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Professional Resource: Astronomy Picture of the Day (1995)

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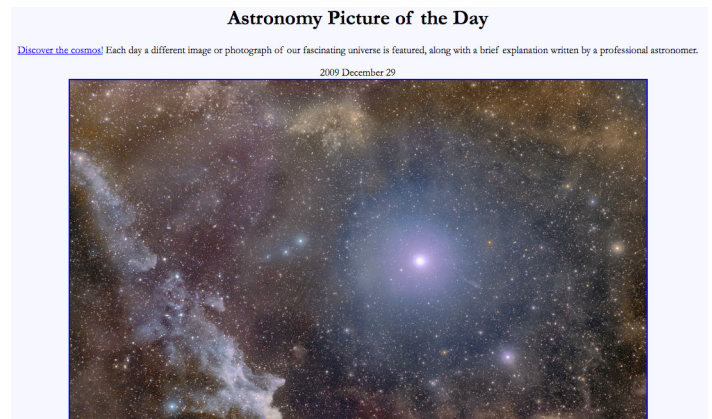
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The Astronomy Picture of the Day (APOD). <http://apod.nasa.gov/apod/>

The year 2009 was the International Year of Astronomy (IYA). IYA marks a global effort initiated by the International Astronomical Union (IAU) and the United Nations Educational, Scientific, and Cultural Organization (UNESCO) to help the citizens of the world rediscover their place in the Universe through the day- and night-time sky, and thereby engage a personal sense of wonder and discovery.¹ The fundamental goal for the initiative is to help people across societies realize the impact of astronomy and other fundamental sciences on our daily lives, and understand how scientific knowledge can contribute to a more equitable and peaceful society.² However, this initiative is coupled with two inherently problematic discourse structures: first, science is a difficult subject to engage interest in across disciplines; and second, most human beings cannot go to Space. Therefore, strategies have to be put in place that helps humans learn about Space in a way that is both meaningful and interesting. One of the most influential and engaging approaches I incorporate in my astronomy classroom, that employs popular media, is the power of digital visual media such as the Astronomy Picture of the Day (APOD). As I continue to incorporate the APOD into my own curriculum, I have come to realize this digital media resource can be used across all subjects in K-12 education, and greatly enhance K-12 classroom instruction around using media literacy practices around science education.

The Astronomy Picture of the Day (APOD) was founded in 1995 and is maintained by the brainchildren Robert Nemiroff and Jerry Bonnell.³ The APOD is considered to be the largest collection of annotated astronomical digital media available on the Internet. Rob-

ert Nemiroff is a professor at Michigan Technological University in Houghton, Michigan, USA. Jerry Bonnell is a scientist at NASA's Goddard Space Flight Center in Greenbelt, Maryland, USA. The Astronomy Picture of the Day has also received the 2001 Scientific American Science and Technology Web Resource Award and continues to be a valuable resource for K-12 educators all over the world



(APOD site: <http://antwrp.gsfc.nasa.gov/apod/astropix.html>)

The APOD is a global effort which captures diverse images and video pertaining to current astronomical phenomena associated with subjects across all K-12 subject areas. The media hosted daily on the APOD are submitted by amateur and professional astronomers from across the globe and are stored in a searchable and downloadable database for easy reference (<http://antwrp.gsfc.nasa.gov/apod/astropix.html>). Because of this, many images clearly reflect the local cultures of various regions all over the world bringing people from the northern hemisphere to the southern skies, and crossing oceans and continents all for a common purpose, to explore the wonders of the Universe. This volume of online digital visual media

is one of the most highly regarded data stores in the world. Housed on National Aeronautics and Space Administration (NASA) web servers and overseen by NASA administrator Phillip Newman, all digital media are beautiful, high-resolution, and clearly described by professionals for non-professionals. The APOD annotations always have links to other related APOD or NASA websites for further information and allow for individual curiosity to be explored further.

I find that the annotations, available in twenty different languages, associated with the APOD are instrumental, as this is where many educational connections are written. In regards to media literacy, the APOD offers a user-friendly, accessible, and digital repository of content around learning about the universe in many different contexts. As a science educator across many different education levels, I often have students ask me about what it may be like on the Moon after we raced to get there in the 1960's. Figure 1 is an example of an APOD image which I use which starts a lot of class discussion about the feasibility of life in Space, the political ramifications of the space race, governmental control of Space (notice American flag), technological development to get to the Moon, personal beliefs about economic impacts of Space exploration costs, astronaut biographies, etc.

The concise annotated explanations are well prepared, informative, and up-to-date. Modern era space exploration is represented as well by providing breathtaking images taken by actual astronauts aboard orbiting space craft such as the Space Shuttle and International Space Station (ISS). I have found questions about life in Space to be of common interest among many students. In one instance, a student exclaimed, "Wait, there are people in Space right now?" Images beamed back from the International Space Station (ISS) and other unmanned robot satellites such as the Martian rovers Spirit and Opportunity clearly help students understand, that modern Space exploration is real as seen in Figure 2.

Figure 1: A sample APOD

Astronomy Picture of the Day

Discover the cosmos! Each day a different image or photograph of our fascinating universe is featured, along with a brief explanation written by a professional astronomer.

2005 December 17



Apollo 17: Last on the Moon

Credit: Apollo 17, NASA

(Image scanned by Kipp Teague)⁴

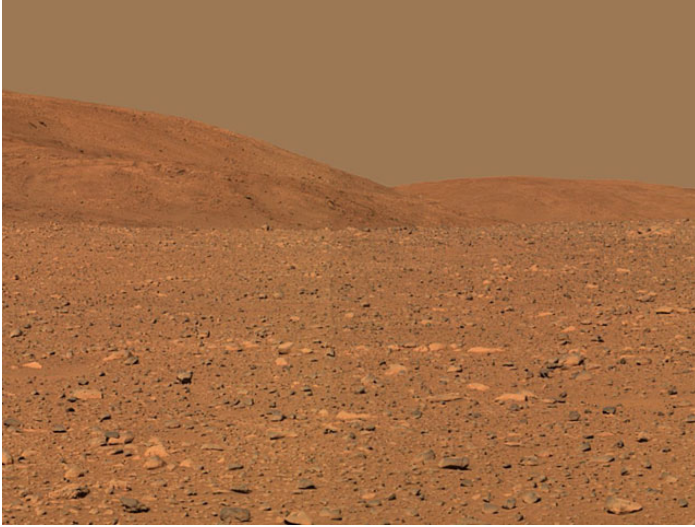
Explanation: In December of 1972, Apollo 17 astronauts Eugene Cernan and Harrison Schmitt spent about 75 hours on the Moon, in the Taurus-Littrow valley, while colleague Ronald Evans orbited overhead. Near the beginning of their third and final excursion across the lunar surface, Schmitt took this picture of Cernan flanked by an American flag and their lunar rover's umbrella-shaped high-gain antenna. The prominent Sculptured Hills lie in the background while Schmitt's reflection can just be made out in Cernan's helmet. The Apollo 17 crew returned with 110 kilograms of rock and soil samples, more than from any of the other lunar landing sites. Cernan and Schmitt are still the last to walk on the Moon.

Figure 2: A sample APOD

Astronomy Picture of the Day

Discover the cosmos! Each day a different image or photograph of our fascinating universe is featured, along with a brief explanation written by a professional astronomer.

2004 June 28

**Spirit Rover Reaches the Columbia Hills on Mars**

Credit: Mars Exploration Rover Mission, JPL, NASA⁵

Explanation: The Spirit robotic rover on Mars has now reached the Columbia Hills on Mars. Two of the hills are shown on approach near the beginning of June. The above true-color picture shows very nearly what a human would see from Spirit's vantage point. The red color of the rocks, hills, and even the sky is caused by pervasive rusting sand. Spirit has now traveled over 3 kilometers since it bounced down onto the red planet in January. The robotic explorer, controlled and programmed remotely from Earth, is now investigating a rock called Pot of Gold. On the other side of Mars, Spirit's twin Opportunity is now inspecting unusual rocks inside a pit dubbed Endurance crater.

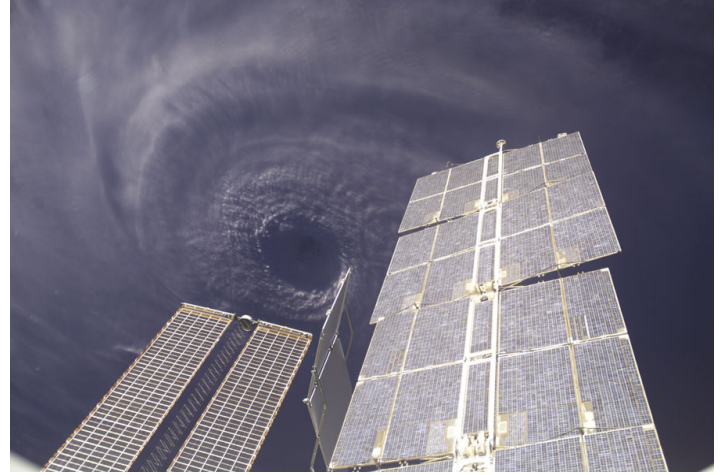
Many times I find the APOD displaying some of our most advanced missions which can be used in many classrooms as a center for discussion and lesson planning. In Figure 2, I find it simply amazing that this is not Hollywood, but rather real pictures taken by our robotics space missions to the Red Planet. This particular image I find can be used in an arts class when students are thinking about landscapes and perspective...Martian style! We have landscapes of three Space places, the Earth, Moon, and Mars which can be used as a comparison study in the arts as well. I feel these images are so sophisticated they are often a source of discussion which can lead into all disciplines. A search of 'history' in the APOD database produced some 173 APOD pages including Figure 3, depicting the historic hurricane Ivan which produced devastation and destruction in the United States.

Figure 3: A sample APOD

Astronomy Picture of the Day

Discover the cosmos! Each day a different image or photograph of our fascinating universe is featured, along with a brief explanation written by a professional astronomer.

2008 January 13

**Hurricane Ivan from the Space Station**

Credit: Expedition 9 Crew, International Space Station, NASA⁶

Explanation: Ninety percent of the houses on Grenada were damaged by the destructive force of Hurricane Ivan. At its peak, Ivan was a Category 5 hurricane, the highest power category on the Saffir-Simpson Scale, and created sustained winds in excess of 200 kilometers per hour. Ivan was the largest hurricane to strike the US in 2004, and, so far, the 10th most powerful in recorded history. As it swirled in the Atlantic Ocean, the tremendous eye of Hurricane Ivan was photographed from above by the orbiting International Space Station. The name Ivan has now been retired from Atlantic Ocean use by the World Meteorological Organization.

I feel amazing images such as Figure 3 can greatly enhance any historical or economic, as well as scientific, discussion of famous natural disasters in the United States. This image shows the intimidating size of such a devastating event, taken from the relative tranquility of Space.

These particular examples are only a few of the thousands of visual representations found in the free APOD database. Although sparking huge interest among learners of astronomy students, this application can breach the four walls of an astronomy classroom and into the broader context of K-12 education. Allowing students to critically analyze high-tech digital media develops a student understanding that a seemingly abstract world of astronomy can be used to greatly enhance all subjects of study. I highly encourage teachers to think collaboratively and develop cross-discipline lesson planning focused around the wonderful APOD digital media database.

Next steps for the APOD could include creating a database of lesson plans around their vast array of resources. The site generates much traffic, and offers an opportunity to provide a structured learning repository for educators across disciplines and throughout K-12 education, something that is in great demand.

I often find myself working with my students to help them realize the technological capabilities of our modern world. I find that students positively respond to the APOD resource and generally find them quite interested when used in class discussions, as well as lesson plans and laboratory exercises. The APOD digital media system allows all K-12 educators, who have access to the Internet, a chance to become engaged in astronomical discourse which relates to the social, political, scientific, historical, and economic pillars of our global society.

Digital media has enabled students across all disciplines and education-levels to have access to media resources like never before. Educators can use this newfound access to allow for a greater engagement with subjects that in the past seemed complex and prohibitory for real engagement. Media literacy education enables content to be used in new and dynamic ways across disciplines and across education platforms, a new and exciting development for science education at large.

Notes

¹ International Astronomical Union. 2009. Accessed November 18, 2009 from <http://www.astronomy2009.org/>.

² International Astronomical Union. 2009. Accessed November 18, 2009 from <http://www.astronomy2009.org/>.

³ Nemiroff, R. & Bonnell, J. 2010. Astronomy Picture of the Day About. Accessed January 6, 2010 from http://apod.nasa.gov/apod/lib/about_apod.html.

⁴ Astronomy Picture of the Day. 2009. Accessed November 18, 2009 from <http://antwarp.gsfc.nasa.gov/apod/ap051217.html>.

⁵ Astronomy Picture of the Day. 2009. Accessed November 18, 2009 from <http://antwarp.gsfc.nasa.gov/apod/ap040628.html>.

⁶ Astronomy Picture of the Day. 2009. Accessed November 18, 2009 from <http://antwarp.gsfc.nasa.gov/apod/ap080113.html>.