National Aeronautics and
Space Administration

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

AIRS Project Overview

T. Pagano
NASA JPL

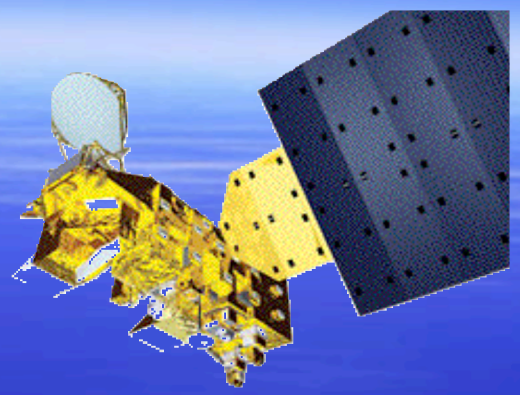
AIRS Science Team Meeting

November 30, 2004

National Aeronautics and
Space Administration

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

AIRS/AMSU/HSB Project Overview



Spacecraft:	**EOS Aqua**
Instruments:	**AIRS, AMSU, HSB, MODIS, CERES, AMSR-E**
Launch Date:	**May 4, 2002**
Launch Vehicle:	**Boeing Delta II Intermediate ELV**
Mission Life:	**5 years**
Team Leader:	**Moustafa Chahine (JPL)**

AIRS Project Objectives

1. **Improve Weather Forecasting: AIRS data assimilated operationally by major NWP centers**
2. **Support Climate Modeling: AIRS Water Vapor Profiles**
3. **Understanding Tropospheric Chemistry: O_3, CO, CO_2, CH_4 + Others**

AIRS Science Team

Continuing Members

Chahine, M. (TL)	JPL
Aumann, H.	JPL
Gautier, C.	UCSB
Goldberg, M	NOAA/NESDIS
Kalnay, E.	UMD
LeMarshall, J.	JCSDA
McMillin, L.	NOAA/NESDIS
Revercomb, H	U of Wisconsin
Rosenkrantz, P.	MIT
Staelin, D.	MIT
Strow, L.	UMBC
Susskind, J.	GSFC

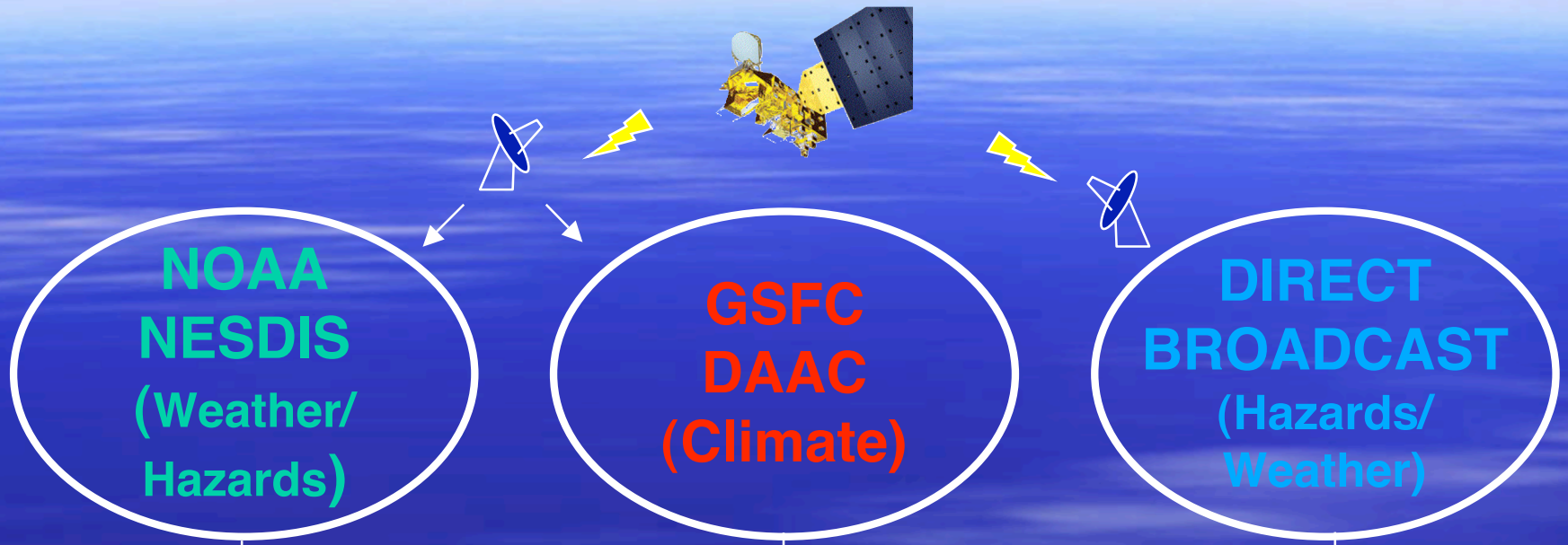
New Members

Brewster, K.	U of Oklahoma
Barker, D.	NCAR
Icano, M.	AER
McMillan, W.	UMBC
Atlas, R.	GSFC
Lord, S.	NOAA/NCEP
Barnet, C.	NOAA/NESDIS
Knuteson, R.	U of Wisconsin
Milosevich, L..	NCAR
Tobin, D.	U of Wisconsin
Mlynczak, M	LARC

International Partners

Chedin, A. (Continuing)	CNRS
Rizzi, R. (Continuing)	U of Bologna
Calheiros, R. (Continuing)	Brazil/HSB
McNally, T.	ECMWF
Saunders, R.	UKMO

AIRS/AMSU DATA DISTRIBUTION CENTERS



NWP Centers

- **Science Community**
- **Public**

http://daac.gsfc.nasa.gov

- **Universities**
- **Local Weather Stations**
- **Brazil (INPE)**
- **China**
- **Korea**
- **DoD**
- **Other International**

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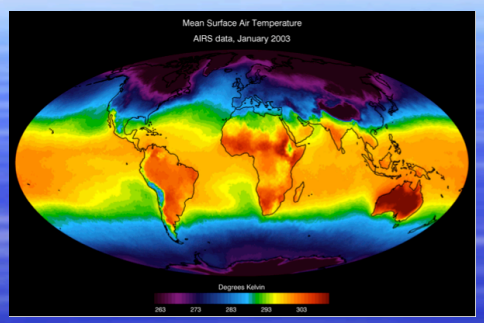
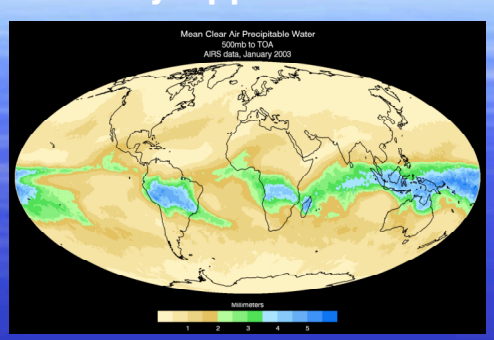
AIRS Supports Climate Science

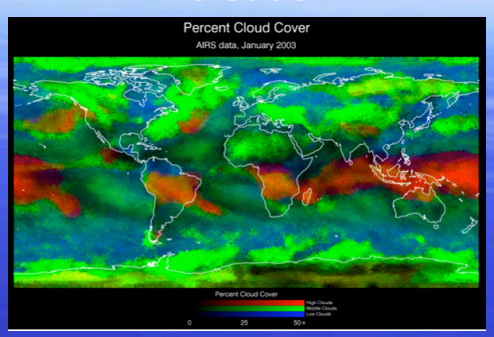
Monthly Temperature



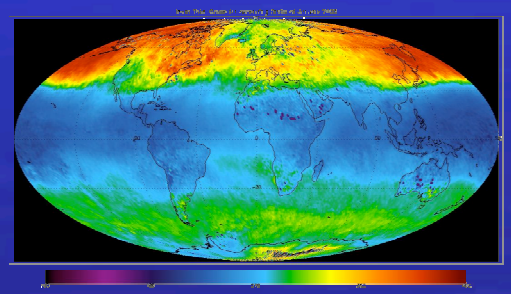
Monthly Upper Atm. H2O



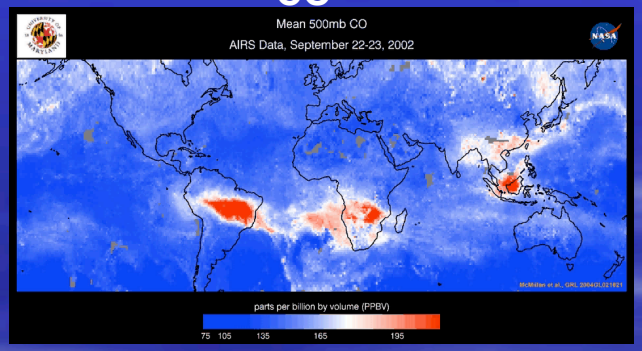
Clouds



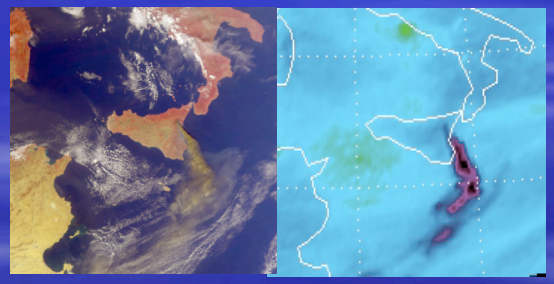
Ozone



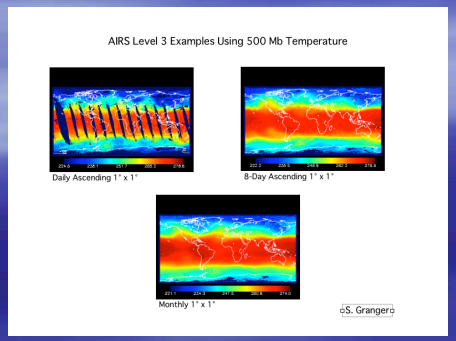
CO



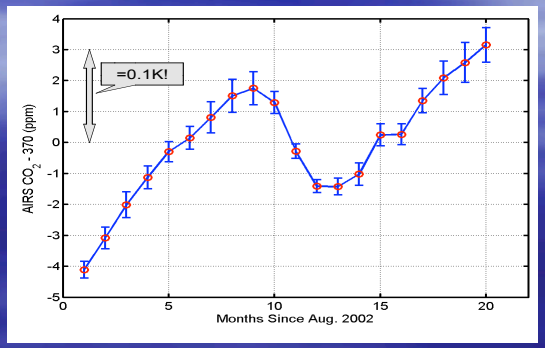
SO2



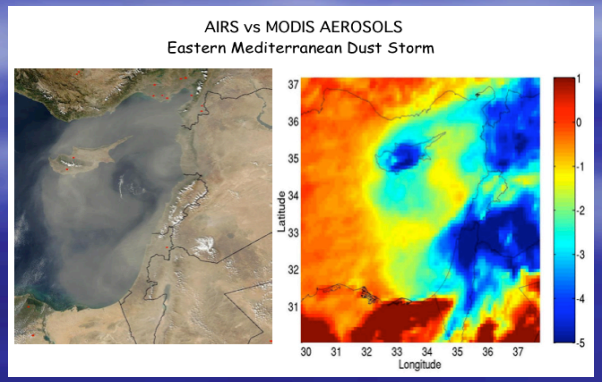
Level 3 Products



CO2



Aerosols



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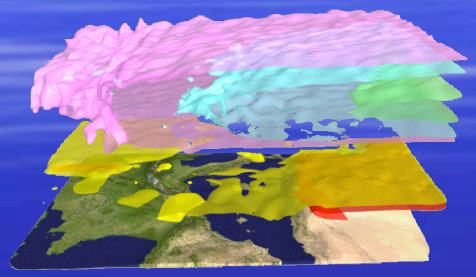
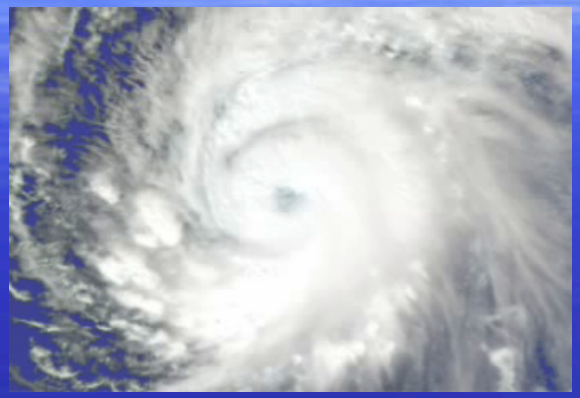
AIRS Supports Weather Forecasting

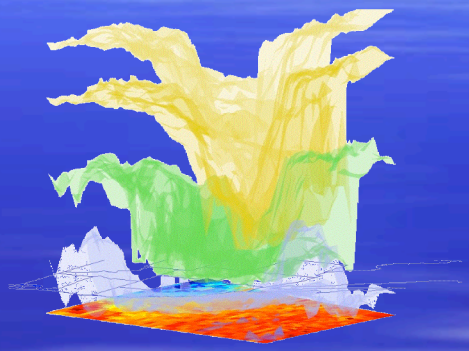
Improved Temperature Profiles



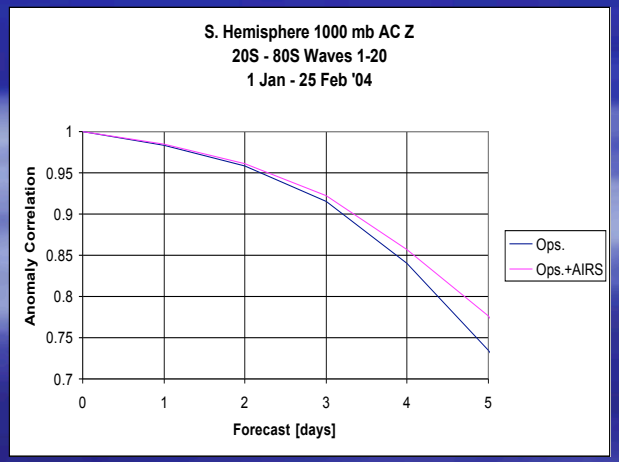
Super Typhoon Pongsona Isotherms



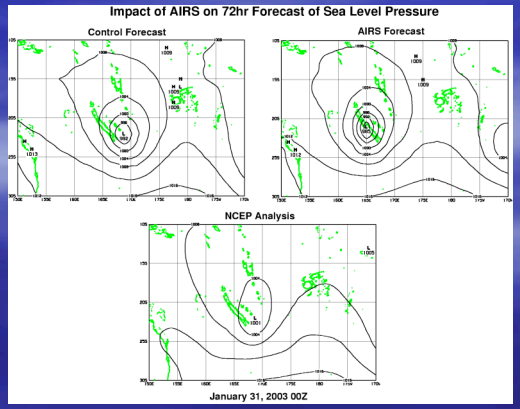
Improved Water Vapor Profiles



Forecast Impact

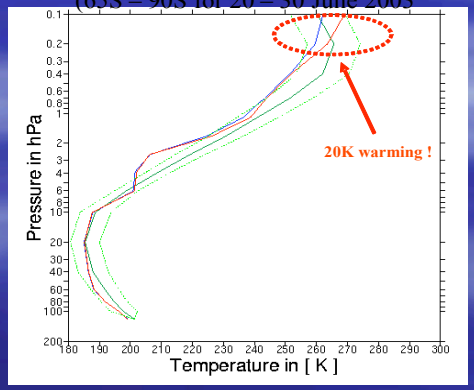


Improved Position and Magnitude Forecast of Cyclones



Model Improvement

26R3 – WITH AIRS radiances
(65S – 90S for 20 – 30 June 2003



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AIRS Project Major Milestones

L+0	***May 2002***	***AIRS Launched***
L+5 m	***Oct 2002***	***AIRS operational***
L+6 m	***Nov 2002***	***L1B Released to Public***
L+16 m	***Sep 2003***	***L2 Released to the Public***
L+16 m	***Sep 2003***	***L2 Products Validated over Oceans***
L+17 m	***Oct 2003***	***First NWP Center Assimilation***
L+17 m	***Oct 2003***	***Forecast Impact SH (Atlas)***
L+29 m	***Oct 2004***	***Forecast Impact NH (LeMarshall)***

Coming in 2005…

- ***Level 3 Released to Public***
- ***Retrievals Working over Land Released to Public***
- ***AIRS Used for Atmospheric Composition***

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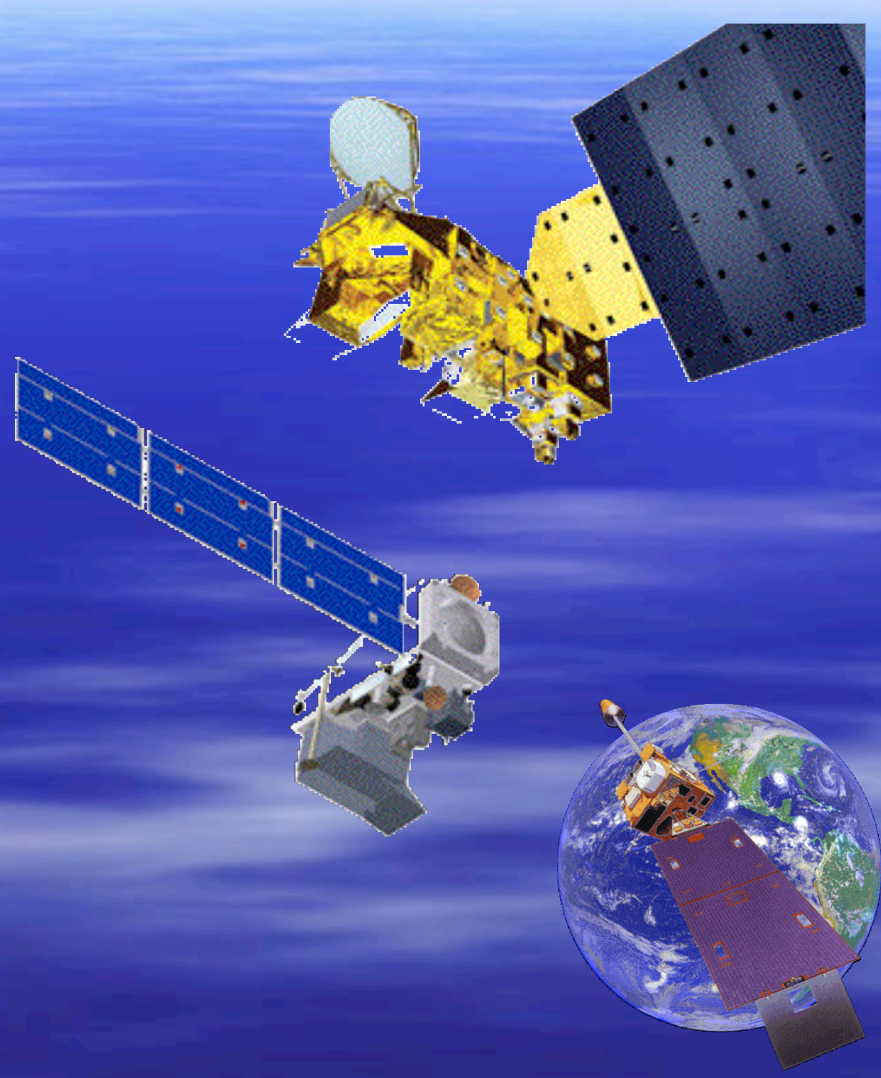
AIRS Paving the Way for Future Sounders

- Current IR Sounder
  - Aqua AIRS
    - 2002 Launch
    - LEO
    - 3.7-15.4 μm
    - 13.5 km IFOV
- Planned IR Sounders
  - NPOESS CrIS
    - 2006 Launch
    - LEO
    - 3.9-15.4 μm
    - 14 km Resolution
  - GOES-R HES
    - 2012 Launch
    - GEO
    - 4.4 – 15.4 μm
    - 4 km Resolution



Summary and Conclusions

- AIRS Experiment has been very Successful
  - Hardware proven to provide climate quality measurements
  - Retrieval Algorithms proven to work effectively
  - Weather Forecasters Showing Impact
  - IR Spectrum a “Fundamental CDR”
- What lies ahead…
  - Land Surface Spectral Emissivity
  - Retrieval of Trace Gases and Aerosols
  - Further improvement in weather forecasting
- http://airs.jpl.nasa.gov

Order your AIRS T-shirts/sweatshirts online by Dec 3 to receive your order by the holidays...

www.bookstore.caltech.edu/JPLLAB

AIRS User Services

- Community Data Requests
  - Folks who ask for special types/formats of data:
  - Wallace McMillan, UMBC
  - Roger Heymann, NOAA/NESDIS
  - Kurt Lightner, UMBC
  - GODAE high-resolution sea surface temperature (GHRRST)
  - Bob Atlas, GLA
  - Vinson/Revercomb, UW
  - Elena Lobl, AMSR MSFC
  - Sam Benedict, GEWEX
  - Matt Thomas, UCSB
  - Duane Waliser, NCAR
  - GDAAC
- Information Requests
  - 49 Questions Received and Answered on the AIRS Inquiry Web Page:
  - University of Johannesburg, South Africa, Boston university, Florida State University, University of Alabama, Huntsville, George Institute of Technology. University of California, Los Angeles, George Mason University, California Institute of Technology, University of Wisconsin, Madison, Imperial College, London, Atmospheric and Environmental Research, Inc, Larcon Construction, FL,Boeing, Korea Remote Sensing Satellite Ground Station, Daejun, Nacional de Pequisas Espaciais (INPE), Brazil