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## New Spanish Language Astronomy Resources

**Editors Note:** Readers may have noticed that the ASP depends on volunteers to translate this newsletter into a variety of languages. This issue is about a focused effort by two astronomy education providers, the ASP and NASA, to make their most popular resources available in both English and Spanish.

**Part 1: NASA Resources in Spanish**

**Part 2: ASP Resources in Spanish**

### NASA Resources in Spanish

by Teresa J. Kennedy, Ph.D., NASA OSS Idaho Broker Facilitator, Space Science Network Northwest (S2N2)

Many resources translated in the Spanish language can be found online, at NASA Space Centers and at NASA Educator Resource Centers scattered across the United States. These resources, many of which have been aligned with national standards, appropriate state frameworks and inquiry guidelines, are available online or at NASA Education Resource Centers found nationally.

**Ciencia@nasa**, the Spanish-language companion to NASA's award-winning science@NASA site, features stories from all fields of science, aeronautics and aerospace (<http://ciencia.nasa.gov>). This site contains information regarding space sciences, astronomy, living in space, earth science, as well as physical and biological sciences. It also contains a site called *Thursdays Classroom* <http://www.thursdaysclassroom.com>. Educators can subscribe to a mailing list and receive regular lessons, also posted online in Spanish at <http://ciencia.nasa.gov/>.

Many NASA Centers have provided Spanish-language translations of their educational products. Below is a listing of available resources by Center.

### AMES Research Center (Moffett Field, California)

- **Amesnews**, [http://amesnews.arc.nasa.gov/index\\_span.html](http://amesnews.arc.nasa.gov/index_span.html) disseminates news releases, document and image archives, fact sheets, point-of-contact information and related items to provide access to news releases to Spanish-speaking reporters, the public and educators.
- **NASA Ames Engineering and Science: A curriculum for K-12 in Spanish** <http://ldaps.arc.nasa.gov/Spanish>
- **The Genesis Mission** website is organized into sets about the Genesis mission, the Genesis spacecraft, and about different disciplines in science. <http://www.genesismission.org/educate/kitchen/resource/factsheets/index.html>
- **Lego Design and Programming System** — Engineering and Science: A curriculum for K-12 <http://ldaps.arc.nasa.gov/Spanish/>
- The **Center of Excellence Science Information and Technology** [http://www.arc.nasa.gov/spanish/s\\_computing.html](http://www.arc.nasa.gov/spanish/s_computing.html)
- **Bilingual Women of NASA** The Women of NASA project has assembled an outstanding website containing historical information, women of NASA profiles, chat opportunities and ESL materials. <http://quest.arc.nasa.gov/women/espanol/intro.html>
- **Robin Whirlybird** is an online, interactive book about one girl's visit with her mother to the rotorcraft research center where her mother works written in English, Spanish and Chinese. <http://quest.arc.nasa.gov/test/rotorcraft>

### Goddard Space Flight Center (Greenbelt, Maryland)

- **The Sun Earth Day Kit** <http://sunearthday.nasa.gov> contains materials that provide a basic understanding of the dynamics of the Sun, of the aurora, and of the turbulent space around Earth.
- **Mission to Geospace** <http://www-istp.gsfc.nasa.gov/istp/outreach/conexion.html> This site contains links to several individual sites dealing with Geospace.

- **Star Gazers** Solar Terrestrial Probes/Living With a Star Education & Public Outreach <http://stargazers.gsfc.nasa.gov/> (choose Spanish version and enter site).
- **Solar storms** poster can be found at <http://www-istp.gsfc.nasa.gov/istp/outreach/cmeposter/spindex.html>
- **Star child** <http://starchild.gsfc.nasa.gov/docs/StarChild/translations.html>
- **Star Gazers** from Goddard <http://www-spod.gsfc.nasa.gov/stargaze/Meclipt.htm> <http://www-istp.gsfc.nasa.gov/stargaze/Mintro.htm>
- **The Exploration of the Earth's Magnetosphere** found at <http://www-istp.gsfc.nasa.gov/Education/MIntro.html> contains an overview of space research on the Earth's environment in space. The description, provided in both English and Spanish, is non-mathematical but quite detailed.
- **From Stargazers to Starships** <http://www-istp.gsfc.nasa.gov/stargaze/Mintro.htm>
- **The Great Magnet The Earth** <http://www-istp.gsfc.nasa.gov/earthmag/Mdmagint.htm>
- The **El Niño Primer** contains a Power Point in Spanish available in audio format that explains the ENSO event. <http://nsipp.gsfc.nasa.gov/enso/primer/spanishwelcome.html>
- Constellation of SAC-C, EO1, Terra & Landsat 7 <http://orbis.conae.gov.ar/sac-c>

#### Jet Propulsion Laboratory (Pasadena, California)

- The New Millennium Program [http://nmp.jpl.nasa.gov/index\\_flash.html](http://nmp.jpl.nasa.gov/index_flash.html)
- **Deep Space** <http://nmp.jpl.nasa.gov/espanol.html>
- **NASA Kids Space Place** <http://spaceplace.jpl.nasa.gov/espanol> which contain information and materials from all NASA missions and enterprises.
- **Toll-free Question Phone** line (866) 575-6178 Contains prerecorded answers to many frequently asked questions about space or space exploration, adding a new question each month. The recorded message is available in both English and Spanish.
- **Greetings to the Universe** can be accessed in 55 Different Languages <http://vraptor.jpl.nasa.gov/voyager/lang.html>.
- **Cassini Mission to Saturn Fact Sheet** [http://eis.jpl.nasa.gov/cassini\\_epo/gallery/products/pdfs/cassini\\_msn\\_espanol.pdf](http://eis.jpl.nasa.gov/cassini_epo/gallery/products/pdfs/cassini_msn_espanol.pdf)
- **Search for Origins Project** created the **Genesis Facts Sheets** in Spanish found at <http://www.genesismission.org/educate/kitchen/resource/factsheets/index.html>
- **Infrared Processing and Analysis Center** <http://www.ipac.caltech.edu/Outreach/Edu>. The website provides images and information about infrared astronomy projects that have been and currently are being supported by IPAC. The site is translated into Spanish at <http://ipac.jpl.nasa.gov/SIRTFspanish/index.html>.

#### Johnson Space Center (Houston, Texas) has some collaborative projects in Texas.

- **Topex Poseidon Coloring and Activity Book** on-line in Spanish by the Texas Space Grant Consortium <http://www.tsgc.utexas.edu/topex/spanish/coloring>
- **StarDate Universo Guide** in Spanish was created by the McDonald Observatory at the University of Texas at Austin. <http://www.radiouniverso.org>

#### Kennedy Space Center (Cocoa Beach, Florida)

- **NASA Kennedy Space Center News en Español:** Links to biographies of Spanish Astronauts, bilingual women at NASA, employment at NASA, interplanetary exploration, the search for extraterrestrial intelligence, and much more! This site contains many links to translated information in Spanish. <http://www-pao.ksc.nasa.gov/kscpao/spanish/spanish.htm>

#### Langley Research Center (Hampton, Virginia)

- **Functions and Statistics: Dressed for Space** is a NASA Connect Lesson Guide that corresponds to the 2002-2003 NASA Connect Series. <http://connect.larc.nasa.gov/lessonguides.html>
- The Solar Website is available in pages in Spanish, French, Italian, Portuguese or German, you can easily do so by installing the "Babel Fish" on your browser. <http://www-sage3.larc.nasa.gov/solar/siteinfo.html>

#### Marshall Space Flight Center (Huntsville, Alabama)

- NASA Kids, a product of Science @ NASA is located at <http://kids.msfc.nasa.gov/> and contains selected items translated in Spanish on a link Nueva Ciencia La NASA Kids Historias <http://kids.msfc.nasa.gov/sp/News/> including stories about Mossy Spirals, Earthgazing, In Search of Moon Trees, A Close Look at Launch, Skeletons in NASA's Closet!, The First Day of Autumn, The Real Lord of the Rings — Saturn, Mixed up in Space and more.
- **A Little Rock on Mars** is a story dedicated to the Mars Pathfinder Team is translated into Spanish, German, Japanese, Portuguese, Czech, Catalan, French, and Italian. <http://kids.msfc.nasa.gov/Sites/ExternSite.asp?url=http%3A%2F%2Feis%2Ejpl%2Enasa%2Egov%2F%7Eskientz%2Flittle%5Frock%2F>

## Stennis Space Center (South Mississippi)

- **Stennis es**, <http://www.ssc.nasa.gov/about/stennis/stennis-es.html> is an online introduction to NASA's Stennis Space Center, which conducts propulsion testing and remote-sensing research on the Mississippi Gulf Coast.

**NASA Core** manages the distribution of many educational materials that can be purchased <http://core.nasa.gov/index.html> and a complete catalog can be viewed at <http://catalog.core.nasa.gov/core.nsf/f402529750e8ecca8625670b007b1dce/5e69d814409bbec786256bea006da480?OpenDocument> Titles translated in Spanish include:

- **Winning: Aerospace – The Next Decade** is a 20 minute video targeted at students introduces students in grades 7-12 to the unique career opportunities in America's aerospace industry.
- **Nuestra Propia Estrella el Sol** - This is the Spanish version of the easy-to-read book Our Very Own Star: the Sun that can also be used in a basic bilingual or Spanish classroom. Item number: 300.1-14P, 2002. Cost: \$ 3.00
- **Our Solar System** is a 29 minute video that teaches the names, orbital positions, and characteristics of each planet using the phrase "my very educated mother just served us nine pizza piesÓ, for grades K-4. Each tape contains four versions of the program: English, Spanish, sign language, and open captioned for the Hearing Impaired
- **Star Gaze: Hubble's View of the Universe.** Star Gaze is a DVD that contains over an hour of images of the universe from the Hubble Space Telescope in 2000, plus Dolby Digital and DTS surround sound music from 2002 and provides in depth facts and details about the telescope and what it has found so far.
- **NASA Destination Tomorrow™ 2000-2001 5-PART SERIES** is a 30-minute educational program in Spanish, designed for educators, parents, and lifelong learners by NASA's Center for Distance Learning.

## NASA also has many International Programs that provide educational materials in many languages:

- **The CERES S'COOL Project** <http://asd-www.larc.nasa.gov/SCOOL/> CERES - Clouds and the Earth's Radiant Energy System - is a high priority scientific satellite instrument which is now orbiting the Earth as part of NASA's Earth Science Enterprise (formerly known as Mission to Planet Earth). Scientists are using it to study the ways in which clouds may affect the Earth's climate.
- **The International GLOBE Program** <http://www.globe.gov/> The GLOBE Program is a hands-on environmental science and education program designed for use in Kindergarten through Grade 12. It is a world-wide network of students, teachers and scientists from over 15,000 schools in 101 different countries and focuses on activities that complement studies in science, mathematics, technology, social studies, and literacy in many languages.

## Summary

Visit NASA's ERCN website at <http://spacelink.nasa.gov/ercn> to find a complete listing of all Educator Resource Centers by state as well as those located on or near NASA Field Centers or at planetariums, museums, colleges, universities, and other non-profit organizations around the United States where you can obtain free NASA educational materials for your classroom as well as information regarding educational training workshops. As additional NASA sites go online, they'll be added to a comprehensive list of Spanish-language Websites being managed on the agency's primary homepage at: <http://www.nasa.gov/hqpao/espanol.html>

Also visit the **Idaho NASA Educators Resource Center** website at [http://www.uidaho.edu/ed/imtc/nasa\\_rerc](http://www.uidaho.edu/ed/imtc/nasa_rerc) for a listing of NASA materials, including materials that have been translated into many languages. Many of the lessons currently being translated are from NASA Explores <http://www.nasaexplores.com> where free weekly K-12 educational articles and lesson plans on current NASA projects can be easily accessed through an internal search engine. Printable and downloadable, these supplemental curriculum resources meet national educational standards in science (NSTA), mathematics (NCTM), technology (ISTE, ITEA), and geography (NGS).

## Author's Footnote:

Dr. Teresa Kennedy, NASA OSS Idaho Broker Facilitator for S2N2 (Space Science Network Northwest) has been assembling a collection of NASA materials translated into Spanish from the various NASA centers since 1996 and is currently translating selected NASA educational materials into the Spanish language with her translation team, representing Spain, México, Ecuador, Colombia and Perø. Many of the lessons currently being translated and enhanced are from NASA Explores <http://www.nasaexplores.com> that provides free weekly K-12 educational articles and lesson plans on current NASA projects that can be easily accessed through an internal search engine. Printable and downloadable, these supplemental curriculum resources meet national educational standards in science (NSTA), mathematics (NCTM), technology (ISTE, ITEA), and geography (NGS). For links to selected translated materials visit the Idaho website at [http://www.uidaho.edu/ed/nasa\\_rerc](http://www.uidaho.edu/ed/nasa_rerc) Contact Dr. Kennedy at [tkennedy@uidaho.edu](mailto:tkennedy@uidaho.edu)



## New Spanish Language Astronomy Resources

### Spanish Language Astronomy Resources Inspire Innovation around the Planet

by Erica Fortescue, Stanford University School of Education

**New resources**  
**International use**  
**Available on line**

#### New resources

Weeks before the book went to print last May, Peggy Motes of the Muncie Community Schools' Planetarium in Indiana, called the Astronomical Society to request an advance copy of **El Universo a sus pies**. She had been using the hands-on astronomy activities in **The Universe at Your Fingertips** and **More Universe at Your Fingertips**, for years. Having heard that a Spanish version was due to be released, she was especially eager to have a build-your own starfinder to use in her planetarium's Spanish-language programs.

With the recent release of **El Universo a sus pies**, along with a Spanish version of NASA's Space Place website, the astronomy education community has a lot to be excited about. These Spanish-language astronomy resources are being put to innovative use around the world. Although they were created primarily for use in bilingual U.S. classrooms, some of the most exciting uses of these resources are in parental involvement programs and international partnerships.

The release of these resources in the U.S. is especially timely. The most recent census data shows that the Spanish-speaking population of the U.S. has increased 58% in the last decade, to reach 35 million. Although many U.S. Spanish speakers are also fluent in English, a substantial portion of school-age children and their parents prefer Spanish language science resources.



It is not surprising to hear that the most excitement about these Spanish-language astronomy resources comes from states with high numbers of Spanish-speakers such as New Mexico, Texas, California, Arizona and Florida. For example, in New Mexico, where 28% of the population report speaking Spanish at home, **El Universo a sus pies** has been a hit. Kenn Hitchcock, Education Director of the [New Mexico Museum of Space History](#), says: "The book is a great resource for our family events. Having materials translated into Spanish is important for including all of the parents and teachers, not only in New Mexico, but also for our audience in Texas."

Dr. Connie Walker, a Senior Science Education Specialist at the National Optical Astronomy Observatory in Tucson, Arizona, also hails the new resource. She coordinates a [Project ASTRO program](#), partnering astronomers and schoolteachers for on-going partnerships in the local schools. Located in close proximity to Mexico, the Tucson Unified School district has a large population of Spanish-speakers. Connie Walker explains, "**El Universo a sus pies** has been an effective resource for the teachers in Tucson's Project ASTRO program. We see it in the smiles of bilingual children, when light bulbs glow above their heads."

The Astronomical Society of the Pacific chose to translate **The Universe at Your Fingertips** to help increase the number of high quality, hands-on science resources available to bilingual classrooms. The 490-page translation was edited by Andrew Fraknoi and Dennis Schatz. It includes 55 ready-to-use classroom activities that are drawn from the Society's own programs and from projects and curricula from around the U.S. and Canada. A number derive from NASA missions and workshops. They include such favorites as "The Reasons for the Seasons", "The Venus Topography Box", "The Toilet Paper Solar System Model", "Inventing an Alien", "Galaxy Sorting", and "Creating Your Own Constellations."



The project was made possible through funding from The National Science Foundation, and through the volunteer efforts of 23 advisors, including Spanish-speaking astronomers and educators from the U.S., Chile, Mexico, Spain and Puerto Rico. With the help of this bilingual and bicultural advisory committee, a number of changes were made to help make this resource useful outside of North America. Smaller changes include listing target ages instead of U.S. grade levels, on each activity. One significant change was the alteration of the title to one that would make sense culturally in Spanish. Literally translated, the new title, **El Universo a sus pies** would be "The Universe at Your Feet" in English. Another significant change is the addition of Southern Hemisphere activities on stars and constellations, so that the book can be used in South America.

### International use

It appears that efforts to "internationalize" the book have paid off. **El Universo a sus pies** is finding an audience in astronomy communities abroad. One example is a new project in Chile at Cerro Tololo Inter-American Observatory ([CTIO](#)). One research fellow, explains: "Here in Chile we greatly need these kinds of hands-on activity texts and finding them in Spanish is difficult." A number of copies of the book were sent to CTIO from their partner observatory in Tucson. The books were received with exuberant enthusiasm and have subsequently been used extensively. Barring some minor cultural differences, the Chilean teachers found the activities well written, exciting for the students and easy to use.

In fact, the high interest instigated a video workshop on spectrometers (Activity 10.1 in **El Universo a Sus Pies**) between the Chilean teachers, the CTIO and NOAO-Tucson staff and three bilingual teachers from the Tucson who facilitated the entire workshop in Spanish. The teachers exchanged methods and ideas about how to explain and demonstrate the nature of light and color to students of various ages. One of the participants notes with enthusiasm, "Even half a world apart and across people of different languages and cultures, the most effective ways to teach concepts in astronomy can be a lively topic for discussion." The workshop is envisioned as the beginning of an even larger collaboration, currently dubbed ASTRO-Chile. This effort is meant to take advantage of successful efforts in the United States such as Project ASTRO, and efforts in Chile, by merging the strategies and techniques from each into a cross-cultural exchange.



Spanish-speaking astronomy enthusiasts can expect more Spanish language resources in the near future. To further support parental involvement in science, the Astronomical Society of the Pacific is translating some of its Family ASTRO activity kits into Spanish, and supporting Spanish language family events in Boston, Arizona, and California. NOAO is creating an online Spanish Language Materials Educational Center that will include a web-based catalog of generally available Spanish-language materials for all grade levels in astronomy and space science. NASA expects more mission-related websites to include bilingual components. The translations discussed in this article, and those expected soon, are a fantastic contribution to the Spanish-speaking astronomy world.

### Available on line

These popular resource books from the ASP, edited by Andrew Fraknoi and Dennis Shatz are a collection of activities from a wide range of sources from Fresno Unified School District, Nederland Elementary School in Boulder, CO to universities like Furman University, Harvard, Montana State University, University of Toronto, University of Arizona and Oklahoma State University. Sources also include science centers like the Lawrence Hall of Science, Pacific Science Center and St. Louis Science Center. Other contributing organizations include SETI Institute, The Planetary Society, Newton's Apple and the Vatican Observatory Foundation. The two English language volumes contain 114 activities and many other resources. Over half are now available in Spanish in **El Universo a sus pies**.

**The Universe at Your Fingertips** *An Astronomy and Activity Resource Notebook edited by Andrew Fraknoi, et al.*

The essential astronomy notebook for anyone involved with science education at any level! This collection features 90 of the very best ready-to-use, hands-on activities for teaching many basic aspects of astronomy. Includes dozens of resource guides, helpful articles on student learning, and tips for creating an astronomy curriculum for any age group. Everyone who works with students or teachers in science should have this notebook on their shelf. *400 sheets, 3-hole punched, fits into 3" binder. For all grades. (BO122) \$34.95*



**More Universe at Your Fingertips** *edited by Andrew Fraknoi and Dennis Schatz*

The best-selling astronomy education resource available just got better! The thousands of educators and astronomers who own the original Universe at Your Fingertips have asked us for more! Here are 25 new classroom-tested activities, a host of resource listings and teaching suggestions, plus a guide to reliable astronomy information and activities on the web. Activities include Measuring the Hubble Deep Field, Organizing the Galaxies, Sorting Saturn's Moons, Making a Mapping a Volcano, and many more! An indispensable supplement to the first notebook and a stand-alone guide to the most up-to-date astronomy education resources. *180 sheets, 3-hole punched. For all grades. (BO123) \$24.95*



**El Universo a sus pies**

The Universe at Your Fingertips in Spanish! This new collection of over 60 exemplary hands-on activities features the "greatest hits" from Universe at Your Fingertips and More Universe at Your Fingertips, the most popular resource notebook and activity manuals published by Project Astro. The activities have been reviewed by a multi-national group of Spanish-speaking educators and astronomers and updated and appended for use in the northern or southern hemisphere. Perfect for the bi-lingual or Spanish classroom or youth group. *490 pp. 3-hole punch. For all grades. (BO322) \$29.95*

