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**Science, Technology and Education News from Taiwan  
Number 05 - May 2010**

Taiwanese authorities have come out with a new program that is says will create some 10'000 high-tech research jobs over the next three years. An official with the government's Department of Industrial Technology said the thrust of the program will be to help local companies carry out forward-looking research and development projects. That includes R&D on highly integrated digital chips, advanced display systems, precision machinery and high-end materials. The subsidies to be offered under this program will not be subject to existing regulations that cap the government's high-tech R&D subsidies at NT\$30 mio.

**Highlights of major news from the scientific world in Taiwan in May 2010:**

The National Cheng Kung University won a gold medal at the Geneva Invention Exhibition for its development of a hydrogen sensor – the National Space Organization launched Sounding Rocket VII to gather information on changes in the ionosphere over the Taiwan region as well as the structure and production mechanism of plasma irregularities in the ionosphere – the Center for Crystal Research created its own industrial crystals – a Taiwanese-lead team at Katholieke Universiteit Leuven developed a surgical robot – Asia's first unmanned aerial vehicle powered by a fuel cell and lithium battery hybrid made its maiden flight in Taiwan – the National Taitung University launched the world's 1<sup>st</sup> water-fueled school bus – Prof Ding-Shinn Chen was awarded the 2010 Nikkei Asia Prize in the category of science and technology for his research related to Hepatitis B and liver cancer – a Taiwan research team discovered that the androgen (male hormone) receptor is the key mechanism that leads to hepatitis B to develop into liver cancer – the Center for Disease Control developed the world's fastest test kit for enterovirus type 71 – a Taiwanese scientists developed a new approach for investigating the amount of nano/microparticles taken up by mammalian cells.

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### **1. Local scholars elected fellows of American Academy of Arts, Sciences**

(Central News Agency, 04 05 2010)

Two Taiwanese scholars, Sunney Chan and Evelyn Hu, have been elected as fellows of the American Academy of Arts and Sciences (AAAS) for their distinguished contributions to the sciences. Chan's research focuses on physical biochemistry, the structure and function of membrane proteins, magnetic resonance spectroscopy, bio-inorganic chemistry, protein folding and bio-energetics. Hu's research focuses on microelectronics technology.

Full article:

[http://focustaiwan.tw/ShowNews/WebNews\\_Detail.aspx?ID=201005040028&Type=aEDU](http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?ID=201005040028&Type=aEDU)

### **2. Student designs handlebar-free motorcycle**

(Liberty Times, 05 05 2010)

Han Jun-long, a senior in the Department of Industrial Design at Taipei County's Huafan University, created a motorbike with no handlebars, steered completely by the weight of the rider's body.

Full article:

<http://www.taiwantoday.tw/ct.asp?xItem=101639&ctNode=445>

### **3. Hydrogen sensor developed by Taiwan scientists wins gold in Geneva**

(Central News Agency, 05 05 2010)

A Taiwanese research team from the Department of Electrical Engineering of National Cheng Kung University in Tainan has won a gold medal at the 38<sup>th</sup> Int'l Exhibition of Inventions of Geneva for its invention of a tiny device, a semiconductor transistor-type hydrogen sensor, that can quickly detect very low levels of hydrogen leaks in factories and elsewhere. The portable device, which has already been patented, is one centimeter in diameter, weighs 0.6 grams, can operate on as little as 50 milliwatts of power and can function at temperatures ranging from room temperature to 300 degrees Celsius. It can detect concentrations of hydrogen leaks of less than 5ppm within 10 seconds, which makes it suitable for use in chemical and semi-conductor factories. According to NCKU, in the future the device may be incorporated into the design of automobile batteries, fuel cells for aircraft and spacecraft, and hydrogen refueling stations. It may also include use in integrated circuits, micro electrical engineering and communication.

Full article:

[http://focustaiwan.tw/ShowNews/WebNews\\_Detail.aspx?Type=aALL&ID=201005050027](http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aALL&ID=201005050027)

### **4. Taiwan wins big at Paris invention fair**

(Taiwan News, 10 05 2010)

Taiwan has garnered a total of 17 medals, including four gold and four silver, at one of the world's most prestigious invention fairs, the Concours Lepine International Paris 2010. Taiwan was the third largest competitor in the show, behind Poland, with 31 inventions, and China with 27. Taiwan's gold-medal entries were a biocide air filter, an ergonomic chair, a custom-made LED lamp and reusable adhesive. Silver-medal items included a specially designed life vest, a fragrant necklace and a safety shoe toe.

Full article:

[http://www.etaiwannews.com/etn/news\\_content.php?id=1251125&lang=eng\\_news&cate\\_img=49.jpg&cate\\_rss=news\\_Society\\_TAIWAN](http://www.etaiwannews.com/etn/news_content.php?id=1251125&lang=eng_news&cate_img=49.jpg&cate_rss=news_Society_TAIWAN)

### **5. Taiwan achieves successful rocket launch**

(Central News Agency, 10 05 2010)

The National Space Organization (NSPO) touted the recent launch of Sounding Rocket VII as a success, describing it as a major breakthrough in Taiwan's space exploration efforts. The rocket was launched at 7: 50 p.m. on 5 May from the Jioupeng military base in southern Taiwan's Pingtung County after a string of delays since its original launch date



of November 2008. During its 500 second-plus mission, the rocket was able to retrieve valuable information on changes in the ionosphere over the Taiwan region as well as the structure and production mechanism of plasma irregularities in the ionosphere. The data is crucial for improving Taiwan's global positioning system (GPS) and telecommunication infrastructures such as digital television and cell phone reception. One of Sounding Rocket VII's most notable breakthroughs is its ability to carry the largest payload ever in Taiwan's space program. The payload for the May 5 flight included a retarding potential analyzer, a Langmuir probe, a spectrometer, a GPS system and two ion traps. This was also the first time that such a rocket has been able to simultaneously co-conduct scientific experiments with Formosat-3, a satellite operated with Taiwanese and U.S. collaboration, to measure plasma density and ion irregularities in the ionosphere.

The ultimate goal of Taiwan's rocket program is being aimed at enhancing the country's self-reliance in terms of its space exploration program such as launching its own satellite, possibly in three to four years based on current abilities. Taiwan has launched six rockets between 1998 and 2007, and the NSPO estimates that the next launch will take place in 2012. The project was the result of collaboration among National Central University, the NSPO and the Chung Shan Institute of Science and Technology.

Full article:

[http://focustaiwan.tw/ShowNews/WebNews\\_Detail.aspx?Type=aALL&ID=201005100015](http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aALL&ID=201005100015)

## **6. Taiwan can create own industrial crystals**

(Central News Agency, 10 05 2010)

Taiwan has developed the technology to create single crystals, a key element in medical, high-tech and other industries. The Center for Crystal Research was established in 2008, with the support of the Cabinet-level National Science Council (NSC) and the university's Center for Nanoscience and Nanotechnology. The rising costs of mining have spurred the development of artificial crystals, the NSC said in a statement. "Taiwan is the fourth country after the United States, Japan and Australia to have developed ability to manufacture this kind of crystal," according to NSC. The center has been cooperating with four local companies, but they have yet to begin mass production. It is also working with research institutes in Germany, California and South Korea. It hopes it will be able to take part in a particle accelerator project in Europe next year.

Full article:

[http://focustaiwan.tw/ShowNews/WebNews\\_Detail.aspx?ID=201005100029&Type=aECO](http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?ID=201005100029&Type=aECO)

## **7. Taiwanese-led team develops surgical robot in Belgium**

(Central News Agency, 12 05 2010)

A robot developed by a Taiwanese doctoral candidate in Belgium and his research team has won acclaim for its ability to perform minimally invasive surgery precisely and with more dexterity than a currently available system. At present, the Da Vinci Surgical System is the only robotic system being used for minimally invasive surgery. One drawback, however, is that the Da Vinci system's robotic arms need a lot of maneuvering room, limiting their operating range. In contrast, the Vesalius robot, created by Tang's team under the sponsorship of Katholieke Universiteit Leuven, allows better control of robotic arm movements and provides better robotic dexterity. The range of movement of the robotic system's arms can cover up to a 120-degree angle and extend out by as much as 17 cm to perform surgical procedures. The Vesalius system won second place in the Start Academy business plan competition for university students in Belgium and the top prize in the competition's "Best Commercial Business Plan" category.

Full article:

[http://focustaiwan.tw/ShowNews/WebNews\\_Detail.aspx?Type=aECO&ID=201005120010](http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aECO&ID=201005120010)

## **8. GlaxoSmithKline to trial drugs at Taipei hospital**

(Economic Daily News, 13 05 2010)

GlaxoSmithKline PLC signed a contract with Taipei Veterans General Hospital (TPEVGH) on 13 May to conduct clinical trials for more than 10 new drugs and vaccines in development. The deal represents further affirmation of Taiwan's top-notch medical sector, which has led many international drug companies to make the island their first choice in carrying out clinical trials.



GSK Taiwan said the first clinical trials to be carried out under the agreement would be third-stage trials for a varicella zoster virus vaccine. Also being selected for clinical trials at TPEVGH is Denosumab, a monoclonal antibody that is being studied in the treatment of osteoporosis and other degenerative bone diseases.

Full article:

<http://www.taiwantoday.tw/ct.asp?xItem=102918&ctNode=413>

### **9. Asia's first hybrid-powered UAV makes 1st flight**

(China Post, 14 05 2010)

Asia's first unmanned aerial vehicle (UAV) powered by a fuel cell and lithium battery hybrid made its maiden flight in southern Taiwan on 13 May, marking a milestone in Taiwan's development of green-powered drone aircraft. The UAV, dubbed the Gray-faced Buzzard, flew for 15 minutes at between 80-100 kph at an altitude of less than 300 m. It costs about NT\$500,000 to build the UAV, which weighs 22 kg, is nearly 2 m long and produces 1 kilowatt of power, or approx 1.34 horsepower.

Full article:

<http://www.chinapost.com.tw/taiwan/national/national-news/2010/05/14/256416/Asias-first.htm>

### **10. Taiwanese university launches world's 1st water-fueled school bus**

(Central News Agency, 14 05 2010)

The 20-minute bus ride for university students in Taitung is now more environmentally friendly, as the vehicle has become the world's first school bus equipped with a water-diesel hybrid system. The school bus was revealed at a green technology science exhibition held by National Taitung University (NTTU). The oxy-hydrogen hybrid fuel system first generates oxy-hydrogen gas from the water, then introduces the gas into the vehicle's engine, where it helps the fuel burn, therefore increasing fuel efficiency. It creates up to 20 % savings in fuel costs and also lowers exhaust fume emissions by 20 %. The system was developed by Kaohsiung-based Epoch Energy Technology Corp.

Full article:

[http://focustaiwan.tw/ShowNews/WebNews\\_Detail.aspx?Type=aECO&ID=201005140019](http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aECO&ID=201005140019)

### **11. Researchers develop cucumber-flavored bitter melons**

(Liberty Times, 14 05 2010)

The Zhixue Farm in Hualien County's Shoufeng Township produced a mountain bitter melon that has the texture and flavor of a cucumber, emitting a sweet, fruitlike aroma. The Hualien District Agricultural Research and Extension Station started cross-breeding native types of mountain bitter melons in 1998, and has since developed four types of the vegetable that are both pleasantly flavorful and full of nutrients.

Full article:

<http://www.taiwanheadlines.gov.tw/ct.asp?xItem=189487&CtNode=9>

### **12. Taiwan students clean up at Intel science fair**

(United Daily News, 17 05 2010)

Taiwan's reputation as a "clever country" continues to rise following a record seven-award haul by local students at this year's Intel International Science and Engineering Fair in California on 14 May. Nine students from Taiwan entered the world's largest high school science competition, collecting one top prize, five third place honors and a fourth in categories ranging from animal and mathematical science to chemistry and electrical and mechanical engineering. This was the highest winning percentage of all national representations. Jacqueline Hung and Lin Chi-chieh of Taipei Municipal First Girls' Senior High School won first place in the team projects category for their study "Synthesis and Analysis of the New Superconducting Material—FeSe Nanocrystals."

Full article:

<http://www.taiwantoday.tw/ct.asp?xItem=103314&ctNode=445>



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### **13. Taiwan team sweeps awards at invention contest**

(China Times, 17 05 2010)

Students from Taiwan captured 18 gold, 22 silver and four bronze medals on 15 May at the 21st International Invention, Innovation and Technology Exhibition (ITEX) in Malaysia. Out of the 47 entries submitted by Taiwan, 44 received medals, the highest medal-winning rate in ITEX history.

Full article:

<http://www.taiwantoday.tw/ct.asp?xItem=103338&ctNode=445>

### **14. Designers from Taiwan Win 68 Prizes in 2010 Red Dot Product Design Awards**

(Taiwan Economic News, 18 05 2010)

Designers from Taiwan won 68 prizes, including one Best of Best, the highest honor, in the 2010 Red Dot Product Design Award, regarded as the Oscars in product design, compared to only two in 2004 or 20 in 2005.

Full articles:

[http://cens.com/cens/html/en/news/news\\_inner\\_32350.html](http://cens.com/cens/html/en/news/news_inner_32350.html)

<http://www.taiwanheadlines.gov.tw/ct.asp?xItem=191106&CtNode=9>

### **15. Local professor wins overseas prize for hepatitis research**

(Liberty Times, 18 05 2010)

Professor Ding-Shinn Chen, the former head of the National Taiwan University College of Medicine and a Fellow at the Academia Sinica, has made a name for himself for his research related to Hepatitis B and liver cancer. He was awarded the 2010 Nikkei Asia Prize in the category of science and technology, the fourth Taiwanese to have been awarded the prize, and the first person in Taiwan's medical community to win the honor.

Full article:

<http://www.taiwanheadlines.gov.tw/ct.asp?xItem=189857&CtNode=9>

Related article:

<http://www.taiwantoday.tw/ct.asp?xItem=103512&ctNode=445>

### **16. New method helps visually disabled persons learn massage easier**

(Liberty Times, 19 05 2010)

Visually handicapped people, who usually learn the meridian acupuncture points throughout the body by listening to tapes over and over again to commit this information to memory, are now able to learn about the points in an interactive manner through Taiwan's first meridian acupuncture point-content CD database system released by the Technology Development Association for the Disabled.

Full article:

<http://www.taiwanheadlines.gov.tw/ct.asp?xItem=190030&CtNode=9>

### **17. Mobile computer service nets Austrian prize**

(United Daily News, 19 05 2010)

A mobile computer and Internet van serving rural Taiwan received an honorary mention in the digital communities category on 17 May at the 2010 Prix Ars Electronica in Linz, Austria.



Full article:

<http://www.taiwantoday.tw/ct.asp?xItem=103705&ctNode=445>

### **18. Research team makes liver cancer breakthrough**

(China Times, 21 05 2010)

A Taiwan research team discovered that the androgen (male hormone) receptor is the key mechanism that leads hepatitis B to develop into liver cancer, and that ASC-J9, a compound derived from ginger, can suppress the development of liver cancer without reducing androgen concentrations. The results of the study by the research team led by China Medical University professor Chang Chawn-shang were published on 19 May as the latest cover story in the U.S. journal Science Translational Medicine. The ASC-J9 compound's most special attribute is that it can reduce the cancer cell's androgen without lowering serum androgen concentrations, allowing the brain and testes to continue secreting androgen as normal, and thereby not impacting the male mice's sex drive or reproductive functions. The findings on ASC-J9 offer a new direction for the development of liver cancer drugs and health foods.

Full article:

<http://www.taiwantoday.tw/ct.asp?xItem=104054&ctNode=413>

### **19. Researchers turn used cooking oil to compost**

(China Post, 25 05 2010)

Researchers from the Tainan District Agricultural Research and Extension Station in Sinhua Township, Tainan County, have developed a way to turn used cooking grease into compost. The method, which was developed with the help of National Chung Hsing University in Taichung City, involves using bacteria to break down the oils in the grease. Before administering the bacteria, however, the grease has to be mixed with a material developed by the station.

Full article:

<http://www.chinapost.com.tw/taiwan/national/national-news/2010/05/25/257892/Researchers-turn.htm>

### **20. Taiwanese university develops smart electric bicycles**

(Central News Agency, 26 05 2010)

The Chienkuo Technology University's Department of Automation Engineering in Changhua County unveiled a new electric bicycle that overcomes the limitations of traditional bicycles and improves on the functions of electric models on the market. The electric bicycle still has pedals but is otherwise configured differently than traditional bikes, with motors on both wheels replacing the usual chain and derailleur. Another unique feature is that riders can adjust speeds when they run the bicycle on electric power. The new electric bicycle has incorporated other special functions that add to rider convenience and safety. The handle can be warmed up with a built-in control, and the LED headlight can be automatically adjusted according to the distance of objects in front of the bike. Also, a touch screen control panel on the handlebar has a GPS system, speedometer, anti-theft device and a system to prevent drunk cyclists from riding.

Full article:

[http://focustaiwan.tw/ShowNews/WebNews\\_Detail.aspx?Type=aECO&ID=201005260028](http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aECO&ID=201005260028)

### **21. CDC develops rapid enterovirus test kit**

(China Times, 26 05 2010)

The Center for Disease Control under the Department of Health has developed the world's fastest test kit for enterovirus type 71. The quick test kit requires just one drop of a patient's blood plus three drops of a diluting agent, with results available in 5-20 minutes. In preliminary tests it has been 80 % accurate. Fomosa Biomedical Technology Corp. has been selected for the first technology transfer, and the kit will be clinically tested at National Taiwan University Hospital, Linkou Chang Gung Memorial Hospital, Taichung Veterans General Hospital, Changhua Christian Hospital and Kaohsiung Veterans General Hospital. It is expected to sell for NT\$200 and go on the market by year's end, contributing to the rapid diagnosis and treatment of several thousand children annually.





Full article:

<http://www.taiwantoday.tw/ct.asp?xItem=104654&ctNode=445>

## **22. German center introduces updated exchange programs**

(Central News Agency, 28 05 2010)

Marking the 10<sup>th</sup> anniversary of the German Information Center Taipei, Director Stefan Rummel outlined plans to expand academic exchanges. Germany is currently offering more flexible programs, Rummel said, including a doctoral program in which students can complete a course of study from undergraduate to doctoral degree in only eight years. Last year, some 550 students applied for scholarships at German universities.

Full article:

[http://focustaiwan.tw/ShowNews/WebNews\\_Detail.aspx?ID=201005280029&Type=aEDU](http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?ID=201005280029&Type=aEDU)

## **23. Taiwanese research center named as OIE reference laboratory**

(Central News Agency, 28 05 2010)

A Taiwanese research center, the National Taiwan University's School of Veterinary Medicine, has been designated at the 78th OIE General Session in Paris as a reference laboratory of the World Organization for Animal Health (OIE) for herpes-like viral diseases in abalone. Taiwan now has three OIE reference laboratories. The other two are for detection of white spot syndrome virus and spherical baculovirus in shrimp. In the future, Taiwan plans to also have OIE reference laboratories for detection of disease in terrestrial animals and for detection of salmonella in animals.

Full article:

<http://www.taiwanheadlines.gov.tw/ct.asp?xItem=191110&CtNode=9>

## **24. Taiwanese scientists develop new nanotech approach**

(Central News Agency, 31 5 2010)

A Taiwanese research team has developed a new approach for investigating the amount of nano-/microparticles taken up by mammalian cells. "This research brings more efficiency to the measurement and detection of the mass changes of a cell as a result of malignancy or the uptake of nanoparticles," said the first author of the study, Lin Huan-Chang of the Department of Bio-Industrial Mechatronics Engineering at National Taiwan University. "The spectrometer called the Charge-Monitoring Mass Spectrometer (CMS) is proven to be useful in streamlining the determination the quantity of both gold and polystyrene nano-/microparticles taken up into cells. The Taiwanese scientists used a different type of spectrometer called CMS, a device that was developed by a group at the Genomics Research Center (GRC) and the Institute of Atomic and Molecular Sciences at Academia Sinica in 2007, to measure single cancer cells at higher speeds. The group's findings indicate that CMS is effective for measuring nanogold uptake by cells. The also found that CMS can measure particles over a much larger size range. In addition, as CMS only takes two steps to examine the nanogold compared to other methods that can take five steps, CMS is more time-efficient. Most importantly, CMS can also measure non-metal nanoparticles, including polymeric nanoparticles, carbon nanotubes, diamond nanoparticles, viruses, micelles and liposomes. The full text of the study, titled "Quantitative Measurement of Nano-/Microparticle Endocytosis by Cell Mass Spectrometry" was published online 13 April in the leading international journal "Angewandte Chemie."

Full article:

[http://focustaiwan.tw/ShowNews/WebNews\\_Detail.aspx?Type=aEDU&ID=201005310014](http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aEDU&ID=201005310014)