
PI: Bienvenido Vélez, PhD  
Institution: University of Puerto Rico - Mayagüez,  
Strategic Sector: Information and Communications Technology

9. HIV-1 gp120 promotes glioma tumor growth and chemotherapy resistance via unfolded protein response  
PI: Nawal Boukli, PhD  
Institution: Universidad Central del Caribe  
Strategic Sector: Biotechnology and Life Sciences

10. Influence of Virtual Reality Product Representations on Subject Preference via Discrete Choice Experimentation  
PI: José E Lugo, PhD  
Institution: University of Puerto Rico – Mayagüez