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The **Industrial Technology Research Institute (ITRI)** developed the See-Through technology, a new autonomous vehicle safety system, which was awarded as the **Switzerland regional winner in the European Satellite Navigation Competition (ESNC) 2013** for its creativity and great potential (<http://www.galileo-masters.eu/index.php?anzeige=switzerland13.html>). ITRI also revealed a new streaming technology as a solution to Internet congestion, especially in packed areas such as stadiums or concerts halls. Moreover, the Hsinchu-based institute introduced its software-based **Wi-Fi Multicast** system that overcomes **online streaming congestion** to deliver crisp, uninterrupted images to a large audience. The **National Cheng Kung University (NCKU)** is developing a warning system which provides much needed warning time in the event of a tsunami by monitoring ionospheric disturbances, while professor Yueh-Min Huang of NCKU unveiled his **cloud history interactive e-book reader**, which allows teachers to observe and advise on students' reading behavior to significantly boost study efficacy. Local institutes have signed a memorandum of understanding to establish a **magnetic resonance imaging R&D and image service platform** to enhance domestic MRI system R&D and related technology to promote high-level MRI use in such fields as basic biomedicine, animal modeling, preclinical research and translational medicine. Taiwanese researchers of **National Taiwan University Hospital** examined whether a correlation exists in Taiwanese with the disease between **Parkinson's disease** susceptibility genes and the risk of developing the condition, and showed different results for local people with the international studies. A local medical research team also discovered that **monascin** inhibits inflammation and improves insulin resistance, and could therefore help diabetics better control their disease.

**Contents**

1.	Taiwanese researchers unveil quick-maturing purple cauliflower	2
2.	NCKU develops tsunami warning system	2
3.	ITRI unveils new streaming technology	3
4.	NCKU professor invents interactive e-reader	3
5.	Researcher wins national award for promising anticancer agent	3
6.	ROC sets up biomedical imaging R&D platform	4
7.	NTU research tests Parkinson's susceptibility genes	4
8.	Monascus products found to have compounds that curb diabetes	5
9.	See through: Driving as You've Never Seen Before	5



## 1. Taiwanese researchers unveil quick-maturing purple cauliflower

(Central News Agency, 03 12 2013)

Taiwan unveiled a new strain of purple cauliflower, which researchers said can be harvested 10-20 days earlier than ordinary cauliflower. The vegetable, dubbed Tai Nong No.1, which needs only 55-65 days to mature, is the result of 33 years of effort, said Hui-ling Lo, an assistant researcher at the Fengshan Tropical Horticultural Experiment Branch. Through heat tolerance breeding, Lo told CNA, her team developed a strain that is "suitable for Taiwan's weather and Taiwanese tastes." In accordance with the local cooking style of predominantly stir-frying, Taiwanese people prefer a crunchy texture, she said, adding that the new type is not as hard as those that are usually used for soup or gratin, she added. Wang San-tai, the branch's vegetable crop department head, said the new vegetable has been authorized for local distributors and that mass production could be expected in 2014. Purple cauliflower is more nutritious than the white varieties, as it is rich in anthocyanidin, a bioflavonoid that has various health



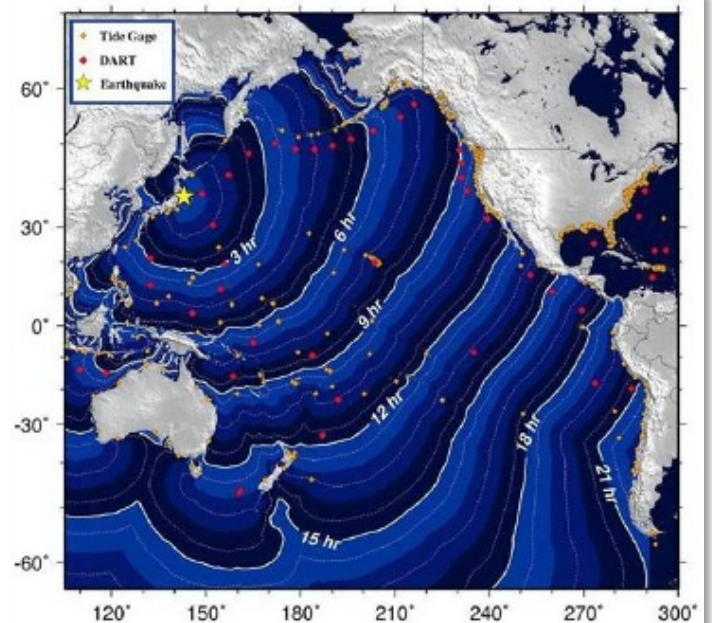
benefits, Wang said.

<http://focustaiwan.tw/news/ast/201312030042.aspx>

## 2. NCKU develops tsunami warning system

(China Post, 13 12 2013)

A research team at Taiwan's National Cheng Kung University said it is developing a warning system that it believes can provide much needed warning time in the event of a tsunami by monitoring ionospheric disturbances. The system is being developed by a team led by Charles Lin, an associate professor at the university's Department of Earth Sciences. Using a network of GPS receivers, the system can monitor changes in the ionosphere caused by corresponding disturbances on the surface of the Earth such as earthquakes and tsunamis. Early warning is possible because disturbances in the ionosphere travel much faster than tsunamis. Ionosphere is a layer of electrons and ion particles that surrounds the Earth, stretching from an altitude of about 100 kilometers to 800 km, the team said. The warning system can allow up to 25 minutes warning time in cases where a tsunami is 370.15 kilometers offshore, said Chia-hung Chen, a post-doctoral fellow on the research team who studied ionospheric disturbances. If the tsunami is 200 km offshore, the warning time will be 15 minutes, which means people will have 15 minutes to evacuate to safety, he added. The next step of the research involves using the existing GPS receivers owned by the Central Weather Bureau to obtain real-time data on ionospheric disturbances and tsunamis. Although it is still in the experimental stages, it could be Taiwan's first tsunami warning system, Chen said. GPS receivers can be installed along the east coast of Taiwan at intervals of 10-20 kilometers as part of the tsunami warning system when the experiment is completed, he said. Each receiver comes at a relatively low price of NT\$300,000 (US\$10,000). There is no need to place GPS receivers on the west coast because a tsunami in the Taiwan Strait is not very likely, Chen said. He said he became interested in the research project because he was in Japan in March 2011 when the country was struck by a powerful earthquake that triggered a massive tsunami along the northeastern coast. Since then, Chen said, he has been eager to examine the relationship between tsunamis and ionospheric disturbances.



<http://www.chinapost.com.tw/taiwan/local/tainan/2013/12/13/395832/NCKU-develops.htm>



### 3. ITRI unveils new streaming technology

(Central News Agency, 17 12 2013)

Taiwan's Industrial Technology Research Institute (ITRI) revealed a new streaming technology, a solution to Internet congestion, especially in packed areas such as stadiums or concerts halls. Based on the theory of broadcasting, the "Wi-Fi Multicast" technology can allow 10 times more users to use the same amount of bandwidth as that provided by ordinary streaming services, the institute said, adding that the technology can also be applied on high-speed trains. Cheng-wen Wu, general director of ITRI's Information and Communications Research Laboratories, said the software can change the coding of video data without the need to buy and install new equipment. The technology can meet the growing demand for online video sharing and viewing, which often leads to bottlenecks in wireless transmission, he said. ITRI has been working with potential partners, including cable companies, to transfer the technology for business use.



Photo courtesy of the Industrial Technology Research Institute

<http://focustaiwan.tw/news/ast/201312170043.aspx>

### 4. NCKU professor invents interactive e-reader

(Taiwan Today, 18 12 2013)

Professor Yueh-min Huang of the Department of Engineering Science at Tainan City-based National Cheng Kung University unveiled Dec. 17 his cloud history interactive e-book reader, which allows teachers to observe and advise on students' reading behavior to significantly boost study efficacy, NCKU said. The e-reader, jointly developed with the Cloud System Software Institute of the Taipei City-based Institute for Information Industry, combines interactive multimedia with cloud-based user history recording and feedback. The multimedia content includes text, audio, notes, and peer-to-peer note sharing, as well as a full-text search function, index and supplemental resources, giving capability far beyond a standard e-reader, NCKU said. According to NCKU, the cloud history recording and feedback uses Iii's SmartStor Cloud storage system. It can record the student's underlinings, so the teacher can tell if the students have grasped the main points and provide guidance accordingly. The system can also measure the time it takes a student to read each page, generating progress statistics for teachers to monitor learning difficulties. The e-reader also has a built-in video camera which measures the user's attention by detecting facial expression, line of sight and frequency of blinking, NCKU said. Other sensors monitor heartbeat, blood oxygen and cushion pressure to assess the user's emotional status, fatigue and posture, providing additional diagnostics for study bottlenecks. "The recording and feedback system is the key feature separating this e-reader from others," Huang said. "The detailed study history can be used to analyze the student's progress, basic learning ability, memory and focus." NCKU said the e-reader was tested on 166 elementary school students in Tainan City, who described using it as interesting and fun, especially its variable underlining function. According to Huang, the younger the students are, the better able they are to take advantage of the system's range of features to display their creativity. Teachers also said they found the system helped them keep a better grasp on the overall progress of their classes.



A Tainan City elementary student proudly displays her work on a cloud history interactive e-reader invented by NCKU professor Huang Yueh-min

<http://www.taiwantoday.tw/ct.asp?xItem=212751&ctNode=445>

### 5. Researcher wins national award for promising anticancer agent

(Central News Agency, 19 12 2013)

A National Innovation Award for academic achievement was presented to a medical researcher for his achievements in creating an anticancer agent and spraying device that promises to help fight lung cancer. Hueih-min Chen, a researcher with the National Nano Device Laboratories under the National Applied Research Laboratories, generated the novel anticancer peptide called CB1a using a natural antimicrobial peptide, Cecropin B, as a template. He then devised a sprayer that is able to compress liquid CB1a solution into small particles that are sprayed deep into the lungs to achieve the most effective treatment. Current cancer treatments have more complicated screening procedures and stronger side effects than the newly developed method, Chen said, adding



that his agent has relatively few side effects. The agent has passed toxicology tests and has registered patents in both Taiwan and the United States. Chen is also preparing to apply for a patent for the innovative sprayer, which can also be used for other drugs. Preclinical trials for CB1a will be completed once it passes toxicology tests that adhere to the Organization for Economic Cooperation and Development (OECD)'s Principles of Good Laboratory Practice, Chen said. He estimated a NT\$3 billion (US\$100 million) market for the drug after the completion of its preclinical trials. The National Innovation Awards, presented by the Taiwan-based Institute for Biotechnology and Medicine Industry, also bestowed a corporate award to General Biologicals Corporation (GBC), which specializes in liver disease diagnostic devices, for devising a non-invasive technology to detect liver fibrosis. The technology is able to assess the extent of liver fibrosis through blood sampling and can be used to detect the conditions of patients with Hepatitis B, Hepatitis C, alcoholic liver disease and non-alcoholic fatty liver disease. The technology is made unique because it allows patients to avoid painful liver biopsies while providing doctors with highly precise diagnostic results at the same time, GBC said.

<http://focustaiwan.tw/news/ast/201312190033.aspx>

## 6. ROC sets up biomedical imaging R&D platform

(Taiwan Today, 20 12 2013)

National Applied Research Laboratories, National Health Research Institutes and National Taiwan University signed a memorandum of understanding on 19 Dec., establishing a magnetic resonance imaging R&D and image service platform. The platform will be set up at Hsinchu City-based Biomedical Science Park, with the aim of enhancing domestic MRI system R&D and related technology to promote high-level MRI use in such fields as basic biomedicine, animal modeling, preclinical research and translational medicine. "Taiwan already has a wealth of talent and experience in basic and clinical MRI R&D, but the two fields are insufficiently integrated," said NARL President Ching-hua Lo. "This agreement will provide domestic industry, academia, research institutes, and medical service providers with the necessary MRI R&D services to enhance the nation's biomedical research capacity and promote clinical applications development. "At the same time, the platform will improve the development of high-end MRI system R&D skills and establish autonomous software and hardware design and manufacturing capability. It will also serve to cultivate experience in product development, certification, management and manufacturing." Lo said the new platform is expected to drive establishment of a domestic up, mid and downstream MRI production chain, turning Hsinchu Biomedical Science Park into Asia's biomedical imaging R&D and applications hub. "The vision of this tripartite cooperation is to make Taiwan home to the world's most advanced integrated brain imaging platform," NTU President Pan-chyr Yang said. "The aim is to make the nation a world-leader in brain research and clinical applications, leading to development of new technology for the early diagnosis and treatment of disorders such as Alzheimer's."

<http://www.taiwantoday.tw/ct.asp?xItem=212818&ctNode=445>

## 7. NTU research tests Parkinson's susceptibility genes

(Taipei Times, 23 12 2013)

Although international genome-wide studies have revealed significant links between certain genes and an increased risk of developing Parkinson's disease, research on the correlation conducted by a research team at National Taiwan University Hospital showed different results for Taiwanese people. Presenting the findings at a press conference held in Taipei to celebrate the sixth anniversary of the National Taiwan University Hospital's Center for Parkinson's and Movement Disorders, center convener and the hospital's neurology division director Ruey-mei Wu said that studies conducted in Europe and Japan indicated that gene polymorphisms of genes BST1, FBOX7, GAK, HLA-DRA, RIT2 and STX6 could play a key role in the development of idiopathic, or non-hereditary, Parkinson's disease, which accounts for about 95 percent of the cases of the disease. The team examined whether a correlation exists in Taiwanese with the disease between Parkinson's disease susceptibility genes and the risk of developing the condition. It found that two specific genetic variants of FBOX7 could lead to early-onset Parkinson's disease in Taiwanese, said Wu, a co-author of at least four of the research studies on the correlation. The study confirmed that GAK is a Parkinson's disease susceptibility gene found in a Taiwanese PD population, she added. However, in Taiwanese, the gene polymorphisms of HLA-DRA, RIT2, STX6, VDR and BST1 are not found to correlate with increased risk of developing Parkinson's disease, as found in foreign studies, according to the team. While the BST1 rs11724635 polymorphism is not associated with an increased risk of the disease in Taiwan, people with the gene variant are nevertheless 1.6 times more likely to develop Parkinson's disease if they use water from a well than those with the variant who do not use well water, according to a study on how environmental factors interact with the gene Wu said this might have to do with the heavy metals that have contaminated underground water.

<http://www.taipeitimes.com/News/front/archives/2013/12/23/2003579615>



## 8. Monascus products found to have compounds that curb diabetes

(Central News Agency, 25 12 2013)

A Taiwanese research team has published a paper in the science magazine *Food & Function* in which it says that a substance found in red yeast rice, or monascus, could play an important role in curbing diabetes. Among the 24 compounds the team identified from the product -- long a staple of Chinese traditional medicine -- 11 were first discovered by the scientists, with the ingredient monascin appearing the most effective in controlling diabetes. Tzu-ming Pan, a National Taiwan University professor and leader of the team, said further clinical trials on human are being carried out by the National Sun Yat-sen University and the results could be available in six months.

The team discovered that monascin inhibits inflammation and improves insulin resistance, and could therefore help diabetics better control their disease. Monascin is not cheap, however, Pan said, costing some NT\$11.62 million (US\$387,000) per gram. It is possible that monascin could be used in health products to treat Alzheimer's disease or metabolism-related diseases, but it might take more than a decade to commercialize such products, he added. According to government statistics, Taiwan has 1.56 million people being treated for diabetes. Pan said that by 2030, the population suffering from diabetes will have reached 366 million around the world, more than double the number in 2000.



National Taiwan University professor Pan Tzu-ming

<http://focustaiwan.tw/news/ast/201312250026.aspx>

## 9. See through: Driving as You've Never Seen Before

(ITRI Today, No. 75 4th Quarter 2013)

ITRI has developed the See-Through technology, which can blend video streams captured by both vehicles to render the vehicle ahead "transparent" for the vehicle behind when the vehicle ahead is close. This innovative vehicle safety technology proposed by Che-tsung Lin, Yu-chen Lin and Long-tai Chen from ITRI's Mechanical and Systems Research Laboratories was crowned as the Switzerland regional winner in the European Satellite Navigation Competition (ESNC) 2013 for its creativity and great potential. Che-tsung Lin indicates that the short-term goal for the development of See-Through will be to enhance the algorithm proficiency and efficiency. By improving the hardware performance as well as streamlining the programming process, it is expected to finish processing a single image in less than 1/30 second to meet the requirement of real-time V2V application. It is also hoped that with more high-tech integration, such as the support of the human machine interface and information communication technologies, See-Through can inch closer to daily-life applications to augment driving safety and convenience.



ITRI researcher Che-tsung Lin represented his team to claim the prize for the Switzerland regional winner in the ESNC 2013

[https://www.itri.org.tw/eng/econtent/about/about09\\_02.aspx?SCid=1&sid=132](https://www.itri.org.tw/eng/econtent/about/about09_02.aspx?SCid=1&sid=132)

## Research finds planets form much more quickly

(Taipei Times, 28 12 2013)

A Taiwanese researcher has discovered evidence of how planets formed in the early stages of the solar system, which could lead to a better understanding about how life on Earth emerged. Lai Shih-ping, a professor at National Tsing Hua University who leads an international research team, said previous studies indicated planets form millions or tens of millions of years after the birth of a star. However, Lai's discovery of a "protoplanetary" disk — a plate-like field upon which planets are formed — shows that planet formation could occur in less than 1 million years. The findings are published in the latest issue of the scientific journal *Astronomy and Astrophysics*. The project has taken Lai two years of planning with Nadia Murillo, a doctoral student in Germany, using the world's most advanced radio telescopes, known as astronomical interferometers, developed jointly by European, US and Asian scientists. A large group of radio telescopes, named the Atacama Large Millimeter Array (ALMA) has enabled Lai's team to examine a protostellar system called VLA1623A to better understand the correlation between the field and the planets. "The ALMA is amazing. It's 10 times more powerful than the Hubble telescope," she said. There are similarities between VLA1623A and our own solar system, which make it possible to apply some of the findings to Earth's formation, Lai said.

<http://www.taipeitimes.com/News/taiwan/archives/2013/12/28/2003579984>