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The National Science Council (NSC) held its 9th quadrennial National Science and Technology Conference on 17./18. December 2012 to set the national tech policy for the period 2013-2016. The conference's main theme was: "How to face Taiwan's technology transformation." Seven topics, such as how to deal with the brain drain in the field of technology or how to generate technology projects from a higher administrative level that integrate resources from different ministerial agencies were the main points of discussion. Other topics on the agenda included how to link upstream research with downstream industries, move forward coherent technology projects, promote sustainable development, and tackle the talent crisis in the science and technology sector. The event was attended by government agency heads, academics, industry specialists and influential businesspeople. It was noted that the technology sector needs to be reformed as the development policies had failed to change to cope with the rapid development in information and telecommunication over the past 15 years. The NSC is planning to implement a new project next year to foster cross-ministerial integration so that the heads of ministries can work together to forge major technology policies, such as the Ten Major Construction Projects, and reform the nation's technological infrastructure. It has been observed at the meeting that a large amount of the government's budget for technological development is dispersed among many small projects proposed by different agencies and reviewed by the council, resulting in ministry heads lacking the authority needed to conduct long-term, influential projects. Conclusions of the conference will be submitted to the cabinet for review and are to serve as an important reference for ministries to set science and technology policies and drive related research and development in the coming years.

News Highlights:

Intel Labs and ITRI jointly developed an experimental memory array that will enable low energy and higher performance – National Chung Cheng University students created a 'smart' pedometer – scientists developed a body lotion made with extract from soft corals grown in aquariums – the Council of Agriculture developed a new strain that can be used to produce a biopesticide fertilizer and animal feed – EMBO, EMBC and the National Science Council in Taiwan signed a cooperation agreement – three Academia Sinica Academicians and one Researcher got elected fellows of the American Association for the Advancement of Science – the Society of Genetics, Genomics and Computational Biology at National Cheng Kung University set up an education center to facilitate genetics and computational biology studies – the Stanford-Taiwan biomedical Fellowship Program helps develop new medical technology industry in Taiwan – ITRI unveiled an interactive TV app – the National Cheng Kung University developed a new generation of intelligent robots with mobility functions – ITRI made an integrated circuit technology breakthrough, developing an ultralow power system on chip (SoC) – the National Chin-Yi University of Technology unveiled a prototype of a submicron precision lathe, the most precise lathe designed and manufactured in Taiwan – local researchers developed a technique for extracting protein from silk fibers for possible use in cosmetics and the field of biomedicine.

Contents:

1.	Intel, ITRI announce research on super-fast memory	2
2.	University creates 'smart' pedometer	2
3.	Scientists make body lotion from coral	3
4.	Taiwan researchers develop new biopesticide from bacteria	3
5.	EMBO, EMBC and the National Science Council of Taiwan Sign Cooperation Agreement	3
6.	Three Academicians and One Researcher at Academia Sinica Elected Fellows of AAAS	4
7.	NCKU Sets Up Genetics, Genomics, Computational Biology Education Center	4
8.	Taiwan aiming to develop its medical technology industry	5
9.	Taiwan's ITRI unveils interactive TV app	5
10.	NCKU unveils i-Transport robot to assist the disabled	5
11.	ITRI makes IC technology breakthrough	6
12.	University unveils submicron precision lathe	6
13.	Taiwan researchers develop silk protein extraction technique	6



1. Intel, ITRI announce research on super-fast memory

(Central News Agency, 04 12 2012)

Intel Labs, the primary research arm of U.S. chip maker Intel Corp., announced an experimental memory array jointly developed with Taiwan's Industrial Technology Research Institute (ITRI) that will enable low energy and higher performance. The super-fast memory array architecture will be used in future ultra-mobile devices such as ultrabook lightweight computers, tablet computers and smartphones, as well as large data centers using cloud computing technology. "Taiwan has long been at the forefront of technology innovation and we look forward to continued research collaboration that sustains Taiwan's status as a major center of innovation for the global IT industry," Intel Chief Technology Officer Justin Rattner said at a news conference in Taipei. By creating memory with the new architecture, devices will be able to achieve longer battery life, faster integration of mobile data and improved graphics with higher resolution, Rattner said. Started in 2011, the research collaboration includes the creation of experimental memory arrays, prototyping and the development of model simulation software, he said. The research is expected to begin testing on terminal devices in 2013, including handheld devices and super computers, Rattner said. Wu Cheng-wen, vice president and general director of the ITRI's Information and Communications Research Laboratories, said the collaboration represents an effort to assist Taiwan-based foundries in meeting future market challenges. The joint research project is likely to have a significant impact on the development of future memory products and high-end application processors, Wu said. Additionally, the Intel-NTU Connected Context Computing Center, a joint center established in 2011 by Intel Labs, National Taiwan University and the National Science Council for machine-to-machine computing research, has made great progress, Rattner said. The center is working on research areas such as intelligent agriculture, remote healthcare management, in-home energy saving and intelligent transportation for greater safety, he said. The Intel-NTU center also offers internship opportunities to 12 international students from countries including the United States, the United Kingdom and Singapore, with another four Taiwanese students receiving internship at Intel Labs in the U.S., Rattner went on. The Intel-NTU center is the chipmaker's first research center for machine-to-machine communication technology to promote knowledge innovation. Intel has built its own worldwide university collaborative research network, including seven Intel science and technology centers in the U.S. and five collaborative research institutes in Europe and Asia, according to Intel Labs' website. Taiwan's Industrial Technology Research Institute and U.S.-based Intel Labs have developed a quicksilver experimental memory array that stands to significantly boost the local semiconductor industry, according to ITRI Dec. 5. The new technology, which has e-reader, cloud-based data center, laptop, smartphone and tablet applications, uses less energy while delivering higher performance. Devices featuring the technology will boast longer battery life, faster integration of mobile data and improved graphics with higher resolution. "Our partnership [with Intel Labs] enables Taiwan's semiconductor foundries to better prepare for fresh challenges forward," said ITRI Vice President Wu Cheng-wen. "It will also shape the future of the memory and high-end processor sectors." Justin Rattner, Intel chief technology officer, said Taiwan has long been at the forefront of technology innovation and his company looks forward to continued research collaboration sustaining the country as a major center of innovation for the global information technology industry. The next-generation technology is the result of a five-year project involving ITRI, Intel and the ROC Ministry of Economic Affairs. The three parties pledged to commit US\$5 million each in December 2011 to the creation of experimental memory arrays, prototyping and the development of model simulation software. Wu, who also doubles as director-general of ITRI's Information and Communications Research Laboratories, said testing is expected to begin in 2013 with rollout dependent on strategy planning with the parent company of Intel Labs, chipmaker Intel Corp. "By developing more efficient memory, the mobile devices of tomorrow will be better equipped to handle heavier data loads," he said. "We are all looking forward to the results of this exciting and productive collaboration."

http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aTPS&ID=201212040033

"ITRI, Intel unveil quicksilver memory technology": <http://www.taiwantoday.tw/ct.asp?xItem=199321&ctNode=445>

"ITRI, Intel Co-Release Experimental Memory Array": http://cens.com/cens/html/en/news/news_inner_42268.html

2. University creates 'smart' pedometer

(Central News Agency, 04 12 2012)

A pedometer designed by National Chung Cheng University students, a winner of the 2012 ARM design contest, is easy to wear and can provide more accurate and instant information on physical activity than existing devices, the Chiayi-based university said. Named the "I-wrist," the device is shaped like a wrist watch to make it easier to wear, the university said. It incorporates three-axis accelerometers to obtain more accurate calculations on the number of steps walked and the length of each step taken. Additionally, the blue-tooth transmission technology provides instant information on the user's heart rate and respiration, the university said. The pedometer, designed by Chou Po-ting, Wu Cheng-hsi and Tseng Shao-wei, placed third at the 7th ARM Code-O-Rama Design Contest among 110 entries, according to the results, which were announced in late November. The contest is organized by the Taiwan branch of the U.K.-based semiconductor intellectual property supplier ARM Holdings, Texas Instruments and Taiwan's National Chip Implementation Center, to encourage local college students to create smart devices that have applications in daily life. Tainan's National Cheng Kung University (NCKU) took the first prize this year with a "smart shoe" that



allows users to monitor dance moves and the calories consumed with a hand-held device and chip-integrated shoes. The New Taipei-based Oriental Institute of Technology's entry took second prize. It incorporates cloud technology to allow remote control of household appliances by gesturing to a "s

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3. Scientists make body lotion from coral

(Central News Agency, 08 12 2012)

Local scientists have developed a body lotion made with extract from soft corals grown in aquariums. Su Rui-hsin, an assistant researcher at the National Museum of Marine Biology & Aquarium in Checheng Township, Pingtung County and Wu Yu-ren, an associate professor at Meiho University in the southern Taiwan township, began to study ways to make body care materials from soft coral extracts two years ago. Wu said the extract is an effective anti-inflammatory substance and can soothe the nervous system, cure small wounds, whiten the skin and slow the aging process. Wu said he and Su have succeeded in using the coral extract to make moisturizing body lotion, anti-wrinkle cream, skin-whitening cream and makeup-removing lotion. The extract is drawn from coral cultivated by the National Museum of Marine Biology & Aquarium rather than wild coral, so the process does not damage the environment. Su said the chemical component of the extract is very stable and the technology to obtain the extract is well-established, adding that two local cosmetics companies are interested in buying the expertise. The National Museum of Marine Biology & Aquarium began 10 years ago to cultivate soft corals -- known for the difficulty of growing them in captivity -- and few studies have been conducted on these species. Thanks to its successful cooperation with Meiho University in developing the body lotion, the museum is going to enter into a strategic alliance with the university, Su added.

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4. Taiwan researchers develop new biopesticide from bacteria

(Central News Agency, 11 12 2012)

Taiwan's Council of Agriculture (COA) said it has successfully developed a new strain of bacteria that can be used to produce a biopesticide, fertilizer and animal feed. Hsieh Feng-chia, head of the project at the COA's Taiwan Agricultural Chemicals and Toxic Substances Research Institute, said researchers spent five years collecting thousands of bacterial strains from deep mountain soil in Taiwan. They then spent another three years working with the National Science Council to isolate the bacteria and create a novel strain called *Bacillus amyloliquefaciens*, coded "Ba-BPD1," he said. Director of the research institute Fei Wen-chi said the new strain of bacteria can produce antibiotic substances such as iturin and surfactin that inhibit the growth of fungus and harmful bacteria. It also helps plants absorb higher amounts of phosphorus, which is vital to their growth and health, Fei said. Trials of the biopesticide on strawberries and Chinese cabbage showed that it helps double the crop yield, she said. The biopesticide also protect animals against harmful bacteria, making it a desirable feed additive, the institute said. The new bacterial strain was patented in Taiwan in October and is awaiting patent approval in China and the United States, Fei said. Taiwan Fertilizer Co. has paid NT\$1.7 million (US\$58,454) for non-exclusive rights to mass produce the natural pesticide, according to the institute. The biopesticide has also attracted the interest of the German chemical and drug group Bayer HealthCare and Japanese pharmaceutical company Daiippon Sumitomo Pharma Co., the institute said.

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5. EMBO, EMBC and the National Science Council of Taiwan Sign Cooperation Agreement

(MEPO Forum, 13 12 2012)

New ways of global scientific interaction have been created following a cooperation agreement between EMBO, its inter-governmental funding body, the European Molecular Biology Conference (EMBC), and the National Science Council of Taiwan (NSC). The agreement will allow Taiwanese scientists to participate in EMBO training programmes and activities. It also means that EMBO Courses & Workshops can take place at Taiwanese research institutes. This is the first cooperation agreement of its kind between EMBO, EMBC and Taiwanese scientists, represented by NSC and Academia Sinica. The Taipei City-based Academia Sinica and NSC work together to create new opportunities for Taiwanese life scientists. Under the terms of the agreement, scientists can apply for EMBO Short-Term and Long-Term Fellowships. Young Taiwanese group leaders will be eligible to benefit from the EMBO Young Investigator Programme, which provides outstanding young scientists with financial, academic and practical support to start up their first independent research laboratories. Taiwanese scientists and EMBO will also cooperate in the organization of EMBO Courses & Workshops, which will help to spark collaborations between different scientific disciplines. Earlier this year, Academia Sinica and EMBO jointly organized the lecture course "Logic of Regulatory Circuits in Life Sciences" in Taipei City. Conference organizers can apply for funding for plenary lectures given by EMBO Members or lectures given by EMBO Young Investigators at Taiwanese institutes and universities. Travel



stipends will be available for Taiwanese scientists to attend EMBO Courses & Workshops and The EMBO Meeting. The cooperation agreement will run for three years.

<http://web1.nsc.gov.tw/techwp.aspx?id=1011209001&ctunit=208&ctnode=287&mp=7>

6. Three Academicians and One Researcher at Academia Sinica Elected Fellows of AAAS

(MEPO Forum, 13 12 2012)

Three Academia Sinica Academicians and one Research Fellow have been elected fellows of the American Association for the Advancement of Science (AAAS), the association announced November 29. Academicians Samuel TING, Chien HO and Wen-Hwa LEE, and Academia Sinica Research Fellow, Wolfgang SCHMIDT received the honor, which will be conferred at the AAAS Fellows Forum on February 16 during the 2013 AAAS Annual Meeting in Boston. This year 702 members of AAAS were elected by their peers as fellows in 24 different sections. Academician Samuel TING was elected to the Physics section; and Academicians Chien HO and Wen-Hwa LEE, and Research Fellow Wolfgang SCHMIDT were elected to the Biological Sciences section. This year's AAAS Fellows will be formally announced in the AAAS News & Notes section of the journal Science on 30 November 2012. Academician Samuel C.C. TING, the Thomas D. Cabot Professor of Physics in Massachusetts Institute of Technology and 1976 Nobel Laureate of Physics, was elected for his "distinguished contributions to particle physics, particularly the installation of the Alpha Magnetic Spectrometer on the International Space Station". Academician Chien HO, an Alumni Professor at Department of Biological Sciences, Carnegie Mellon University, was elected for his "pioneering the use of magnetic resonance to unravel allosteric mechanisms of hemoglobin, and to develop a non-invasive method to monitor immune responses in vivo." Academician Wen-Hwa LEE, Distinguished Research Fellow at Genomics Research Center, Academia Sinica, was elected for "pioneering contributions to the understanding of human tumor suppressors, including Retinoblastoma gene, p53 and BRCA genes in cell cycle, differentiation and genomic stability." Dr. Wolfgang SCHMIDT, a Research Fellow at the Institute of Plant and Microbial Biology at Academia Sinica, who specializes in systems biology, molecular plant nutrition and root development, was elected for his "distinguished contributions in the field of molecular plant nutrition, in particular for implementing bioinformatics tools and high-throughput technologies into a systems biology approach." The AAAS was founded in 1848. It is the world's largest general scientific society and includes about 262 affiliated societies and academies of science. The mission of the non-profit association is to advance science and serve society through initiatives in territories including science policy, international programs and science education. The AAAS is the publisher of Science, Science Translational Medicine and Science Signaling. The tradition of AAAS Fellows began in 1874.

<http://web1.nsc.gov.tw/techwp.aspx?id=1011209002&ctunit=208&ctnode=287&mp=7>

7. NCKU Sets Up Genetics, Genomics, Computational Biology Education Center

(MEPO Forum, 18 12 2012)

The Society of Genetics, Genomics and Computational Biology had officially set up an education center at National Cheng Kung University (NCKU), southern Taiwan, to facilitate genetics and computational biology studies and to promote international interaction and communication in these fields, the university announced Dec. 5. Dr. Chi-Chuan Hwang, Chair of the education center, said that in order to promote research in these areas, the society had set up different teams based on different job contents, including the biology database team, the non-biological resource team, the computational biology skills team, the genetics team, the biotechnology team and the talent development team, and assigned people from the society's member countries to these teams. "The education center established at NCKU is focusing on talent cultivation," said Hwang, adding that the center hopes to recruit young students from different fields, including biology, medicine and engineering, in order to conduct interdisciplinary research. With Fujitsu providing the hardware equipment, the first step taken by the education center was to ensure that the new software is capable of handling huge amount of data, and also to carry out the construction of gene pool and genome sequencing alignment, according to Hwang. Japan's National Institute of Genetics (NIG) Deputy Director Takashi Gojobori, who is also Visiting Distinguished Chair Professor of NCKU, pointed out that efforts will be focused on the research of the variation of native species in Taiwan, especially the collection and analysis of seed gene pool, to build a complete gene sequencing database and also conduct a complete gene sequencing analysis on the collected genes. The center will serve as an important platform for international interaction and communication in these fields, according to GOJOBORI who serves as the president of the center, whose main purpose is not only to develop and nurture talent for research, but also to recruit domestic and foreign scholars to conduct education training and organize idea exchange sessions between member countries including China, Japan, South Korea, and Malaysia. The education content includes the research themes of each team in this society, which will be executed at three levels -- foundation, application and advancement. Besides, this center will host and organize an annual international competition in order to lead Taiwan towards achieving international level of competitiveness as well as to strengthen the cooperation between Taiwan and other member countries in these fields.

<http://web1.nsc.gov.tw/techwp.aspx?id=1011215031&ctunit=208&ctnode=287&mp=7>



8. Taiwan aiming to develop its medical technology industry

(Central News Agency, 24 12 2012)

A cooperative project between Taiwan and the United States in the field of medical technology has proved successful and can now be used as a stepping stone for Taiwan to seek more business in that area, Taiwan's National Applied Research Laboratories (NARL) said. Nearly 30 Taiwanese doctors and professionals have participated in the seven-year Stanford-Taiwan Biomedical Fellowship Program (STB), and 17 have come back to Taiwan to either start their own business or transfer technological expertise to commercial production, said Lin Bou-wen, who is in charge of the program in Taiwan. The 17 returning participants have already established eight startups or innovation teams, but the business aspect is still in the early stages, he said at a press briefing. Taiwan's healthcare industry has great potential and already has a small share of the global medical equipment market, Lin said. In 2011, the output value of the industry in Taiwan totaled US\$2.5 billion, less than 1 percent of the global market of US\$273.3 billion, he said. "There are big business opportunities" in the medical equipment sector, Lin said. The sector has been growing annually by 4 to 6 percent because of the aging society and an increasing number of people suffering from chronic diseases, according to Lin. Among the 17 returning participants in the Taiwan-U.S. cooperative project are Jeffrey Mao and Carson Chen, both of whom spoke at the press conference about their experience in the program. Mao, who has a background in mechanics, said he learned about cash flow and business models as well as how to apply his expertise to medical technology. "Even poor designs are valuable as long as you can find a niche," he told CNA on the sidelines of the event. After joining the program in 2008, Mao came up with a mechanical-powered knee brace called "iStrider," which he said can help people with osteoarthritis walk and climb stairs more easily. Currently, Mao is refining the model for a second version, which he said will be lighter and easier to wear. It will become available in about two years time, he said. Meanwhile, Chen, who has a doctoral degree in electric engineering, said he and two other STB participants started an enterprise one month after they returned to Taiwan in July, with the aim of providing mobile services in healthcare. Chen said he and his team have devised a prototype that incorporates information and communication technology and they are seeking a partnership. However, he declined to give any further information about the initiative. Initiated in 2008, the Taiwan-U.S. cooperative project is a multidisciplinary program to train the next generation of medical technology innovators and create an innovative core in Taiwan, according to the NARL. Under the project, 41 Taiwanese professionals are being sent to the U.S. over a seven-year period at an annual cost of NT\$30 million (US\$1.03 million). Alongside that program, the NARL said, it has also launched a local project to nurture talent in medical technology-related fields and so far, has produced over 30 innovations of commercial value.

http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aECO&ID=201212240011

9. Taiwan's ITRI unveils interactive TV app

(Taiwan Today, 24 12 2012)

The Industrial Technology Research Institute in northern Taiwan's Hsinchu City unveiled CutX App Dec. 22, a free smartphone application allowing users to interact with televisions. "CutX is the nation's first innovative service successfully integrating content providers with social media," Chou Sheng-lin, deputy director of ITRI's Information and Communications Research Laboratories, said at the launching ceremony in Taipei City. "It is also the first cross-media cooperation between the sectors of television and Internet apps." "CutX enables users to capture images and video clips instantly from the program they are watching or from those they have missed, note down important information and take pictures of or record stunning scenes," Chou explained, adding that the captured scenes can be shared with friends through Facebook and other social media. Chou pointed out that the saved images will not take up any storage space in one's smartphone, because when users download CutX, the software automatically establishes an exclusive database in the cloud server to store photos and clips. Users need only launch the app to retrieve something, he said. Another feature supports searches for information on brands, restaurants, tourist attractions, cuisine or recipes that appear in soap operas, travel shows or food programs. Through ITRI's collaboration with companies such as Taiwan's China Television Co., Formosa TV and Unique Broadcasting Inc., CutX users can also view programs offered by these channels, Chou said. The app won the 2012 European Interactive TV Grand Challenge in Berlin, Germany, in July. Offered in both Android and iOS versions, it can be downloaded free at Google Play and Apple Inc.'s App Store.

<http://www.taiwantoday.tw/ct.asp?xItem=200067&ctNode=445>

10. NCKU unveils i-Transport robot to assist the disabled

(China Post, 25 12 2012)

A new generation of intelligent robots with mobility functions such as lifting disabled people and helping them to stand has been developed by a National Cheng Kung University (NCKU) research team. The i-Transport machines can be adjusted to perfectly accommodate an individual user's height and body type. The team was led by Fong-Chin Su and Tain-Song Chen, professors from the NCKU Department of BioMedical Engineering. Su said that i-Transport was designed with an embedded health monitoring system for tracking blood pressure and breathing conditions, providing the disabled with the basic yet vital ability to stand and move.

<http://www.chinapost.com.tw/taiwan/national/national-news/2012/12/25/365184/NCKU-unveils.htm>



11. ITRI makes IC technology breakthrough

(Taiwan Today, 26 12 2012)

Taiwan's Industrial Technology Research Institute has made an integrated circuit technology breakthrough, developing an ultralow power SoC, or system on chip, which is energy efficient and environmentally friendly. "Boasting optimized energy management capabilities, the technology has applications in IC design and product development involving audio, signals and video compression," ITRI Vice President Wu Cheng-wen said Dec. 25. According to ITRI, the video recording chip runs at only 0.6 voltage, half of a traditional SoC, and employs proprietary technology developed by the state-run research organization in conjunction with local academia and semiconductor firms. Capable of cutting power consumption by 75 percent, the technology is an ideal candidate for developing extended usage devices such as event data recorders. Utilizing maximum power point tracking technology, an electronic system that allows energy modules to operate at top capacity, ITRI also incorporates thermoelectricity into the design. This enables the chip to use environmental energy sources such as body heat and light, with possible applications including handheld smart devices and medical electronics. The ITRI innovation spans complete design flow and verification procedures, Wu said, as well as methodology and various ultralow power consumption IC modules. "Such a highly integrated design approach is the focus of many research institutes and IC design houses around the world. "ITRI has begun patent applications and will soon start working with local firms on product development," Wu said, adding that he expects this partnership to spur advanced R&D activity in Taiwan.



<http://www.taiwantoday.tw/ct.asp?xItem=200150&ctNode=445>

12. University unveils submicron precision lathe

(Central News Agency, 26 12 2012)

A university in Taichung unveiled a prototype of a submicron precision lathe that the school says is the most precise lathe designed and manufactured in Taiwan. The submicron precision lathe made by National Chin-Yi University of Technology can make components with tolerances as small as 0.2 microns (a micron is 0.001 millimeters), said Tsai Kuo-ming, an associate professor who was involved in the machine's design. Tsai said Taiwan's machine tool industry is among the best in the world, but Japan and Germany still have a technical edge in producing components used in the ultra-precision lathes that produce parts used in high-tech electronics gadgets, such as optical lenses, that have to be precise, thin and lightweight. As a result, Taiwan's lens suppliers and optical companies have had to import such lathes from abroad, he said. Hsieh Chung-yu, director of a research center at the university, explained that the critical components for ultra-precision lathes are spindles, controllers, positioning measurement systems, and guideways. Taiwan has had the ability to produce spindles and positioning measurement devices, but the university made a breakthrough in the area of hydrostatic guideways, and advanced controllers are currently being tested, Hsieh said. The research center director said that the school is testing controllers made locally on its precision lathe to see if they can meet the general high standard of the new machine. Hsieh said the school hopes the testing phase for controllers can be completed in 2013 so that it can manufacture a submicron precision lathe to supply to local factories in which all of the critical parts are made in Taiwan.

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13. Taiwan researchers develop silk protein extraction technique

(Central News Agency, 26 12 2012)

Researchers at the Council of Agriculture's Miaoli District Agricultural Improvement Station said they have developed a technique for extracting protein from silk fibers for possible use in cosmetics and the field of biomedicine. Wu Teng-chen, a researcher at the station, said silk fibers are composed mainly of protein and its base amino acid. The inner layer of a silk fiber is made of fibroin, a natural protein, while its outer layer is sericin, a gelatinous protein that allows both layers to stick together, Wu said. Sericin can preserve and maintain moisture, is anti-oxidant, and can prevent the penetration of ultraviolet rays, Wu said. Fibroin is also UV absorbing and anti-bacterial, he said. Both proteins extracted from silk fibers can be used to make cosmetics, health products, synthetic fibers, and biomedical materials, according to researchers.

http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aALL&ID=201212260049