NASA Earth and Space Science Fellowship (NESSF) Program - 2012

NASA received a total of 497 applications in 2012 to the NASA Earth and Space Science (NESSF) Fellowship Program announced in November 2011 among Earth Science Research, Heliophysics Research, Planetary Science Research, and Astrophysics Research – the four research programs of the Science Mission Directorate (SMD) at NASA Headquarters.

These four SMD science divisions make respective selection of applications for award on a competitive basis. Criteria for evaluation included: (a) the scientific merit of the proposed research; (b) the relevance of the proposed research to NASA's objectives in Earth or space science; and (c) academic excellence based upon an applicant's transcripts, the letter of recommendation by the student's academic advisor, and the degree to which it supported the proposed research. Evaluation was conducted via either mail or panel review, or both, and by the relevant expertise in the science divisions of SMD.

The purpose of the NESSF is to ensure continued training of a highly qualified workforce in disciplines required to achieve NASA's scientific goals. Awards resulting from the competitive selection are made in the form of training grants to the respective universities and educational institutions, with the faculty advisor serving as the principal investigator.

NESSF awards are made initially for one year and may be renewed for no more than two additional years, contingent upon satisfactory progress, as reflected in academic performance, research progress, and recommendation by the faculty advisor, and the availability of funds. An award is $30,000 per annum, including $24,000 student stipend and an allowance of up to $6,000, consisting of $3,000 for student expenses and $3,000 for university expenses.

The student allowance may be used for tuition; fees; travel in support of the research investigation to conferences, symposia, or collaborative meetings; books; expendable laboratory supplies; page charges for journal articles; printing of a thesis; health insurance; and other similar expenses related to the proposed research investigation. The university allowance may be used for tuition or research expenses, if agreed upon by the student and faculty advisor; it may also support research-related travel for the advisor (i.e. to accompany the student to a scientific meeting, oversee the student's research, etc.); or by the student. The budget in these two allowance categories may be exchanged, as long as the total sum for the two combined allowance categories does not exceed $6,000.

An individual accepting this award may not concurrently receive other Federal fellowships or traineeships. However, NASA may allow an applicant to receive supplements from other U.S. Federal agencies to cover expenses not covered by NASA's graduate fellowships; for example, the purchase of equipment, which is not permitted through a NASA fellowship.

The names of the students and their faculty advisors, institutions, and proposal titles of the 2012 NESSF selections are listed below by each of the four SMD science divisions.

The announcement for 2013 NESSF is anticipated in November 2012. The release will be posted at http://nspires.nasaprs.com/external/, and the deadline for submission of new applications to NASA will be February 1, 2013.

Inquiries about the program may be directed to:

Program Manager for NESSF Earth Science Research – Dr. Ming-Ying Wei at (202) 358-0771 or by E-mail at mwei@nasa.gov.

Program Manager for NESSF Heliophysics Research, Planetary Science Research, and Astrophysics Research – Dolores Holland at (202) 358-0734 or by E-mail at

hq-nessf-Space@nasa.gov.

Earth Science

NASA received a total of 287 applications in Earth Science Research and selected 54 for award, pending acceptance by each applicant and their respective institution; they are:

Shahab Arabshahi (Student); Joseph Dwyer (Advisor); Florida Institute of Technology
Investigation of the Radio Signatures Produced by Cosmic-Ray Air Showers Traversing Thunderclouds and the Association with Lightning Initiation and Narrow Bipolar Events

Emily Arnold (Student); Richard Hale (Advisor); University of Kansas
Enhancing Airborne Remote Sensing Radar to Provide Higher Quality Ice Sheet Measurements Used for Predicting Sea-Level Rise

Hamed Ashouri Talouki (Student); Soroosh Sorooshian (Advisor); University of California, Irvine
Spatio-Temporal Modeling of Extreme Precipitation Events Using Satellite-Based Observations

Katherine Barnhart (Student); Robert Anderson (Advisor); University of Colorado, Boulder
Flexible Heat Flow Models of the Active Layer and Conductive Permafrost: Thermal State from Field Measurements and Satellite-Derived Skin Temperature

Matthew Beals (Student); Raymond Shaw (Advisor); Michigan Technological University
Improved Mixed Phase Cloud Microstructure Measurements: The Holographic Detector for Clouds II (HOLODEC II)

Tom Bell (Student); David Siegel (Advisor); University of California, Santa Barbara
Hyperspectral Remote Sensing of Kelp Condition in the Santa Barbara Channel

Sarah Brody (Student); M. Susan Lozier (Advisor); Duke University
Examining Physical Drivers of Phytoplankton Bloom Phenology in Subpolar Regions

Thinh Bui (Student); Mitchio Okumura (Advisor); California Institute of Technology
High Precision Laboratory Spectroscopy of Oxygen and CO2 in Support of Remote Sensing

Mattias Cape (Student); Maria Vernet (Advisor); Scripps Institution of Oceanography
Phytoplankton and Sea Ice Dynamics Following Climate-Driven Ice Shelf Collapse in the Northwest Weddell Sea, Antarctica

Magdalena Carranza (Student); Sarah Gille (Advisor); University of California, San Diego
Effect of High Frequency Winds on the Mixed Layer Depth of the Southern Ocean

Swarup China (Student); Claudio Mazzoleni (Advisor); Michigan Technological University
Contact Ice Nucleation Studies in an Environmentally Controlled Acoustic Levitation Trap

Nicholas Cuba (Student); John Rogan (Advisor); Clark University
Interannual Variability in Seasonally Dry Tropical Forest Deciduousness and Implications for Soil Carbon Storage and Aerosol Emissions in the Mexican Southern Yucatán

Chunli Dai (Student); C. K. Shum (Advisor); Ohio State University
Earthquake Seismic Deformations from Spaceborne Gravimetry

Natasha DeLeon-Rodriguez (Student); Konstantinos Konstantinidis (Advisor); Georgia Institute of Technology
Quantifying the Role of Airborne Bacteria in Cloud Formation and Climate Modeling

Mohammad Ebtehaj (Student); Efi Foufoula-Georgiou (Advisor); University of Minnesota
Towards the Next Generation of Multi-sensor Multiscale Precipitation Fusion

Emily Foshee (Student); Udaysankar Nair (Advisor); University of Alabama in Huntsville
Gap Wind Analysis and Prediction (GAP): Development of Techniques for Forecasting Mountain Gap Winds Using Satellite-Derived Wind Fields and MERRA

Nicholas Foukal (Student); Andrew Thomas (Advisor); University of Maine
Satellite-Measured Phytoplankton Phenology in the California Current

Jing Gao (Student); James Burt (Advisor); University of Wisconsin-Madison
Bias-Variance Error Decomposition for Data-Driven Geospatial Modeling

Abebe Gebregiorgis (Student); Faisal Hossain (Advisor); Tennessee Technological University
Satellite Rainfall Uncertainty Estimation across the Globe for Diverse Hydrologic Applications Using Readily Accessible Geophysical Features

Colin Gleason (Student); Laurence Smith (Advisor); University of California, Los Angeles
Automated Tracking of Greenland Meltwater Runoff Integrating Surface and Satellite Observations of the Proglacial Zone

Kaiyu Guan (Student); Eric Wood (Advisor); Princeton University
Predicting Vegetation Phenology of African Savanna Ecosystems in a Changing Climate

Yanghui Kang (Student); Mutlu Ozdogan (Advisor); University of Wisconsin
Yield Estimation Through Assimilation of Remotely Sensed Data into Crop Growth Models

Alexandra Konings (Student); Dara Entekhabi (Advisor); Massachusetts Institute of Technology
Algorithms for P-band SAR Root-Zone Soil Moisture Retrieval

Yang Lei (Student); Paul Siqueira (Advisor); University of Massachusetts
Determination of Vegetation Vertical Structural Profile and Changes for DESDynI-Like missions Utilizing InSAR and PolInSAR Techniques

Zhao Liu (Student); James Famiglietti (Advisor); University of California, Irvine
An Explicit Representation of River Networks in a Catchment-Based Land Surface Model Framework for SWOT Assimilation

David Marvin (Student); Robyn Burnham (Advisor); University of Michigan
Are Tropical Lianas Increasing in Abundance? An Integrated Satellite-Aerial-Ground Approach for Liana Detection at the Landscape Scale

Eric McIntyre (Student); Albin Gasiewski (Advisor); University of Colorado at Boulder
L-band Spectrometry for SMAP Spatial Validation and RFI Mitigation

Diego Melgar (Student); Yehuda Bock (Advisor); Scripps Institution of Oceanography, UCSD
Rapid Source Imaging of Large Earthquakes for Early Response

Samiah Moustafa (Student); Asa Rennermalm (Advisor); Rutgers, The State University of New Jersey
Assessing Greenland Ice Sheet Meltwater Losses Through Braided Rivers Using ASTER, Landsat, Airborne NASA IceBridge, and In Situ Data

Ivan Ortega (Student); Rainer Volkamer (Advisor); University of Colorado at Boulder
Improving Trace Gas and Aerosol Vertical Information: Application to Satellite Validation

Fernando Paolo (Student); Helen Fricker (Advisor); Scripps Institution of Oceanography
Interannual and Decadal Variations of Antarctic Ice Shelves Using Multi-Mission Satellite Radar Altimetry, and Links with Oceanic and Atmospheric Forcings

Sam Rabin (Student); Stephen Pacala (Advisor); Princeton University
Understanding Land Use and Fire at a Global Scale

Carlos Ramirez Reyes (Student); Volker Radeloff (Advisor); University of Wisconsin-Madison
Monitoring Deforestation to Evaluate Mexico's Payments for Ecosystem Services and Assess Land Use Change Effects on Jaguar Habitat

Anthony Reisinger (Student); James Gibeaut (Advisor); Texas A&M University, Corpus Christi
Suspended Sediment Dynamics of Shallow Wind-Driven Estuaries: A Remote Sensing Approach

Bryan Riel (Student); Mark Simons (Advisor); California Institute of Technology
Sparse Inversion of Geodetic Data for Detecting Transient Signals

Paul Schmid (Student); Dev Niyogi (Advisor); Purdue University
Investigating the Impacts of Land-Surface Heterogeneity and Urban Aerosols on Thunderstorms Using Numerical Models and Multiplatform Satellite Observations

Rachel Schwartz (Student); Alexander Gershunov (Advisor); Scripps Institution of Oceanography
Marine Layer Clouds and California Coastal Climate: Behavior, Evolution and Consequences

David Shean (Student); Ian Joughin (Advisor); Applied Physics Laboratory - University of Washington
Quantifying Ice-Sheet Dynamics and Variability with Meter-Scale DEM and Velocity Data

Xiaopeng Song (Student); John Townshend (Advisor); University of Maryland
An integrated Assessment of Deforestation on Terrestrial Carbon Storage and Value of Ecosystem Services

Kang Sun (Student); Mark Zondlo (Advisor); Princeton University
Validation of TES Ammonia Using an Open-Path Quantum Cascade Laser Based Spectrometer

Hao Tang (Student); Ralph Dubayah (Advisor); University of Maryland
Determining Tropical Rain Forest Successional States Using Vertical Leaf Area Index (LAI) Profiles from Lidar Remote Sensing

Holly Taylor (Student); Matthew Pritchard (Advisor); Cornell University
A Search for Active Deformation in the Basin & Range Province and Rio Grande Rift of the Western U.S. and Northern Mexico

Luke Trusel (Student); Karen Frey (Advisor); Clark University
Antarctic Surface Melting: Intensity, Climatology, and Driving Mechanisms

Pouya Vahmani (Student); Terri Hogue (Advisor); University of California, Los Angeles
Urban Canopy Modeling (UCM) of the Los Angeles Metropolitan Area: Improving UCM Parameterization and Validation Using MODIS and Landsat Products

Maria Vega-Rodriguez (Student); Frank Muller-Karger (Advisor); University of South Florida
Influence of Temperature and Water Quality Variability on Oral Reef Diversity

Zhiyu Wang (Student); Timothy Garrett (Advisor); University of Utah
How will Future Arctic Sea Ice Decline Impact Atmospheric Stability and Cloudiness?

Nic Wayand (Student); Jessica Lundquist (Advisor); University of Washington
Here Today, Gone Tomorrow: Using Remote Sensing to Improve Modeling of Intermittent Snow

Emma Wear (Student); Craig Carlson (Advisor); University of California
Exploring the Role of Photobleached Dissolved Organic Matter on Bacterial Community Activity and Carbon Export Potential in Upwelling-Driven Case II Waters

David Whittleston (Student); Dara Entekhabi (Advisor); Massachusetts Institute of Technology
Delineating the Role of Arctic Forcing in Extratropical Extreme Weather

Alana Wilson (Student); Mark Williams (Advisor); University of Colorado
Using Remote Sensing and Physically-Based Hydrologic Models to Assess the Contribution of Snow and Ice Melt to the Major Rivers of High Asia

Abel Woldemichael (Student); Faisal Hossain (Advisor); Tennessee Technological University
Understanding Atmospheric Rivers, Terrain and Anthropogenic Land Cover Changes on Storm Modification Around Large Dams Using Multi-Sensor Satellite Data, Cloud Tracking and Numerical Modeling

Xiaoguang Xu (Student); Jun Wang (Advisor); University of Nebraska-Lincoln
Constraining Global Sources of Atmospheric Mineral Dust with Multi-Sensor Satellite Observations and the GEOS-Chem Adjoint Model

Noah Yavit (Student); Miles Silman (Advisor); Wake Forest University
Ecosystem Effects and Carbon Content of Amazonian Bamboo-Dominated Forests

Chen Zhou (Student); Andrew Dessler (Advisor); Texas A&M University
Improvements in our Understanding of the Cloud Feedback