NASA.gov Metadata Guidelines

Version 1.0

2003/05/28

dc.title element:

- Mandatory.
- A name given to the content item.
- If a content item lacks a formal title, a descriptive title should be derived.

dc.contributor element:

- Optional.
- An entity or entities responsible for making contributions to the content item.
- Examples of a contributor include a person, an organization or a service.
- A personal name entry in this field should take the following format:
  Personal name : Organization Name/Acronym
  John Dyson : JPL

dc.creator element:

- Mandatory.
- The person responsible for submitting the content item to the CMS.
- A personal name entry in this field should take the following format:
  Personal name : Organization Name/Acronym
  John Dyson : JPL

dc.audience element:

- Mandatory.
- A type of group that the content would be targeted at or most relevant to.
- For example, students, press, general public etc. as they will often have different needs and interests.
- A content item may be relevant for more than one audience and it is acceptable to select more than one audience tag.
- When determining appropriate audiences at the meta data page in the CMS, remember to consider the segment (within the information architecture) that the content will be targeted to.

dc.audience.level element:

- Mandatory for educational content. This tag is specific to content that has previously been identified as targeted to an educational (teacher or student) audience.
- This tag indicates the educational grade level of a content item.
- It facilitates students and educators searching for content appropriate to formal educational levels.

dc.type element:

- Mandatory.
- The nature or genre of the content item, i.e. the kind of content. For example, a game, an e-card, a speech, etc.
- Reference http://www.dlese.org/Metadata/vocabularies/vocabs.htm for further explanations.

dc.type.difficulty element:

- Mandatory for educational content; optional for other content.
- Indicates how hard it is to work through the resource for the typical target audience.

dc.type.duration element:

- Mandatory for educational content; optional for other content.
- An indication of how long it would take to work through the resource for the typical target audience.
- Expressed as number of hours and minutes.

dc.type.interactivitylevel element:

- Mandatory for educational content; optional for other content.
- Indicates the level of interaction required by the target audience to obtain value from the content.

- Interactivity levels:
    - Active level - "Active" learning (e.g. learning by doing) is supported by content that directly induces productive action by the learner. An active learning object prompts the learner for semantically meaningful input or for some other kind of productive action or decision, not necessarily performed within the learning object's framework. Active documents include simulations, questionnaires, and exercises. Examples:
        - Simulation (learner manipulates, controls or enters data or parameters)
        - Questionnaire (learner chooses or writes answers)
        - Exercise (finds solution)
        - Problem Statement (writes solution)

    - Passive level - Passive learning occurs when the learner's job mainly consists of absorbing the content exposed to him (generally through text, images or sound). A passive learning object displays information but does not prompt the learner for any semantically meaningful input. Examples of passive level content items are:
        - Hypertext document (reads, navigates)
        - Video (views, rewinds, starts, stops)
        - Graphical material (views)
        - Audio material (listens, rewinds, starts, stops)

    - Mixed level - When a content item blends the active and passive interactivity types, then its type is "mixed". For example:
        - Hypermedia document with embedded simulation applet.

- Active level items may have a high interactivity level (e.g., a simulation environment endowed with many controls) or a low interactivity level (e.g., a written set of instructions that solicit an activity.)

- Passive level items may have a low interactivity level (e.g., a piece of linear, narrative text produced with a standard word processor) or a medium to high interactivity level (e.g., a sophisticated hyperdocument, with many internal links and views).

- Reference http://ltsc.ieee.org/doc/wg12/LOM_1484_12_1_v1_Final_Draft.pdf (page 24 & 25).

dc.rights element:

- Optional.
- Information about rights held in and over the resource.
- Typically dc.rights will contain a rights management statement for the resource, or reference a service providing such information. Rights information often encompasses Intellectual Property Rights, Copyright, and various Property Rights. If the Rights element is null, no assumptions may be made about any rights held in or over the content item.

dc.coverage element:

- Optional.
- This tag should be valued to indicate the geographic region, when relevant, for content items specific to NASA Events.

dc.subject element:

- Mandatory if dc.subject.nasat is null.
- A topic of the content item expressed as keywords or key phrases.
- This field is available to allow inclusion of natural language terms that may not be part of a controlled vocabulary or new terms that may have not yet been added to the NASA Thesaurus or other vocabularies.
- This element is also useful for content items that are brief, such as NASA Facts.

dc.subject.nasat element:

- Mandatory if dc.subject is null.
- A topic of the content item.
- NASA Thesaurus terms should be used whenever possible, particularly for feature content items.
- The controlled vocabulary of the NASA Thesaurus increases the integrity of the tagging and as such further facilitates retrieval and management of content.

dc.subject.discipline element:

- Mandatory.
- A broader subject discipline which when selected from the vocabulary values provided will provide further NASA subject context to the content. This will complement and refine informal terms entered in the dc.subject.

dc.subject.mission element:

- Optional.
- This element will ensure consistency of mission names and acronyms.

dc.subject.organization element:

- Optional.
- This element will ensure consistency of NASA organization names and acronyms.

dc.relation.copyto element:

- Optional.
- This element is used to indicate when a content item exists in more than one location.
- The purpose is to alert users editing a content item of the existence of duplicate items that will also require updating or to inform the segment owner that original content has been modified.

Example: A document is duplicated at the location: Root> NASARoot(Production)> Content> Missions> Current> MI_CM_Feature_04

dc.relation.copyto: Root> NASARoot(Production)> Content> Missions> Current> MI_CM_Feature_04

Notes about applying subject meta tags

The primary purpose of applying subject tags is to represent the primary theme of the content item. Therefore the tags should be selected on the basis of the dominant topic of the content piece. The objective is to help users identify and retrieve content relevant to a specific subject focus that they are interested in and not to index every subject (including organization, mission, etc) mentioned in the item.

Again the focus when selecting subject terms is the content item at hand. Links, references, etc. to external, related content items should not influence subject tag selection for the content item containing the links or references.

If a content item is broad, in that you find many NASA Thesaurus terms applicable for example, look to see if the terms all fall under the same broader term in the organization. If they do you may wish to select that broader term.

You may apply as few or as many subject tags as you judge appropriate. However, care should be taken to ensure that subject terms are not repeated throughout the various subject tags available as repeated terms would skew search results.

dc.subject.nasat is not a mandatory field. However, this field is available to accommodate and encourage the use of standard terms. Vocabulary consistent in form and terminology is vital to precise recall and retrieval of content.

The terms available for dc.mission and dc.organization ensures correct usage of proper names of NASA entities, projects, etc.

Reference:

http://www.dublincore.org/documents/dces/

Examples of non system defined meta tagging:

General Example One

http://www.nasaexplores.com/show2_articlea.php?id=03-013

Have you ever tried to take a shower when the water sprayed everywhere but on your body? It's not very efficient. Farmers faced a similar frustration when they used crop duster airplanes on their fields and orchards. When nozzles were clogged or improperly aligned, the liquids being sprayed didn't hit their targets. Not only was it wasteful of the product, but also it was an environmental concern when crop treatments (pesticides or herbicides) drifted into unintended areas.

NASA aerospace technology helps farmers improve the way the crop dusters spray. NASA worked with Oklahoma State University (OSU) to develop a system that measures and monitors the spray pattern created by the nozzles of the crop duster storage tanks. Making the proper adjustment can make significant differences in how the crop treatments are applied.

Old methods used for testing crop duster spraying patterns used to take days or weeks to complete, but the NASA/OSU system only takes a few hours. The mobile system consists of a 30.5-meter (100-foot) frame connected to a computer. Up to100 crop dusters from a large surrounding area are invited to participate in a "fly in" to take advantage of the testing facilities.

Each plane's tanks are filled with a dyed liquid. The pilot flies the plane over the measurement frame, spraying just as though applying treatment to a crop. As the plane flies over the frame, droplets of the dye fall onto a paper tape running the length of the frame. The tape then feeds into a scanner, and is analyzed using computer modeling programs and data gathered from wind tunnel tests at NASA facilities. The amount of droplets that fell on tape and the pattern they made provide the critical information. The computer printout shows a peak-and-valley graph of the spray pattern.

Using this information, the pilot can adjust the plane's spray nozzles on the spot, and fly over the frame again for another evaluation and printout. By the time the calibration is complete, the pilot can feel assured that the spray applied to crops will be delivered in the most efficient manner possible.

The National Agricultural Aviation Association adopted the OSU system as a key element to improving the safety, efficiency, and cost effectiveness of crop dusting.

NASA has played a role in other farming improvements as well. On the livestock front, farmers have tried to help their baby animals when complications arose. The robotic sow was created to provide a surrogate mother pig to nurse piglets that didn't have a live mother. In years past, traditional refrigeration compressors with Freon®, cables, and thermostats were bulky and inconvenient, yet served the purpose. Now, miniature heat pumps, developed by NASA for satellite cooling, are only 2.5 centimeters (1-inch) square, have no moving parts, and handle both the heating and cooling needed to provide young piglets with the nutrition they need to grow.

While scientists and engineers surely never expected their developments to be used to help farmers with challenges, the transfer of aerospace technology to the agriculture community fills one of NASA's goals, which is to be a recognized source of research and design technology.

Courtesy of NASA's Aerospace Technology Enterprise
Published by NASAexplores: February 27, 2003

General Example One

dc.type.duration: null *(note: there are articles and lessons linked to this article which would require a non-null value for this field)*

dc.type.interactivitylevel: null *(note: there are articles and lessons linked to this article which would require a non-null value for this field)*

dc.type.difficulty: null *(note: there are articles and lessons linked to this article which would require a non-null value for this field)*

dc.audience.level: Teachers.K4, Teachers.5-8, Teachers.9-12

dc.coverage: null

dc.rights: null

dc.relation.copyto: null

dc.audience: Teachers

dc.type: text

dc.contributor: null *(unknown for this example)*

dc.creator: Ellie Trevarthen *(note: Ellie's named used for sake of example)*

dc.subject.organization: null

dc.subject.mission: null

dc.subject.discipline: null

dc.subject.nasat: Agriculture, Crop Dusting, Livestock

dc.subject: Aerospace technology

General Example Two

http://science.nasa.gov/headlines/y2003/14mar_elnino2002.htm

March 14, 2003: Sometimes Earth scientist Bill Patzert wishes he had a degree in psychology. It might help him understand El Niño.

"Every El Niño has a personality all its own, and the latest one has been very quirky," says Patzert, who works at NASA's Jet Propulsion Laboratory. "Here in southern California we expect El Niño to bring heavy rains. But the weather this winter has had a split-personality, alternating between warm and dry months to very cold and wet months."

Strange. But it's not just southern California. Other parts of the world have had quirky El Niño weather, too.

Right: Rains and flooding? Not this time. Southern California has been warm and dry for much of the El Niño winter of 2002. Copyright Michael Pole, all rights reserved.

El Niño is a global weather disturbance that comes along every 4 to 7 years when trade winds blowing across the Pacific Ocean weaken or even reverse. (Why they do this, no one knows.) Normally these winds blow from the Americas toward Australia, pushing sun-warmed surface waters from east to west. "Warm water accumulates near Australia in a region we call 'the warm pool,'" says Patzert.

What happens when the trade winds falter? "That warm water sloshes eastward back across the Pacific Ocean. We can see it in NOAA and NASA satellite maps of sea surface temperature and sea surface height: a band of warmer, higher water stretching along the equator from the mid-Pacific to the coasts of Peru and Ecuador."

This warm strip has multiple influences on global patterns of winds and humidity. For instance, it diverts the course of the jet stream--a "conveyor belt" for storms--which in turn affects weather over much of the globe, especially the North American continent.

In terms of Pacific sea surface temperatures, the 2002-03 El Niño has been far milder than the mammoth El Niño of 1997-98. Recent images from the NASA/CNES Jason-1 satellite show that the mid-equatorial Pacific was only 2°C warmer than average in 2002, compared to the huge, long-lasting tongue of water that was as much as 5°C warmer than average and piled up along the coasts of the Americas in 1997.

Above: A comparison of El Nino's warm strip in Dec. 1997 and Dec. 2002. Sea surface temperature anomalies in these maps were computed from measurements of sea surface temperature collected by the AVHRR sensor on the NOAA polar orbiting satellites. [more]

But don't call this El Niño "weak." It's more complicated than that. In some places its effects have been unusually severe. "Take Australia, for example," says Patzert. "El Niño typically causes dry weather and droughts there--and this year is no exception. What's curious is that the drought of 2002 (when El Niño was mild) is worse than the drought of 1997 (when El Niño was strong)."

Meanwhile in Ecuador and Peru, countries where El Niño usually brings torrential rains and flooding, the 2002 El Niño has had little effect. New England has also experienced contrary weather: The El Niño winter of 1997 was unusually warm. This winter it has been bitterly cold.

"This El Niño definitely has a different personality than the one in 1997-98," Patzert says.

Patzert speculates that the 2002 El Niño is both milder and quirkier than the last one because of something called "the Pacific Decadal Oscillation" (PDO). The PDO is a subtle pattern of sea

surface temperatures in the Pacific Ocean. "It looks like a horseshoe nearly as large as the Pacific Ocean itself, slowly shifting between warm and cool phases every 20-30 years."

Above: The colors in these maps represent temperature anomalies--differences from the average sea surface temperature during the cool and warm phases of the PDO. [more]

Somehow--no one knows the details--the PDO influences El Niño: If El Niño begins during a cool phase of the PDO, El Niño tends to be milder and less predictable. El Niños that come during a warm PDO are stronger and "better behaved, in the sense that we can predict their consequences," he says.

In 1997-98 the PDO was in a warm phase--hence the strong El Niño. Since then the PDO has cooled. "Tropical ocean surface temperatures surrounding El Niño's warm patch now are less like they were in '97-98 and more like they were during the '50s, '60s and early '70s--the last time the PDO was in a cool phase and El Niños were relatively mild," says Patzert.

What's next?

The jury is still out on what the coming months hold. Southern California might yet get a dose of wet weather and the Northeast could still have a warm spell, more like the El Niño stereotype that some forecasters expect.

Patzert, however, thinks this El Niño is nearing its end. "The latest sea surface temperature and sea level maps from space show a cooling trend in the equatorial Pacific." The warm strip of El Niño is giving way to a cool band of water that might herald "La Niña."

"When the trade winds return, they often return with a vengeance," he explains. Not only do they push the warm surface waters back toward Australia, but also they drag cooler-than-usual waters up from the depths. "This is what we call La Niña. She has weather patterns all her own. In this case La Niña would probably mean continuing drought across much of the western U.S." he says.

Right: This Feb. 2003 sea surface temperature map shows cooler waters emerging near the coast of South America. A telltale sign of La Niña? Bill Patzert thinks so.

La Niña often, but not always, follows El Niño. In 1998 the transition happened in the month of May. This time it seems to be happening in March--again, quirky.

"We'll have to wait and see," cautions Patzert. The El Niño of 2002 may have more surprises in store. Anything else would be out of character.

General Example Two

dc.type.duration: null

dc.type.interactivitylevel: null

dc.type.difficulty: null

dc.audience.level: null

dc.coverage: null

dc.rights: null

dc.relation.copyto: null

dc.audience: General Public

dc.type: text

dc.contributor: Tony Phillips : MSFC, Patrick L. Barry : MSFC

dc.creator: Ellie Trevarthen *(note: Ellie's named used for sake of example)*

dc.subject.organization: null

dc.subject.mission: null

dc.subject.discipline: Geosciences

dc.subject.nasat: null

dc.subject: el Nino, weather

For Kids example

http://www.nasa.gov/audience/forkids/kids_feature01_0418_lcn.html

The Physics of Toys

Would you like to play, or do physics? When you play with toys in space you can do both.

Astronauts on several Space Shuttle missions took some toys into space to see how they work in microgravity. They found the toys that push off the floor would move faster. Toys that moved through the air or water by themselves did not do as well. The toys that would travel in a straight line on Earth did not in space. The astronauts played with wind-up toys, racecars on tracks, and fish that swim in water. They had fun while studying science.

Mario Runco was the Space Shuttle mission specialist. He flew on the shuttle STS-54. That crew played with the toys. The mission was called "The Physics of Space." Astronauts and children just like you got to play a part.

The elementary schools where each astronaut went when they were small got to have a live video link with the Shuttle. The children played with the same toys on the ground. They predicted what they thought the toys would do in space. The fun part was watching the astronauts do things to the toys the kids asked them to do. They checked their predictions and talked about why the toys acted the way they did. They could see if they were right or wrong. The students did an experiment using the scientific method with the help of astronauts in space. Science can be fun!

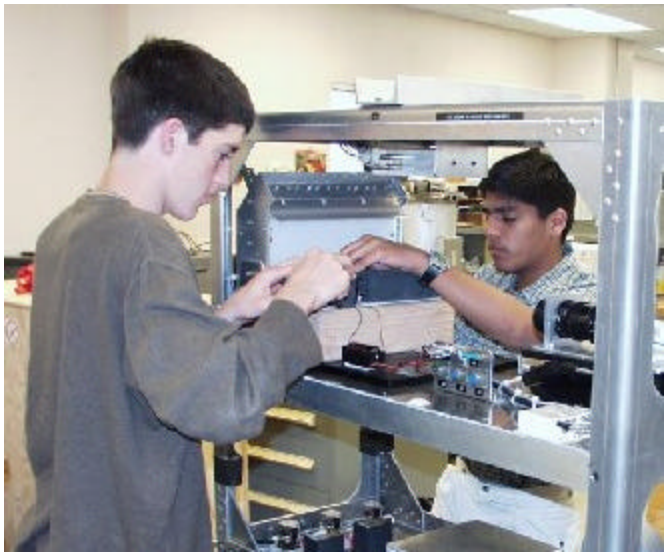
Courtesy of NASA's Human Exploration and Development of Space Enterprise Published by NASAexplores

dc.type.duration: null
dc.type.interactivitylevel: passive - very low
dc.type.difficulty: very easy
dc.audience.level: Students.K-4, Students.5-8, Teachers.K-4, Teachers.5-8
dc.coverage: null
dc.rights: null
dc.relation.copyto: null
dc.audience: General Public, Students, Teachers
dc.type: Feature Article
dc.contributor: null (unknown in this example)
dc.creator: Ellie Trevarthen : JPL (note Ellie's name used for sake of this example)
dc.subject.organization: null
dc.subject.mission: null
dc.subject.discipline: Physics
dc.subject.nasat: microgravity, experimentation
dc.subject: toys

For Students example

http://www.nasa.gov/audience/forstudents/Students_drop_on_a_Dime7733.html

Students Drop on a DIME



Students prepare their experiment for the DIME competition.

Despite the name, NASA?s Dropping In a Microgravity Environment (DIME) competition doesn?t sound anything like a coin hitting the floor. The thud of experiment packages being dropped in the Glenn Research Center?s 2.2 Second Drop Tower and cheers from student teams make for a loud event.

In April of each year, Glenn hosts several teams of high school students for DIME Drop Days. In 2003, sixteen teams submitted proposals and four teams made it to the final stage of the academic year-long program:

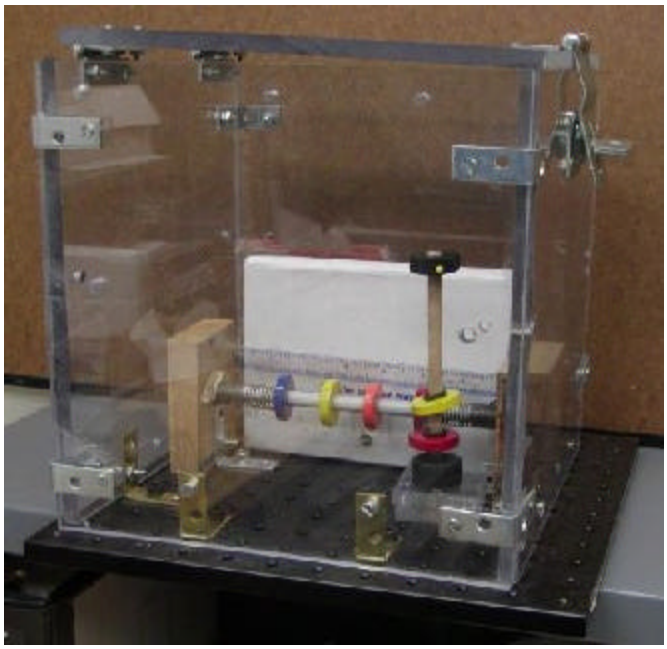
Sycamore High School in Cincinnati, OH
Gettysburg Area High School, Gettysburg, PA
Troy Athens High School, Troy, MI
Cleveland Heights High School, Cleveland Heights, OH

Each of these teams designed and constructed their science experiments for operation in the drop tower. This gives the students real-world experience in an actual NASA test facility. This is NOT your average science fair project!

View down the shaft of the 2.2 Second Drop Tow er at the Glenn Research Center.

"In the DIME program, students learn a fundamental lesson for space experiments -- microgravity; or 'weightlessness', can be created on the ground by dropping experiments in a free fall," said Richard DeLombard, DIME program creator and coordinator from the Glenn Research Center."We hope this program will inspire the next generation of astronauts and project scientists by allowing students to perform their experiments in conditions similar to that in the shuttle and International Space Station."

DeLombard knows what it takes to be a project scientist.He once served in that role for the Space Acceleration Measurement System (SAMS), an operational space flight experiment developed by the Glenn Research Center to measure and record acceleration in low-gravity settings, including facilities on Earth, the space shuttle, and the International Space Station. He oversaw the development of the first SAMS units to measure and record vibrations created by such things as equipment operation, structural motion, crew movement, and thermal expansion.



Student package designed to study magnetic effects in microgravity.

The program is open to students in grades 9 - 12 comprised of teams such as science classes, clubs or scout troops, and their advisors. To be eligible for participation, each group developed an experiment concept, prepared a proposal, and submitted the proposal to NASA. A panel of microgravity experts at Glenn selected the top proposals. These selected teams continued their experiment development and fabrication and then came to Cleveland to conduct their experiments in Glenn?s world-class 2.2 Second Drop Tower. Topics include magnetic forces, buoyancy, and crystal formation.

?During their visit to Glenn, the student teams also participated in microgravity workshops, toured several facilities, and participated in a Self-Contained Underwater Breathing Apparatus (SCUBA) diving lesson at their hotel pool. The SCUBA activity was arranged as a simulation of the astronauts training in the neutral buoyancy facilities while training for space flight EVAs," DeLombard said.

DIME was piloted in 2001 year for Ohio-based schools. The next school year, teams based in Glenn's six-state Great Lakes outreach area were eligible to participate. Beginning in 2003, the competition is nationwide, open for high-school-aged student teams located in all 50 states of the U.S., Washington D. C., and Puerto Rico. The planners are investigating options to allow more teams to compete in the future.

NASA provides expense-paid trips for five representatives of each selected team to attend DIME Drop Days in April at NASA Glenn Research Center in Cleveland, Ohio. The activities are Web-cast so that the home schools and parents could observe the teams? activities in real time.

Information about DIME and related educator resources (available on a CD-ROM) by sending requests to: dime@grc.nasa.gov.

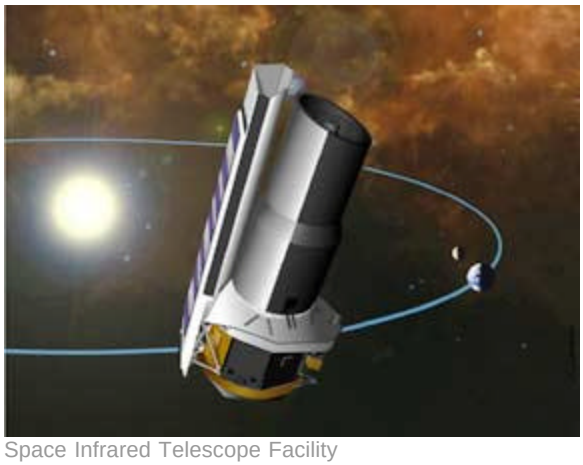
For Students example

dc.type.duration: null
dc.type.interactivitylevel: Passive - very low
dc.type.difficulty: Very easy
dc.audience.level: Students.9-12, Teachers.9-12
dc.coverage: null
dc.rights: null
dc.relation.copyto: null
dc.audience: General Public, Students, Teachers
dc.type: Feature Article
dc.contributor: null (unknown in this example)
dc.creator: Ellie Trevarthen : JPL (note Ellie's name used for sake of this example)
dc.subject.organization: null
dc.subject.mission: null
dc.subject.discipline: Physics
dc.subject.nasat: microgravity, experimentation
dc.subject: DIME Drop Days, Dropping in a microgravity environment, 2.2 Second Drop Tower

General Public example

http://www.nasa.gov/missions/current/MI_CM_Feature_01.html

The Last of the Great Observatories



Space Infrared Telescope Facility

SIRTF - the Space Infrared Telescope Facility - will be launched into space by a Delta rocket from Cape Canaveral, Florida in mid-August, 2003. During its 2.5-year mission, SIRTF will obtain images and spectra by detecting the infrared energy, or heat, radiated by objects in space between wavelengths of 3 and 180 microns (1 micron is one-millionth of a meter). Most of this infrared radiation is blocked by the Earth's atmosphere and cannot be observed from the ground.

Consisting of a 0.85-meter telescope and three cryogenically-cooled science instruments, SIRTF will be the largest infrared telescope ever launched into space. Its highly sensitive instruments will give us a unique view of the Universe and allow us to peer into regions of space, which are hidden from optical telescopes. Many areas of space are filled with vast, dense clouds of gas and dust, which block our view. Infrared light, however, can penetrate these clouds, allowing us to peer into regions of star formation, the centers of galaxies, and into newly forming planetary systems. Infrared also brings us information about the cooler objects in space, such as smaller stars which are too dim to be detected by their visible light, extrasolar planets, and giant molecular clouds. Also, many molecules in space, including organic molecules, have their unique signatures in the infrared.

Because infrared is primarily heat radiation, the telescope must be cooled to near absolute zero (-459 degrees Fahrenheit or -273 degrees Celsius) so that it can observe infrared signals from space without interference from the telescope's own heat. Also, the telescope must be protected from the heat of the Sun and the infrared radiation put out by the Earth. To do this, SIRTF will carry a solar shield and will be launched into an Earth-trailing solar orbit. This unique orbit will carry SIRTF far enough away from the Earth to allow the telescope to cool rapidly without having to carry large amounts of cryogen (coolant). This innovative approach has significantly reduced the cost of the mission.

SIRTF will be the final mission in NASA's Great Observatories Program - a family of four orbiting observatories, each observing the Universe in a different kind of light (visible, gamma rays, X-rays, and infrared). Other missions in this program include the Hubble Space Telescope (HST), Compton Gamma-Ray Observatory (CGRO), and the Chandra X-Ray Observatory (CXO). SIRTF is also a part of NASA's Astronomical Search for Origins Program, designed to provide information, which will help us understand our cosmic roots, and how galaxies, stars and planets develop and form.

General Public example

dc.type.duration: null
dc.type.interactivitylevel: null
dc.type.difficulty: null
dc.audience.level: null
dc.coverage: null
dc.rights: null
dc.relation.copyto: null
dc.audience: General Public
dc.type: Feature Article
dc.contributor: null (unknown in this example)
dc.creator: Ellie Trevarthen : JPL (note Ellie's name used for sake of this example)
dc.subject.organization: null
dc.subject.mission: Space Infrared Telescope Facility [SIRTF]
dc.subject.discipline: Space Sciences
dc.subject.nasat: infrared telescopes
dc.subject: satellites

For Press and Media example

http://www.nasa.gov/home/hqnews/2003/apr/HP_news_03143.html

NASA Spins Up New Vehicle Rollover Test

NASA and the National Highway Traffic Safety Administration (NHTSA) joined forces to, literally, take vehicles out for a spin. The NHTSA wanted to research new methods for testing vehicle rollover resistance, and NASA's High Capacity Centrifuge (HCC) was exactly what was needed to spin up some unique and original vehicle testing.

Vehicles were spun, using the HCC at NASA's Goddard Space Flight Center (GSFC), Greenbelt, Md., on a test platform, until inertia and centrifugal force caused them to tip.

NHTSA employs a consumer rating system, the Static Stability Factor, which uses an engineering formula to determine vehicle rollover rankings. NHTSA wanted to research alternative methods for determining rollover resistance. According to NHTSA's system, a one-star rating means a high likelihood of rolling over, and a five-star rating means a low likelihood.

Officials at NASA and NHTSA expect this first-of-its-kind test will enable them to gain valuable safety information about vehicles that move millions of Americans every day. "The NASA project gives us a chance to really explore the potential of centrifuge testing," said Stephen Kratzke, NHTSA associate administrator for rulemaking. "We were lucky to have a sophisticated facility like Goddard's to perform this valuable research. No one else has such a centrifuge, including the Department of Defense," Kratzke said.

NASA uses the HCC to test spacecraft before they're sent into space. Engineers use the HCC to approximate the effects encountered during the rigors of a rocket launch. By testing hardware on a centrifuge, a satellite's structural integrity can be validated prior to liftoff.

The HCC is a big machine, more than 150 feet in diameter, filling an entire circular building. With two powerful motors running at full tilt, the outer edge of the test arm can reach speeds of more than 200 miles per hour, producing a force 30 times Earth's gravity. It is also a finely tuned machine. At rest, the giant multi-ton arm sits on bearings so smooth just two or three people can push it around the room.

"We can control the centrifuge within a hundredth of an RPM (revolutions per minute)," said Carmine Mattiello, section head of NASA's structural dynamics lab at GSFC. "So we can tell exactly when the wheels are coming off the ground," Mattiello said.

A crash-test dummy went along for the ride in each vehicle. Sitting in the driver's seat, the "passenger" was an important part of the physical test environment. The dummy, similar in shape and weight to a person, increased the realism and accuracy of the test results.

Since its inception, NASA has pursued a commitment to technology transfer to industry, academia and other government agencies. NASA makes technology, as well as facilities and expertise, available to help improve safety, security and quality of life.

For images and information about the rollover tests on the Internet, visit:.

http://www.gsfc.nasa.gov/topstory/2003/0212suv.html

For more information about NASA and technology programs on the Internet, visit:

http://www.nasa.gov

- end -

For Press and Media example

dc.type.duration: null
dc.type.interactivitylevel: null
dc.type.difficulty: null
dc.audience.level: null
dc.coverage: null
dc.rights: null
dc.relation.copyto: null
dc.audience: Press and Media
dc.type: Press Releases
dc.contributor: null (unknown in this example)
dc.creator: Ellie Trevarthen : JPL (note Ellie's name used for sake of this example)
dc.subject.organization: null
dc.subject.mission: null
dc.subject.discipline: null
dc.subject.nasat: null
dc.subject: National Highway Traffic Safety Administration [NHTSA], vehicle rollover tests, vehicle rollover testing, High Capacity Centrifuge

For Parents example

http://www.nasa.gov/audience/forstudents/dreams_into_reality.html

Huntsville Area School Students Turn Dreams Into Reality With NASA's Student Launch Initiative

Students from four Huntsville, Ala., area high schools get their chance to prove they have the "right stuff" Saturday, May 3. That's when the rockets designed and built by student teams during the school year lift off as part of NASA's high-flying Student Launch Initiative.

The event, sponsored by NASA's Marshall Space Flight Center in Huntsville, will be held at an Army test range on Redstone Arsenal. Participating schools include Johnson High School and New Century Technology High School in the Huntsville city system, Sparkman High School in the Madison County system, and Bob Jones High School in the Madison city system.

Each team, under the guidance of Marshall Center engineers, will launch a reusable rocket, aiming for an altitude of one mile, and carrying a science payload. After recovering the payload focused on biology, physics or model rocketry improvement, students will investigate the effects of low gravity on their projects. Including the one-mile goal, Marshall engineers evaluate the students on their rocket design, including propulsion, materials, payload, and safety features.

"This event highlights one of NASA's missions: to inspire the next generation of explorers," said Jim Pruitt, manager of the Education Programs Department at the Marshall Center. "These students work hand-in-hand with NASA mentors, which gives them an opportunity to see the real-world challenges faced daily by NASA engineers, designers and scientists. Developing problem-solving and design skills takes on additional excitement when combined with model rocketry. The benefits of such an experience are immeasurable."

Marshall's Student Launch Initiative is a hands-on, interdisciplinary learning program for high school students at schools within a 50-mile radius of Huntsville.

For more information, please visit the Student Launch Initiative Web site at:

http://education.msfc.nasa.gov/docs/127.htm

For Parents example

dc.type.duration: null
dc.type.interactivitylevel: null
dc.type.difficulty: null
dc.audience.level: null
dc.coverage: Alabama
dc.rights: null
dc.relation.copyto: null
dc.audience: Parents, Students, Teachers
dc.type: Feature Article
dc.contributor: null (unknown in this example)
dc.creator: Ellie Trevarthen : JPL (note Ellie's name used for sake of this example)
dc.subject.organization: null
dc.subject.mission: null
dc.subject.discipline: Astronautics
dc.subject.nasat: rocket launching, rockets
dc.subject: Student Launch Initiative, Johnson High School, New Century Technology High School, Sparkman High School, Bob Jones High School