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Science, Technology and Education News from Taiwan
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- The *Intellectual Property Office* (IPO) in Taipei reported that the *digital industry* outpaced the semiconductor industry to take first place in the number of local patent applications last year, accounting for 12% of the total. Patent applications are an indication of market trends for the next 3-4 years, IPO said, and so it expects the digital industry, particularly digital technology, content, and processes-to continue thriving in years to come. In 2009, IPO received 2'722 patent applications from the digital industry, and the semiconductor industry came second with 1'796 patent applications. Market experts explained that the semiconductor industry used to lead in patent applications, but now it seems to have reached a stage of maturity and the development of related technologies has slowed down. By contrast, the digital and energy-conservation industries are emerging rapidly and attracting an increasing number of companies to become involved. Light emitting diodes (LEDs) and solar energy are the two hottest lines in the energy-conservation industry today; last year the number of patent applications for LED-related products reached 740, and those for solar batteries surged by 105% from the 2007 figure. The IPO receives at least 70,000 patent applications every year, and the review of an application usually takes about 3 years. In 2009 the number of applications reached 78,425, and this year it is likely to be over 80,000. The top five sectors last year in terms of number of patent applications were electronic digital data processes, semiconductor devices, optical controls, printed circuit boards (PCBs), and video telecommunications, which together accounted for 28% of all applications.
- There may be *14 foreign firms* approved to set up *R&D centers in Taiwan* this year, which involve total investment of US$432 mio. Some of the companies include Elpida (Japan), Corning (USA), HP (USA), IMEC (Belgium), Microsoft (USA), IBM (USA), Tokyo Electron (Japan), and Intel (USA).

Highlights of major news from the scientific world in Taiwan in October 2010:
Breakthrough in cancer diagnosis – waste material turned into insulating bricks – new self-parking vehicle system – optical fiber sensor to detect early landslide – breakthrough in stem cell therapy - chemistry teacher develops new varieties of air plants – low-cost hybrid rocket launched – the National Laboratory Animal Center was the first research institute in the world to build a technological platform to breed genetically modified laboratory rats with regulable genes – Academia Sinica develops flu detection chips - cooperation with Moscow State University and Russian Academy of Science – online academic platforms in French, German and Japanese – big successes at Taipei Invention Show, British Invention Show, and Nuremberg Invention Show

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1. Taiwan researchers announce breakthrough in cancer diagnosis

(Central News Agency, 30 09 2010)

A Taiwan-developed technology could allow cancer patients to undergo same-day CT and MRI scans without the need to wait for the clearance of contrast agents, cutting diagnostic times in half. Laboratory tests of iron and platinum (FePt) nanoparticles for dual modal CT/MRI molecular imaging, the first of its kind in the world, was conducted by a research team led by Chen Chia-chun, a professor with Academia Sinica and National Taiwan Normal University in Taipei, and Shieh Dar-bin, a doctor and professor with National Cheng Kung University Medical Center in Tainan. The research was partly funded by the National Science Council. Results of in vitro and in vivo testing were carried in the 29 Sep issue of the Journal of the American Chemical Society as a cover story.

Full article:
http://www.taiwanheadlines.gov.tw/ct.asp?xItem=204808&CtNode=9

2. Waste material can made into green insulating bricks

(Liberty Times, 30 09 2010)

The National Yunlin University of Science and Technology's Department of Construction has been found recently that fly ash released by the generation of electricity can be used to create a type of highly insulating material that can actually lower the temperature of a room by two degrees Celsius, making it another likely green building material.

Full article:
http://www.taiwanheadlines.gov.tw/ct.asp?xItem=204789&CtNode=9

3. Taiwan unveils microalgal biofuel technology

(Central News Agency, 02 10 2010)

A research institute unveiled a Taiwan-developed technology for producing biofuel from microalgae, as part of efforts to target the growing environmentally friendly renewable energy industry. The Industrial Technology Research Institute (ITRI) showed off the process of turning microalgae into biodiesel at the four-day Taipei International Invention Show. Microalgae, which has extraordinary potential for cultivation as an energy crop, consumes large quantities of carbon dioxide and produces oxygen through photosynthesis. During the process of consuming carbon dioxide, microalgae turns carbon dioxide into materials containing oil. The ITRI uses these materials to produce crude lipids that can then be converted into biodiesel. According to the ITRI, one gram of algae will produce 0.5 grams of lipids.

Full article:
http://www.taiwanheadlines.gov.tw/ct.asp?xItem=205067&CtNode=9

4. Taiwan smart clothes rack wins gold at invention fair

(Central News Agency, 02 10 2010)

A rack designed by a Taiwanese inventor that automatically prevents drying clothes from getting rained on impressed judges at the Taipei Invention Show, one of Asia's largest invention shows, taking a gold award. A total of 962 entries from 18 countries took part in the competition, with 832 entries from Taiwan and 130 entries from other countries featuring more than 2,000 new inventions and technologies. Taiwan was the top winner with 113 gold awards, 115 silvers and 153 bronzes.

Full article:
http://www.taiwanheadlines.gov.tw/ct.asp?xItem=205052&CtNode=9

5. Taiwan's information institute unveils new gadgets

(Central News Agency, 02 10 2010)

Taiwan's Institute for Information Industry has unveiled a number of inventions for better social networking, medical care and navigation at Taipei Invention Show. The government-sponsored body designed a large white plastic capsule that automatically provides pills at different times of the day, with music and lights to prevent patients from forgetting to

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take their medication or taking the wrong pills. Another invention of the institute's is a small device called "pippo" that allows users to quickly swap personal information through radio-frequency identification with just one click of the device. The device is 3 cm in width and length and can be integrated with social websites such as Facebook and Twitter.

Full article:
http://www.taiwanheadlines.gov.tw/ct.asp?xItem=205035&CtNode=9

6. Locally designed self-parking vehicle unveiled

(Liberty Times, 05 10 2010)

A locally designed self-parking vehicle was announced by Taiwan' Automotive Research and Testing Center. An engineer from the center says that the auto-parking system, in combination with ultrasound and image location detection technology, produces a picture of the available parking space using the on-board camera. The vehicle is equipped with a touchscreen, and the driver need only lightly tap the screen to choose the position he wants the car to park in. He can then get out of the car, while the computer calculates a perfect parking path in real time.

Full article:
http://www.taiwanheadlines.gov.tw/ct.asp?xItem=205227&CtNode=9

7. National animal lab gets international accreditation

(Taiwan Today, 06 10 2010)

Full accreditation of the National Laboratory Animal Center's (NLAC) Tainan facility by the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC) was recognized in a ceremony 6 Oct. The NLAC, established in 1994, is part of Taiwan's National Applied Research Laboratories. In recent years, it has transformed itself from a supplier of laboratory animals to a multifunctional institute supporting research and development. The center provides services involving laboratory animal quality control, contract breeding and reproduction, cryopreservation and genetic modification. It has now two facilities: one at the Academia Sinica in Taipei, and the other, set up in 2008, at the Southern Taiwan Science Park. The AAALAC granted full accreditation to the NLAC's Taipei facility in 2007 and renewed it this year.

Full article:
http://www.taiwantoday.tw/ct.asp?xitem=120969&CtNode=416

8. NSC databases assist Taiwan researchers

(Taiwan Today, 07 10 2010)

National Science Council online academic platforms in French, German and Japanese are providing both scholars and the general public with a wealth of previously hard-to-obtain information. NSC commissioned National Chengchi University and National Taiwan University in December 2008 to compile a pool of non-English information resources in the humanities and social sciences. The academic platforms contain a diversity of information in the three languages, including official government materials, published journals, newspapers, broadcast media resources, encyclopedias, dictionaries, literary collections and bibliographies in specialized fields. The three online platforms can be freely accessed at http://german2.nccu.edu.tw/, http://french2.nccu.edu.tw/, and http://jpndbs.lib.ntu.edu.tw.

Full article:
http://www.taiwantoday.tw/ct.asp?xItem=121269&ctNode=445

9. NCKU Signed MOU with Moscow State University and Russian Academy of Science

(Central News Agency, 08 10 2010)

Senior Executive Vice-President Hwung-Hweng Hwung of National Cheng Kung University (NCKU), Tainan, Taiwan, has led a delegation to visit Russia and signed Memorandum of Understanding (MOU) with Moscow State University

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and A. M. Prokhorov General Physics Institute and P. P. Shirshov Institute of Oceanology of Russian Academy of Science, expecting to establish a transnational center of wave motion research and application in the future.
In the future, National Cheng Kung University, Moscow State University, and A. M. Prokhorov General Physics Institute and P. P. Shirshov Institute of Oceanology of Russian Academy of Science will cooperate on the research fields of the detection methods and equipments of earthquake on Taiwan's eastern coastal sea beds, the application of elastic wave energy absorption on coastal protection methods, and the application of underwater acoustic wave and remote sensing on the internal wave detection of Taiwan's continental shelf.

Full article:
http://www.taiwanheadlines.gov.tw/ct.asp?xItem=205668&CtNode=9

10. Optical fiber sensor aids early landslide detection

(Taipei Times, 09 10 2010)

An optical fiber vibration sensor that won a silver medal at the Taipei International Invention Show has proved extremely effective in monitoring and providing early warnings of landslides. The sensor, developed in 2008 by a research team at National Kaohsiung First University of Science and Technology, was able to detect landslides or rockslides that were about to occur during flood seasons.

Full article:
http://www.taipeitimes.com/News/taiwan/archives/2010/10/09/2003484952

11. One-handed biker develops unique braking system

(Liberty Times, 12 10 2010)

Biking fan Lai Nan-you, who teaches at Hsinchu County's St. Aloysius Technical School, improved both his bike's braking and gearshift systems, and other disabled people have also benefited from the innovation.

Full article:
http://www.taiwanheadlines.gov.tw/ct.asp?xItem=205978&CtNode=9

12. Research team shows benefit of red wine

(Taiwan Today, 12 10 2010)

Experiments by local researchers indicate that blood circulation can be improved while the risks of cardiovascular disease are lowered if a person drinks red wine moderately every day.

Full article:
http://www.taiwantoday.tw/ct.asp?xitem=121909&CtNode=416

13. Researchers make stem cell therapy breakthrough

(Taiwan Today, 13 10 2010)

A research team at National Cheng Kung University has conducted the world's first successful experiments on large animals indicating that heart stem cell therapy can be used to reduce cardiac muscle cell damage and to form new cardiovascular vessels from stem cells. Patrick C. H. Hsieh, assistant professor at NCKU's Graduate Institute of Clinical Medicine, said Oct. 12 his research team combined self-assembling peptide nanofiber hydrogel with autologous bone marrow stem cells to inject into areas of cardiac infarction in the test animals. The experiments were conducted on Lanyu miniature pigs, which have a similar cardiac structure to that of humans, Hsieh said. The team's breakthrough findings on the novel stem cell therapy for heart repair were published in the September 2010 issue of Circulation, the leading international journal in cardiovascular studies. Patent applications for the new technology have already been filed in Taiwan and abroad. Hsieh explained that if stem cells are injected into the test animal's heart, as past studies have done, the survival rate of the cells tends to be low. With the help of self-assembling peptide nanofiber hydrogel, the cell retention rate improved eight times in a month's time, said Hsieh. According to Hsieh, his school and Harvard University jointly made breakthroughs in nanofiber hydrogel research several years ago. Hsieh,

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who is also a cardiovascular surgeon at NCKU Hospital, said the team started the heart stem cell therapy tests on Lanyu miniature pigs over a year ago following successful experiments on laboratory mice that began a few years earlier. He stressed that while the team succeeded in forming new cardiovascular vessels from stem cells, it was not able to regenerate heart tissue.

Full articles:
http://www.taiwantoday.tw/ct.asp?xItem=122258&ctNode=445
http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aLIV&ID=201010140037

14. Taiwan wins big at British Invention Show

(Central News Agency, 17 10 2010)

Taiwan emerged as the biggest winner at the British Invention Show 2010 (BIS), capturing 12 gold and two silvers, as well as special awards of diamond, platinum and double-gold medals. Taiwan submitted 19 entries to the UK's largest invention and technology exhibition and garnered its best score in the four years since it first participated in the event. Sixteen countries took part this year. Chen Tsung-tai, president of the Taiwan Invention Association and leader of the Taiwanese team, said that pieces invented by Taiwan's youth amazed the judges with their creativity and innovative ideas, adding that these young people represented the hopes of the future and the keys to improving Taiwan's competitiveness. Kane Kramer, president of the assembly and founder of the British Inventors Society, said at the award presentation ceremony that he was attracted by the top award entry, a multi-channel headphone system submitted by Taiwan's Cotron Corp, describing it as a well-deserved winner. Kramer, inventor of the first digital audio player and whose work helped inspire the design of Apple's iPod, said he would work together with a Taiwanese firm regarding his latest invention. Another Cotron invention, a wireless audio player, also won the special platinum medal, making the company the biggest winner at the event. A student team from Far East University in Tainan won four gold medals for its coffee machine capable of adjusting caffeine content and aroma strength, a device designed to completely destroy information stored on a CD disc, a water-saving planting container, and a solar-powered vacuum tube heat collector. The five-member team from the Affiliated Experimental High School of Tunghai University earned two golds with its new video monitor and PC Mirror Cam.

Full article:
http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aLIV&ID=201010170014

15. Chemistry teacher develops new varieties of air plants

(Liberty Times, 19 10 2010)

Life-long plant aficionado Lin Qing-shan has taken a special interest in air plants, known in the scientific community as bromeliads, over the past five years. The National Taoyuan Senior High School chemistry teacher has experimented with cross-breeding various types of air plants, many of which are quite difficult to find, and has developed nearly 100 new varieties. Even the National Museum of Natural Sciences, which is getting ready to hold an exhibit of air plants, was amazed at Lin's achievements. Using seeds that he purchased abroad on the Internet, Lin has raised a wide range of air plants, and gone a step further by cross-breeding and developing whole new varieties, including those that will thrive in Taipei's relatively cold winters.

Full article:
http://www.taiwanheadlines.gov.tw/ct.asp?xItem=206721&CtNode=9

16. NCKU successfully launches low-cost hybrid rocket

(China Post, 20 10 2010)

A low-cost hybrid rocket built by a research team at the National Cheng Kung University (NCKU) was successfully launched on mid-October. The rocket measures 3.6 meters in height, 16cm in diameter and 68kg in take-off weight. It used a hybrid propellant system with 50 percent paraffin, 50 percent HTPB as solid fuel grain and liquid nitrous oxide (N2O) as oxidizer fuel to acquire a 300 kgf thrust.
Using a mix of solid and either gas or liquid propellants, a hybrid system is simpler, safer and cheaper than systems using only liquid or solids as fuel. The NCKU rocket, for example, was composed of independently manufactured main

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components and fueled by propellant that is easy to acquire and without the restriction of export license, resulting in a low cost of merely NT$300,000, according to the university. The NCKU, the first university in Taiwan to research and develop a hybrid rocket, launched a smaller rocket with 30kgf thrust last year in Tainan.

Full article:
http://www.chinapost.com.tw/life/science-&-technology/2010/10/20/276804/NCKU-successfully.htm

17. Scientists reach disease research milestone

(China Post, 21 10 2010)

The National Science Council became the first research institute in the world to build a technological platform to breed genetically modified laboratory rats with regulable genes, paving the way for finding better treatment of diseases such as diabetes and cancers. By switching on or off certain specifically designed gene fragments transferred into these modified rats, researchers from the NSC's National Laboratory Animal Center (NLAC) can administer changes to the big rodents such as transform their color from fluorescent red to fluorescent green. Research can monitor particular genes by observing the brightness and location of the fluorescent. By regulating gene fragments, researchers can accurately control the timing of the onset of disease and therefore conduct more synchronized observation. By studying the change of the fluorescent colors, researchers will also be able to screen the effectiveness of different drugs. Such observation method is precise, swift and non-intrusive. It reduces the number of laboratory animals required in each test. In the future, the NLAC will be able to mass produce custom-made genetically modified rats with gene fragments of required diseases and to share these laboratory animals with foreign researchers through its National Laboratory Rodent Bank, greatly contributing to the development of drugs and boosting the quality of biomedical experiments.

Full article:
http://www.chinapost.com.tw/taiwan/national/national-news/2010/10/21/276952/Scientists-reach.htm

18. Taiwan researchers develop flu detection chips

(Taiwan Today, 27 10 2010)

Researchers at Academia Sinica have successfully developed sugar chips capable of diagnosing influenza. The technique will enable rapid identification of the specific virus a person is affected with, such as type A, type B or a new H1N1 strain, by applying infected saliva to the chip. The research team spent three years designing and synthesizing glycans that bind the hemagglutinins found on the surface of influenza viruses commonly seen in Taiwan. The researchers were able to plant 17 glycans that bind avian viruses and 10 binding human viruses on the chip. The team's findings have been published in the 2 7 October issue of the Journal of the American Chemical Society

Full article:
http://www.taiwantoday.tw/ct.asp?xItem=125163&ctNode=445

19. Taiwan excels at Nuremberg invention fair

(Central News Agency, 317 10 2010)

Taiwan once again emerged as the top winner at the world's oldest invention show, capturing 27 gold, 32 silver and 23 bronze medals at the 2010 iENA Nuremberg after winning the team championship in 2009. A total of 800 inventions from 37 countries were on display. Taiwan had the biggest overseas delegation, exhibiting 98 inventions. Taiwanese students performed particularly well at the show, whose theme this year was "Young, creative, oriented on the future -- Inventing at School."

Full article:
http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aECO&ID=201010310004