SPACE BRIEF

ROUND THE SPACE-WORLD IN TIME

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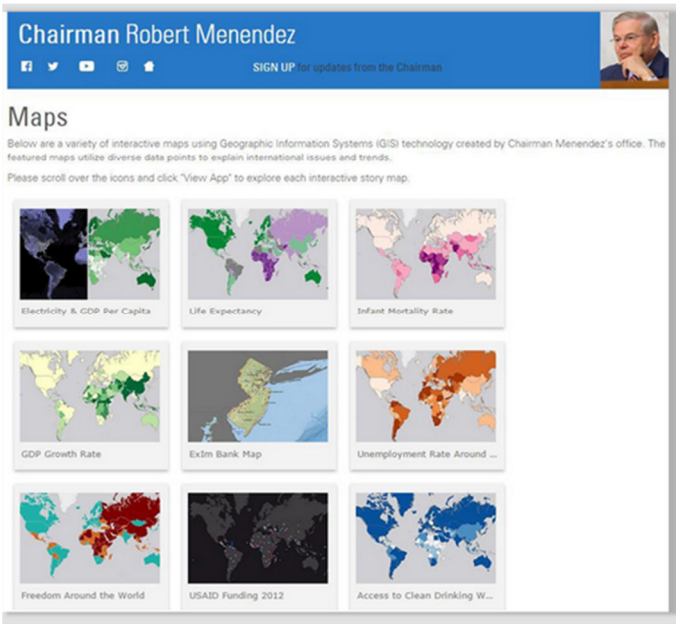
EARTH OBSERVATION

Using GIS for public engagement in foreign policy

A Geographic Information System (GIS) is a computer system for capturing, storing, analyzing, manipulating and displaying geographical data so as to deduce relationships or patterns. GIS is often utilized in natural resource management; mineral mapping; urban and regional planning; Environmental Impact Assessment; disaster management and in many other applications that can utilize geographical data. A GIS could be used to produce maps that meet different criteria depending on the types of data that are fed into it.

Using GIS technology, the United States Senate Committee on Foreign Relations has launched an interactive digital map which highlights current global trends. The map contains 10 apps showing: Electricity and GDP Per Capita; Life Expectancy; Infant Mortality Rate; GDP Growth Rate; ExIm Bank Map; Unemployment Rate and GDP Per Capita; Freedom Around the World; USAID Funding 2012; Access to Clean Drinking Water; and Human Trafficking. The Committee intends to use the map in engaging the public in foreign policy issues.



Screen shot of the interactive online map

Nigeria now uses satellite data to monitor gas flaring

Nigeria has commenced the utilization of data from a U.S. National Oceanographic and Atmospheric Administration satellite for the monitoring of gas flaring in the country. The gas flare tracker is able to estimate the amount of gas flared, its carbon dioxide content and its potential monetary value. Gas flaring has been outlawed in the country since 1984. The country hopes to use the system to penalise oil and gas companies for illegal gas flaring, and hence force the companies to seek for ways to re-use the gas and reduce environmental pollution.

SPACE SCIENCE AND ASTRONOMY

SKA to provide telecom services to community

In a media release on 27 November, 2014, Square Kilometre Array South Africa (SKA SA) and Vox Telecom stated their intention to "provide farming communities in the Northern Cape affected by the implementation of the Astronomy Geographic Advantage (AGA) Act with voice and data services at a dramatically reduced cost." The Act was enacted to prohibit activities that could interfere or interrupt the SKA project, particularly signal interference. The intervention by SKA SA would bring subsidized satellite telecommunications services and Internet access to the remote areas using equipment and facilities that would not interfere with the SKA project.

The SKA project is a giant international radio telescope project which will enable astronomers to monitor space in very fine detail. The telescope will cover one square kilometer and will be located in Australia and South Africa. The SKA surpasses every other telescope in existence in sensitivity, performance, capacity, resolution and speed. It will give explanations to the behaviors of space and time in extreme regions; nature of gravity; galaxy formation & evolution; magnetism in space; and extraterrestrial life. The core site of SKA SA is in Karoo, South Africa, with stations in Botswana, Ghana, Kenya, Madagascar, Mauritius, Mozambique, Namibia and Zambia.

SMALL SATELLITES

New incentivized competition on cubesats now open

Incentivized competition is often used to bring out the innovative spirit and creativity of people. In 1714, the British government established the Longitude Prize "for a simple and practical method for the precise determination of a ship's longitude"; it was won by John Harrison in 1765. In 1927, Charles Lindbergh won the $25000 Orteig Prize, after he flew non-stop from New York to Paris; this spurred up a revolution in aviation. Getting inspiration from Charles Lindbergh, Peter Diamandis facilitated the $10million Ansari XPrize for any team in the world that could "build a reliable, reusable, privately financed, manned spaceship capable of carrying three people to 100 kilometers above the Earth's surface twice within two weeks." The prize was won by Mojave Aerospace Ventures in 2004, and it sparked off commercial spaceflight. Other competitions in the space sector include, but not limited to European Satellite Navigation Competition, Google Lunar X-Prize, robotic competitions, and cubesat competitions. The latest in incentivized competitions is NASA's $5million Cube Quest Challenge. Currently, cubesats are placed within the Low-Earth Orbit (between 150km and 800km above Earth surface). The objective of Cube Quest is to explore the use of cubesats in very high orbits and deep space communication.

SPACE EXPLORATION

First female Italian astronaut docks in space

The International Space Station (ISS) is a large satellite in space that provides a unique environment for experiments and research. This environment is called 'micro-gravity'. Since 2000, the station has being a home for at least two persons, who reside for at least 3 months. Each trip to the ISS is called an 'expedition'. Expedition 43, comprising of Anton Shkaplerov (Russia), Samantha Cristoforetti (Italy), and Terry Virts (USA), successfully docked at the ISS on 24 November, 2014. They will live in the ISS for six months conducting different kinds of research including 'space headaches.' The trio has joined Barry "Butch" Wilmore (USA), Alexander Samoukutyaev (Russia) and Elena Serova (Russia), who have being there since September 2014. The items taken with them include a 3D printer and a customized espresso machine.

Samantha Cristoforetti is Italy's first female astronaut. She is also one of the first female fighter pilots in the Italian Air Force and was the co-pilot on Expedition 43. A social networking site called 'Friends in Space' has been developed in her honour. As of November 2014, women represented 11% of all people who have flown to space.

Asteroid mining gets boost

Asteroids are small bodies found in the inner solar system. There are millions of asteroids, with majority found within the orbits of Mars and Jupiter (referred to as the asteroid belt). Some asteroids share orbit with Planet Jupiter (and are called Jupiter Trojans or Trojan asteroids), while some reside close to the Earth (and are called Near-Earth asteroids). Asteroids are known to contain rare-Earth metals, such as platinum, titanium, iron and nickel. In the past decade, there have being research on how to mine asteroids for these minerals.

As a boost towards development of technologies for asteroid mining and commercialization, NASA has awarded contracts to Deep Space Industries and Planetary Resources Mining Company.

INTERNATIONAL COOPERATION

South Asian countries to cooperate more on space

The South Asian Association for Regional Cooperation (SAARC) concluded her 18th SAARC Summit on 27 November, 2014, at Kathmandu, Nepal. At the end of the event, the Heads of States reached agreements in different areas and signed the 'Kathmandu Declaration.' Number 22 of the Declaration, which focuses on Science and Technology, states thus: "The Leaders agreed to develop capacity of the Member States to apply space technology for socio-economic development and the welfare of the peoples through experience sharing among themselves. In this context, they welcomed the offer of India to develop and launch a satellite dedicated to SAARC Countries." India also intends to enlarge the footprint of her space-based navigation system so as to serve the whole region. The members of SAARC are Afghanistan, Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan and Sri Lanka. The next summit is scheduled to hold in Pakistan in 2016.

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