



**FIU**

FLORIDA  
INTERNATIONAL  
UNIVERSITY

**NASA/FIU Hurricane and Remote  
Sensing Summer Education and Research  
Internship Program (HRSSERP)  
Aug. 12-23, 2013**

# Internship Objectives

- Increase the participation of minorities and women in the field of meteorology and remote sensing.
- Offer direct research experience for undergraduate students on hurricane and remote sensing.
- Enhance presentation skills of students who are minorities and women.
- Inform participants about NASA's mission activities and graduate fellowship/internship opportunities, and meteorology career opportunities requiring skills in acquisition, processing, and interpretation of NASA remote sensing data.

# The Team

- **PI: Haiyan Jiang:** FIU Dept. of E&E, PC342B (haiyan.jiang@fiu.edu)
- **Co-I: Robert Rogers:** NOAA Hurricane Research Division (HRD)
- **Evaluator: Stephanie Doscher:** FIU Office of Global Learning Initiatives
- **Graduate Student Leaders (office: PC329):**
  - Cheng "Emmy" Tao
  - Margie Kieper
  - Yongxian "Isaac" Pei
- **Student Participants:**
  - Alannah Irwin
  - Albert Betancourt
  - Amanda Zapata
  - Juan Pena
  - Nathassa Astorga
  - Stephanie De Souza
  - Yamil Perez

# Schedule

- Two weeks, 10am-3pm everyday
- 5-6 lectures on
  - Research and presentation skills
  - Satellite remote sensing
  - Tropical cyclones
  - Hurricane inner core processes and storm rapid intensification.
- 2 labs on
  - Using IDV to view Visible and IR satellite images
  - Online resources for hurricane monitoring and forecasting
- One final project
  - Using all you learned to study one historic storm of your interest and present your results on the last day of the internship.



# NOAA HRD Visit & Research Seminars

- HRD visit planned on Friday August 16<sup>th</sup> - 9:30am to 3:00 pm:  
(Arrive early please!)
  - 10:30am-12pm:
    - HRD director Dr. Frank Marks: an overview of HRD's research activities
    - Field Program Director, Paul Reasor: HRD's field program plan for this year
    - Internship Co-PI DR. Rob Rogers: research using aircraft data
    - Ms. Shirley Murillo : career opportunities at NOAA
  - 12pm-12:30pm: Join HRD daily tropical weather discussion
  - 12:30pm-1:30pm: Lunch
  - 1:30pm-2:30pm: tour HRD, "Sunset Fridays"
  - If there is a live storm, we'll have to reschedule the visit to the following week
- Research seminars
  - Dr. Hugh Willoughby
  - Dr. Ping Zhu
  - Dr. Haiyan Jiang
  - Graduate student Margie Kieper

# Website and more

- <http://tcpf.fiu.edu/Jiang/education/HRSSERP/index.html>
  - All materials will be posted online
- Feedbacks are welcome
- Your final presentations will be evaluated by faculty members and graduate students

# Pictures from 2011 Internship





# Pictures from 2011 Internship





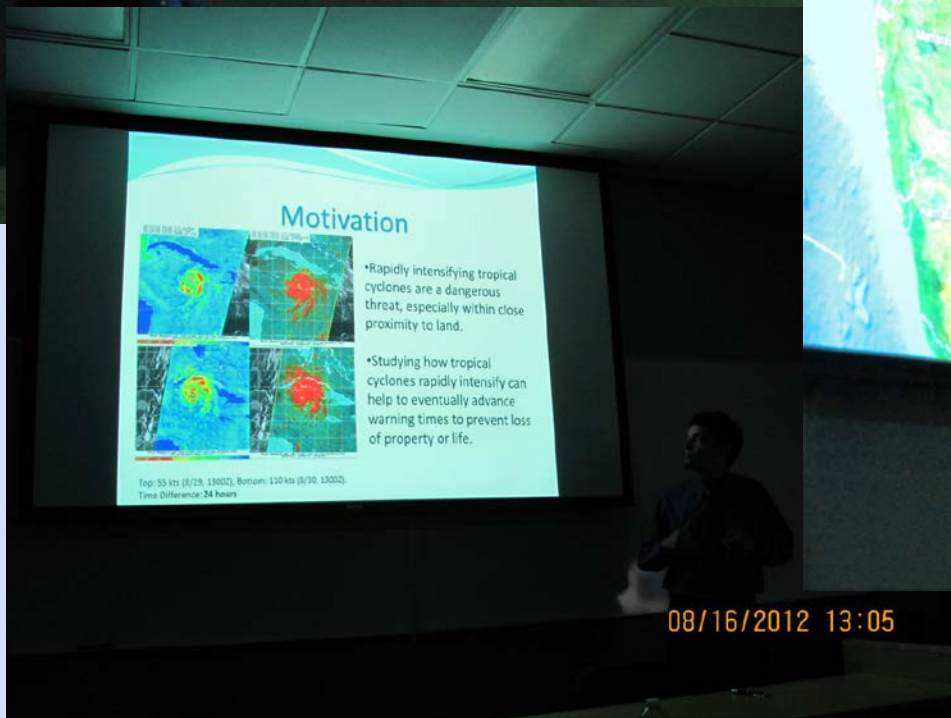
# Pictures from 2011 Internship



# Pictures from 2012 Internship



# Pictures from 2012 Internship



08/16/2012 13:05

08/16/2012 12:16



# Pictures from 2012 Internship





# Pictures from 2012 Internship



# Pictures from 2012 Internship





# Pictures from 2012 Internship



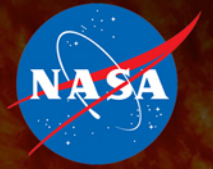


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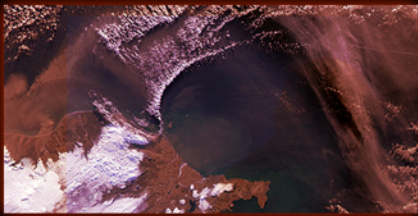
# **NASA's Science Missions and Student Internship/Fellowship Opportunities**

*For the NASA/FIU Hurricane and Remote Sensing Summer  
Education and Research Internship Program (HRSSERP)  
Aug. 12, 2013*

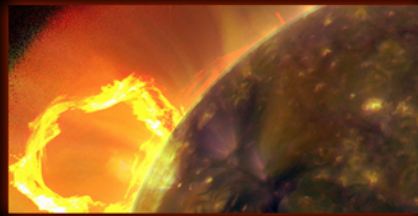


# NASA Science:

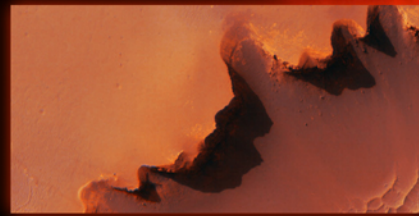
Earth Science  
Heliophysics  
Planetary Science  
Astrophysics



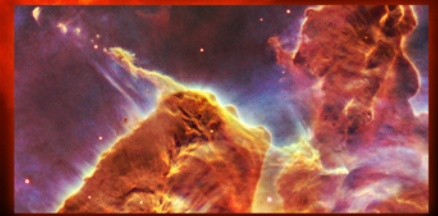
EARTH SCIENCE



HELIOPHYSICS



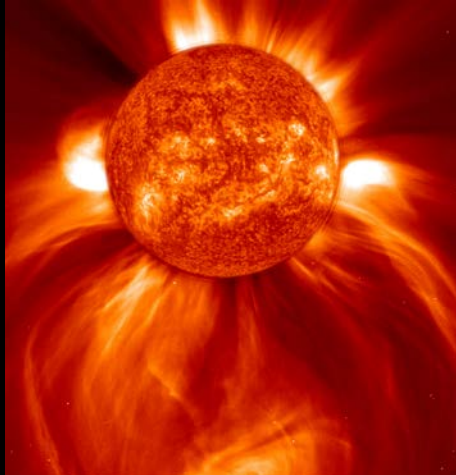
PLANETARY SCIENCE



ASTROPHYSICS



# NASA Science



**Answers science questions of compelling interest to all humanity.**

**Extends our nation's leadership in science while enabling partnerships that strengthen our international standing and relationships.**

**Inspires and trains the next generation of scientists, engineers, educators and citizens.**

**Provides information for use in response to national and international disasters.**

**Develops new technologies that drive innovation and impact the economy.**

**Provides objective research and observations to policy-makers and decision-makers in both the public and private sectors**

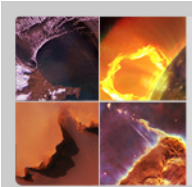




# NASA's Journey of Discovery

NASA's science program seeks answers to profound questions that touch or may affect us all:

- How and why are Earth's climate and the environment changing?
- How and why does the Sun vary and affect Earth and the rest of the solar system?
- How do planets and life originate?
- How does the universe work, and what are its origin and destiny?
- Are we alone?



# **NASA's Science Mission Directorate (SMD) At A Glance**

**98 spacecraft, 57 missions in operation, 28 more in development**

- **Plus aircraft, sounding rockets, balloons, and surface networks**

**Over 94% of every dollar NASA receives goes out the door to universities, commercial entities, and not-for-profits**

**More than 10,000 U.S. scientists funded by 3,000 competitively selected research awards**

**Partnerships with a dozen Federal agencies and 60 other nations**

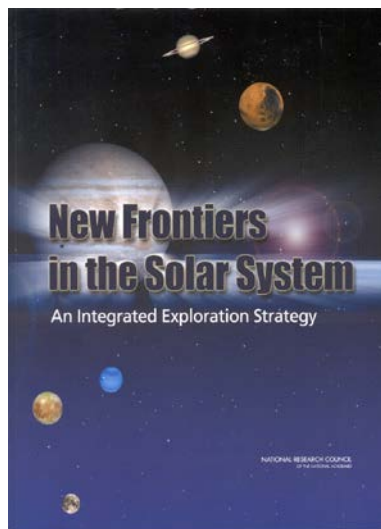
**More than \$500M of total SMD funds invested annually in technology development**

**Global impact on humanity's understanding of our place in the universe**





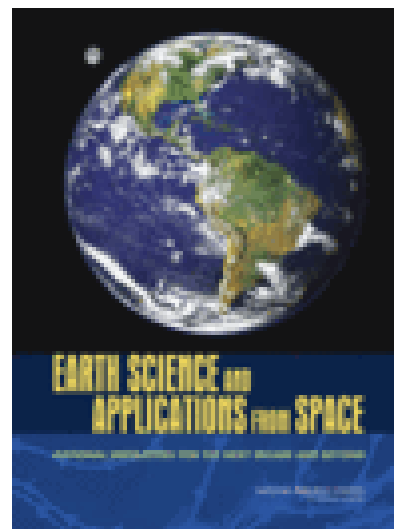
# Recommendations from the U.S. Scientific Community Through NRC Decadal Surveys



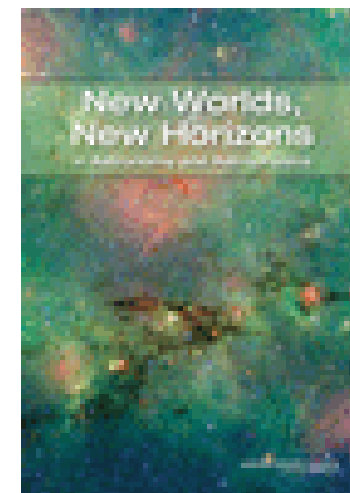
**Planetary Science  
2002  
(2011)**



**Heliophysics  
2003  
(2012)**



**Earth Science  
2007  
(2017)**



**Astrophysics  
2010  
(2020)**



# Engaging the Next Generation

*To share the story, the science, and the adventure of NASA's scientific explorations of our home planet, the solar system, and the universe beyond...*

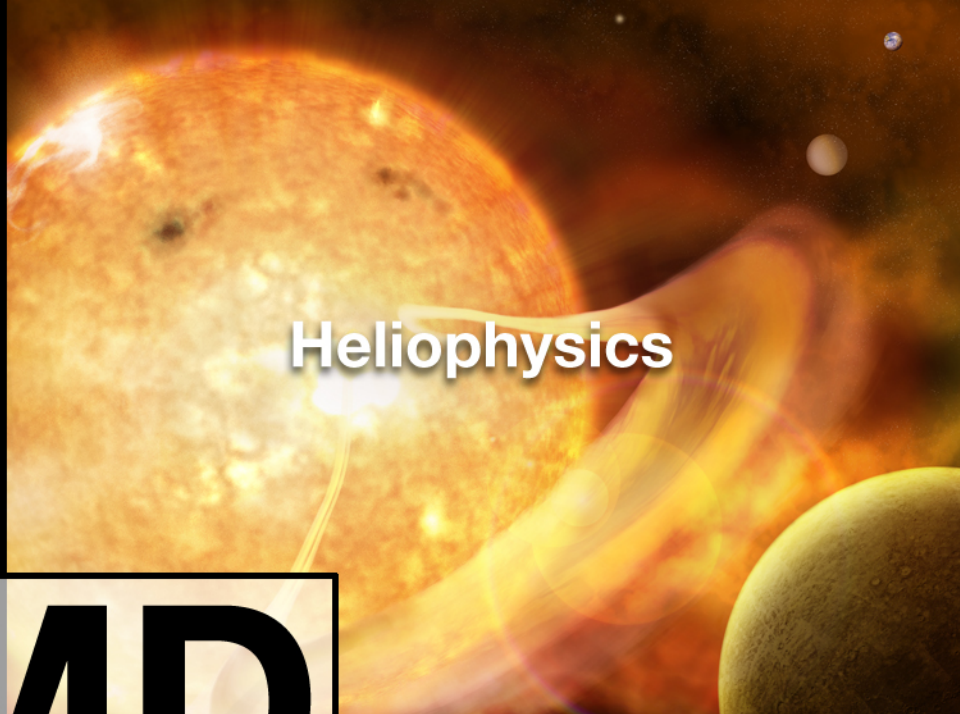
- SMD policy calls for each mission to allocate at least **1% of the mission budget for education and public outreach (E/PO activities)**
- Each SMD Division has a Science Education and Public Outreach Forum (SEPOF) to help better connect NASA and the broad national education community
- SMD engages in collaborations with such organizations as:
  - NASA Museum Alliance for science centers, museums, and planetariums
  - Boys Scouts/Girl Scouts, 4-H clubs, and Boy's and Girl's Clubs of America
- SMD's E/PO programs are coordinated with the NASA Office of Education







**Earth Science**

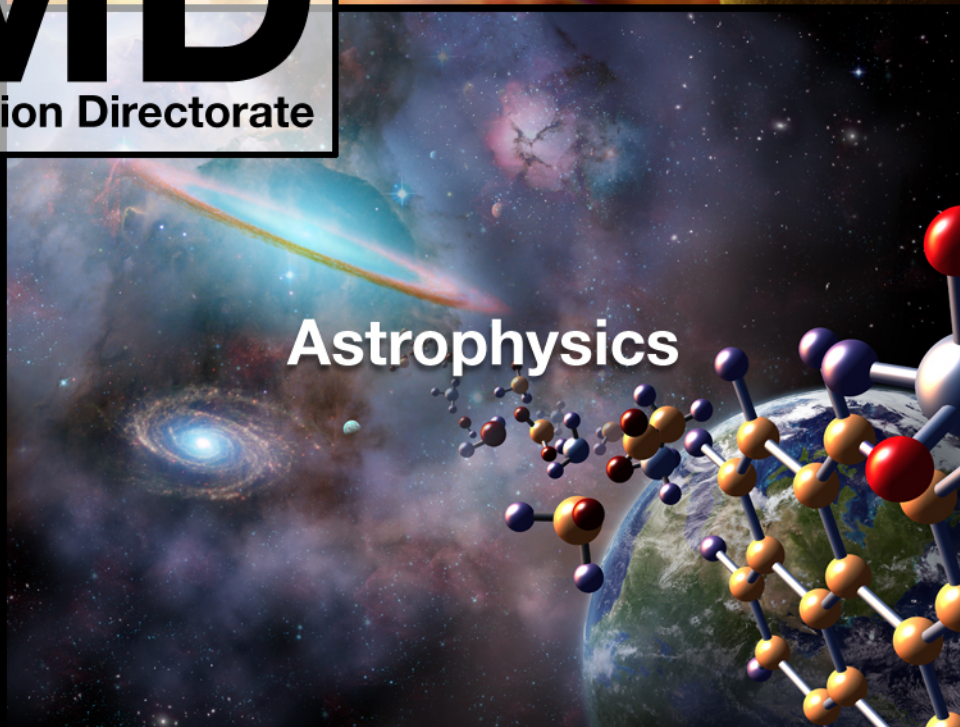


**Heliophysics**

**SMD**  
Science Mission Directorate



**Planetary Science**



**Astrophysics**



National Aeronautics and Space Administration



# Astrophysics



# Astrophysics

***Discover how the universe works, explore how the universe began and evolved, and search for Earth-like planets***

- How do matter, energy, space, and time behave under the extraordinarily diverse conditions of the cosmos?
- How did the universe originate and evolve to produce the galaxies, stars, and planets we see today?
- What are the characteristics of planetary systems orbiting other stars, and do they harbor life?



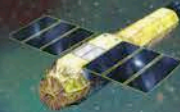




**XMM-Newton (ESA)**  
1999 (10 year mission)



**Swift**  
2004 (2 year mission)



**Suzaku (JAXA)**  
2005 (5 year mission)



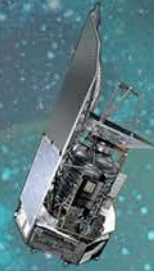
**Fermi**  
2008 (5 year mission)



**INTEGRAL (ESA)**  
2002 (2 year mission)



**RXTE**  
1995 (2.5 year mission)



**Herschel (ESA)**  
2009 (3 year mission)



**Planck (ESA)**  
2009 (3–4 year mission)



**GALEX**  
2003 (20–5 year mission)



**WISE**  
2009 (10 month mission)

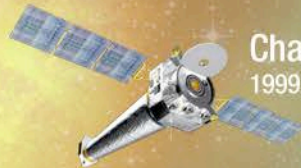


**Hubble**  
1990 (15 year mission)

**Kepler**  
2009 (3.5–6 year mission)



**Chandra**  
1999 (5 year mission)



**Spitzer**  
2003 (2.5 year mission)

# Astrophysics Missions in Operation

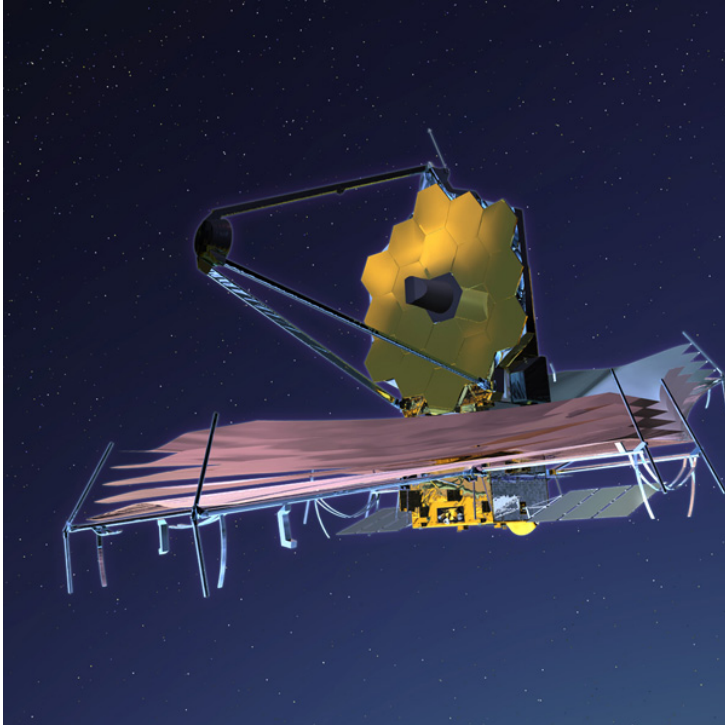


**SOFIA**  
2010 (20 year mission)



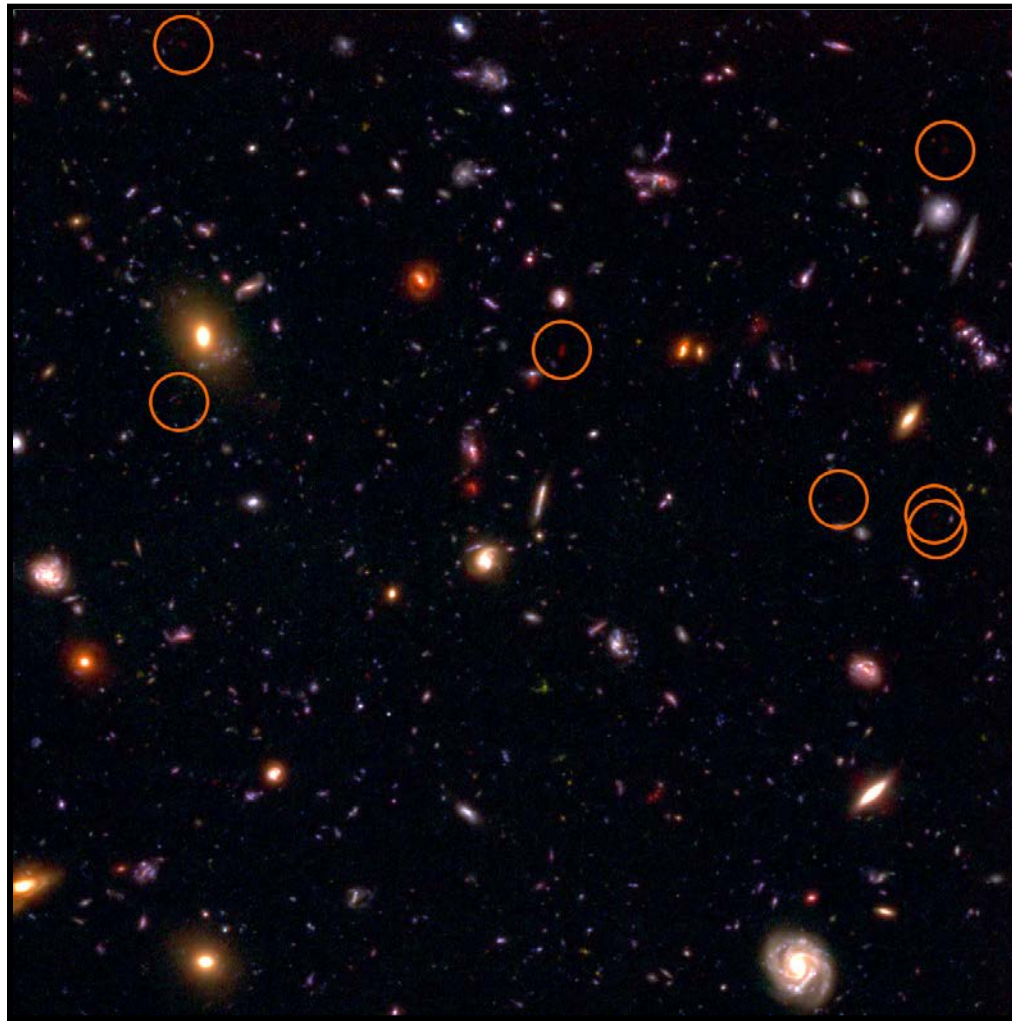


# James Webb Space Telescope (JWST)



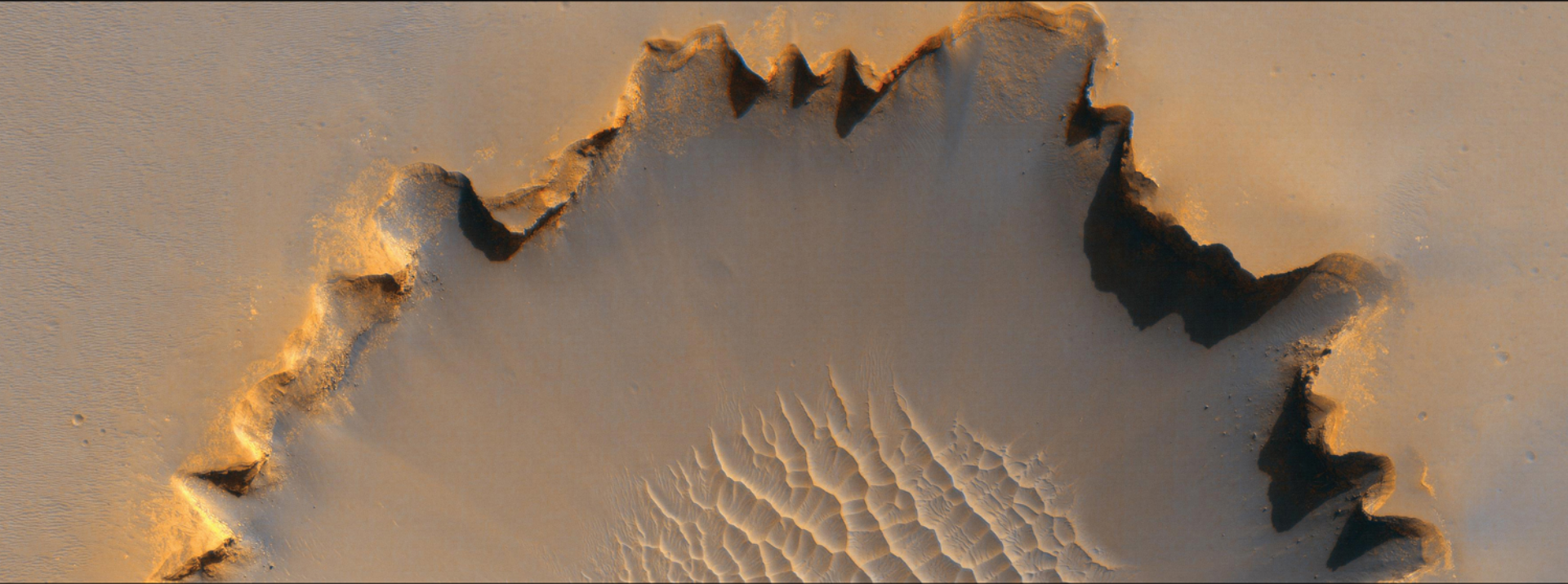
The James Webb Space Telescope (sometimes called JWST) is a large, infrared-optimized space telescope. **The project is working to a 2018 launch date.** JWST will look back in time to find the first galaxies that formed in the early Universe, connecting the Big Bang to our own Milky Way Galaxy. JWST will peer through dusty clouds to see stars forming planetary systems, connecting the Milky Way to our own Solar System.

# Hubble's Deepest View of the Universe



The Hubble Space Telescope has acquired the deepest image of the universe ever taken in near-infrared light using the newly installed **Wide Field Camera 3**.





# Planetary Science



# Planetary Science

***Ascertain the content, origin, and evolution of the solar system and the potential for life elsewhere***

- What is the inventory of solar system objects and what processes are active in and among them?
- How did the Sun's family of planets, satellites, and minor bodies originate and evolve?
- What are the characteristics of the solar system that lead to habitable environments?
- How and where could life begin and evolve in the solar system?
- What are characteristics of small bodies and planetary environments that pose hazards and/or provide resources?





# Planetary Science Missions in Operation



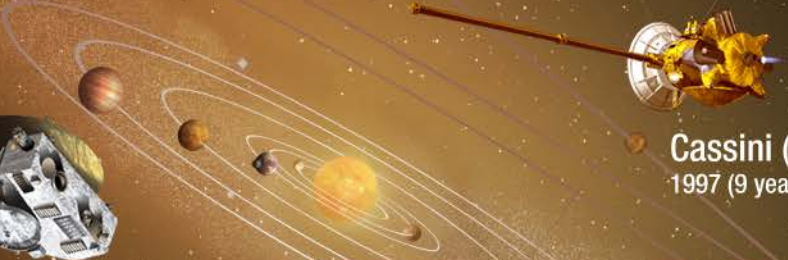
**Deep Impact-EPOXI**  
2005



**Messenger**  
2004 (8 year mission)



**Stardust-NEXT**  
1999



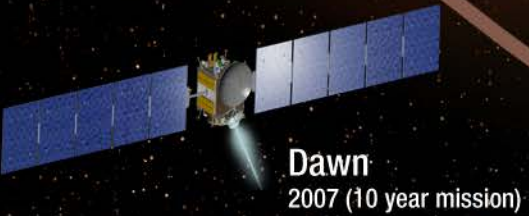
**Cassini (NASA/ESA)**  
1997 (9 year mission)



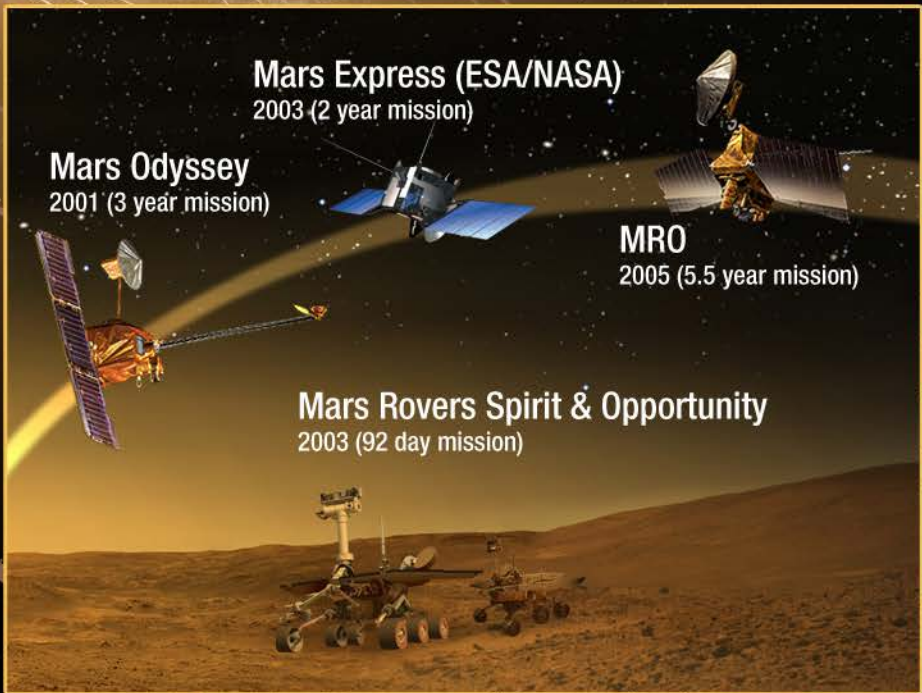
**New Horizons**  
2006 (15 year mission)



**Rosetta (ESA)**  
2004 (15 year mission)



**Dawn**  
2007 (10 year mission)



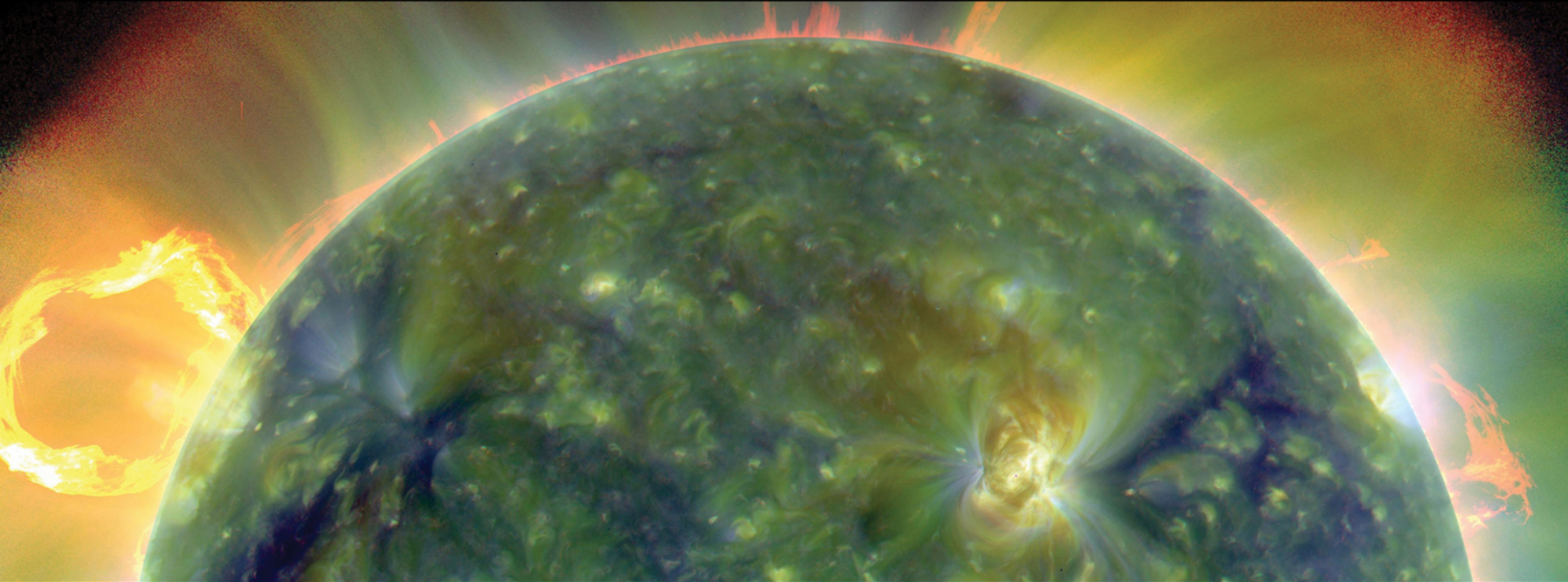
**Mars Express (ESA/NASA)**  
2003 (2 year mission)

**Mars Odyssey**  
2001 (3 year mission)

**MRO**  
2005 (5.5 year mission)

**Mars Rovers Spirit & Opportunity**  
2003 (92 day mission)





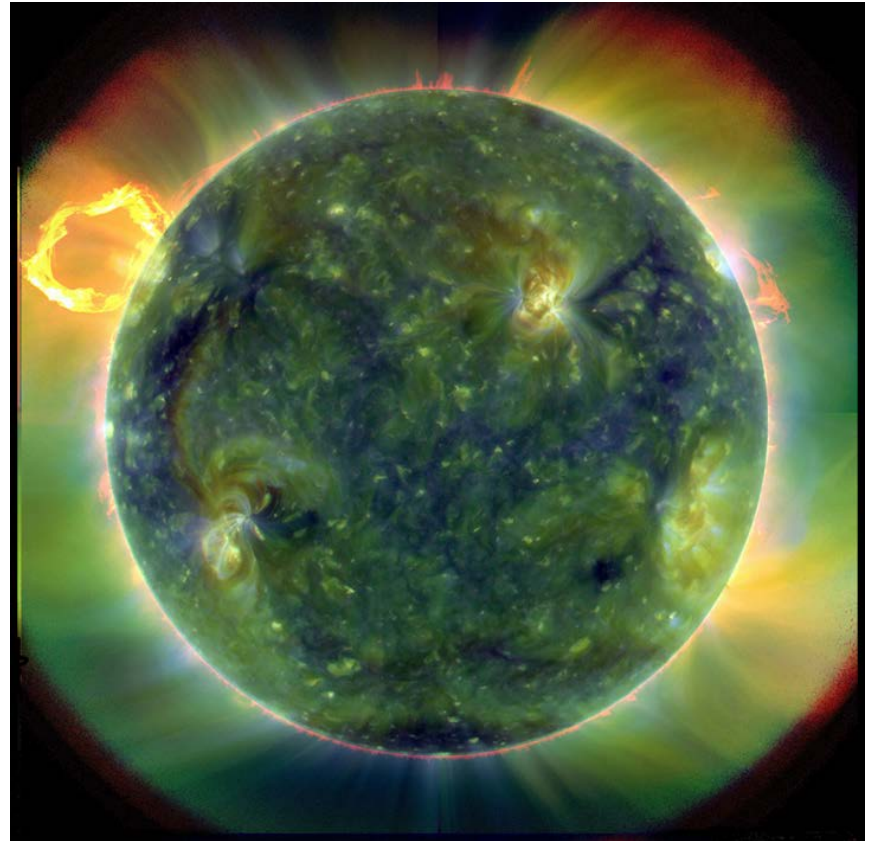
# Heliophysics



# Heliophysics

## *Understand the Sun and its interactions with the Earth and the solar system*

- What causes the Sun to vary?
- How do the Earth and the heliosphere respond?
- What are the impacts on humanity?





# Applications of Heliophysics Science

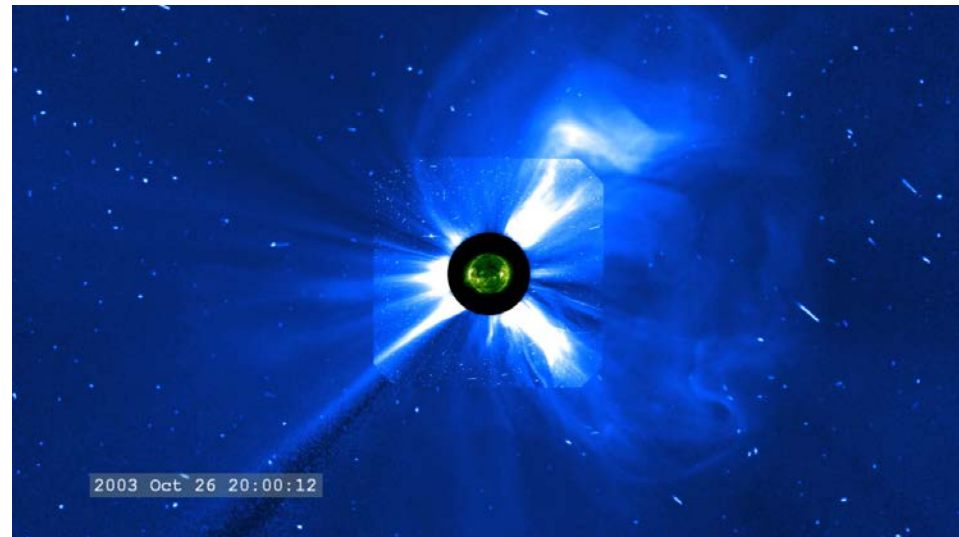
Modern society depends on a variety of technologies susceptible to the extremes of space weather

- Electric power grids and oil & gas pipelines
- High frequency radio communication and GPS navigation
- Satellites and spacecraft in Earth orbit

Human and robotic explorers across the solar system are also affected by solar activity

SMD makes its Heliophysics research data sets and models continuously available to all users via Internet sites, including:

- Combined Community Modeling Center
- Integrated Space Weather Analysis System





# Heliophysics Missions in Operation

**STEREO (2)**  
2006 (2 year mission)

**RHESSI**  
2002 (2 year mission)

**Cluster-ESA (4)**  
2000 (2 year mission)

**SOHO-ESA**  
1995 (2 year mission)



**CINDI**  
2008 (2 year mission)



**SDO**  
2010 (5 year mission)

**AIM**  
2007 (2 year mission)



**ACE**  
1997 (5 year mission)



**WIND**  
1994 (2 year mission)



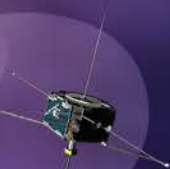
**Hinode-JAXA**  
2006 (3 year mission)



**TIMED**  
2001 (2 year mission)



**THEMIS (5)**  
2007 (2 year mission)



**TWINS (2)**  
2008 (7 year mission)



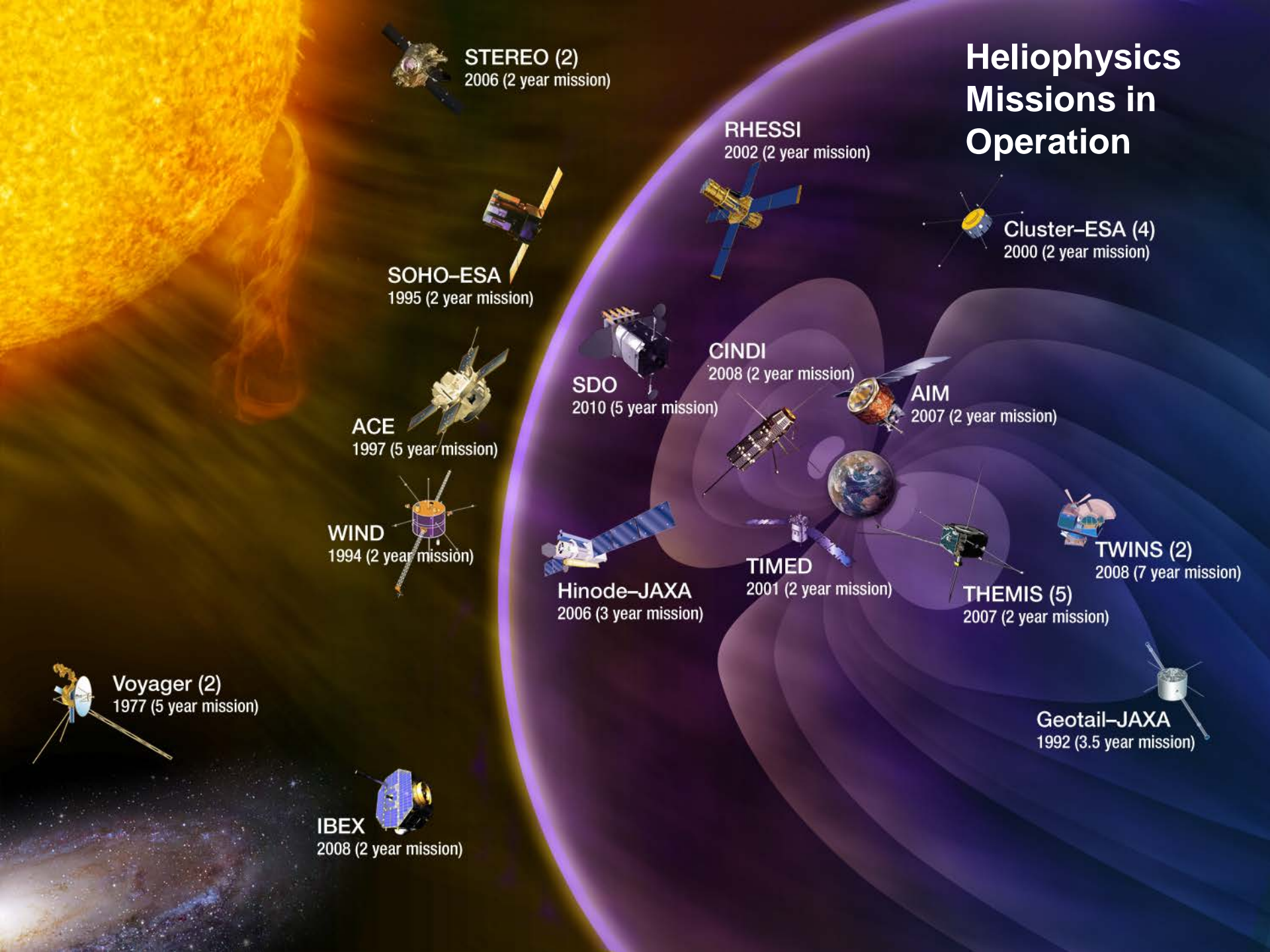
**Geotail-JAXA**  
1992 (3.5 year mission)



**IBEX**  
2008 (2 year mission)

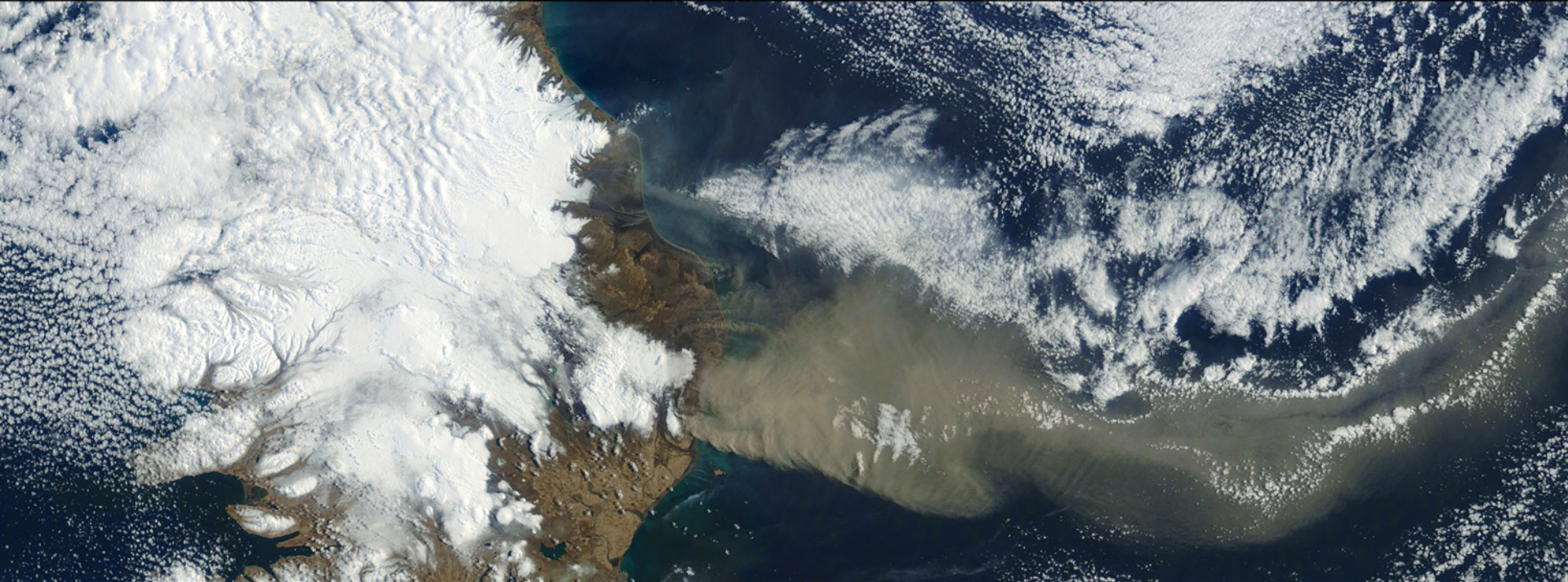


**Voyager (2)**  
1977 (5 year mission)





National Aeronautics and Space Administration



# Earth Science





# Earth Science

## ***Advance Earth System Science to meet the challenges of climate and environmental change***

- **How is the global Earth system changing? (Characterize)**
- **What are the sources of change in the Earth system and their magnitudes and trends? (Understand)**
- **How will the Earth system change in the future? (Predict)**
- **How can Earth System Science improve mitigation of and adaptation to global change? (Apply)**



***An end-to-end program*** encompassing space missions, suborbital platforms, data and information systems, fundamental research, data assimilation and modeling, applications research, and technology development.

# Earth Science Research and Applications

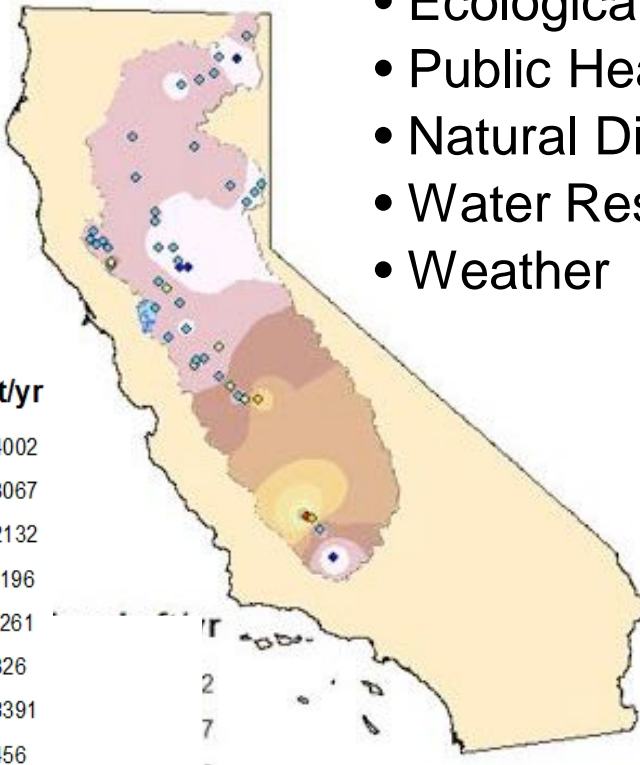
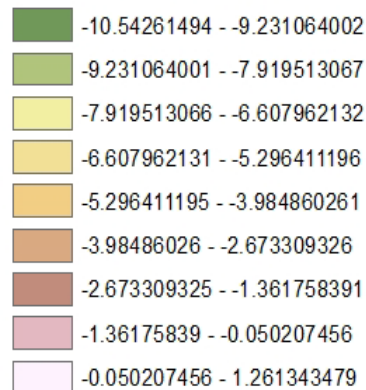
## Science Focus Areas:

- Atmospheric Composition
- Carbon Cycle & Ecosystems
- Climate Variability & Change
- Weather
- Water & Energy Cycle
- Earth Surface & Interior

## Applications Themes:

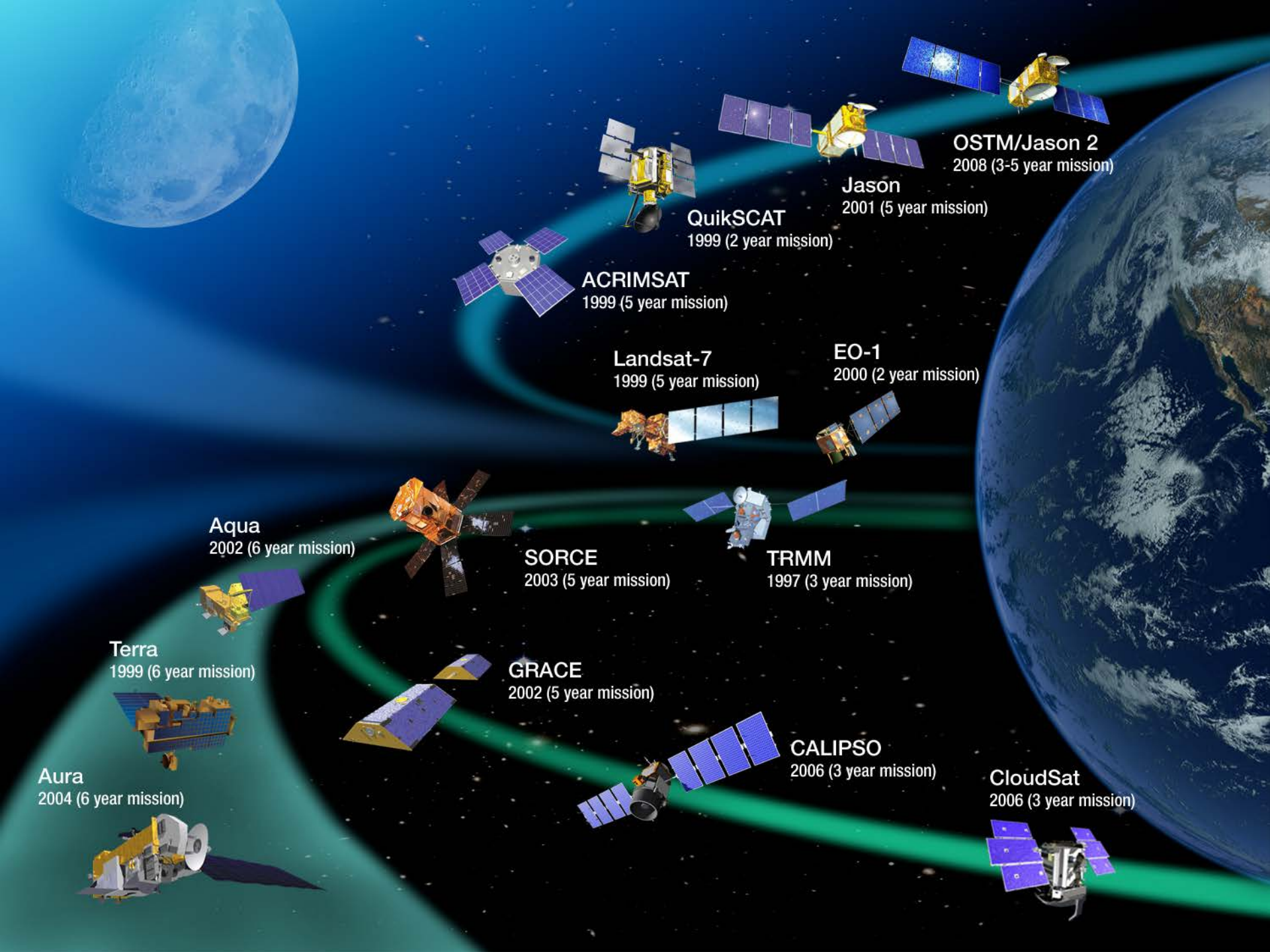
- Agriculture
- Air Quality
- Climate
- Ecological Forecasting
- Public Health
- Natural Disasters
- Water Resources
- Weather

### Ground Water Trends ft/yr



Observed trends in  
groundwater levels  
from GRACE  
October 2003 – March  
2009





**OSTM/Jason 2**  
2008 (3-5 year mission)

**Jason**  
2001 (5 year mission)

**QuikSCAT**  
1999 (2 year mission)

**ACRIMSAT**  
1999 (5 year mission)

**EO-1**  
2000 (2 year mission)

**Landsat-7**  
1999 (5 year mission)

**TRMM**  
1997 (3 year mission)

**SORCE**  
2003 (5 year mission)

**Aqua**  
2002 (6 year mission)

**Terra**  
1999 (6 year mission)

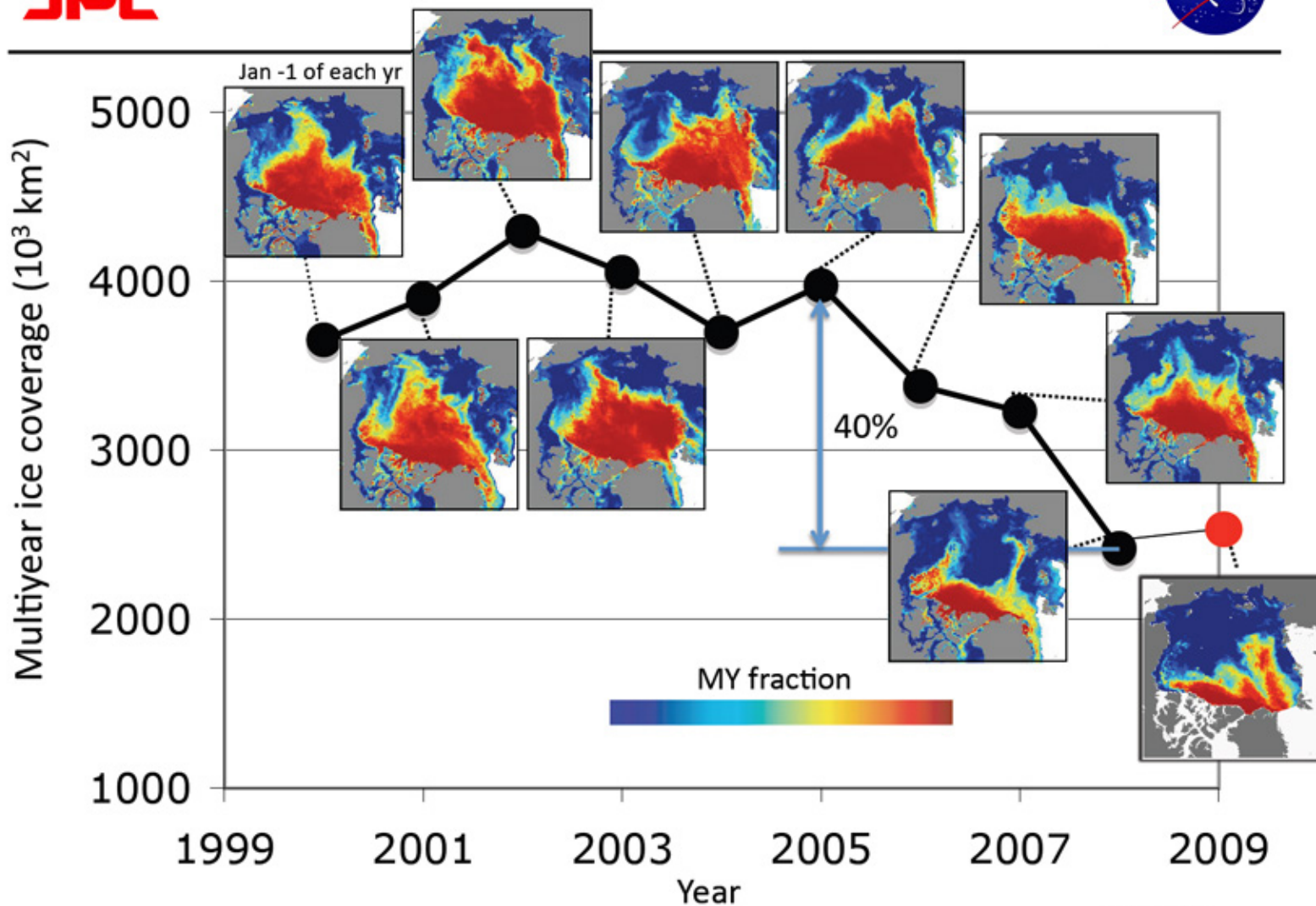
**GRACE**  
2002 (5 year mission)

**CALIPSO**  
2006 (3 year mission)

**Aura**  
2004 (6 year mission)

**CloudSat**  
2006 (3 year mission)

# Decline in Arctic Ocean Multiyear Sea Ice Coverage (1999-2009)



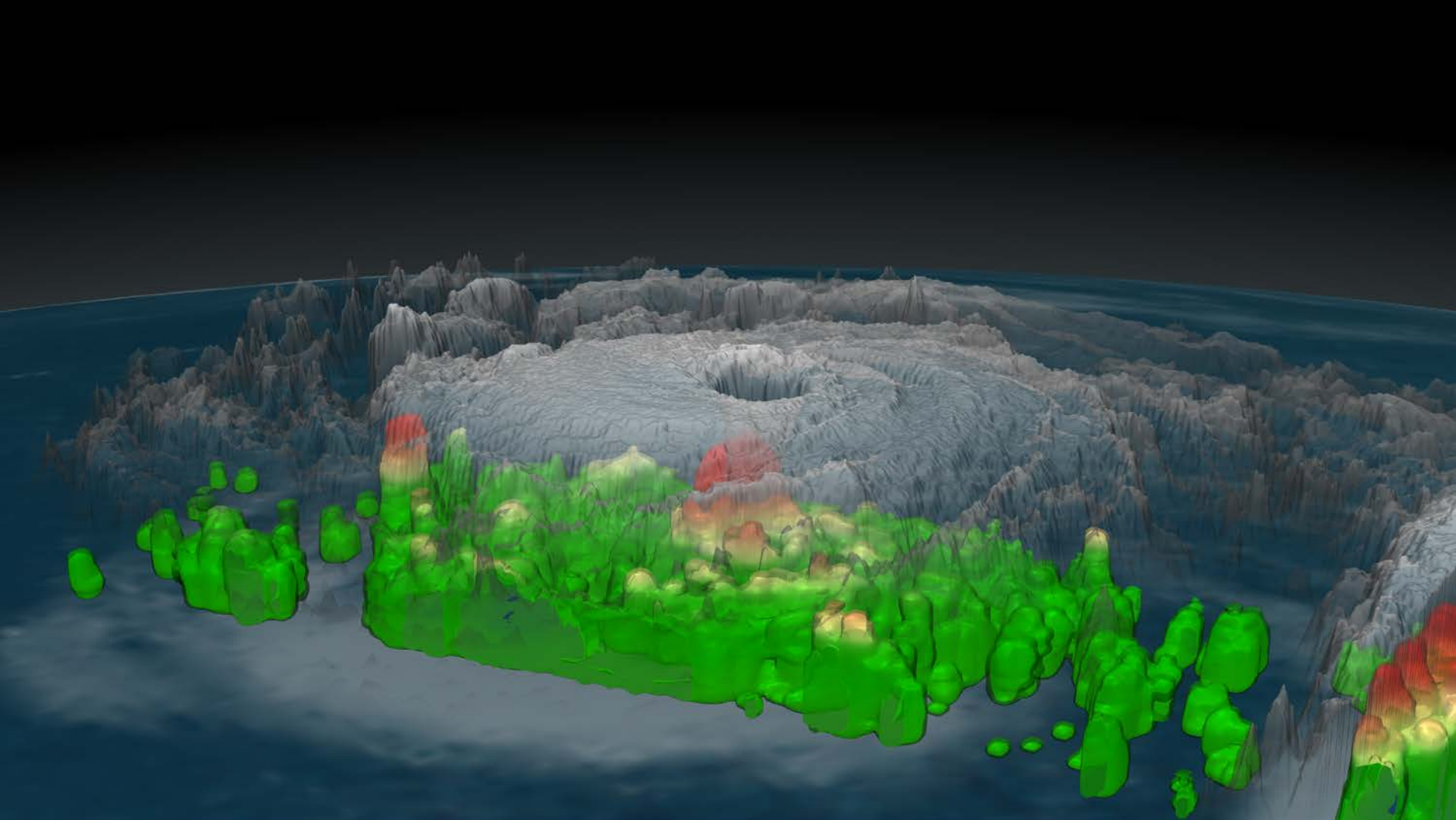
(Kwok, 2009)

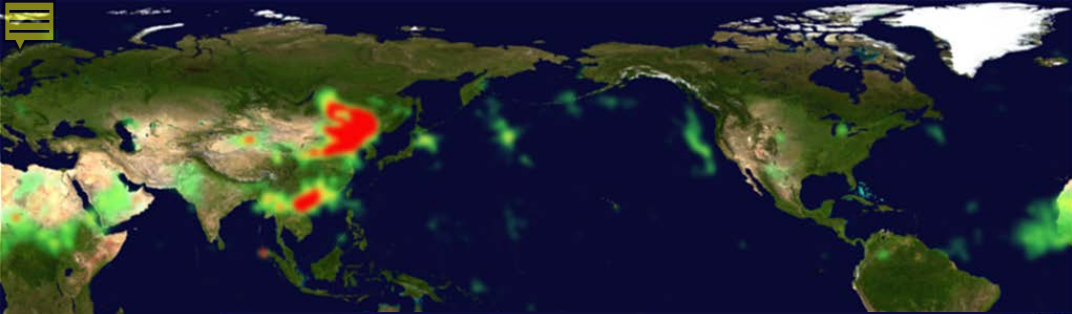




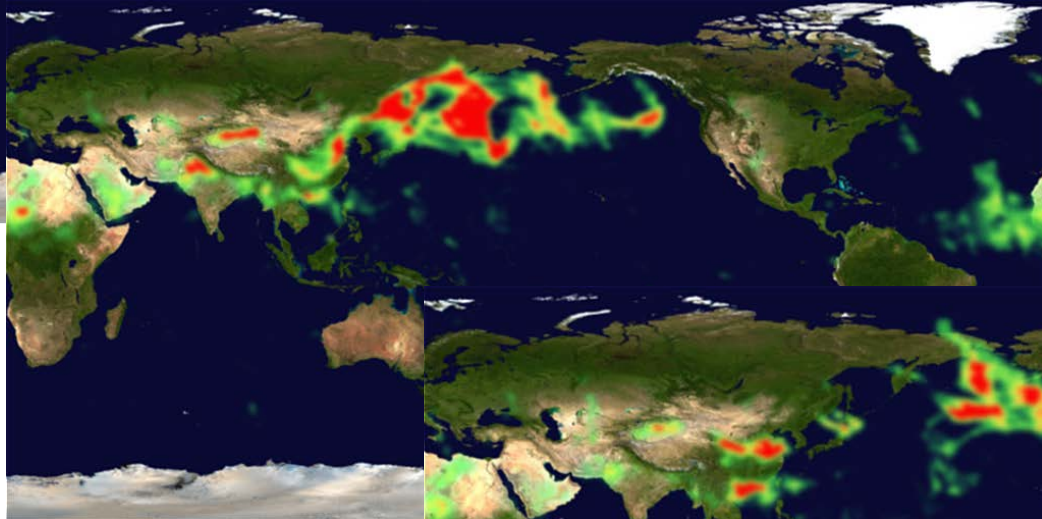
# Hurricane Danielle's Hot Towers from TRMM

August 27, 2010

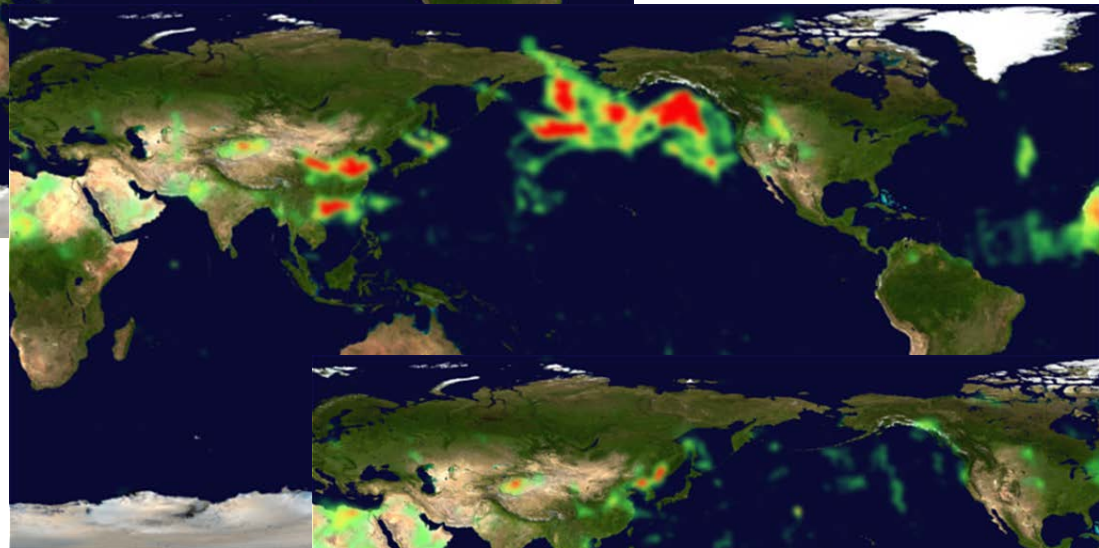




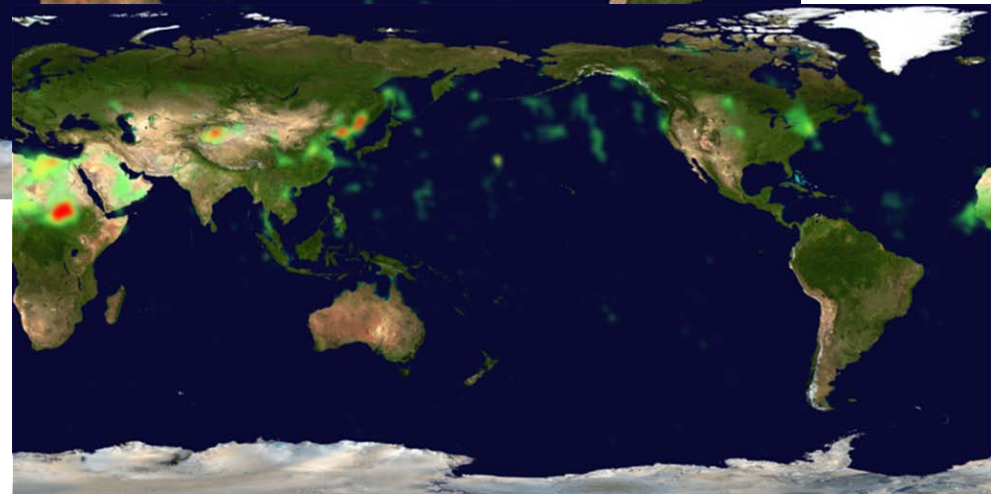
April 7, 2001



April 11, 2001



April 13, 2001



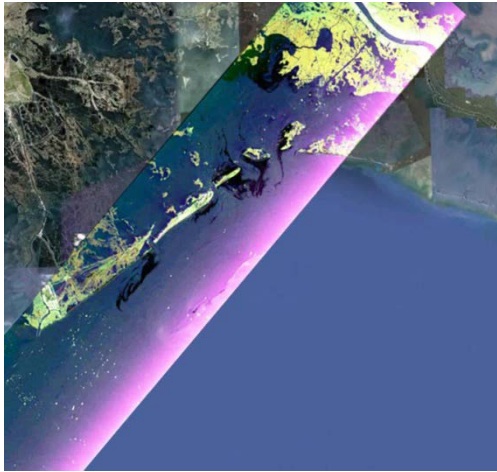
April 16, 2001

China Dust Storm  
Pollutes the Air in  
the Eastern US in  
April 2001

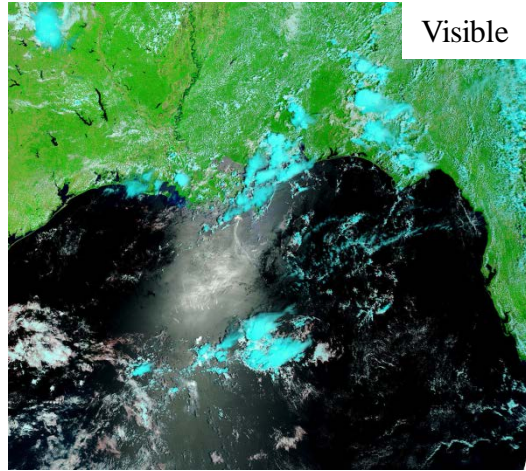


# Response to Gulf Oil Spill

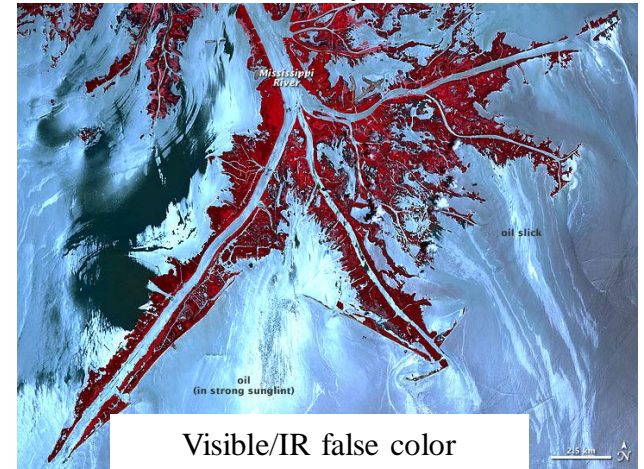
UAVSAR 23 June 2010



MODIS 31 May 2010



ASTER 24 May 2010



Satellite instruments: continually monitored the extent of the spill

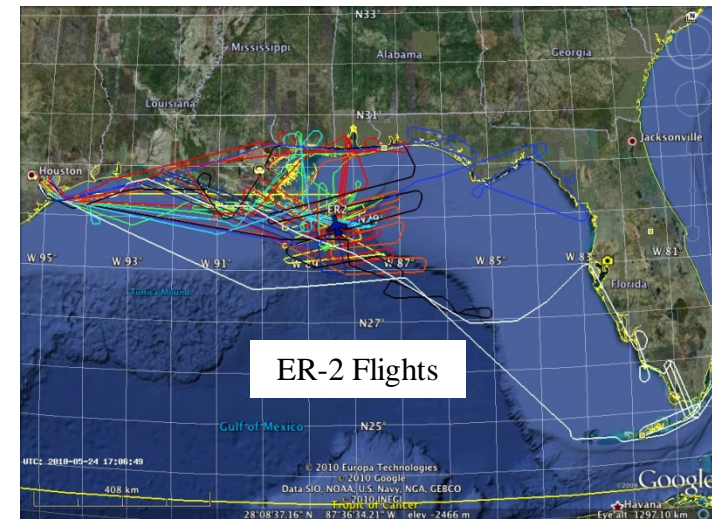
- Terra & Aqua / MODIS – visible and infrared daily synoptic
- Terra / ASTER – visible, near IR and thermal IR high res
- EO-1 / Advanced Land Imager and Hyperion – highest res
- Terra / MISR
- CALIPSO / CALIOP

Airborne instruments: measured *surface* extent and volume

- ER2 / AVIRIS and DCS, MASTER – May, Jul, Aug, Sept
- Twin Otter / AVIRIS (July 1-12)
- B200 / HSRL– 10-11 May; two FOO; CALIOP studies
- UAVSAR– 22-24 June

Data and provided to USGS for use by first responders;

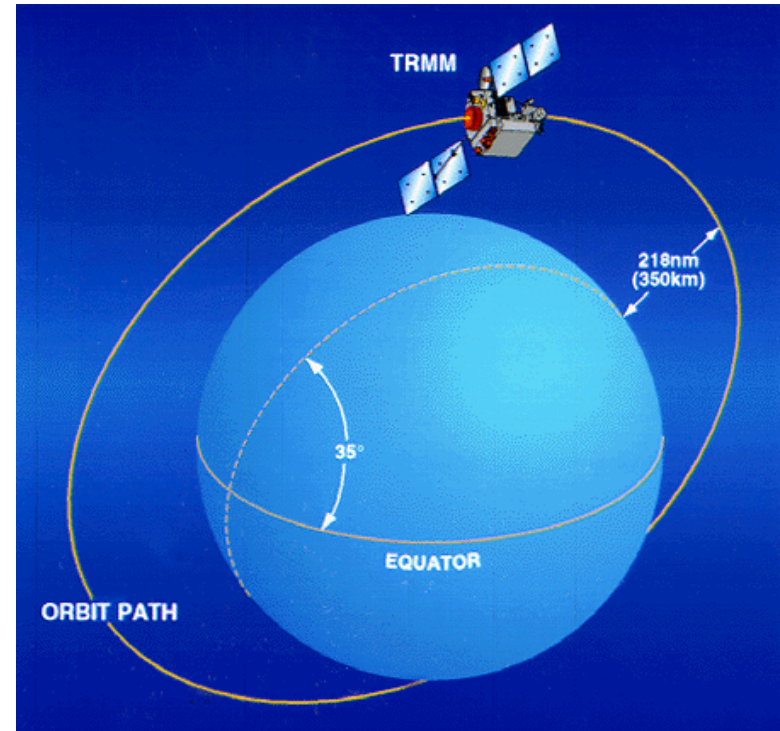
NOAA using radiances to initialize trajectory model, USGS for oil concentration





# Tropical Rainfall Measuring Mission (TRMM)

- Launched in Dec. 1997.
- TRMM's goal is to determine rainfall in the tropics and subtropics of the Earth.
- 14 years (1998-current) of data available, very unique dataset for precipitation and convection studies in tropical cyclones
- TRMM satellite orbit: circular (Non-Sun Synchronous)
- Observation frequency: 16 times per day.





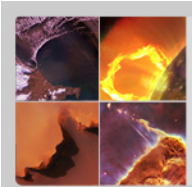


# TERRA - Launch Date: December 18, 1999

Terra simultaneously studies **clouds, water vapor, aerosol particles, trace gases, terrestrial and oceanic properties, the interaction between them and their effect on atmospheric radiation and climate.** Moreover, Terra will observe changes in Earth's radiation budget (a measurement of all the inputs and outputs of the Earth's radiative energy), together with measurements of changes in land/ocean surface and interaction with the atmosphere through exchanges of energy, carbon, and water. Comprehending these interactive processes is essential to **understanding global climate change.**



# Instruments on TERRA



- **Clouds and the Earth's Radiant Energy System (CERES)**
- **Multi-angle Imaging SpectroRadiometer (MISR)**
- **Moderate- Resolution Imaging Spectroradiometer (MODIS)**
- **Measurements of Pollution in The Troposphere (MOPITT)**
- **Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER)**

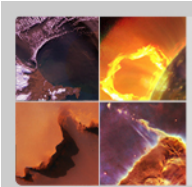


Terra MODIS, 21 October 2005, 1625 UTC: Hurricane Wilma

Terra MODIS, 28 October 2003, 1825 UTC: Fires in Southern California



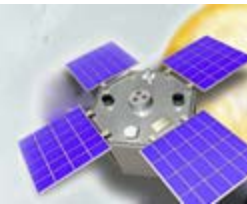




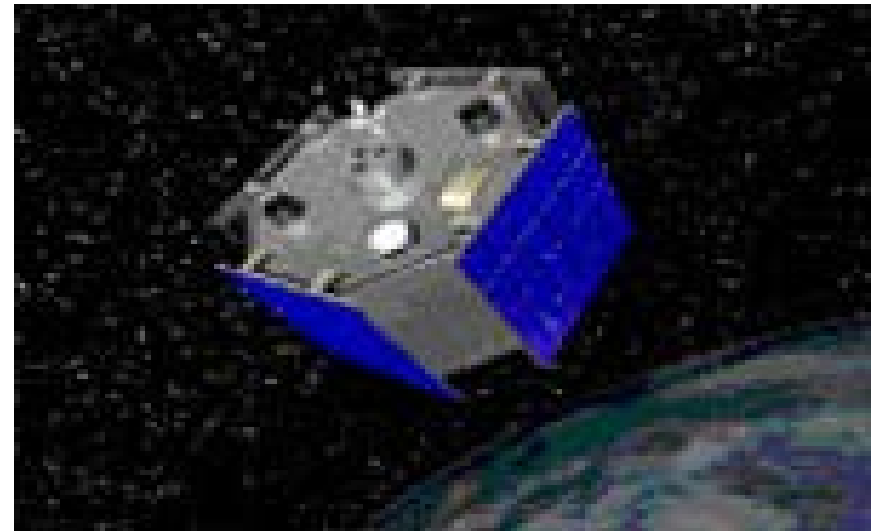
# Active Cavity Radiometer Irradiance Monitor (ACRIMSAT)

ACRIMSAT

Measuring the Sun's Energy



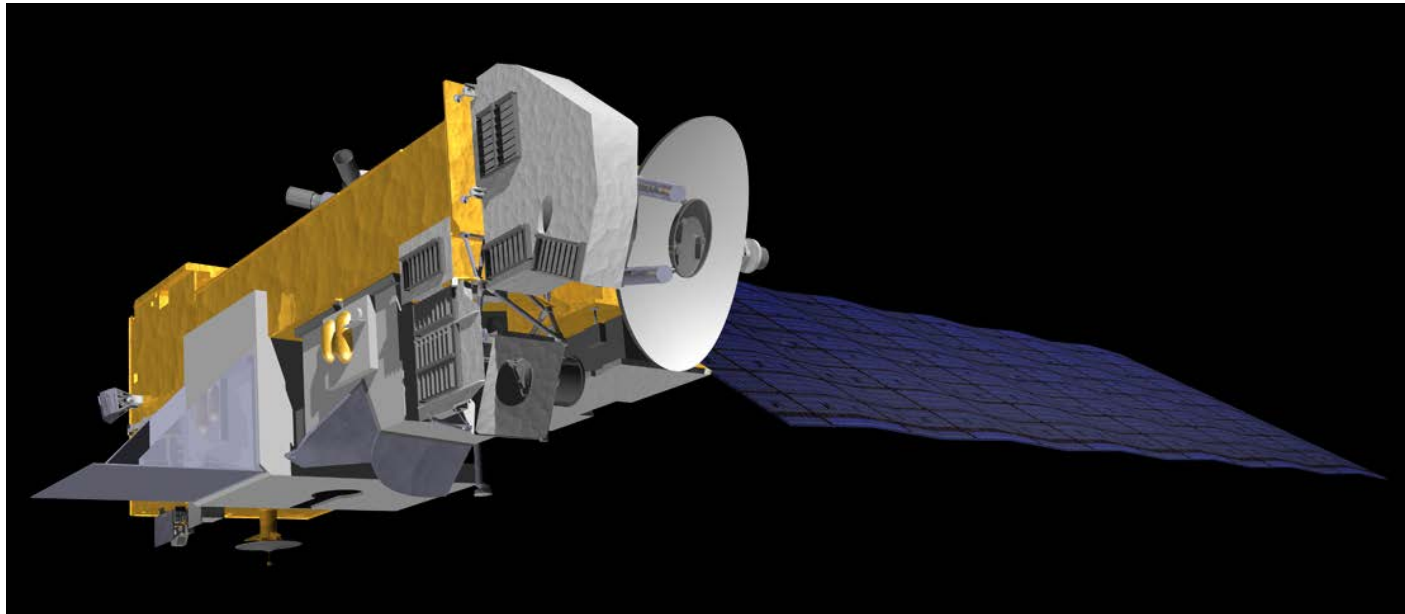
Launch Date:  
December 20,  
1999.



The purpose of the Active Cavity Radiometer Irradiance Monitor III (ACRIM III) instrument is To study total solar irradiance from the Sun



# Aura-- Launch Date: July 15, 2004



Aura's objective is to study **the chemistry and dynamics of the Earth's atmosphere** with emphasis on the upper troposphere and lower stratosphere (0-30km) by employing multiple instruments on a single satellite. The satellite's measurements enable scientists to investigate questions about ozone trends, air quality changes and their linkages to climate change. These observations provide accurate data for predictive models and provide useful information for local and national government agencies.

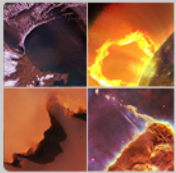




# Aqua-- Launch Date: May 04, 2002

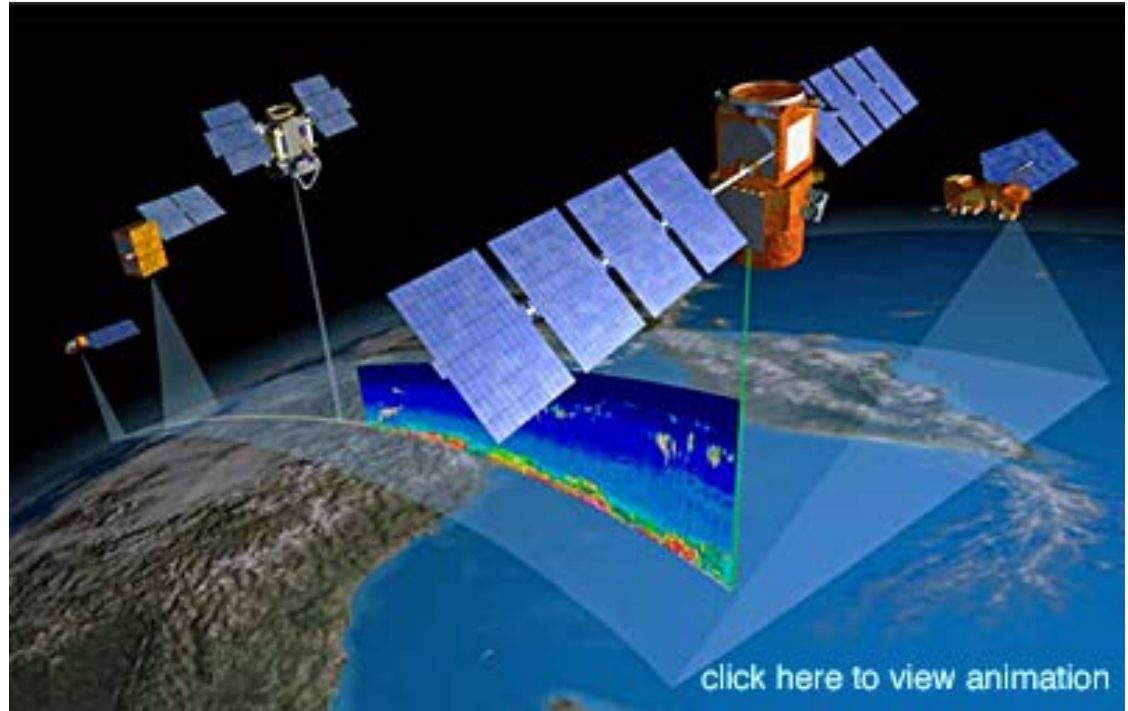
Aqua, Latin for "water," is named for the large amount of information that the Aqua spacecraft will collect about **the Earth's water cycle**. In particular, the Aqua data will include information on water vapor and clouds in the atmosphere, precipitation from the atmosphere, soil wetness on the land, glacial ice on the land, sea ice in the oceans, snow cover on both land and sea ice, and surface waters throughout the world's oceans, bays, and lakes.





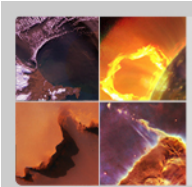
# Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observations (CALIPSO)

Launch Date:  
April 28, 2006



The CALIPSO satellite was developed to help scientists answer significant questions and provide new information about the effects of **clouds and aerosols (airborne particles)** on changes in the Earth's climate.



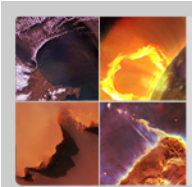


# CloudSat

Launch Date:  
April 28, 2006



CloudSat is an experimental satellite that uses radar to **observe clouds and precipitation** from space. CloudSat orbits in formation as part of the A-Train constellation of satellites ([Aqua](#), [CloudSat](#), [CALIPSO](#), [PARASOL](#), and [Aura](#)).



# Geostationary Operational Environmental Satellite, I-M Series (GEOS I-M)

Launch Date:  
April 13, 1994



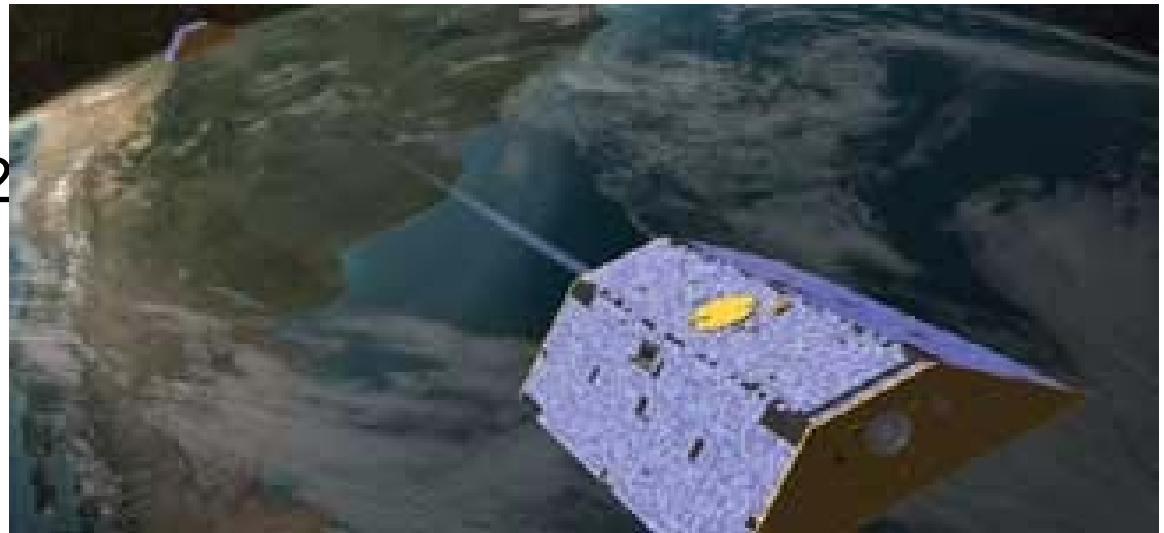
The GOES I-M satellites are the primary element of **U.S. weather monitoring and forecast operations** and are a key component of NOAA's National Weather Service operations and modernization program. Spacecraft and ground-based systems work together to accomplish the mission of providing weather imagery and quantitative sounding data that form a continuous and reliable stream of environmental information used for weather forecasting and related services.





# Gravity Recovery and Climate Experiment (GRACE)

Launch Date:  
March 17, 2002

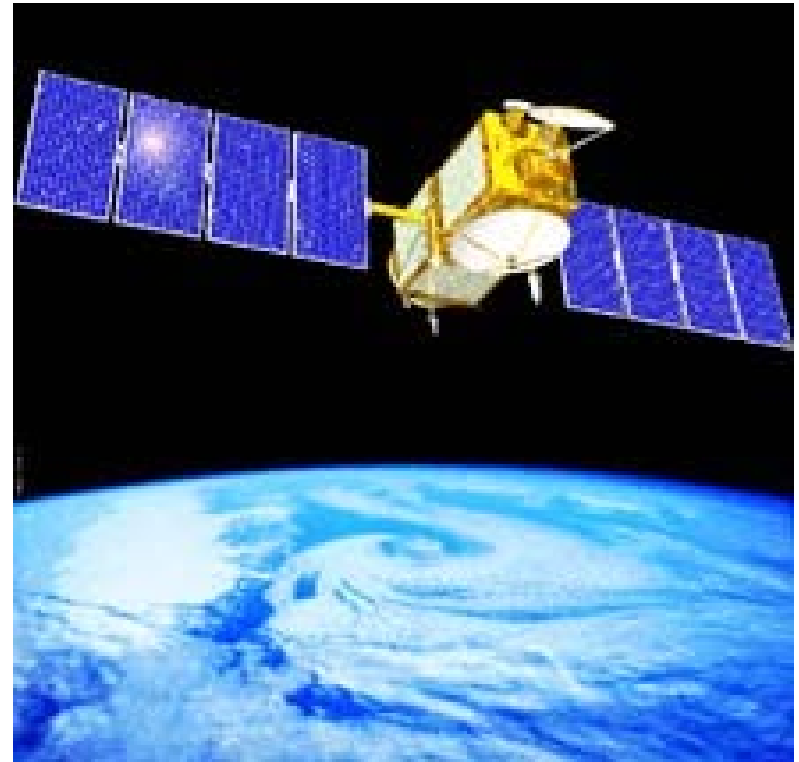


GRACE, twin satellites launched in March 2002, are making detailed measurements of **Earth's gravity field** which will lead to discoveries about gravity and Earth's natural systems. These discoveries could have far-reaching benefits to society and the world's population.



# Jason-1: Launched on December 07, 2001

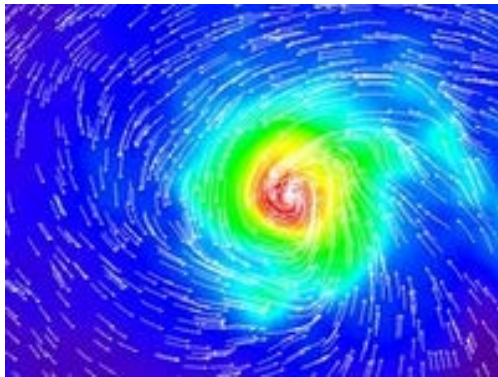
Jason is an oceanography mission to monitor **global ocean circulation**, improve global climate predictions, and monitor events such as El Niño conditions and ocean eddies. The Jason-1 satellite carries a radar altimeter, and it is a follow-on mission to the highly successful TOPEX/Poseidon mission, that measured ocean surface topography to an accuracy of 4.2 cm, enabled scientists to forecast the 1997-1998 El Niño, and improved understanding of ocean circulation and its effect of global climate.





# Quick Scatterometer (QuickScat)

QuikSCAT mission is intended to record **sea-surface wind speed and direction** data under all weather and cloud conditions over Earth's oceans.



QuikSCAT image of Hurricane Dora in the eastern tropical Pacific Ocean on August 10, 1999



Launch Date:  
June 19, 1999 <sup>55</sup>





# Global Precipitation Measurement (GPM)

Launch Date:  
Early 2014



Building upon the success of the Tropical Rainfall Measuring Mission (TRMM), GPM will initiate the measurement of global precipitation, a key climate factor. Its science objectives are: to improve ongoing efforts to predict climate by providing near-global measurement of precipitation, its distribution, and physical processes; to improve the accuracy of weather and precipitation forecasts through more accurate measurement of rain rates and latent heating; and to provide more frequent and complete sampling of the Earth's precipitation.



# NPOESS Preparatory Project (NPP)

Launch Date:  
October 28, 2011

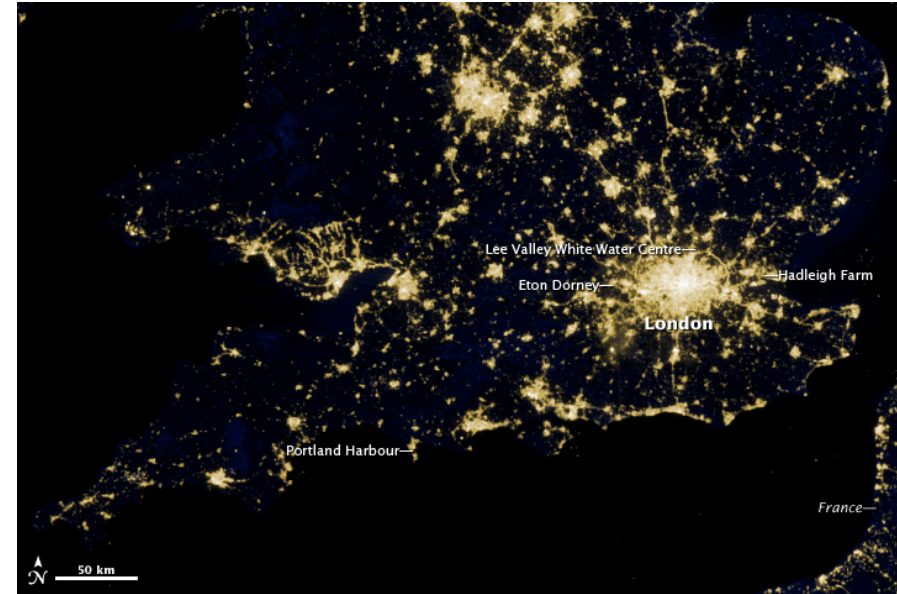
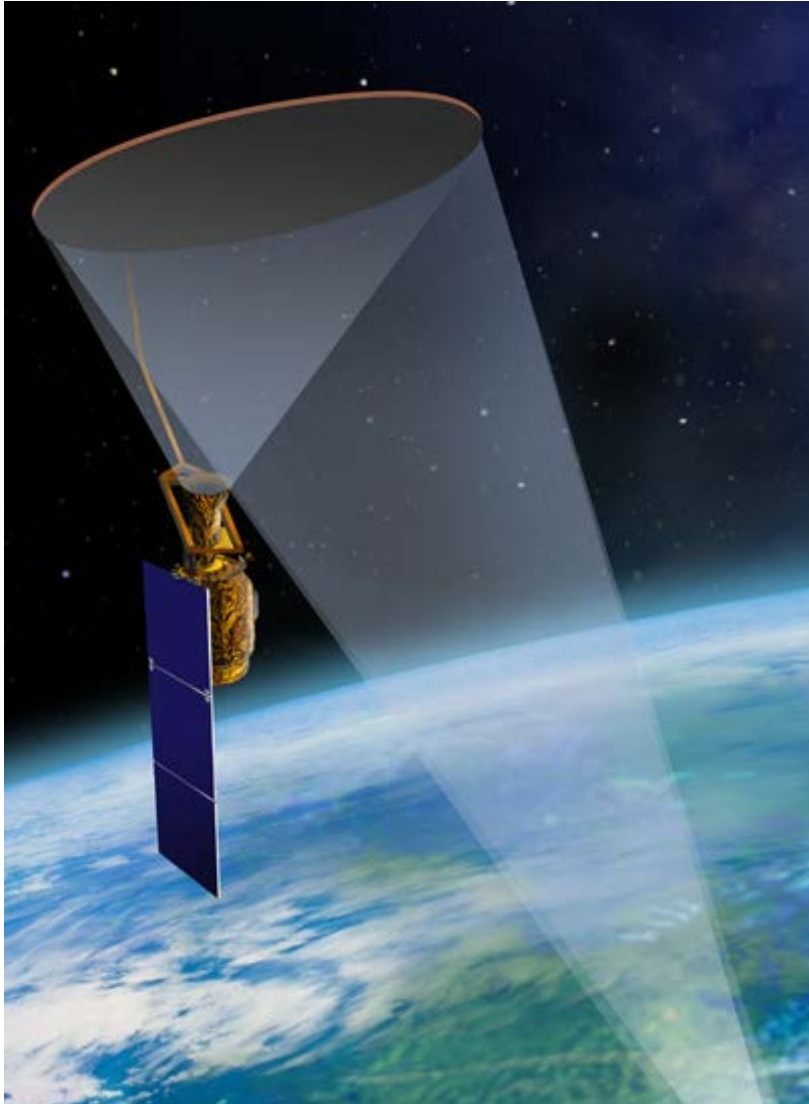


Image taken by  
VIRS on NPP:  
***Lights of London***  
(March 27 2012)

NPP is the bridge between the major Earth Observing System satellites (Terra, Aqua, and Aura) and the forthcoming series of Joint Polar Satellite System (JPSS) satellites which will compose the civilian polar-orbiting weather satellites. NPP data will be used for both **climate research and operational weather prediction.**

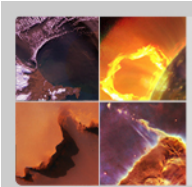


# Soil Moisture Active/Passive (SMAP) - 2015

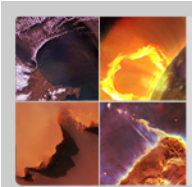


**SMAP will provide the first global measurements of soil moisture, a key missing element in modeling the global water cycle.**





# **NASA's Undergraduate and Graduate Internship/Fellowship Opportunities**



# NASA Undergraduate Student Research Program (USRP)

•NASA USRP is an internship program that offers NASA research and development opportunities to undergraduate students. USRP is NASA's largest nationwide internship program for undergraduates. Students may apply for a 10-week Summer session or a 15-week Spring or Fall session.

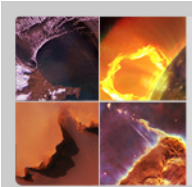
The *NASA-USRP* will consist of a 10–15 week research experience at a [participating NASA Center](#) under the supervision of a NASA technical mentor. Selected students must be available to work 10 consecutive weeks at 40 hours per week during the Summer session or 15 consecutive weeks at 40 hours per week during Spring or Fall sessions (exact dates to be determined by Centers).

Submit Internship Application for Spring 2014 in [OSSI:SOLAR](#)

06/01/2013 - 10/11/2013

<http://usrp.usra.edu/>

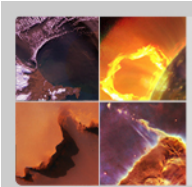
<http://intern.nasa.gov/>



# NASA Earth and Space Science Fellowship (NESSF)

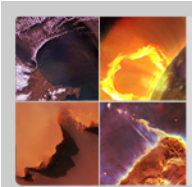
- For students pursuing MS or PhD degree.
- Solicitation every year, due Feb. 1
- Very competitive.
- Application materials: a 6-page research proposal, Transcripts, recommendation letter from your advisor
- Award: \$30,000 per year renewable up to 3 years
  
- Information: You can register in NSPIRES at <http://nspires.nasaprs.com/>.
  
- For further information contact Ming-Ying Wei, Program Administrator for NESSF Earth Science Research, Telephone: (202) 358-0771, E-mail: [mwei@nasa.gov](mailto:mwei@nasa.gov)





# NASA Graduate Student Researchers Project (GSRP)

- For students pursuing MS or PhD degree.
- Solicitation every year, due date: usually Feb. 1
- This twelve month award requires students to participate in a 10 week NASA Center or HQ-based research experience at the NASA Center/HQ extending the GSRP Fellowship award.
- Underrepresented groups in science, technology, engineering, and mathematics fields (STEM) are encouraged to apply.
- Application materials: a 6-page research proposal, Transcripts, recommendation letter from your advisor
- <https://fellowships.nasaprs.com/gsrp/nav/>



## **Other Opportunities at NASA:**

<http://www.nasa.gov/audience/forstudents/postsecondary/programs/index.html>

- **Langley Aerospace Research Summer Scholars**

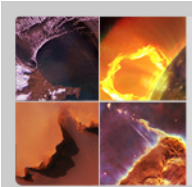
**Project:** Participants spend 10 weeks conducting state-of-the-art research with other students from across the nation. They work with NASA researchers exploring an array of high-technology development projects and activities in pursuit of space exploration. <http://www.nianet.org/larss/>

- **Student Employment at NASA:**

<http://nasajobs.nasa.gov/studentopps/employment/default.htm>

- **Jobs at NASA:**

<http://nasajobs.nasa.gov/default.htm>



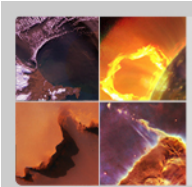
# NSF Research Experiences for Undergraduates:

[http://www.nsf.gov/crssprgm/reu/reu\\_search.cfm](http://www.nsf.gov/crssprgm/reu/reu_search.cfm)

- **University of Oklahoma Norman Campus:** [REU Site: Research Experiences for Undergraduates at the National Weather Center](http://www.caps.ou.edu/reu/). <http://www.caps.ou.edu/reu/>
- **Astryd Rodriguez:** Our 2011 intern who were accepted for this OU REU program this summer. She studied how forecasters manage uncertainty at NSSL in Norman OK. Part of the program is doing a bit of tornado chasing (May 25, 2012 Dodge City, KS, 3 tornados):







# NSF Research Experiences for Undergraduates:

[http://www.nsf.gov/crssprgm/reu/reu\\_search.cfm](http://www.nsf.gov/crssprgm/reu/reu_search.cfm)

- **Colorado State University**

[Center for Multi-Scale Modeling of Atmospheric Processes \(CMMAP\)](http://www.cmmmap.org/scienceEd/internships.html) <http://www.cmmmap.org/scienceEd/internships.html>

- **Tony Cosio & Heather Vazquez:** Our 2011 interns who were accepted for this CSU REU program this summer.

