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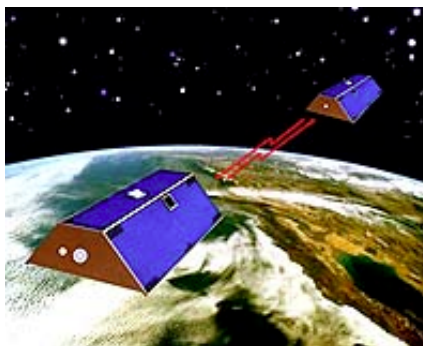
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### Scientists Say "Grace" As Twin Birds Prepare To Divine Water

Greenbelt - Mar 24, 2002

The joint US-German gravity mission Grace is progressing with the twin birds now 256 kilometers apart in stable orbits. Launch March 17 from Russia's Plesetsk Cosmodrome - the Gravity Recovery and Climate Experiment mission (Grace) is comprised of identical twin satellites that will precisely measure Earth's shifting water masses and map their effects on Earth's gravity field.



Grace is a joint partnership between NASA and the German Center for Air and Space Flight (DLR).

The five-year Grace mission -- the first launch of NASA's Earth System Science Pathfinder program -- will be a scientific boon to researchers who study Earth with space-based instruments.

The monthly gravity maps generated by Grace will be up to 1,000 times more accurate than those currently in use, substantially improving the accuracy of many techniques used by oceanographers, hydrologists, glaciologists, geologists and other scientists to study phenomena that influence climate.

These phenomena range from shallow and deep ocean currents, water movement on and beneath Earth's surface, and the movement and changing mass of ice sheets, to sea-level heights, sea-level rise and changes in the structure of the solid Earth.

Under partly cloudy, cold skies, the Grace twins lifted off on a Russian Rockot launch vehicle at 09:21 GMT Mar 17. Riding 160,000 kilograms of thrust, the rocket headed northward over the Arctic Ocean and Alaska, then south across the Pacific Ocean and Antarctica



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### Antarctic Ice Seals Life's Fate

Chicago - Dec 20, 2002



Microbes discovered packed in an ice-sealed, briny lake in Antarctica may help advance techniques to search for signs of life locked in the subterranean ice on Mars, and provide a model for what lakes on

Earth may have looked like during severe glacial periods. The findings were reported in the online edition of the Proceedings of the National Academy of Sciences the week of Dec. 16.

**EARTH OBSERVATION**

### NASA Awards Contracts For Remote Sensing Technology

Greenbelt - Dec 19, 2002



NASA has awarded funding for nine new investigations for technology development of innovative Earth Science remote-sensing

instruments, under the Instrument Incubator Program (IIP), to support the mission to understand and protect our home planet.

**MARSDAILY**

### NASA Testing K9 Rover In New 'Marscape' For Future Missions

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before heading north again over Africa and Europe.

At 85 minutes, 38 seconds into the mission -- or 2:47 a.m. Pacific time -- the satellites separated from the launch vehicle's third stage above Africa into a polar orbit 500 kilometers (311 miles) above Earth.

Ground controllers successfully acquired the spacecraft's signal from the German Space Operations Center's ground tracking station in Weilheim, Germany at 2:49 a.m. Pacific time. Initial telemetry reports received by the Grace team show both satellites to be in excellent health.

Following separation, the leading Grace satellite began pulling away from the trailing satellite at a relative speed of about 0.5 meters (1.6 feet) per second. Over the course of the next four days, the satellites will be spaced 220 kilometers (137 miles) apart -- a little more than the distance between Los Angeles and San Diego.

As they race around the globe 16 times a day, the satellites will sense minute variations in Earth's surface mass below and corresponding variations in Earth's gravitational pull. Regions of slightly stronger gravity will affect the lead satellite first, pulling it slightly away from the trailing satellite.

By measuring the constantly changing distance between the two satellites using an extremely sensitive microwave ranging system and combining that data with precise positioning measurements from Global Positioning System instruments, scientists will be able to construct a precise Earth gravity map.

During the next two and a half weeks, basic satellite operations will be established. During a subsequent three- week commissioning phase, Grace's science instruments and supporting systems will be powered up, evaluated and calibrated.

The performance of the Grace system for measuring Earth gravity will then be validated over the following six months. The mission then enters its observational phase, during which routine operational data products will be made available to scientists.

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NASA scientists and engineers are testing new technologies using a K9 rover in a newly built 'Marscape' test facility in

preparation for future missions to Mars.

**UAV NEWS**

**Four Northrop Grumman UAVs Pass Autonomous Flight Tests**

San Diego - Dec 19, 2002



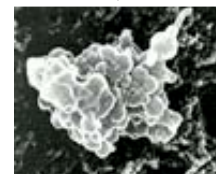
Four different Northrop Grumman Corporation unmanned air vehicles (UAV) achieved flight milestones over a recent 10-day

period, demonstrating the company's experience with a variety of autonomously controlled unmanned systems.

**EXO LIFE**

**Microorganism Isolated In "Space"**

Cardiff - Dec 18, 2002



How far up into the sky does the biosphere extend? Do microorganisms exist at heights of 40 km and in what quantity? To answer these

questions several research institutes in India collaborated on a path-breaking project to send balloon-borne sterile "cryosamplers" into the stratosphere.

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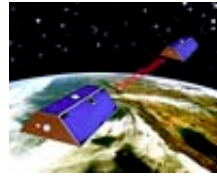
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## **Grace Space Twins Set To Team Up To Track Earth's Water And Gravity**

Pasadena - Mar 8, 2002

NASA and the German Space Agency are preparing to launch the Gravity Recovery and Climate Experiment (GRACE), a scientific pathfinder mission that will test a novel approach to tracking how water is transported and stored within the Earth's environment.



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