The View from Both Sides: Pathways to Working at NASA and Personal Perspectives on JCET

Steve Platnick
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NASA Goddard Space Flight Center (GSFC)

1. GSFC Earth Science Division Overview
2. Student and Career Paths at GSFC and NASA
3. The JCET-GSFC Relationship
4. Postdoc Science: Two Examples

1. GSFC Earth Sciences Division Overview

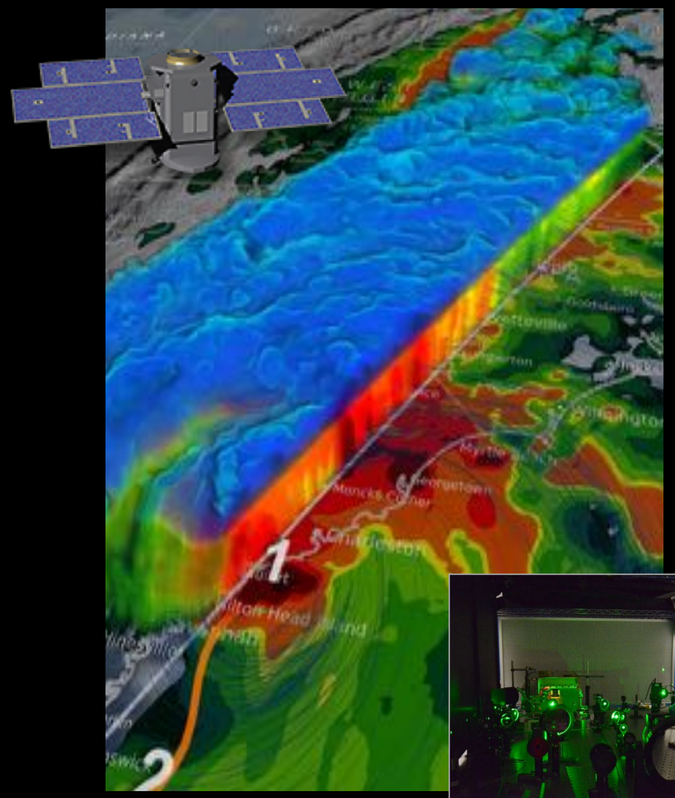
GSFC Earth Sciences Division: What We Do

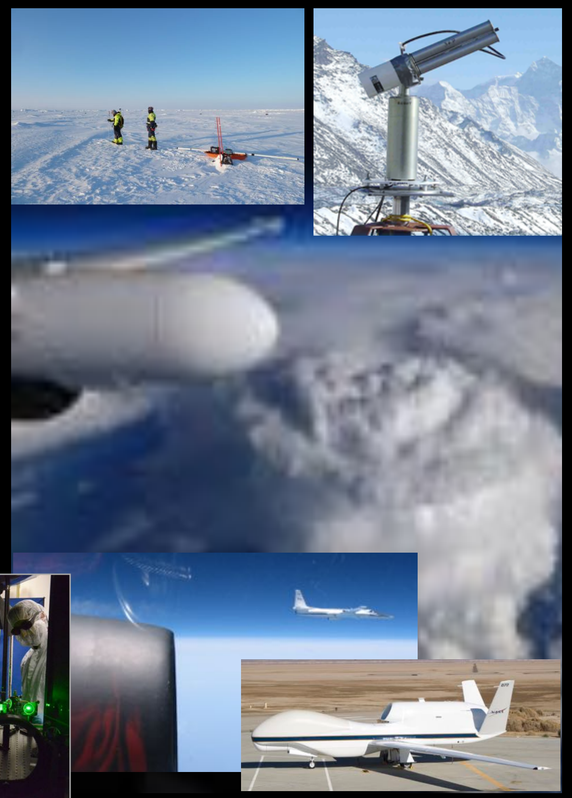
Satellite Obs., Algorithms, Data Processing/Distribution, Data Analysis

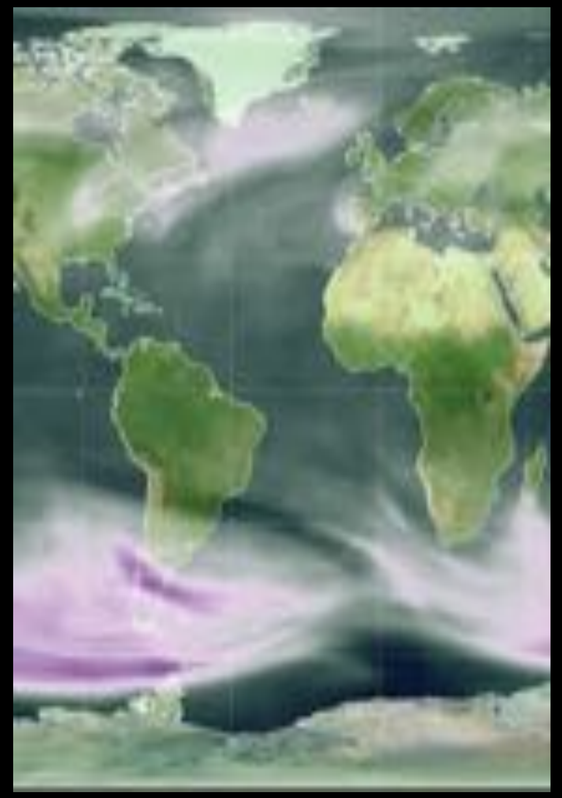
Suborbital (Airborne, Ground)

Modeling Processes/Earth System/Climate

Applied Sciences



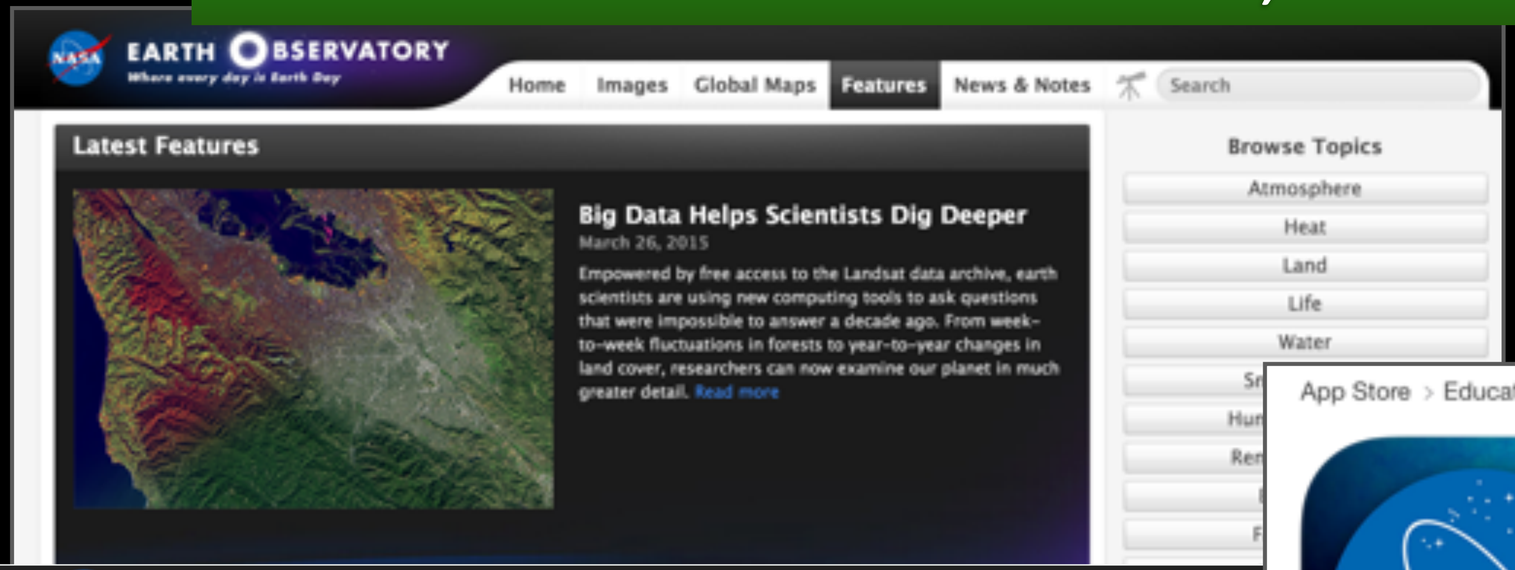


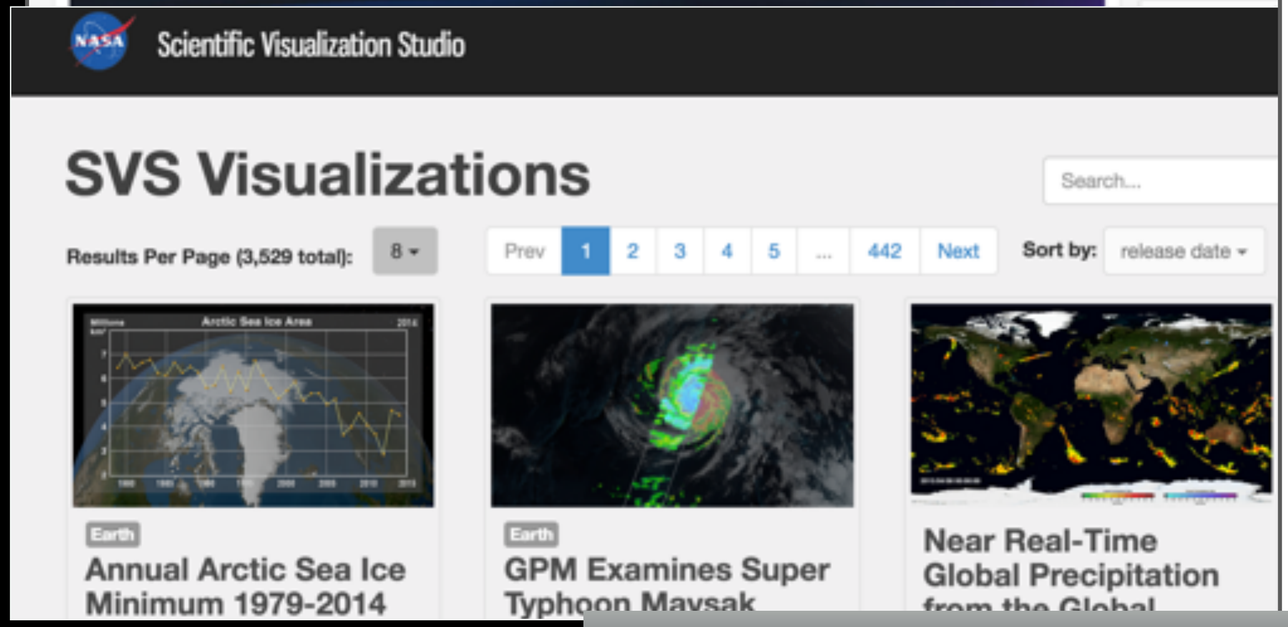


NASA Communication: Web, Social and Printed Media

NASA Earth Observatory, Science Visualization Studio, @NASA, etc.

NASA Communication: Web, Social and Printed Media





NASA Earth Observatory, Science Visualization Studio, @NASA, etc.

NASA Communication: Web, Social and Printed Media

EARTH OBSERVATORY
Where every day is Earth Day

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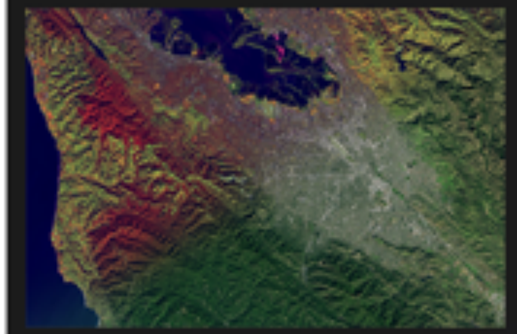
Latest Features



Big Data Helps Scientists Dig Deeper
March 26, 2015

Empowered by free access to the Landsat data archive, earth scientists are using new computing tools to ask questions that were impossible to answer a decade ago. From week-to-week fluctuations in forests to year-to-year changes in land cover, researchers can now examine our planet in much greater detail. Read more

Browse Topics
Atmosphere
Heat
Land
Life
Water

Thirty Years Reporting on NASA's Earth Science Program

The Earth Observer

National Aeronautics and Space Administration

March – April 2019. Volume 31, Issue 2

Editor's Corner
Steve Platnick
EOS Senior Project Scientist

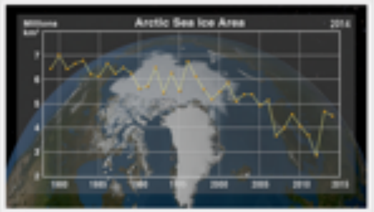
This issue of *The Earth Observer* marks the thirtieth anniversary of the publication of our first issue (March 1989)—shortly after the official beginning of NASA's Earth Observing System (EOS) Program. At that time, when the Internet was still in its infancy, print media was the best way to get the word out about the program, meetings, results, announcements, and the like to hundreds of interested researchers across

Scientific Visualization Studio

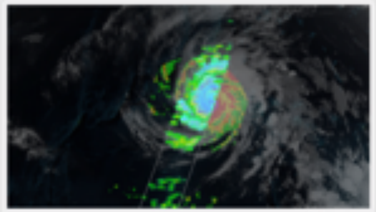
SVS Visualizations

Search...

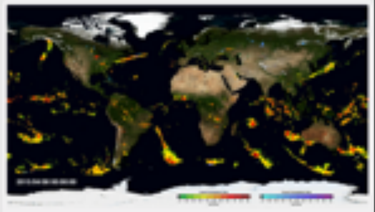
Results Per Page (3,529 total): 8 | Prev 1 2 3 4 5 ... 442 Next | Sort by: release date



Earth
Annual Arctic Sea Ice Minimum 1979-2014



Earth
GPM Examines Super Typhoon Maysak



Near Real-Time Global Precipitation from the Global

App Sto

NASA VIZ

NASA Visualization Explorer 4+

NASA >

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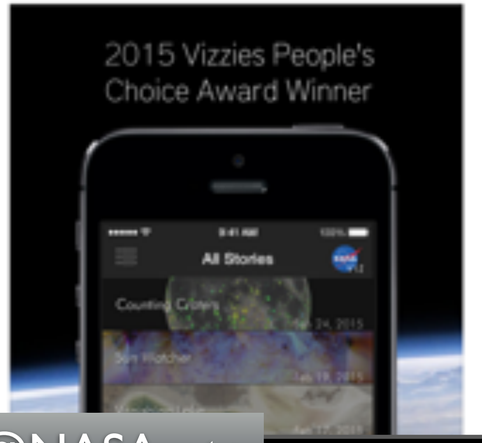
Downloaded

This app is designed for both iPhone and iPad

Rating: 4+

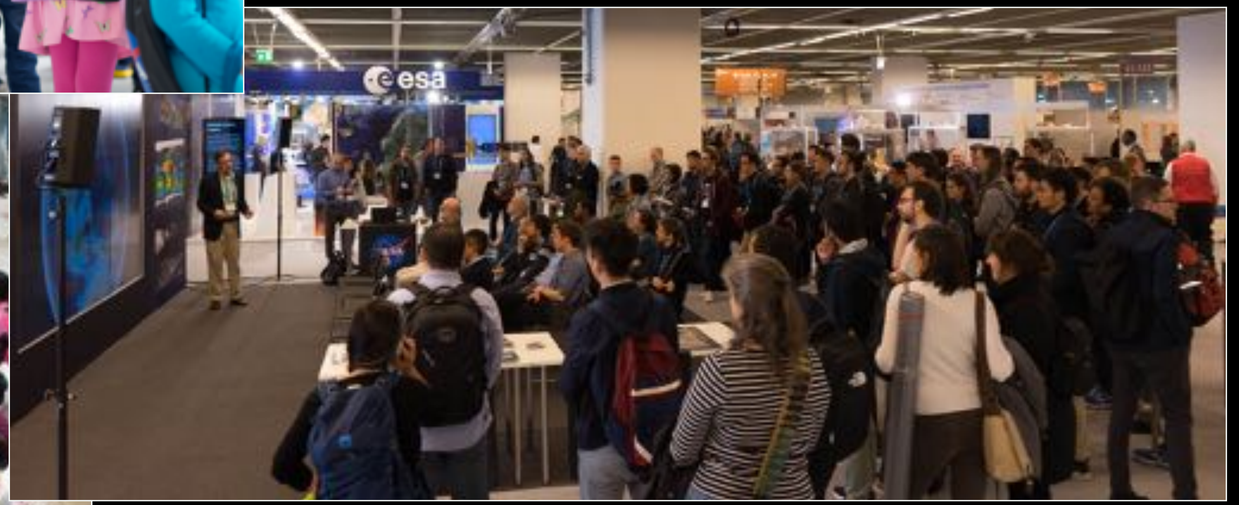
LINKS
License Agreement

Screenshots iPhone iPad



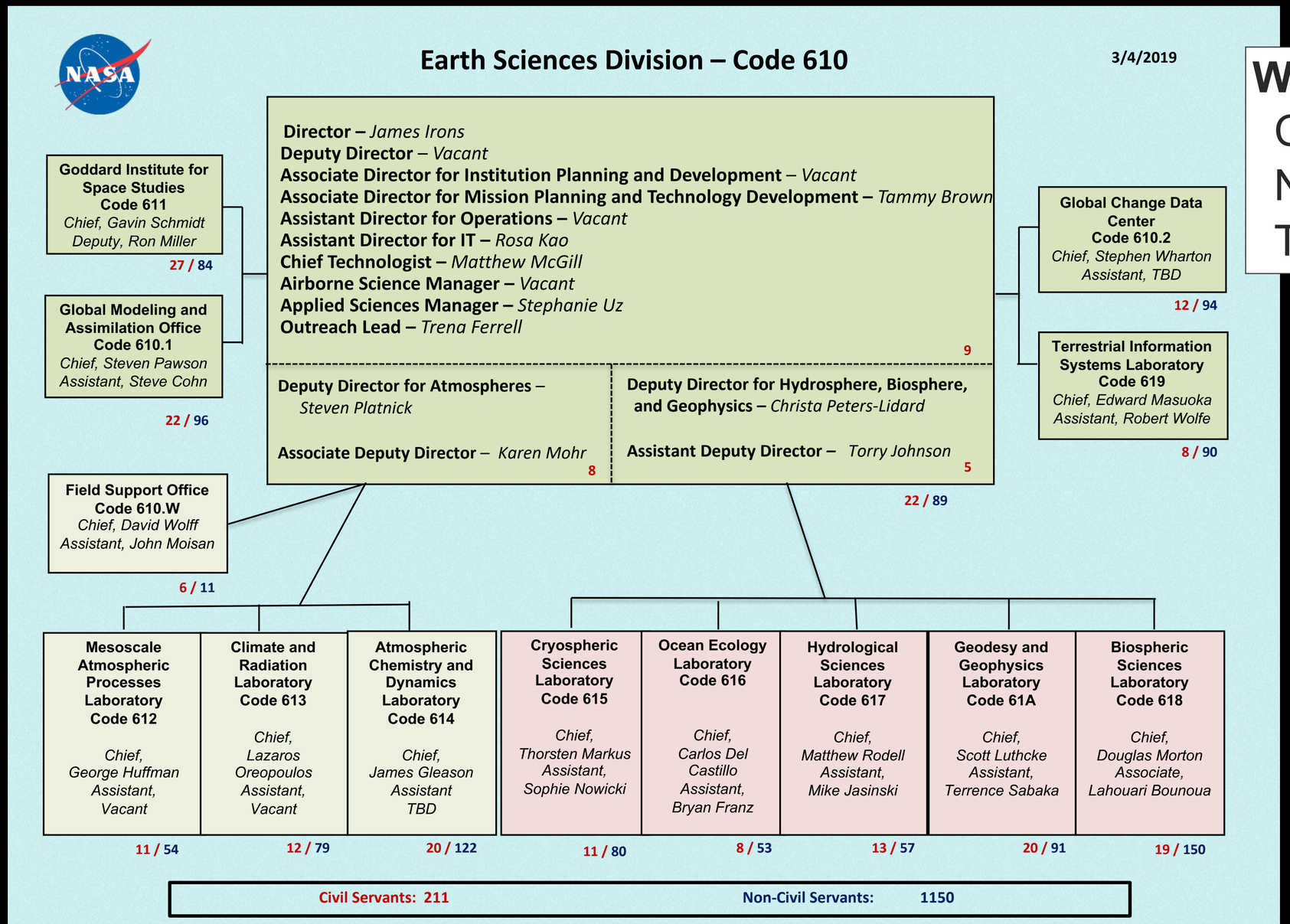
NASA Earth Observatory, Science Visualization Studio, @NASA, etc.

NASA Communication: Face-to-Face



NASA Science Communication Support Office

GSFC Earth Sciences Division: Who We Are



Workforce

Civil Servants: 211

Non-Civil Servants : 1,150

Total: 1,261

Example GSFC Missions Over the Decades

1959 Vanguard II (11 kg)

1960-65 TIROS 1-10 (127 kg)

2002 Aqua (3120 kg)

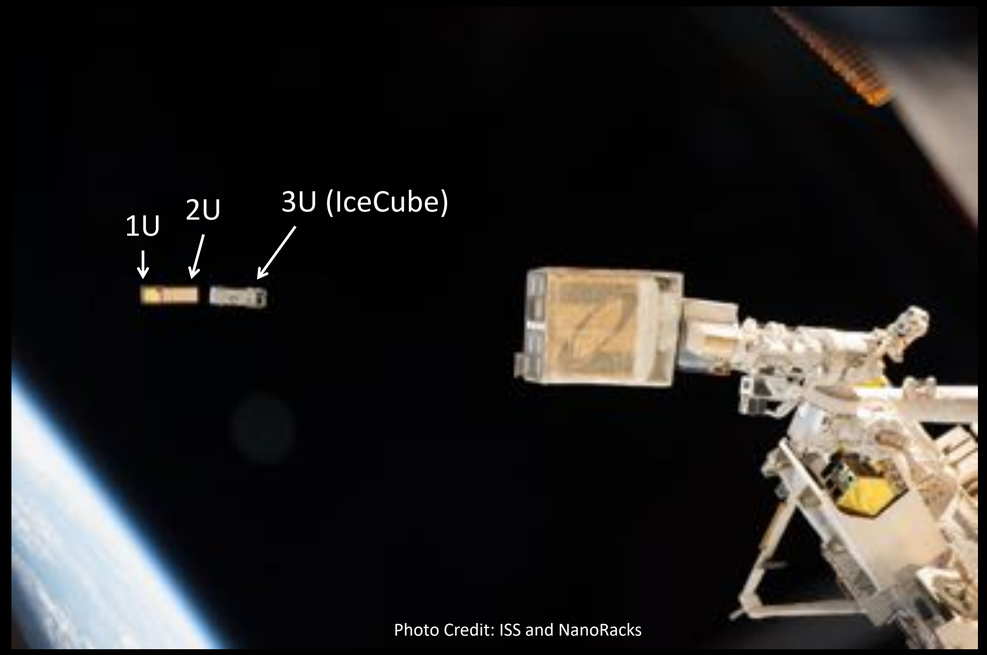
2017 JPSS-1 (1930 kg)

2013 Landsat 8
(1510 kg)

courtesy Ron Gelaro/GSFC

Return of the Small Sat

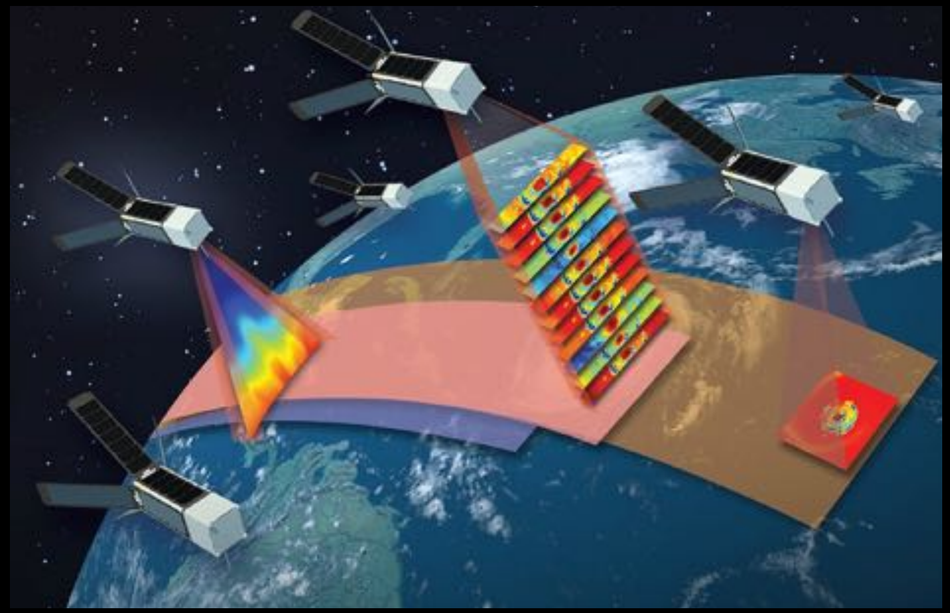
ICECube [NASA GSFC]



3U cubesat (1U=10x10x10 cm), 883 GHz cloud radiometer (launched 2017)

TROPICS [MIT, NASA]

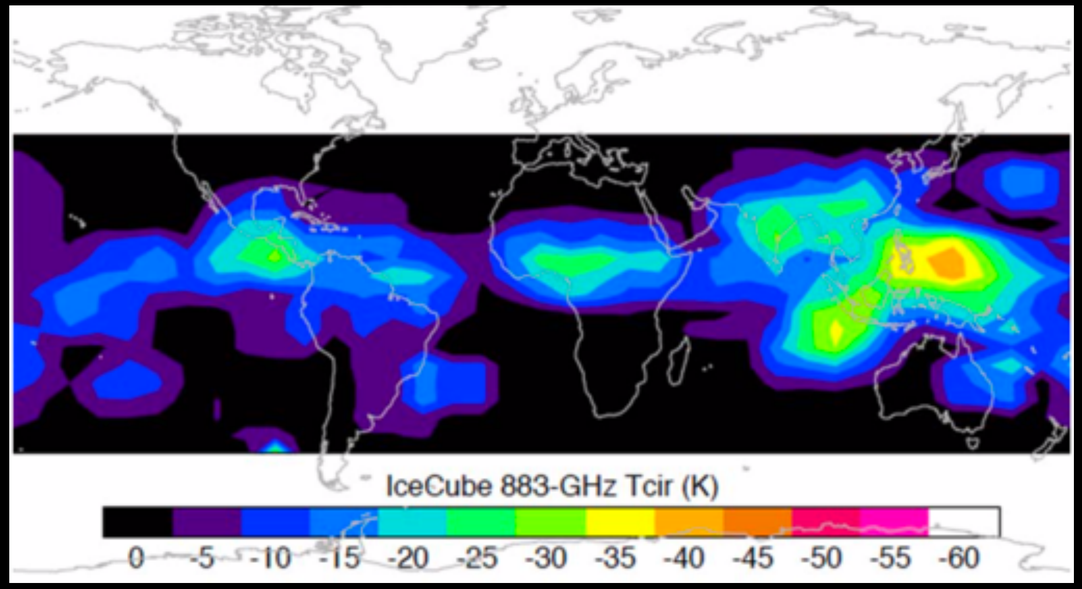
(**T**ime-**R**esolved **O**bs. of **P**recip. structure and storm **I**ntensity with a **C**onstellation of **S**mallsats)



Six 3U cubesat constellation, microwave radiometer, build completed end of 2019, awaiting ride

Return of the Small Sat

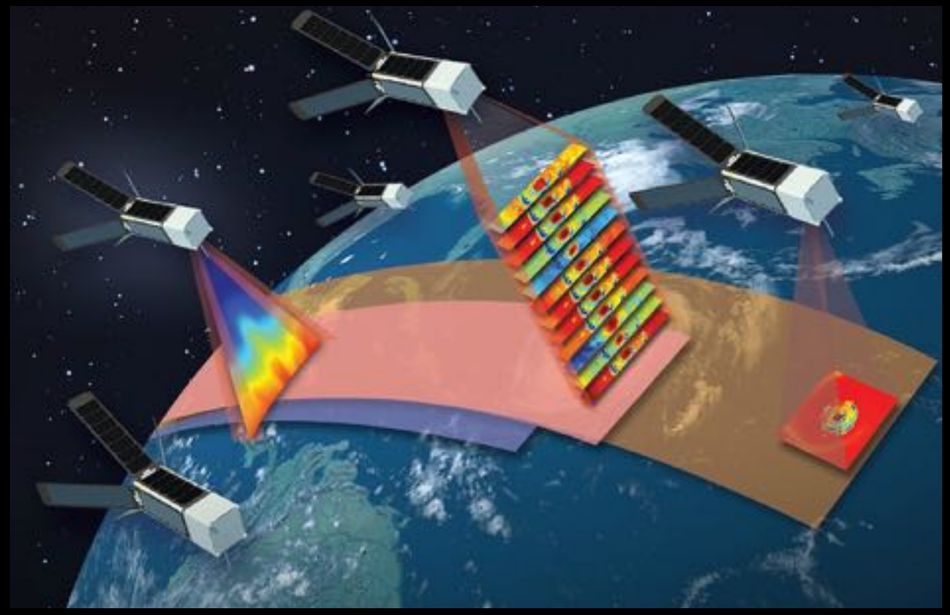
ICECube [NASA GSFC]



3U cubesat (1U=10x10x10 cm),
883 GHz cloud radiometer
(launched 2017)

TROPICS [MIT, NASA]

(**T**ime-**R**esolved **O**bs. of **P**recip. structure and storm **I**ntensity with a **C**onstellation of **S**mallsats)



Six 3U cubesat constellation,
microwave radiometer, build completed
end of 2019, awaiting ride

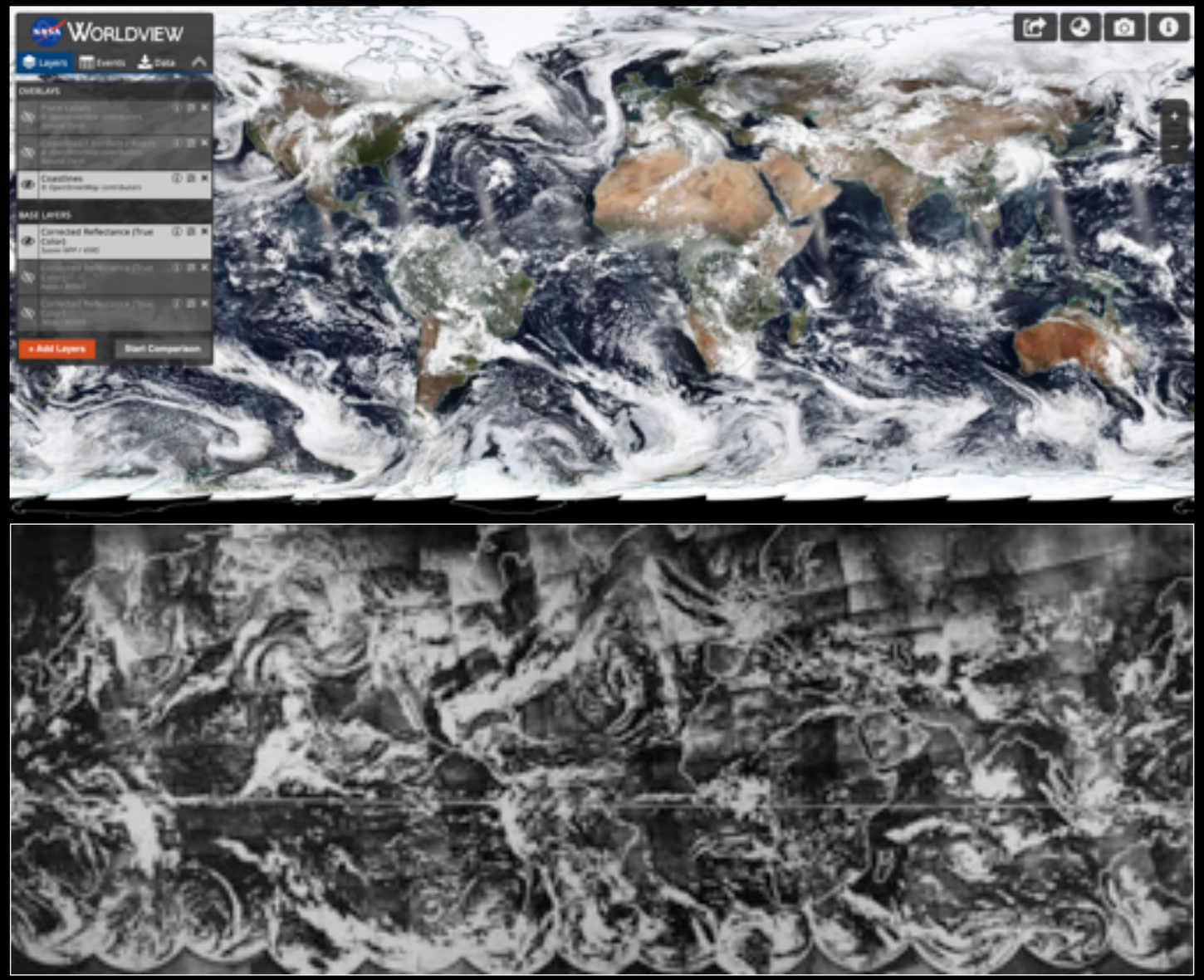
Example GSFC Missions Over the Decades

1960-65 TIROS 1-10 (127 kg)

In 1965, 450 TIROS images were put together to produce the first complete global view of the Earth's weather patterns.

Example GSFC Missions Over the Decades

Suomi NPP VIIRS
22 April 2019



1960-65 TIROS 1-10 (127 kg)

2. Student and Career Paths at GSFC & NASA

NASA Support Opportunities for College Students

- Internship program: summer (10 weeks), academic year (16 weeks), student must be full time enrolled, paid stipend
- Student Research Assistant or Collaborator: flexible schedule, part/full time, stipend arranges via advisor
- Graduate Fellowships
  - FINESST: Funded through NASA HQ, ~100 awards
  - Office of STEM Engagement: ~10 awards, requires 10-week research experience at NASA center for each year of fellowship

courtesy B. Meeson/GSFC

NASA Postdoctoral Program (NPP)

- Two-year appointment (3rd year option) working with NASA civil servant. Program currently administered by Universities Space Research Association (USRA).
- Includes stipend, professional travel allowance, NASA-supported insurance, relocation to NASA center.
- Applications accepted 3 times/year: March, July, November
  - Competitive process. Limited slots!
  - Applicants submit a research proposal in response to posted research opportunities and conversation with prospective civil servant advisors.

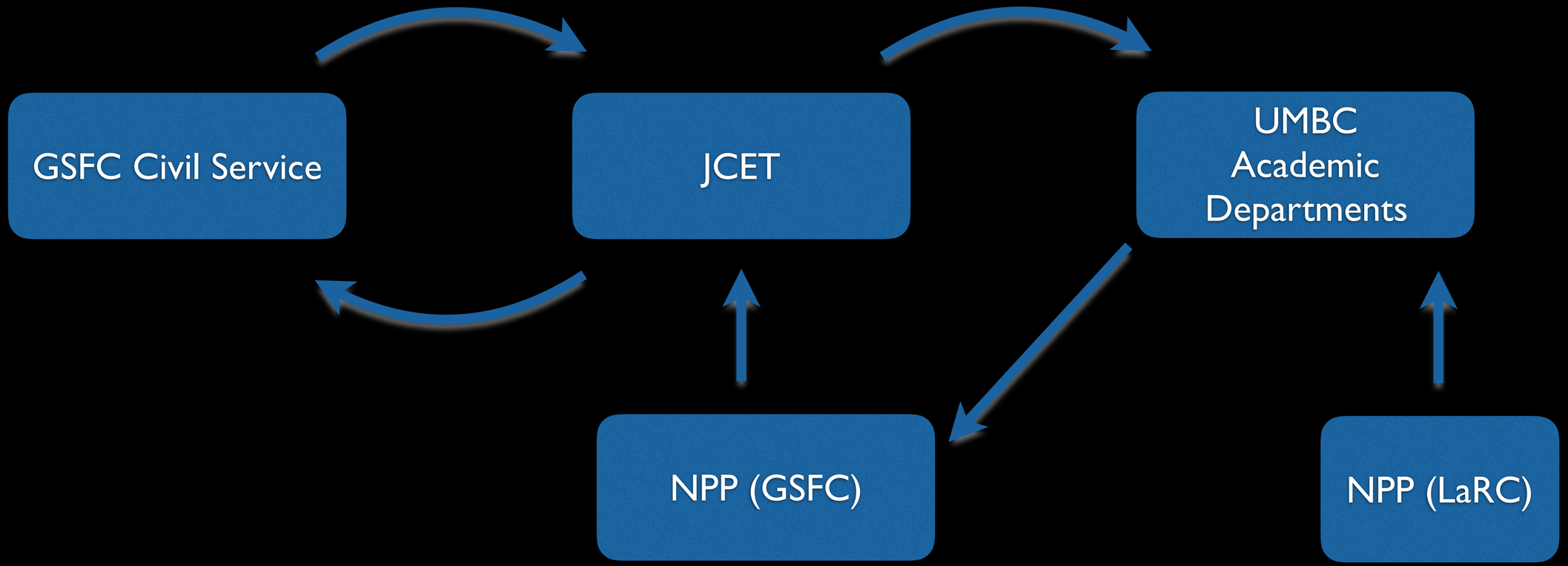
courtesy B. Meeson/GSFC

Non-NPP Postdoctoral and Career Employment at GSFC

- GSFC Earth Sciences has three cooperative agreements in place: JCET (UMBC), GESTAR (USRA, Morgan St.), ESSIC (UMCP)
  - Cooperative agreement scientists typically have on-site GSFC offices
  - Can/encouraged to write PI proposals (typically with GSFC Civil Servant scientists)
  - JCET is unique in encouraging “affiliation” with an UMBC department

3. The JCET-GSFC Relationship

Example GSFC and JCET Pathways: A Two-way Street



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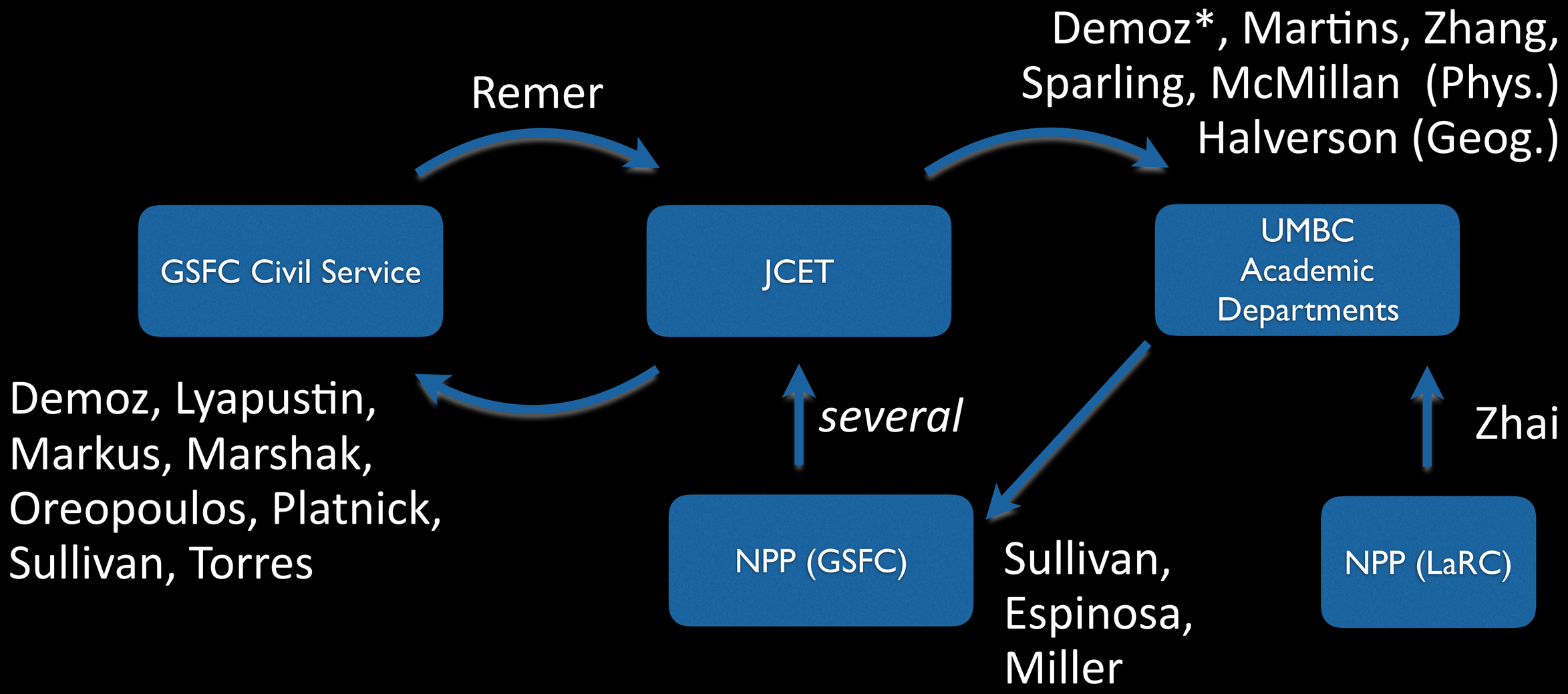

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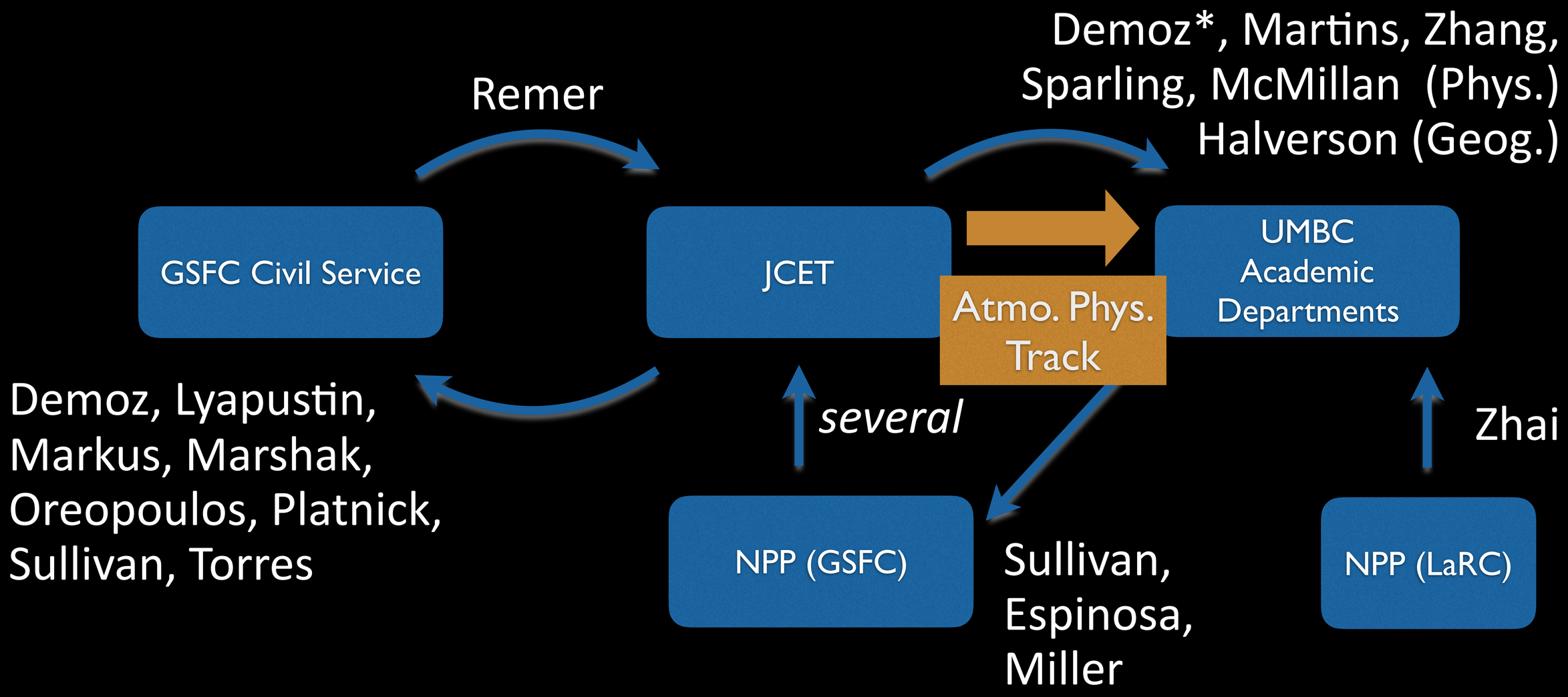
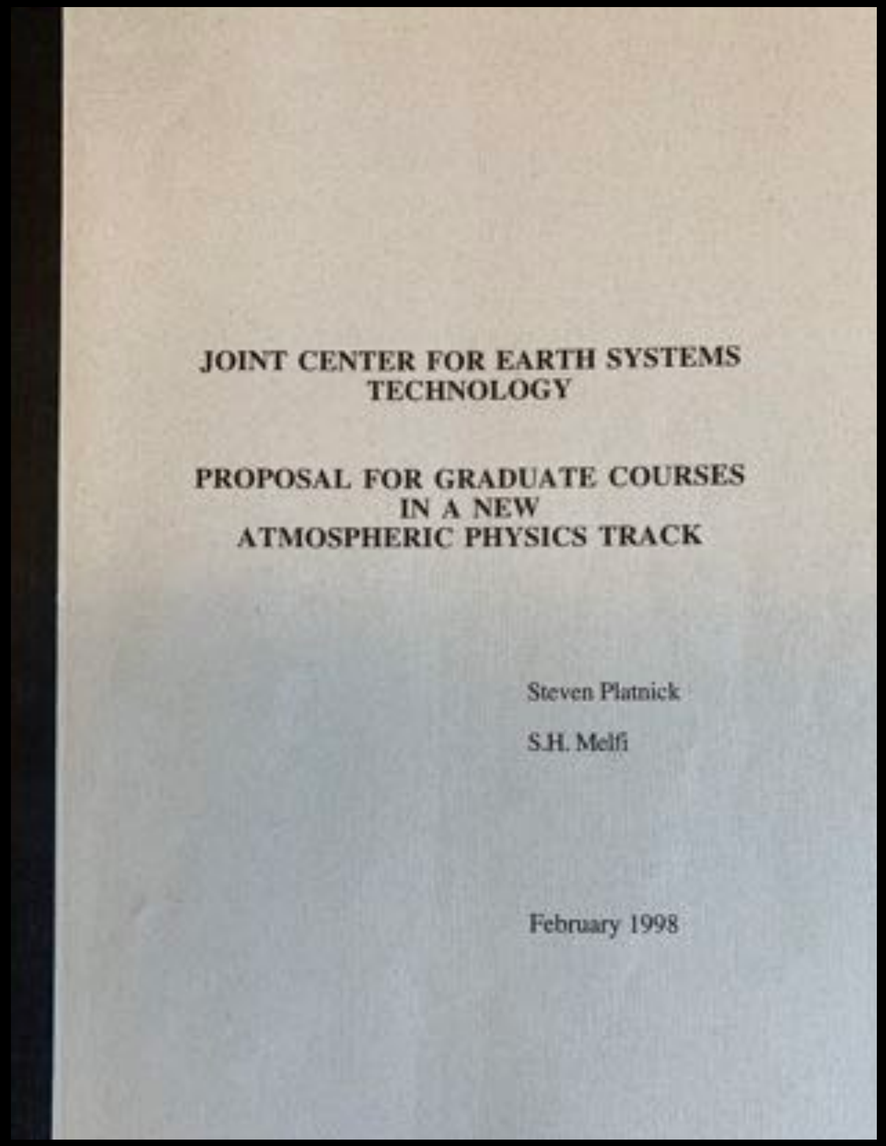


JCET Legacy: Atmo. Physics Program Curriculum



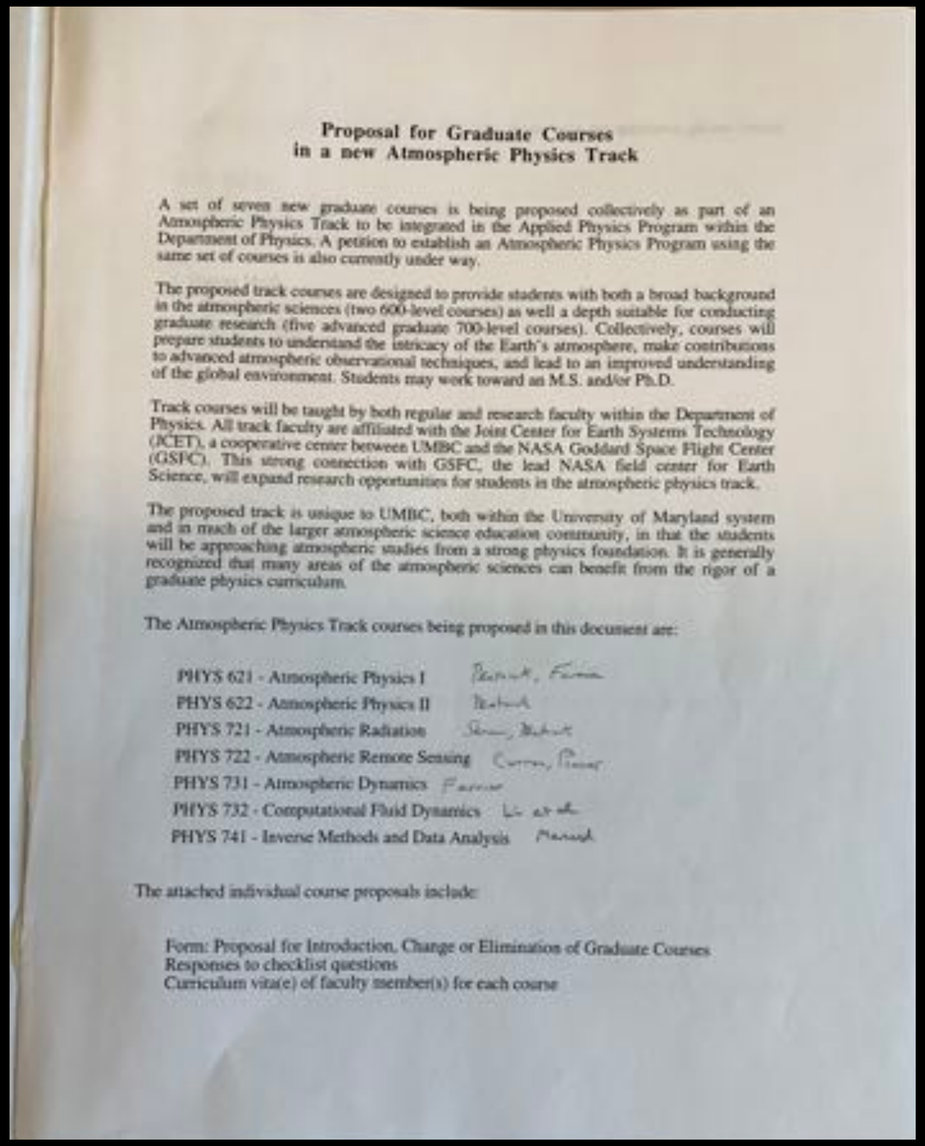
JOINT CENTER FOR EARTH SYSTEMS TECHNOLOGY

PROPOSAL FOR GRADUATE COURSES IN A NEW ATMOSPHERIC PHYSICS TRACK

Steven Platnick

S.H. Melfi

February 1998



Proposal for Graduate Courses in a new Atmospheric Physics Track

A set of seven new graduate courses is being proposed collectively as part of an Atmospheric Physics Track to be integrated in the Applied Physics Program within the Department of Physics. A petition to establish an Atmospheric Physics Program using the same set of courses is also currently under way.

The proposed track courses are designed to provide students with both a broad background in the atmospheric sciences (two 600-level courses) as well a depth suitable for conducting graduate research (five advanced graduate 700-level courses). Collectively, courses will prepare students to understand the intricacy of the Earth's atmosphere, make contributions to advanced atmospheric observational techniques, and lead to an improved understanding of the global environment. Students may work toward an M.S. and/or Ph.D.

Track courses will be taught by both regular and research faculty within the Department of Physics. All track faculty are affiliated with the Joint Center for Earth Systems Technology (JCET), a cooperative center between UMBC and the NASA Goddard Space Flight Center (GSFC). This strong connection with GSFC, the lead NASA field center for Earth Science, will expand research opportunities for students in the atmospheric physics track.

The proposed track is unique to UMBC, both within the University of Maryland system and in much of the larger atmospheric science education community, in that the students will be approaching atmospheric studies from a strong physics foundation. It is generally recognized that many areas of the atmospheric sciences can benefit from the rigor of a graduate physics curriculum.

The Atmospheric Physics Track courses being proposed in this document are:

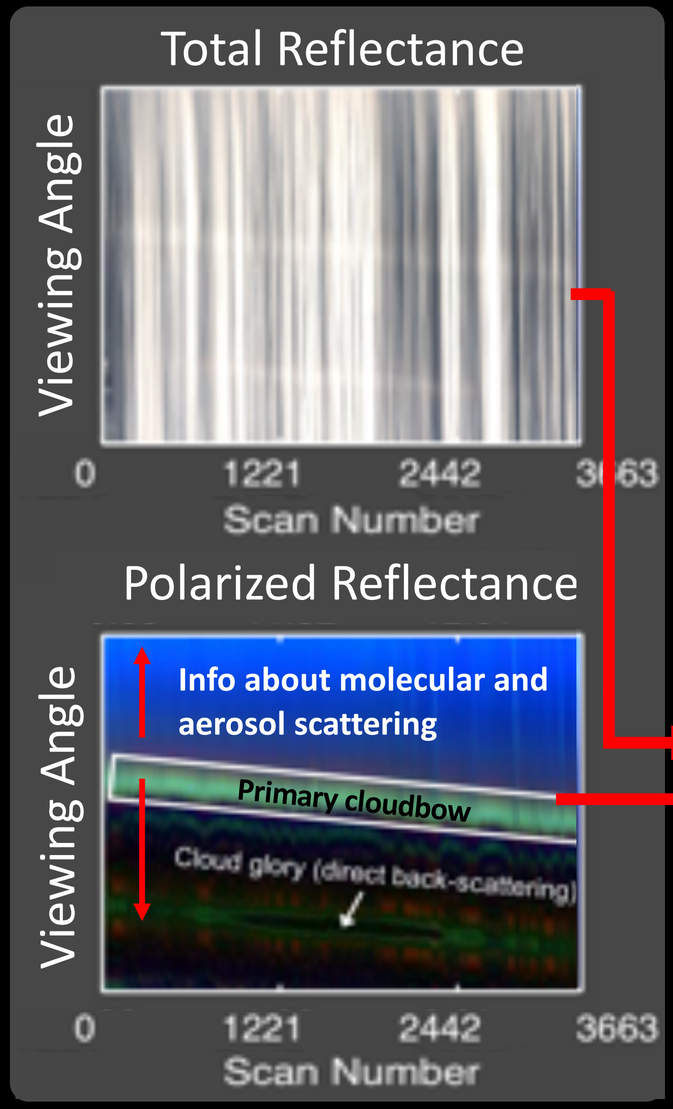
PHYS 621 - Atmospheric Physics I
PHYS 622 - Atmospheric Physics II
PHYS 721 - Atmospheric Radiation
PHYS 722 - Atmospheric Remote Sensing
PHYS 731 - Atmospheric Dynamics
PHYS 732 - Computational Fluid Dynamics
PHYS 741 - Inverse Methods and Data Analysis

The attached individual course proposals include:

Form: Proposal for Introduction, Change or Elimination of Graduate Courses
Responses to checklist questions
Curriculum vita(e) of faculty member(s) for each course

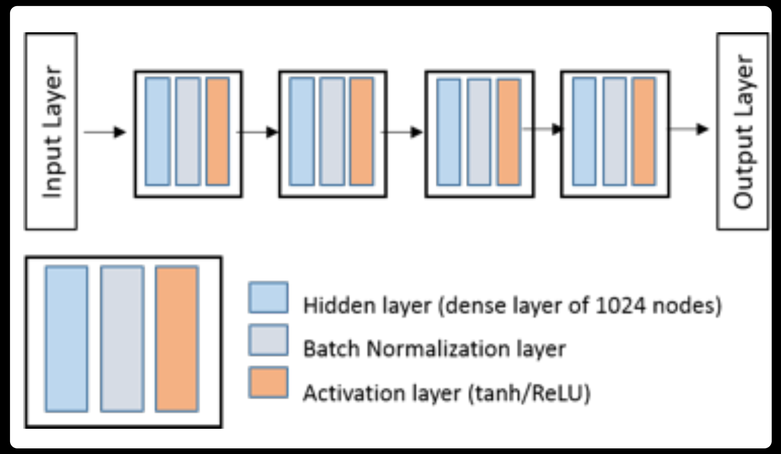
4. NPP Science: Two Examples

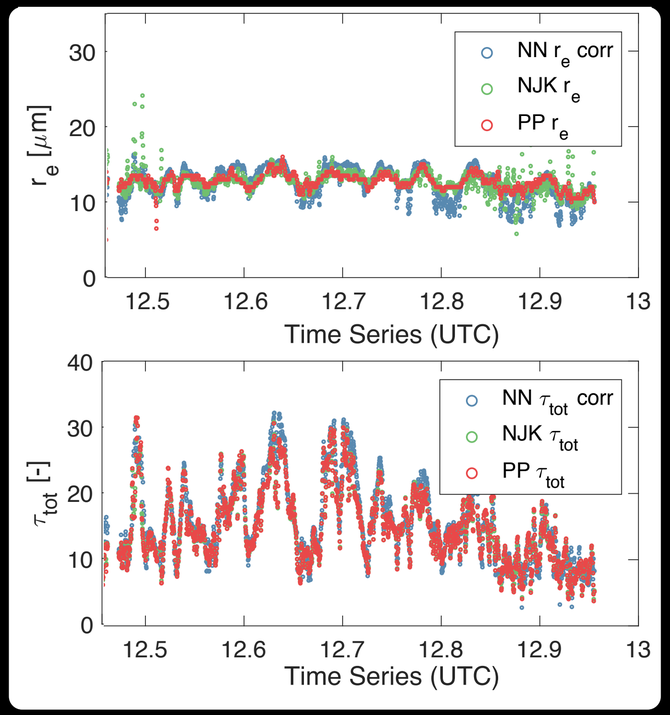
NPP Science, Dan Miller: Machine Learning Approaches for Cloud and Aerosol Remote Sensing



The airborne Research Scanning Polarimeter (RSP) produces a large multi-spectral multi-angular dataset for each observation. Using machine learning techniques we developed a fast retrieval of cloud properties using the full RSP dataset. This retrieval can be used as a rapid first-guess to accelerate slower but more rigorous retrievals. We applied this to cloud and aerosol observations made during the ORACLES sub-orbital field campaign.

Synthetically trained feed forward neural network





NPP Science, Reed Espinosa: Retrievals using a hybrid implementation of Dark Target and GRASP Aerosol algorithms

A new retrieval has been developed (DT-GRASP) combining the pixel preparation techniques of the Dark Target algorithm and the versatile inversion capabilities of GRASP. The flexibility of GRASP allows *a priori* assumptions to be derived from a joint retrieval with AERONET. When the tuned retrieval is applied exclusively to space-based observations from MODIS very good agreement is found with the measured aerosol optical depth (τ).