

NASA Daily News Summary  
For Release: Dec. 10, 1999  
Media Advisory m99-255

SUMMARY:

NASA OPENS NEW, VIRTUAL AIRPORT CONTROL TOWER AT AMES

Video File for Dec. 10, 1999

NOTE: ALL TIMES EASTERN

- ITEM 1 - FUTURE FLIGHT CENTRAL - ARC
- ITEM 2 - CLOUD PATTERNS NEAR CAPE VERDE ISLANDS - GSFC
- ITEM 3 - HYDRA A GALAXY CLUSTER - CHANDRA X-RAY OBSERVATORY  
IMAGE (replay)
- ITEM 4 - EL NIÑO'S DRAMATIC IMPACT ON OCEAN BIOLOGY(replay)
- ITEM 5 - SCIENTISTS STUDY ARCTIC OZONE IN SOLVE CAMPAIGN  
- ARC, LARC, DFRC (replay) special request
- ITEM 6 - TERRA MISSION - GSFC (replay) special request

NOTE: Due to equipment maintenance today, the video file will run ONLY at Noon and 3:00 pm Eastern Time. It will run approximately 1 hour, 15 minutes.

\*\*\*\*\*

NASA OPENS NEW, VIRTUAL AIRPORT CONTROL TOWER AT AMES

"FutureFlight Central," the world's first full-scale virtual airport-control tower, will open with a ribbon-cutting ceremony on Monday, Dec. 13, at NASA's Ames Research Center, Moffett Field, CA. Constructed at a cost of \$10 million, the two-story FutureFlight Central facility was jointly funded by NASA and the Federal Aviation Administration (FAA). The facility is designed to test -- under realistic airport conditions and configurations -- ways to solve potential air and ground traffic problems at commercial airports.

Contact at NASA Ames Research Center, Moffett Field, CA: Michael Mewhinney (Phone 650/604-3937).  
Contact at NASA Headquarters, Washington, DC: Michael Braukus (Phone 202/358-1979).

For full text, see:  
<ftp://ftp.hq.nasa.gov/pub/pao/pressrel/1999/99-143.txt>

-----  
 If NASA issues any news releases later today, we will e-mail summaries and Internet URLs to this list.

Index of 1999 NASA News Releases:  
<http://www.nasa.gov/releases/1999/index.html>

\*\*\*\*\*

Video File for Dec. 10, 1999

ITEM 1 - FUTURE FLIGHT CENTRAL - ARC

Contact at NASA Ames Research Center, Moffett Field, CA: Michael Mewhinney (Phone 650/604-3937).

Contact at NASA Headquarters, Washington, DC: Michael Braukus (Phone 202/358-1979).

ITEM 1a - FUTUREFLIGHT CENTRAL - ANIMATION-----TRT :29

NASA's FutureFlight Facility, opening Dec. 13, 1999, is the world's first full-scale virtual airport control tower. Located at NASA Ames Research Center, Moffett Field, CA, the facility will provide the airline industry with robust test and research capabilities within a safe, real-time, simulated environment.

ITEM 1b - FUTUREFLIGHT CENTRAL - ANIMATION-----TRT 1:38

Simulations from the control tower of NASA's new FutureFlight Facility, depicting San Francisco International airport and its virtual air traffic.

ITEM 1c - FUTUREFLIGHT CENTRAL B-ROLL-----TRT 2:33

Testing of the systems in the new FutureFlight Central facility, showing both the control tower and the downstairs pseudo-pilot areas.

ITEM 1d - AIRPLANE B-ROLL-----TRT 1:34

Montage of commercial aircraft at various U.S. airports engaging in ground transportation maneuvers as well as footage inside an air traffic control tower.

ITEM 1e - INTERVIEW EXCERPTS-----TRT 1:52

Paul Kutler, Deputy Director, Information Sciences & Technology Directorate, NASA Ames Research Center, Moffett Field, CA.

ITEM 1f - INTERVIEW EXCERPTS-----TRT 1:37

Nancy Dorigi, Facility Manager, FutureFlight Central, NASA Ames Research Center, Moffett Field, CA.

ITEM 1g - INTERVIEW EXCERPTS-----TRT 1:24

Jim McClenahan, Air Traffic Control Analyst, FutureFlight Central, NASA Ames Research Center, Moffett Field, CA.

ITEM 2 - CLOUD PATTERNS NEAR CAPE VERDE ISLANDS - GSFC

Contact at NASA Headquarters, Washington, DC: David E. Steitz (Phone 202/358-1730).

Contact at NASA Goddard Space Flight Center, Greenbelt, MD: Wade Sisler (Phone 301/286-6256).

Images taken by NASA's Sea-viewing Wide Field-of-view Sensor (SeaWiFS) satellite on October 15 and December 7 showing the West African Cape Verde Islands' effect on wind fields. The first image shows the dust blowing from the Sahara Desert on the upper right side moving west but getting trapped by the altitude of the islands. The volcanic islands are high enough to interrupt the wind field as seen by the clear water just south of each of the islands. When wind blows past structures such as these, a vortex is usually created in the wake of the water, as seen in the rippled ocean currents.

ITEM 3 - HYDRA A GALAXY CLUSTER - CHANDRA X-RAY OBSERVATORY  
IMAGE (replay)

Contact at Marshall Space Flight Center, Huntsville, AL: Steve Roy (Phone 205/544-0034).

Contact at NASA Headquarters, Washington, DC: Donald Savage (Phone 202/358-1547).

Contact at Chandra X-ray Observatory Center, Harvard-Smithsonian Center for Astrophysics, Cambridge, MA: Dr. Wallace Tucker (Phone 617/496-7998).

ITEM 3a - HYDRA A: A CLUSTER OF GALAXIES-----TRT :15  
IN THE CONSTELLATION HYDRA

This image shows a radio (green and maroon) overlay of the Chandra X-ray (pink, and blue) image of Hydra A. Large magnetized bubbles of radio-emitting high energy particles expanding from the center of the cluster have pushed through the 40 million degree X-ray emitting gas. As the largest gravitationally bound objects in the universe, galaxy clusters provide crucial clues for understanding the origin and fate of the universe. Hydra A is 840 million light years from Earth.

ITEM 3b - X-RAY IMAGE OF HYDRA A GALAXY CLUSTER-----TRT :15

NASA's Chandra X-ray Observatory image of the Hydra A galaxy

cluster has revealed a possible solution to a Herculean puzzle about the fate of the largest objects in the universe. For years astronomers have been searching unsuccessfully for large quantities of matter they believed must be flowing into the central regions of galaxy clusters. The Chandra image of Hydra A displays for the first time long snake-like strands of 35 million degree gas extending away from the center of the cluster. These structures show that the inflow of cooling gas is deflected by magnetic fields produced by explosions from a central black hole. As the largest gravitationally bound objects in the universe, galaxy clusters provide crucial clues for understanding the origin and fate of the universe.

ITEM 3c - Interview Excerpts-----TRT 1:48

Mary Weisskopf, Chandra Project Scientist, NASA Marshall Space Flight Center, Huntsville, AL

<http://chandra.nasa.gov>

ITEM 4 - EL NIÑO'S DRAMATIC IMPACT-----TRT 14:00  
ON OCEAN BIOLOGY(replay)

Contact at NASA Goddard Space Flight Center, Greenbelt, MD:  
Cynthia O'Carroll (Phone 301/614-5563).

Contact at NASA Headquarters, Washington, DC: David E. Steitz  
(Phone 202/358-1730).

Synopsis: The 1997-98 El Niño/La Niña had an unprecedented roller-coaster effect on the oceanic food chain across a vast swath of the Pacific, plunging chlorophyll levels to the lowest ever recorded in December 1997 and spawning the largest bloom of microscopic algae ever seen in the region the following summer. According to new results published in the December 10 issue of the journal Science, El Niño also dramatically reduced the amount of carbon dioxide normally released into the atmosphere by the equatorial Pacific Ocean.

ITEM 4a - AN IMMENSE PACIFIC BLOOM

This sequence illustrates the vast size and intensity of the ocean's biological rebound from El Niño. Satellite imagery from NASA's Sea-viewing Wide-Field-of-view Sensor (SeaWiFS) instrument showed nearly a complete lack of plankton along the equatorial Pacific during El Niño. The cool waters associated with La Niña brought nutrients from the below the surface and enabled an enormous plankton bloom (shown in green).

ITEM 4b - REBOUND FROM EL NIÑO

The SeaWiFS data revealed surprisingly low levels of plankton coinciding with El Niño's strongest phase. The cooler waters associated with La Nina brought a huge plankton bloom along the equator (shown in green).

## ITEM 4c - EXPLOSION IN THE GALAPAGOS

SeaWiFS documented the rapid demise of El Niño in the waters around the Galapagos Islands. The images show an explosion in plankton growth as the warm El Niño waters blamed for choking off essential ocean nutrients are replaced by deep cold upwelled waters. The false color images, which document plankton concentrations from May 9-24 1998, show that life in the region to the west archipelago has returned in remarkable abundance. High concentrations are shown in red. Areas occluded by clouds are shown in white.

## ITEM 4d - THE CARBON CONNECTION - PHYSICAL PROCESSES

By understanding the magnitude of the huge plankton bloom, scientists were able to calculate how changes in biologic activity caused massive changes in carbon dioxide. Scientists determined that El Niño cut the amount of carbon dioxide released into the atmosphere by 700 million metric tons. The deep ocean waters normally release large amounts of carbon dioxide. During El Niño, the carbon dioxide-rich waters were held below the surface.

## ITEM 4e - THE CARBON CONNECTION - BIOLOGICAL PROCESSES

Nutrients in the cooler waters associated with La Niña were brought to the surface and helped fuel a huge plankton bloom. This animation shows how the tiny plants can lock up carbon when they die.

## ITEM 4f - THE 1997-98 EL NIÑO

The 1997-98 El Niño was truly a global event. The sequence shows a superimposition of sea surface temperature anomalies on anomalies of the sea surface elevation. Warmer than normal temperatures are shown in red and cooler than normal temperatures are shown in blue.

## ITEM 4g - 3-D EL NIÑO

The space-based perspective provided by satellite observations trace the evolution of El Niño (shown in red) from its beginning in early 1997 through its decline in early 1998. The onset of La Niña can be seen as the emergence cooler than normal temperatures (shown in blue) along the equator.

## ITEM 4h - PHYTOPLANKTON -- UP CLOSE AND PERSONAL

Images of phytoplankton and zooplankton. Plankton are lowest rungs in the oceanic food chain.

## ITEM 4i - BUOY ARRAY

Scientists also used data from the National Oceanic and

Atmospheric Administration's Tropical Atmosphere Ocean array.

ITEM 4j - EYE IN THE SKY - SEAWIFS

NASA's Sea-viewing Wide Field-of-View Sensor (SeaWiFS) gave researchers an unprecedented view into the extreme biological effects of this El Niño/La Niña event.

ITEM 4k - HOW SEAWIFS "SEES" PLANKTON

The SeaWiFS instrument detects subtle differences in ocean color and is used to determine the concentrations of chlorophyll found in plankton.

ITEM 4l - SCIENTISTS B-ROLL

Scientists at NASA's Goddard Space Flight Center study El Niño and La Niña.

ITEM 4m - INTERVIEW EXCERPTS

Dr. Gene Feldman, Research Oceanographer, NASA Goddard Space Flight Center, Greenbelt, MD.

ITEM 5 - SCIENTISTS STUDY ARCTIC OZONE IN SOLVE CAMPAIGN  
(replay) - ARC, LARC, DFRC

Contact at NASA Ames Research Center, Moffett Field, CA: John Bluck (Phone 650/604-5026).

Contact at NASA Headquarters, Washington, DC: David E. Steitz (Phone 202/358-1730).

ITEM 5a - EXAMINING ARCTIC OZONE-----TRT 1:38

NASA scientists are joining researchers from Europe, Russia, Canada and Japan to mount the largest field-measurement campaign ever to assess ozone amounts and changes in the Arctic upper atmosphere this winter. This collaborative campaign will measure ozone and other atmospheric gases using satellites, airplanes, heavy-lift and small balloons, and ground-based instruments. From November 1999 through March 2000, researchers will examine the processes that control ozone amounts during the Arctic winter at mid to high latitudes.

ITEM 5b - ER-2 AIRCRAFT-----TRT :52

B-roll: ER-2 aircraft being prepped at NASA Ames; pilot getting onboard; takeoff.

ITEM 5c - INTERVIEW-----TRT 1:11

Dr. Michael Kurylo, Manager, Upper Atmosphere Research Program at

NASA Headquarters, Washington, DC

ITEM 5d - INTERVIEW-----TRT :29

Dr. Phil DeCola, Program Manager, Upper Atmosphere Research  
Program at NASA Headquarters, Washington, DC

ITEM 5e - INTERVIEW-----TRT :40

Katja Drdla, Principal Investigator, SOLVE campaign, NASA Ames  
Research Center, Moffett Field, CA

ITEM 5e - INTERVIEW-----TRT 1:01

\*Chip Treppe, Atmospheric Scientist, NASA Langley Research Center,  
Hampton, VA.

Contact at NASA Langley Research Center, Hampton, VA: Chris Rink  
(Phone 757/864-6786).

More information (including a list of participating  
institutions) can be found at:

<http://cloud1.arc.nasa.gov/solve/index.html>

and

<http://www.ozone-sec.ch.cam.ac.uk>

ITEM 6 - TERRA MISSION - GSFC (replay)

Contact at NASA Goddard Space Flight Center, Greenbelt, MD: Allen  
Kenitzer (Phone 301/286-2806).

Contact at NASA Headquarters, Washington, DC: David E. Steitz  
(Phone 202/358-1730).

URL: <http://pao.gsfc.nasa.gov/gsfcc/earth/terra/terra.htm>

ITEM 6a - TERRA, THE EOS FLAGSHIP-----TRT 2:00

NASA will launch and deploy the "flagship" to the Earth Observing  
System (EOS) series of satellites, part of a precedent setting  
program designed to provide daily information on the health of the  
Planet. Terra will be the most comprehensive tool ever launched  
for scientific studies of our home planet.

ITEM 6b - TERRA INSTRUMENT SYNERGY-----TRT :40

Terra is uniquely designed to be an Earth-observing laboratory  
with onboard research instruments that can be used both  
independently and cooperatively.

ITEM 6c - TERRA LOOKS CLOSELY AT EARTH-----TRT :43

Montage of instrument swaths and key science objectives for each of the five instruments on Terra. The instruments (in order) are ASTER (Advanced Spaceborne Thermal Emission and Reflection Radiometer), CERES (Clouds and the Earth's Radiant Energy System), MISR (Multi-angle Imaging SpectroRadiometer), MODIS (MODerate-resolution Imaging Spectroradiometer), and MOPITT (Measurements of Pollution in the Troposphere).

ITEM 6d - TERRA LAUNCH AND DEPLOY ANIMATION-----TRT 1:23

An Atlas II rocket will hoist the Terra satellite into orbit from Vandenberg Air Force Base, CA.

ITEM 6e - TERRA SCIENCE OBJECTIVES-----TRT :52

Terra begins a new generation of Earth science--one that studies the Earth's land, oceans, air, ice and life as a total global system. Terra will help us to understand how the complex coupled Earth system of air, land water and life is linked.

ITEM 6f - TERRA SCIENCE OBJECTIVES-----TRT :28

Terra will simultaneously study clouds, water vapor aerosol particles, trace gases terrestrial and ocean properties, the interaction between them, and their effect on atmospheric radiation and climate. Data sets in visualization: Earth as seen by Galileo spacecraft, radiant energy, vegetation anomalies, temperature, fires, aerosols, clouds, methane, water vapor, and global biosphere.

ITEM 6g - TERRA SCIENCE OBJECTIVES-----TRT :32

Terra will help scientists to examine the Earth as one integrated system by looking closely and examining the major spheres of its environment--the biosphere, aerosols, radiant energy, air pollution, temperature, and water vapor.

ITEM 6h - TERRA SCIENCE OBJECTIVES--VEGETATION-----TRT :58

Terra will help monitor biospheric productivity and will detect subtle changes in forest and ocean ecosystems.

1. Global Biosphere
2. Changes in Vegetation Index

ITEM 6i - TERRA SCIENCE OBJECTIVES--AEROSOLS-----TRT 1:01

Terra carries sensors that will measure aerosol amounts over land and ocean, as well as particle size and composition. Aerosols come from dust storms, forest and grassland fires, volcanoes, living vegetation, and sea spray. Human activities, such as the burning of fuels and changing the land's surface cover, also generate aerosols.



1. Aerosols Maps
2. Global Fires

ITEM 6j - TERRA SCIENCE OBJECTIVES--HEAT FLOW & CLIMATE---TRT 2:26

The Earth's climate is governed by a balance between sunlight that reaches the Earth and heat that is radiated back into space. Terra will help scientists monitor this delicate balance and better understand the relationship between greenhouse gases, cloud cover and long-term climate change.

1. Radiation Budget
2. Water Vapor
3. Methane
4. Global Temperatures
5. 1997-98 El Nino

ITEM 6k - TERRA SATELLITE B-ROLL-----TRT :30

Engineers work on Terra in the clean room at Lockheed-Martin, Valley Forge, PA.

ITEM 6l - EARTH SCIENTISTS AT WORK-----TRT :35

B-Roll of Earth Scientists

ITEM 6m - INTERVIEW EXCERPTS-----TRT :54

Yoram Kaufman, Terra Project Scientist, NASA Goddard Space Flight Center, Greenbelt, MD.

ITEM 6n - INTERVIEW EXCERPTS-----TRT 1:35

Jon Ransom, Terra Deputy Project Scientist, NASA Goddard Space Flight Center, Greenbelt, MD.

ITEM 6o - TERRA INSTRUMENTS--ASTER-----TRT 1:27

ASTER (Advanced Spaceborne Thermal Emission and Reflection Radiometer) will measure snow and ice distribution, vegetation types, rock and soil properties, surface temperatures, and cloud properties.

Contact at NASA Jet Propulsion Laboratory, Pasadena, CA: Diane Ainsworth (Phone 818/354-5011).

Contact at NASA Headquarters, Washington, DC: David E. Steitz (Phone 202/358-1730).

ITEM 6p - INTERVIEW EXCERPTS-----TRT :24

Simon Hook, ASTER Project Scientist, Jet Propulsion Laboratory, Pasadena, CA.

Contact at NASA Jet Propulsion Laboratory, Pasadena, CA: Diane Ainsworth (Phone 818/354-5011).

Contact at NASA Headquarters, Washington, DC: David E. Steitz (Phone 202/358-1730).

ITEM 6q - INTERVIEW EXCERPTS-----TRT 1:49

Ann Kahle, ASTER U.S. Science Team Leader, Jet Propulsion Laboratory, Pasadena, CA.

Contact at NASA Jet Propulsion Laboratory, Pasadena, CA: Diane Ainsworth (Phone 818/354-5011).

Contact at NASA Headquarters, Washington, DC: David E. Steitz (Phone 202/358-1730).

ITEM 6r - TERRA INSTRUMENTS--CERES-----TRT 1:08

CERES (Clouds and Earth's Radiant Energy System) will study the radiation balance on Earth; how much heat is absorbed and reflected from the Earth's surface to the top of the atmosphere. By collecting data on how different cloud formations absorb or reflect various amounts of energy, scientists can develop new predictive models about weather systems and how the Earth maintains its delicate balance in temperature.

Contact at NASA Langley Research Center, Hampton, VA: H. Keith Henry (Phone 757/864-6120/24).

Contact at NASA Headquarters, Washington, DC: David E. Steitz (Phone 202/358-1730).

ITEM 6s - INTERVIEW EXCERPTS-----TRT :22

Bruce Wielicki, CERES Principal Scientist, NASA Langley Research Center, Hampton, VA.

Contact at NASA Langley Research Center, Hampton, VA: H. Keith Henry (Phone 757/864-6120/24).

Contact at NASA Headquarters, Washington, DC: David E. Steitz (Phone 202/358-1730).

ITEM 6t - TERRA INSTRUMENTS--MISR-----TRT 1:45

MISR's (Multi-Angled Spectroradiometer) cameras will allow scientists to produce stereoscopic (3-D) images of clouds and aerosol structures. The detailed analysis will help determine how sunlight behaves and how it interacts as it passes through Earth's environment. MISR will also monitor long term trends in pollution, aerosols, cloud heights, and distribution of land surface cover.

Contact at NASA Jet Propulsion Laboratory, Pasadena, CA: Diane Ainsworth (Phone 818/354-5011).

Contact at NASA Headquarters, Washington, DC: David E. Steitz (Phone 202/358-1730).

ITEM 6u - MISER B-ROLL-----TRT :33

B-Roll of MISR (Multi-Angled Spectroradiometer).

Contact at NASA Jet Propulsion Laboratory, Pasadena, CA: Diane Ainsworth (Phone 818/354-5011).

Contact at NASA Headquarters, Washington, DC: David E. Steitz (Phone 202/358-1730).

ITEM 6v - INTERVIEW EXCERPTS-----TRT :33

David Diner, MISER Principal Investigator, Jet Propulsion Laboratory, Pasadena, CA.

Contact at NASA Jet Propulsion Laboratory, Pasadena, CA: Diane Ainsworth (Phone 818/354-5011).

Contact at NASA Headquarters, Washington, DC: David E. Steitz (Phone 202/358-1730).

ITEM 6w - TERRA INSTRUMENTS--MODIS-----TRT :53

MODIS (MODerate Resolution Imaging Spectroradiometer) will measure cloud cover and aerosol concentrations on a global scale so that, with CERES and MISR data, scientists can gauge the effects on the Earth's radiation budget. MODIS will study surface temperatures (including fire detection), ocean sediment, phytoplankton concentrations, vegetation maps, land cover changes, pollution, and snow cover.

Contact at NASA Goddard Space Flight Center, Greenbelt, MD: Allen Kenitzer (Phone 301/286-2806).

Contact at NASA Headquarters, Washington, DC: David E. Steitz (Phone 202/358-1730).

ITEM 6x - INTERVIEW EXCERPTS-----TRT 1:09

Jim Collatz, Terra Associate Project Scientist, NASA Goddard Space Flight Center, Greenbelt, MD.

Contact at NASA Goddard Space Flight Center, Greenbelt, MD: Allen Kenitzer (Phone 301/286-2806).

Contact at NASA Headquarters, Washington, DC: David E. Steitz (Phone 202/358-1730).

ITEM 6y - TERRA INSTRUMENTS--MOPITT-----TRT 1:03

MOPITT (Measurements of Pollution in the Troposphere) will measure carbon monoxide and methane levels in the lower atmosphere. By studying where these atmospheric gases are concentrated, how they circulate through the atmosphere, and how they form, scientists hope to gain a more complete picture about how atmosphere pollution interacts and affects our environment.

Contact in Canada: Marion Neiman (Phone 613/990-8622).

Contact at NASA Headquarters, Washington, DC: David E. Steitz (Phone 202/358-1730).

ITEM 6z - INTERVIEW EXCERPTS-----TRT :24

James Drummond, Professor, University of Toronto, Canada

Contact in Canada: Marion Neiman (Phone 613/990-8622).  
 Contact at NASA Headquarters, Washington, DC: David E. Steitz  
 (Phone 202/358-1730).

-----  
 Unless otherwise noted, ALL TIMES ARE EASTERN.

ANY CHANGES TO THE LINE-UP WILL APPEAR ON THE NASA VIDEO FILE  
 ADVISORY ON  
 THE WEB AT <ftp://ftp.hq.nasa.gov/pub/pao/tv-advisory/nasa-tv.txt>  
 WE UPDATE THE ADVISORY THROUGHOUT THE DAY.

The NASA Video File normally airs at noon, 3 p.m., 6 p.m., 9 p.m.  
 and midnight Eastern Time.

NASA Television is available on GE-2, transponder 9C at 85 degrees  
 West longitude, with vertical polarization. Frequency is on 3880.0  
 megahertz, with audio on 6.8 megahertz.

Refer general questions about the video file to NASA Headquarters,  
 Washington, DC: Ray Castillo, 202/358-4555, or Elvia Thompson,  
 202/358-1696, [elvia.thompson@hq.nasa.gov](mailto:elvia.thompson@hq.nasa.gov)

During Space Shuttle missions, the full NASA TV schedule will  
 continue to be posted at:  
<http://spaceflight.nasa.gov/realdata/nasatv/schedule.html>

For general information about NASA TV see:  
<http://www.nasa.gov/ntv/>

\*\*\*\*\*

#### Contract Awards

Contract awards are posted to the NASA Acquisition information  
 Service Web site: <http://procurement.nasa.gov/EPS/award.html>

\*\*\*\*\*

The NASA Daily News Summary is issued each business day at  
 approximately 2 p.m. Eastern time. Members of the media who wish  
 to subscribe or unsubscribe from this list, please send e-mail  
 message to:

[Brian.Dunbar@hq.nasa.gov](mailto:Brian.Dunbar@hq.nasa.gov)

\*\*\*\*\*

end of daily news summary