

NASA Earth and Space Science Fellowship (NESSF) Program – 2016 Updated June 17, 2016

NASA received a total of 767 applications in 2016 to the NASA Earth and Space Science (NESSF) Fellowship Program announced in November 2015 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 2016 NESSF selections are listed below by one of the four SMD science divisions.

The announcement for 2017 NESSF is anticipated in November 2016. 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, 2017.

Inquiries about the program may be directed to:

Program Administrator for NESSF Earth Science Research – Claire Macaulay at 202/358 0151 or by E-mail at claire.i.macaulay@nasa.gov.

Program Administrator 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](mailto:hq-nessf-space@nasa.gov).

Earth Science

NASA received a total of 425 applications in Earth Science Research and selected 73 for award, with one being jointly funded with the Heliophysics Division. Pending acceptance of the fellowship offer by each applicant and their respective institution, the selections are:

Marion Alberty (Student); Jennifer MacKinnon (Advisor); University of California, San Diego
The Crucial Role of Sub-Mesoscale Upper Arctic Ocean Mixing on Air-Sea-Ice Heat Fluxes: Analysis of a Novel Dataset
16-EARTH16F-0020

Austin Alford (Student); Michael Biggerstaff (Advisor); University of Oklahoma, Norman
Dynamics and Microphysics of Tropical Cyclones
16-EARTH16F-0101

Samer Alnussirat (Student); James Miller (Advisor); University of Alabama, Huntsville
Production of Energetic Emission and Acceleration of Particles in Thunderstorms: Terrestrial Gamma-Ray Flashes (jointly funded with Heliophysics Division)
16-EARTH16F-0181

Bernadette Arakwiye (Student); Ron Eastman (Advisor); Clark University
Monitoring Forest Degradation and Restoration in a Post Conflict Landscape: a Multidisciplinary and Multiscale Assessment in Western Rwanda
16-EARTH16F-0296

Malarvizhi Arulraj (Student); Ana Barros (Advisor); Duke University
Quantifying and Elucidating the Physical Basis of Uncertainty in GPM Precipitation in Mountain Regions Using Multifrequency Radar Observations and Models
16-EARTH16F-0404

Hannah Attard (Student); Andrea Lang (Advisor); State University of New York, Albany
Exploring the Relationship Between Tropospheric Synoptic Events, Vertical Wave Activity Flux, and Sudden Stratospheric Warmings Using the NASA MERRA-2 Dataset
16-EARTH16F-0105

Hannah Baranes (Student); Jon Woodruff (Advisor); University of Massachusetts, Amherst
Modeling the Relative Impacts of Changing Storm Climatology, Sea Level Rise, and Shoreline Evolution on Extreme Flooding: a Boston Case Study
16-EARTH16F-0145

Cesar Barbedo Rocha (Student); William Young (Advisor); University of California, San Diego
Upper Ocean Mesoscale to Submesoscale Wavenumber Spectra: Underlying Dynamics and Consequences
16-EARTH16F-0011

Rory Barton-Grimley (Student); Jeffrey Thayer (Advisor); University of Colorado, Boulder
Novel Polarization Techniques and Instrumentation for Glacial Melt Water Laser Bathymetry
16-EARTH16F-0219

El Hachemi Bouali (Student); Thomas Oommen (Advisor); Michigan Technological University
Landslide Life-Cycle Monitoring and Failure Prediction Using Satellite Remote Sensing
16-EARTH16F-0086

Tyler Brandt (Student); Jeff Dozier (Advisor); University of California, Santa Barbara
Using the Spatial Variability of Snow Accumulation to Evaluate the Orographic Effect in California's Sierra Nevada
16-EARTH16F-0381

Camrin Braun (Student); Simon Thorrold (Advisor); Woods Hole Oceanographic Institution
Investigating the Influence of Mesoscale Physical/Biological Interactions on Large Pelagic Predators: a Synergistic Analysis of Shark Behavior and Satellite Observations
16-EARTH16F-0344

Eric Bullock (Student); Curtis Woodcock (Advisor); Boston University
Improved Activity Data for Carbon Emissions from Forest Degradation Through Multi-Sensor Time Series Analysis in Southeast Asia
16-EARTH16F-0295

Leonardo Calle (Student); Benjamin Poulter (Advisor); Montana State University
Disentangling the Role of Phenology and Ecosystem Demographics in the Global Land Carbon Sink with Integrated OCO-2, MODIS and Carbon Cycle Modeling
16-EARTH16F-0375

Dylan Catlett (Student); David Siegel (Advisor); University of California, Santa Barbara
Linking Ocean Optical Properties with Marine Microbial Diversity Assessed by Next-Generation Sequencing
16-EARTH16F-0298

John Clare (Student); Philip Townsend (Advisor); University of Wisconsin, Madison
Leaves, Landscapes, and Lambda: Using Remote Sensing to Improve Predictions and Mechanistic Understanding of Spatiotemporal Wildlife Population Dynamics
16-EARTH16F-0348

Angie Crews (Student); Kerri Cahoy (Advisor); Massachusetts Institute of Technology

Sustained Land Imaging- CubeSats
16-EARTH16F-0234

Michael Croteau (Student); Robert Nerem (Advisor); University of Colorado, Boulder
A Daily-Updated GRACE Water Storage Estimate for Improving Hydrology Models and Forecasting
16-EARTH16F-0326

William Currier (Student); Jessica Lundquist (Advisor); University of Washington, Seattle
Improving Snow Water Equivalent Modeling in Forests Using Remote Sensing at Multiple Spatial Scales
16-EARTH16F-0018

Kimberly DeGrandpre (Student); Zhong Lu (Advisor); Southern Methodist University, Inc
Physics-Based Models of Aleutian Volcanism: A Study of the Effect of Subduction Zone Dynamics on Deformation Source Parameters Using InSAR, GPS, and Seismicity
16-EARTH16F-0038

Francisco Delgado (Student); Matthew Pritchard (Advisor); Cornell University
Understanding the Driving Conditions of a Silicic Eruption and Intrusion Using InSAR Geodesy and Numerical Modeling: The Example of Cordon Caulle (Southern Andes)
16-EARTH16F-0211

Yannis Dialynas (Student); Rafael Bras (Advisor); Georgia Tech Research Corporation
Assessing the Influence of Soil Erosion on Atmospheric CO₂ Using Remote Sensing and a Coupled Spatially-Explicit Model
16-EARTH16F-0033

William Durkin (Student); Matthew Pritchard (Advisor); Cornell University
Coupled Changes in the Cryosphere and Solid Earth Measured by Space Geodesy
16-EARTH16F-0223

Kenneth Earl (Student); Shu-Hua Chen (Advisor); University of California, Davis
Hybrid Assimilation of Satellite Aerosol Observations and Its Impact on Simulations of Atlantic Tropical Cyclones
16-EARTH16F-0422

Mary Engels (Student); Robert Heinse (Advisor); University of Idaho, Moscow
Mapping Soils Through the Trees: a Small Low Island Case Study
16-EARTH16F-0235

Alexis Eugene (Student); Marcelo Guzman (Advisor); University of Kentucky, Lexington
Contribution of Model Aqueous Aerosol Formation from 2-Oxocarboxylic Acids to Earth's Radiation Balance
16-EARTH16F-0309

Henning Finkenzeller (Student); Rainer Volkamer (Advisor); University of Colorado, Boulder
Extended O₂-O₂ Absorption Cross-Sections: Laboratory Measurements and Application to Atmospheric Remote Sensing
16-EARTH16F-0134

Julia Green (Student); Pierre Gentine (Advisor); Columbia University
Observations of Biosphere-Atmosphere Interactions Using Satellite Data
16-EARTH16F-0121

Siddhant Gupta (Student); Greg McFarquhar (Advisor); University of Illinois, Urbana-Champaign
Effects of Spatio-Temporal Variability in Aerosol Concentrations/Composition on Cloud and Radiative Properties in the South East Atlantic
16-EARTH16F-0136

Elias Heimisson (Student); Paul Segall (Advisor); Stanford University
Towards Understanding Where and When Dikes Erupt
16-EARTH16F-0284

Keith Jennings (Student); Noah Molotch (Advisor); University of Colorado, Boulder
Assessing the Climate Sensitivity of Mountain Snowpacks Using the Airborne Snow Observatory and a Distributed Snowpack Model
16-EARTH16F-0378

Daniel Jensen (Student); Kyle Cavanaugh (Advisor); University of California, Los Angeles
Integrating Remote Sensing Datasets for Species Discrimination, Biomass Estimation, and Monitoring Environmental Change in Louisiana's Coastal Wetlands
16-EARTH16F-0012

Miriam Johnston (Student); Paul Moorcroft (Advisor); Harvard College
Improving Terrestrial Biosphere Model Predictions of Coupled Carbon, Water, and Energy Fluxes Using Remotely Sensed Surface and Vegetation Temperatures
16-EARTH16F-0244

Jannes Koelling (Student); Uwe Send (Advisor); University of California, San Diego
Using GRACE Satellite Data to Investigate Variability in Deep Ocean Transports
16-EARTH16F-0022

Ryan Kramer (Student); Brian Soden (Advisor); University of Miami, Key Biscayne
Understanding Radiative Feedbacks and Radiative Forcings of the Hydrological Cycle
16-EARTH16F-0185

Meredith Kraner (Student); Cornelis Kreemer (Advisor); University of Nevada, Reno
Earthquake Weather: Using GPS and Satellite Data to Understand Seasonal Variation in Crustal Deformation and Seismicity
16-EARTH16F-0345

Zachary Lawrence (Student); Kenneth Minschwaner (Advisor); New Mexico Institute of Mining and Technology

A New Perspective on Polar Vortex and Jet Interactions and Their Impacts on Past, Present, and Future Upper Tropospheric/Lower Stratospheric Ozone

16-EARTH16F-0142

Paul Levine (Student); James Randerson (Advisor); University of California, Irvine

Global Remote Sensing Analysis for Model Benchmarking of the Coupled Carbon and Hydrologic Cycles

16-EARTH16F-0196

Kate Lewis (Student); Kevin Arrigo (Advisor); Stanford University

Improved Algorithms for Measuring Phytoplankton Biomass and Productivity in the Changing Arctic Ocean

16-EARTH16F-0064

Paige Logan (Student); LuAnne Thompson (Advisor); University of Washington, Seattle

Resolving Deep Ocean Changes with Deep Argo and Satellite Data

16-EARTH16F-0005

Sandra Marcela Loria-Salazar (Student); Heather Holmes (Advisor); University of Nevada, Reno

Spatiotemporal Estimates of Surface PM_{2.5} Concentrations in the Western U.S. Using NASA MODIS-MISR Retrievals and Data Assimilation Techniques

16-EARTH16F-0135

Qianwen Luo (Student); Wen-wen Tung (Advisor); Purdue University

Impacts on the Surface Energy Balance by the US landfalling Atmospheric Rivers

16-EARTH16F-0269

Kyle Mattingly (Student); Thomas Mote (Advisor); University of Georgia, Athens

Connecting Changes in Poleward Energy Flux to Greenland Ice Sheet Energy Budget and Mass Balance: the Role of Moisture Transport by Atmospheric Rivers

16-EARTH16F-0084

Joshua Maurer (Student); Joerg Schaefer (Advisor); Columbia University

Glacier Changes in High Mountain Asia Since 1970 - Combining Declassified Spy Satellite Imagery with Energy and Mass Balance Models

16-EARTH16F-0347

Brent McBride (Student); J. Vanderlei Martins (Advisor); University of Maryland Baltimore County

Retrievals of Aerosol and Cloud Droplet Microphysical Properties with the Hyper-Angular Rainbow Polarimeter (HARP)

16-EARTH16F-0243

Elin McIlhattan (Student); Tristan L'Ecuyer (Advisor); University of Wisconsin, Madison

Utilizing NASA Active Satellite Observations to Better Understand and Model Polar Cloud Behavior
16-EARTH16F-0160

Karl Meingast (Student); Evan Kane (Advisor); Michigan Technological University
Dissolved Organic Matter Movement Across a Terrestrial-River-Coastal Interface
16-EARTH16F-0106

Andrea Melchiorre (Student); Luigi Boschetti (Advisor); University of Idaho, Moscow
Satellite Constellation Requirements for 30 m Global Burned Area Mapping
16-EARTH16F-0396

Megan Miller (Student); Manoochehr Shirzaei (Advisor); Arizona State University
Remote Sensing of Land Subsidence and Hydrological Properties Across Arizona
16-EARTH16F-0093

Bowen Pan (Student); Renyi Zhang (Advisor); Texas A & M, College Station
Quantification of the Impacts of Saharan Dust on Atlantic Tropical Cyclones Using Satellite and Aircraft Observations and Coupled Atmosphere-Ocean Models
16-EARTH16F-0290

Taejin Park (Student); Ranga Myneni (Advisor); Boston University
Investigation on Changing Photosynthetically Active Growing Season and Gross Productivity of Northern Boreal/Arctic Vegetation Using EOS MODIS and Suomi VIIRS Data in Conjunction with Ground Observations
16-EARTH16F-0265

Briana Phillips (Student); Larry O'Neill (Advisor); Oregon State University
Observational Analysis of the Effects of Extratropical Cyclones Within the North Pacific Gyre Warm Pool
16-EARTH16F-0403

Patrick Poon (Student); Alicia Kinoshita (Advisor); San Diego State University
Estimating Satellite-Based Evapotranspiration After Wildfire
16-EARTH16F-0233

Predrag Popovic (Student); Dorian Abbot (Advisor); University of Chicago
Exploiting Melt Pond Patterns to Understand, Forecast, and Measure Arctic Sea Ice
16-EARTH16F-0083

Adam Purdy (Student); Gudrun Magnúsdóttir (Advisor); University of California, Irvine
SMAP Soil Moisture & OCO-2 Solar Induced Fluorescence to Characterize ET Stress and Improve PTJPL-ET
16-EARTH16F-0143

Bryan Rainwater (Student); Darin Toohey (Advisor); University of Colorado, Boulder

A New Laser Hygrometer for Measurements of Stable Isotopes in Cloud Water
16-EARTH16F-0227

Danielle Rappaport (Student); Ralph Dubayah (Advisor); University of Maryland, College Park
Combining Lidar and Acoustic Remote Sensing to Characterize the Carbon, Habitat and Biodiversity Consequences of Amazon Forest Degradation
16-EARTH16F-0236

Travis Roth (Student); Anne Nolin (Advisor); Oregon State University
Understanding Forest Structure Effects on Snow Accumulation and Ablation for Improved Satellite-Based Snow Mapping and Model Characterization
16-EARTH16F-0426

Jessie Saunders (Student); Jennifer Haase (Advisor); University of California, San Diego
Detecting Large Shallow Slip in Tsunami Earthquakes Using High-Rate GNSS
16-EARTH16F-0411

Anna Savage (Student); Brian Arbic (Advisor); University of Michigan, Ann Arbor
Internal Gravity Wave Continuum Signatures in Sea-Surface Height
16-EARTH16F-0003

Alexey Shiklomanov (Student); Michael Dietze (Advisor); Boston University
Tracking Successional Dynamics of Foliar Traits Using Remote Sensing
16-EARTH16F-0126

Md Sikder (Student); Faisal Hossain (Advisor); University of Washington, Seattle
Operational Flood Forecasting in Flood-Prone River Deltas of the Developing World: Setting the Path forward for Current and Future Satellite Water Missions
16-EARTH16F-0017

Sam Silva (Student); Colette Heald (Advisor); Massachusetts Institute of Technology
Investigating VOC Speciation Measured from Space
16-EARTH16F-0035

Matthew Smarte (Student); Mitchio Okumura (Advisor); California Institute of Technology
Constraining Polar Ozone Depletion with Measurements and Modeling of Chlorine Peroxide Photochemistry
16-EARTH16F-0410

Tasha Snow (Student); Waleed Abdalati (Advisor); University of Colorado, Boulder
Evaluating Fjord and Coastal Sea Surface Temperature Influences on Greenland Outlet Glacier Variability
16-EARTH16F-0151

Shaojie Sun (Student); Chuanmin Hu (Advisor); University of South Florida, Tampa

Ocean Surface Oil Detection and Quantification with Hyperspectral and Multispectral Optical Remote Sensing
16-EARTH16F-0360

Molly Tedesche (Student); David Barnes (Advisor); University of Alaska, Fairbanks
Climate-Driven Extent Changes in Perennial Snowfields in the Central Brooks Range, Alaska: Utilizing Satellite Data to Investigate Impacts on Caribou and Inform Native Alaskan Subsistence Users
16-EARTH16F-0177

Travis Toth (Student); Jianglong Zhang (Advisor); University of North Dakota, Grand Forks
Investigating Seasonal and Annual Variability in Particulate Matter Pollution over China
16-EARTH16F-0188

Victoria Walker (Student); Brian Hornbuckle (Advisor); Iowa State University, Ames
A New Approach for Retrieving Soil Moisture from SMAP over the Corn Belt
16-EARTH16F-0357

Daniel Watkins (Student); Jennifer Hutchings (Advisor); Oregon State University
Atmospheric Feedbacks Associated with Recent Changes in Arctic Sea Ice Dynamics
16-EARTH16F-0419

Erin Wetherley (Student); Dar Roberts (Advisor); University of California, Santa Barbara
Using HypsIRI-like Data to Quantify the Effects of Urban Vegetation and Materials on Microclimate at Sub-Pixel Scales
16-EARTH16F-0150

Casey Youngflesh (Student); Heather Lynch (Advisor); State University of New York, Stony Brook
Environmental Forcing of Antarctic Food Web Dynamics - a Multi-Tiered Approach Employing Multispectral Imagery, Field Spectroscopy, and Stable Isotope Analysis
16-EARTH16F-0004

Meng Zhao (Student); Isabella Velicogna (Advisor); University of California, Irvine
Characterizing Ecosystem Response to Hydro-Climatic Constraints Using Satellite and in Situ Observations
16-EARTH16F-0414