SPACE BRIEF

ROUND THE SPACE-WORLD IN TIME

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SPACE EXPLORATION

Africa2Moon Mission

During the week, the Foundation for Space Development, a South African-registered non-profit organization, announced what could be Africa's first space exploration programme – "Africa2Moon Mission". The mission involves the launch of a probe to the moon that will relay back images of the moon and be distributed via the Internet to classrooms in Africa. The Foundation hopes to raise at least $150,000 for the first phase of the project through crowdfunding. 25% of all the funding raised will be used to promote Science, Technology, Engineering and Mathematics (STEM) education. The project also aims to engage the public in the design, development and operational stages of the mission. Professor Peter Martinez, Chairman of the South African Council for Space Affairs, is the mission administrator, while Mr. Jonathan Weltman, CEO of the Foundation for Space Development, is the project administrator. The first phase will run from January to November, 2015.

UK intends to lead mission to moon

During the just-concluded 'Re-inventing Space 2014', a company announced a program for involving the public in the exploration of the moon (lunar exploration). Tagged "Lunar Mission One", the founder of the project, David Iron stated that they "plan to send an unmanned robotic lander to the south pole of the moon, and there to drill up to a depth of 20m, with a potential of getting up to 100m." It is hoped that this will give access to lunar rocks for the study of the geological composition of the moon, and the relationship of the moon with the Earth. The project will also facilitate understanding of the early solar system, and the feasibility of establishing a lunar base for further space exploration. It is open for world-wide participation and ownership through crowdfunding, knowledge sharing, joint research, free-to-access of all resources derived from the project, and storage of participants' memorials. Lunar Mission One is also aimed at creating a new wave of inspiration for science and technology. Mission launch and lunar operations is scheduled for 2024, with initial design beginning in 2014.

Russia to build own space station

A recent statement by the Deputy Chief of Roscosmos (Russia's federal space agency) indicates that Russia is working on its own space station. It was reported that the space station "would serve as a transit base for the Russian Moon program, as well as to monitor 90 percent of the Russian territory, which is more than the vision field of the ISS." Currently, the only space station is the International Space Station (ISS), with five participating space agencies – NASA (US), Roscosmos (Russia), JAXA (Japan), ESA (Europe) and CSA (Canada). The ISS serves as a laboratory for research in microgravity environment. Russia has indicated that it may not continue in the partnership beyond 2020.

China also plans to develop her own space station since it was denied the opportunity to join the ISS. China has indicated that it will allow other nations to participate in her space station programme. A private space station is also being developed by Bigelow Aerospace.

SMALL SATELLITES

New chapter of UNISEC in Africa

The University Space Engineering Consortium (UNISEC-Global) has established a new chapter in Nigeria. This was announced during the Second UNISEC-Global Meeting, held from 18-20 November, 2014, in Kitakyushu, Japan. Mr. Nnadih Stanislaus Ogechukwu is designated as Secretary of UNISEC-Nigeria on its behalf and a Point of Contact.

UNISEC-Global is an international non-profit organization that promotes capacity building and knowledge sharing in small satellite development at the university level. The vision of UNISEC is stated thus: "By the end of 2020, let's create a world where university students can participate in practical space projects in more than 100 countries." Currently there are chapters in 11 countries in the world, including Egypt, South Africa and Nigeria. Activities of the organization include the Mission Idea Contest, Cansat Leader Training Program, publication of Space Takumi Journal, Universities Space Systems Symposium and the annual UNISEC-Global Meeting.

NAVIGATION AND POSITIONING

Earthquake, Tsunami forecast using GPS

The Global Positioning System (GPS) is a US-owned global infrastructure, used generally for determining one's location and for navigation from one place to another. GPS finds application in several fields including agriculture, transportation, security, surveying & construction, weather forecasting, generation & transmission of precise timing, wireless communication, and Location-Based Services. With continued research, more areas of application of GPS are being discovered.

A team of scientists led by Professor Tim Dixon of University of South Florida has found out that small movements in the Earth's offshore plates increase the probability of occurrence of major earthquakes and the resulting tsunamis. In a paper titled "Earthquake and Tsunami Forecasts: Relation of Slow Slip Events to Subsequent Earthquake Rupture" and published in the Proceedings of the National Academy of Sciences, the researchers reported that the monitoring of a geological phenomenon called 'slow slip events', could accurately predict the occurrence of earthquakes and tsunamis. Slow slip events were discovered in 2001 using high-precision GPS.

Other space-based global navigation systems that are similar to the GPS include GLONASS (owned by Russia), Galileo (owned by Europe) and BeiDou (owned by China). India and Japan are developing systems that will cover their countries.

SPACE SCIENCE AND ASTRONOMY

Nigerian microbiologist to conduct research in space-simulated environment

In 2010, the United Nations Office for Outer space Affairs (UNOOSA) established the Human Space Technology Initiative (HSTI) to create opportunities for more countries to participate in human spaceflight and space exploration, particularly the utilization of the International Space Station. The objectives of HSTI include promotion of awareness among member-states of the benefits of space exploration; capacity building in microgravity science education and research; and promotion of international cooperation in space-related activities. One of the projects under HSTI is the Zero-Gravity Instrument Project (ZGIP), in which microgravity-simulation instruments, called clinostats, are distributed to selected schools and institutions for education and research.

In the recent round of distribution, Dr. Daniel Arotupin, a microbiologist at the Federal University of Akure, Nigeria, was selected as one of the beneficiaries. Dr. Arotupin would lead outreach, education and research in microgravity science in the institution. A similar donation was earlier made to the African Regional Center for Space Science and Technology Education in English (ARCSSTE-E), Obafemi Awolowo University, Ile-Ife, Nigeria. The team in ARCSSTE-E is led by Dr. Wunmi Alabi. The donation of two clinostats to two institutions within the same region in Nigeria opens an opportunity for collaboration between the two institutions.

SPACE LAW

United Nations/China/APSCO Workshop on Space Law

The United Nations/China/APSCO Workshop on Space Law, with the theme "The Role of National Legislation in Strengthening the Rule of Law", was held during the week in Beijing, China. Presentations bordered on the current state of existing national space legislations, in addition to legislations on new areas such as small satellites, Global Navigation Satellite Systems (GNSS), and commercial space activities.

ROCKETRY

Middle/High schools selected for NASA rocket competition

Eight teams from middle and high schools in the USA, have been shortlisted to participate in NASA Student Launch, a high-powered rocket competition organised by National Aeronautics and Space Administration (NASA). The competition is scheduled for 7-12 April, 2015, at the Marshall Space Flight Center in Huntsville, Alabama, USA. The competition involves the design, building and launch of a reusable rocket carrying a payload to a height of 1.6km. The schools include: Durham Area Rocketry, Durham, North Carolina; Krueger Middle School, San Antonio, Texas; Madison West High School (Land Imaging), Madison, Wisconsin; Madison West High School (Muons), Madison; Plantation High School, Plantation, Florida; Spring Grove High School, Spring Grove, Pennsylvania; St. Vincent-St. Mary High School, Akron, Ohio; and Victory Christian Center School, Charlotte, North Carolina. 32 teams had earlier been selected for the university/colleges category. The competition is aimed at giving students the experience of space systems engineering, project management, and the NASA engineering design lifecycle. This would also prepare the students for a career in the space sector.

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