

**NASA Harriett G. Jenkins Pre-Doctoral Fellowship Project (JFPF)**

**Grant # NNX10AU20A**

**Administered by UNCF Special Programs Corporation**

**Type of Agreement: Grant/Cooperative Agreement**

**FY 2013 Annual Report (10/1/12 – 9/30/13)**

**Brenda Collins, Education and Public Outreach Division Chief**

**Ames Research Center 650-604-0978**

**PROJECT DESCRIPTION**

The Harriet G. Jenkins Pre-Doctoral Fellowship Project (JFPF) was developed with a mission to increase the number of underrepresented persons with master's and doctoral degrees in the NASA pipeline and ultimately in the science, technology, engineering and mathematics (STEM) workforce. For thirteen consecutive years, UNCF Special Programs Corporation (UNCFSP) has provided high quality development and implementation of the JFPF that is in harmony with extant workforce needs. Such programming has led to the recruitment of the nation's best and brightest STEM graduate students. In terms of academic and career promise, these students rival those in any other nationally recognized STEM graduate fellowship offers and chose the JFPF award over other nationally recognized scholarships.

The project is named in honor of Dr. Harriet G. Jenkins, the former Assistant Administrator of Equal Opportunity Programs. Dr. Jenkins has made significant contributions to the Nation's aerospace industry and technical workforce. Her dedication to institutions of higher education through the support and development of numerous programs designed to build institutional research capabilities has increased the number of women, minorities, and disabled persons with post-baccalaureate degrees in the science, technology, engineering and mathematics (STEM) disciplines and their participation in NASA-sponsored research and education community.

Furthering the work of Dr. Harriet G. Jenkins, the JFPF has increased the number of women, minorities, and persons with disabilities participating in the STEM-related disciplines. Each year, approximately 20 three-year fellowships have been awarded to support graduate students, to include stipend, tuition offset support, and a NASA Center internship experience. Since the program's inception in September 2000, 211 students have been awarded fellowships.

## PROJECT GOALS

**Goal 1:** Increase the number of underrepresented minority graduate students and preparing them to enter the STEM workforce.

*Objective 1.1: Annually provide tuition assistance and stipend support for up to 20 underrepresented students in pursuit of Master's and Doctoral degrees in NASA-related disciplines.*

*Objective 1.2: Annually provide a 10-week, hands-on research experience at a NASA Center.*

*Objective 1.3: Provide two (2) professional and career development activities within the first two years of fellowship tenure.*

*Objective 1.4: Coordinate an annual symposium event designed to promote networking collaboration and information exchange amongst project constituents and relevant NASA stakeholders.*

**Goal 2:** Develop student's skill sets and competency in applied science and engineering by providing collective and individual outreach opportunities.

*Objective 2.1: At the end of Year-1, as part of their professional development workshop, JPFP fellows are assigned a policy-based real life, opened ended issue/problem to Cohorts that directly or indirectly impacts NASA.*

*Objective 2.2: The fellows are provided the opportunity to present their group project findings at the annual symposium event.*

JPFP plans to achieve these goals by strengthening the future STEM workforce for NASA and the Nation by attracting and retaining a talented and diverse student body. The program seeks to increase the number of women, minorities, and persons with disabilities working in STEM related fields and to serve as a significant source of underrepresented graduate students.

## PROJECT ACCOMPLISHMENTS

JPFP directly supports NASA's Strategic Plan and the Office of Education's Outcomes One (1) and Two (2):

**Outcome 1:** *Contribute to the development of the STEM workforce in disciplines needed to achieve NASA's strategic goals through a portfolio of investments.*

**Outcome 2:** *Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty.*

UNCFSP has worked closely with NASA since 2000 to meet NASA's vision to inspire, engage, educate, and employ in the STEM disciplines. The JPFP Project serves as a major link into the student pipeline. To date, JPFP has accomplished the following:

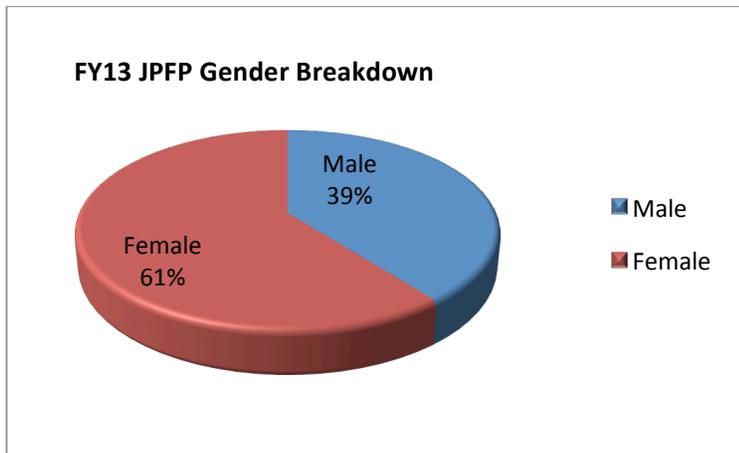
- 211 Fellows to date in the program
  - 131 have received PhDs (10 during this fiscal year)
  - 54 have received M.S.
  - 19 have confirmed that they are currently working at NASA (5 are conducting Post-Doctoral Research and 14 are working at a NASA Center and employed by either NASA or a contractor)
- 83 males; 128 females: Female , 61% Male, 39%
- 19% have attended a Minority Institution.
- 18 fellows participated in the 2013 JPPF Center Based Research Experience (CBRE)
- 20 NASA Ambassadors since 2008 (Cohorts 1-5)

### Project Contributions to API Measures

Since the project’s inception in 2000, JPPF has continued to meet the goal of increasing the number of women and minorities.

Measure Number	Performance Indicator Description (API)
<b>APG 5.1.2.1:ED-12-1</b>	Achieve 40 percent participation of underserved and underrepresented (race and/or ethnicity) in NASA higher education projects
<b>APG 5.1.2.1:ED-12-2</b>	Achieve 45 percent participation of women in NASA higher education projects

The current enrollment for 2013 is 2 (61%) female and 13 (39%) male. Sixty-four percent (64%) of students in FY13 have self-identified as minorities. They are specifically 6% Asian; 34% Black; 15% Hispanic; 6% Native American and 3% Pacific Islander. Both of these percentages exceed the API Measures.



## PROJECT CONTRIBUTIONS TO PART MEASURES

***For the period: October 1, 2012 through September 30, 2013***

**Objective 1.1:** No new students were placed under NASA's direction due to budgetary concerns. Cohorts 10&11 continued to receive stipend and tuition support.

**Objective 1.2:** 19 have been selected to participate in the 2013 JFPF Center Based Research Experience (CBRE) at the following seven (7) NASA centers:

- NASA Ames Research Center (ARC)
- NASA Dryden Flight Research Center (DFRC)
- NASA Glenn Research Center (GRC)
- NASA Goddard Space Flight Center (GSFC)
- NASA Jet Propulsion Laboratory (JPL)
- NASA Johnson Space Center (JSC)
- NASA Marshall Space Flight Center (MSFC)

### **Center Based Research Center at NASA ARC**

**JFPF Fellow:** Fabienne Bastien

**Research Title:** "Enhancing Planet Discovery: Empirically Interrelating the Magnetic Activity, Photometric Variability and Radial Velocity Jitter of stars in NASA's Kepler Mission"

**Mentor:** Dr. Natalie Batalha

**Tenure:** June 3 – August 9, 2013

**Email:** [fabienne.bastien@gmail.com](mailto:fabienne.bastien@gmail.com)

**JFPF Fellow:** Jorge Cintron-Rivera

**Research Title:** "Fault Mitigation for Permanent Magnet Synchronous Motors Under an Internal Turn to turn Failure"

**Mentor:** Dr. Susan Frost

**Tenure:** July 1 – July 28, 2013 (4 weeks)\*

**Email:** [cintronr@msu.edu](mailto:cintronr@msu.edu)

**JFPF Fellow:** Tiffany Kataria

**Research Title:** "Atmospheric Dynamics of terrestrial Extrasolar Planets and Super Earths"

**Mentor:** Robert M. Haberle

**Tenure:** May 28 – August 6, 2013

**Email:** [tkataria@lpl.arizona.edu](mailto:tkataria@lpl.arizona.edu)

**JFPF Fellow:** David Peaslee

**Research Title:** “Nanomaterials Development for Sustainable Energy”

**Mentor:** Dr. Bin Chen

**Tenure:** June 17 – August 30, 2013

**Email:** [dep4gb@mail.umsl.edu](mailto:dep4gb@mail.umsl.edu)

**JFPF Fellow:** Caroline Morley

**Research Title:** “Modeling Planets Observed with the Gemini Planet Imager”

**Mentor:** Mark Marley

**Tenure:** June 3 – August 16, 2013

**Email:** [cmorley@ucsc.edu](mailto:cmorley@ucsc.edu)

**JFPF Fellow:** Carlos Poventud-Estrada

**Research Title:** Optimization of the Electrochemical Ammonia Removal (EAR) System

**Mentor:** Michael Flynn

**Tenure:** June 3 – August 16, 2012

**Email:** [cmpoventud@gmail.com](mailto:cmpoventud@gmail.com)

**JFPF Fellow:** Schetema Stevens

**Research Title:** Developing a High Quality Professional Development Module Focused on the Redox Chemistry of Thermophiles and How it Relates to NASA’s Mars Mission

**Mentor:** Thomas Clausen

**Tenure:** June 3 – August 9, 2012

**Email:** [schetema@mac.com](mailto:schetema@mac.com); [nealys@unlv.nevada.edu](mailto:nealys@unlv.nevada.edu)

**JFPF Fellow:** Kathleen Upton

**Research Title:** Understanding Titan Aerosol Simulants Analysis of Aerosol Simulants in the Gas and Solid Phases

**Mentor:** Dr. Farid Salama

**Tenure:** June 10 – July 19, 2013 (6 weeks)

August 19 – September 13, 2013 (4 weeks)

**Email:** [ktuption07@gmail.com](mailto:ktuption07@gmail.com)

### **Center Based Research Center at NASA DFRC**

**JFPF Fellow:** Neil Dhingra

**Research Title:** “Distributed Sensing and Control of Aeroservoelastic Systems”

**Mentor:** Martin Brenner

**Tenure:** May 20 – July 27, 2013

**Email:** [dhin0008@umn.edu](mailto:dhin0008@umn.edu)

### **Center Based Research Center at NASA GRC**

**JFPF Fellow:** Dionne Hernandez Lugo

**Research Title:** Copper surface modification by a self-assembled technique as the first step for the attachment of the SWCNT

**Mentor:** Dr. Richard Baldwin

**Tenure:** July 1 – August 9, 2013 (6 weeks)

**Email:** dmhernandezlugo@gmail.com

**JFPF Fellow:** Innocent Udom

**Research Title:** “Photocatalytic Studies of ZnO-Based Catalysis”

**Mentor:** Dr. Aloysius Hepp

**Tenure:** May 20 – July 29, 2013

**Email:** iudom@mail.usf.edu

### **Center Based Research Center at NASA GSFC**

**JFPF Fellow:** Robert Alexander II

**Research Title:** “Audification as a Diagnostic Tool for Exploratory Heliospheric Data Analysis

**Mentor:** Dr. Dana Aaron Roberts

**Tenure:** June 3 – August 9, 2013

**Email:** robertalexandermusic@gmail.com

**JFPF Fellow:** Derick Rivers

**Research Title:** “An Dynamic Calibration Method for Radiometers Using a Bayesian Time Framework”

**Mentor:** Dr. Paul E. Racette

**Tenure:** June 3 – August 9, 2013

**Email:** riversdl@mymail.vcu.edu

### **Center Based Research Center at NASA JPL**

**JFPF Fellow:** Rachael Roettenbacher

**Research Title:** “Investigating the Spin-Orbin Misalignments of Spotted Kepler Star”

**Mentor:** Dr. Stephen Kane

**Tenure:** June 3 – August 9, 2013

**Email:** [rmroett@umich.edu](mailto:rmroett@umich.edu)

**JFPF Fellow:** Lauren White

**Research Title:** Iron-Sulfide Compartments: Testing the Hydrothermal Model for the Emergence of Life”

**Mentor:** Dr. Isik Kanik  
**Tenure:** June 3 – August 9, 2013  
**Email:** lspenser@chem.ucsb.edu

#### **Center Based Research Center at NASA JSC**

**JFPF Fellow:** Miriam Sharp  
**Research Title:** Experimental Study of the Partitioning of Siderophile Elements in a Crystallizing Lunar Magma Ocean  
**Mentor:** Kevin Righter  
**Tenure:** December 2012 – May 2013 (10 weeks)  
**Email:** mgalenas@umd.edu

#### **Center Based Research Center at NASA MSFC**

**JFPF Fellow:** Jill Williamson  
**Research Title:** “Investigating the Advancement in the Water Processor Assembly: Enhancing Oxidative Capacity and Utilizing Ionic Membranes for Water Removal of Brine Urine  
**Mentor:** Donald L. Carter  
**Tenure:** June 3 – August 9, 2013  
**Email:** jpwllms1@memphis.edu

**JFPF Fellow:** Deatrick Foster  
**Research Title:** “Monitoring the Very-Long-Term Variability of X-ray Sources in the Nearby Spiral Galaxy M31”  
**Mentor:** Doug Swartz  
**Tenure:** June 3 – August 9, 2013  
**Email:** deatrick.foster@vanderbilt.edu

#### **\*Note:**

**Jorge Cintron-Rivera** was be at NASA ARC for four (4) weeks after working at his home institution – Michigan State University – with Dr. Frost in order to take advantage of equipment integral to their research. The following is his full research date schedule:

**Michigan State University** (with NASA Technical Mentor Dr. Susan Frost)  
Tenure Date(s): May 20 – June 21, 2013 (5 weeks)

#### **Ames Research Center (ARC)**

**Note:** Already noted above under ARC

Tenure Dates(s): July 1 – July 28, 2013 (4 weeks)

**Michigan State University** (with NASA Technical Mentor Dr. Susan Frost)  
Tenure Date(s): July 29 – August 2, 2013 (1 week)

**Dionne Hernandez Lugo** was at NASA GRC for six (6) weeks conducting research with Dr. Baldwin. She then terminated her tenure with JFPF and began working with the NASA Pathways Intern Employment Program. The following is her full research schedule:

**Glenn Research Center (GRC)** (with NASA Technical Mentor Dr. Richard Baldwin)

**Note: Already noted above under GRC**

**Tenure Date(s):** July 1 – August 9, 2013 (6 weeks)

**Objective 1.2 (cont.):** 2 JFPF students have been awarded positions as NASA Student Ambassadors since 2008.

**JFPF Fellows serving as NASA Student Ambassadors**

**NASA AMBASSADORS – COHORT V**

Name	University
<b>Carlos Poventud Estrada</b>	University of Puerto Rico

**NASA AMBASSADORS COHORT IV**

Name	University
<b>Dionne Hernandez Lugo</b>	University of Puerto Rico – Rio Piedras
<b>Jamie Lomax</b>	University of Denver
<b>Thuy Hien Nguyen</b>	University of the Sciences at Philadelphia
<b>Damaris Suazo</b>	University of Puerto Rico – Rio Piedras
<b>Jesus M. Velazquez</b>	University of Buffalo, The State University of New York

**NASA AMBASSADORS COHORT I-III**

Name	University
<b>Quenton Bonds</b>	University of SouthFlorida
<b>Moogega Cooper</b>	Drexel University
<b>Serina Diniega</b>	University of Arizona
<b>Brandon Jones</b>	Cornell University
<b>Erin Burke</b>	University of Washington
<b>Shanna-Shaye Forbes</b>	University of California – Berkeley
<b>Jonathan Gaines</b>	Virginia Polytechnic Institute and State University
<b>Kennda Lynch</b>	Colorado School of Mines
<b>Levica Smith</b>	Texas A&M University
<b>Shannon Tronick</b>	Princeton University
<b>Sherrisse Kelly Bryant</b>	Louisiana State University
<b>Marsha Cole</b>	Louisiana State University A&M
<b>Matthew Smith</b>	Massachusetts Institute of Technology

**Objective 1.3:** UNCSP put together a proposal for a symposium that would have included professional development. Due to budgetary and scheduling concerns, the symposium was not held this year.

**Objective 1.4:** Due to budgetary and scheduling concerns, the symposium was not held this year.

**Objective 2.1:** N/A

**Objective 2.2:** N/A

### **Improvements Made in the Past Year**

N/A

### **Project Partners and Role of Partners in Project Execution**

N/A

### **References**

N/A