

ITRI TODAY

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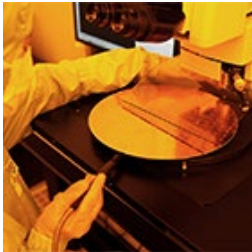


ITRI Takes Helm as RIN Chair, Pioneering Talent Exchange

ITRI assumes the chairmanship of RIN and takes the lead in talent exchange within RIN with a focus on green energy, material development, medical care, and semiconductor research and development.



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ITRI Celebrates Golden Jubilee

On July 5, ITRI celebrated its historic [50th anniversary](#). Over the past five decades, ITRI has remained steadfast in its commitment to empowering Taiwan's industries through innovations, transforming Taiwan from a labor-intensive economy to a technologically advanced country. In light of this significant milestone, ITRI's Chairman and President each took the opportunity to reflect on the Institute's history and outline the vision for the future.



President Tsai Ing-wen attended the golden jubilee ceremony and presented commemorative trophies to the Chairmen and Presidents of ITRI as a token of appreciation for their dedication over the years.

“50 years ago, ITRI was founded as the first applied technology research institution in Taiwan,” remarked ITRI Chairman Chih-Kung Lee. “Throughout the years, ITRI has made significant contributions to driving the growth of emerging industries in various sectors, including semiconductors, ICT, materials and chemicals, machinery, biomedicine, and green

energy.” To commemorate ITRI’s role in advancing Taiwan’s industrialization in these fields, Lee announced the inauguration of an ITRI museum as part of the anniversary celebration. The museum exhibits hundreds of historical documents and objects that bear witness to Taiwan’s industrialization progress and technological milestones over the past five decades, including Taiwan’s first commercial integrated circuit developed in 1976 and the world’s first two-layer flexible copper-clad laminate introduced in 1996.



ITRI Museum of History showcases historical documents and objects that illustrate Taiwan’s progress in semiconductors, ICT, materials and chemicals, machinery, biomedicine, and green energy. (Image from Plain Design)

“As the driving force across industries, ITRI has successfully transitioned Taiwan from a technology follower to a global innovator over the years,” said ITRI President Edwin Liu. To navigate the dynamic global landscape, Dr. Liu declared the rollout of ITRI’s 2035 Technology Strategy and Roadmap. This initiative aims to foster market-oriented development and support industries in four key application domains: Smart Living, Quality Health, Sustainable Environment, and Resilient Society. Dr. Liu highlighted the Institute’s support in net-zero transition and digital transformation for industries, which are crucial for enhancing Taiwan’s global competitiveness. Leveraging its technological capabilities, ITRI is also deepening partnerships with global allies such as the United States, the United Kingdom, Japan, Europe, and many others, positioning Taiwan as a trustable partner among the international community.

Learn more about ITRI's semiconductor development history and future international cooperation.

 [The Birth of Taiwan's Semiconductor Industry](#) 

 [ITRI to Strengthen Taiwan-UK Semiconductor Collaborations](#) 



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» Feature

The Birth of Taiwan's Semiconductor Industry

Since its establishment in 1973, ITRI has played an integral part in pioneering Taiwan's IC development. Yet it is little known that the world-famous semiconductor industry in Taiwan all started with a breakfast meeting.

The time was 1974. In an unassuming breakfast shop, seven men were having a meeting, formulating something big for Taiwan. These individuals were the then Minister of Economic Affairs Yun-Suan Sun, Director General of Transportation and Communications Yu-Shu Kao, ITRI President Chao-Chen Wang, Telecommunication Laboratories Director Bao-Huang Kang, Executive Yuan Secretary-General Hua Fei, Director General of Telecommunications Hsien-Chi Fang, and Radio Corporation of America (RCA) Laboratories Director Wen-Yuan Pan. Over a meal, the semiconductor blueprint that would shape Taiwan's future was established.

Wen-Yuan Pan, one of the key players, shut himself away after the meeting to draft a proposal for the IC development project. ITRI's Electronics Research and Service Organization was the first to join this project. Two years later, a contract initiating the IC technology transfer and licensing was signed between ITRI and RCA, marking the official introduction of semiconductor technology to Taiwan.



ITRI and RCA signed an IC technology transfer and licensing contract in 1976.

A group of 19 skilled engineers were then handpicked by ITRI and sent to RCA for intensive training in the US. The engineers were divided into teams, each specializing in a different aspect of IC development. One team studied IC design in New Jersey, another delved into manufacturing processes in Ohio, a third team mastered verification procedures in California, while the fourth team honed their skills in equipment handling in Florida.

The return of these talented engineers marked a new era for Taiwan's semiconductor industry. They combined their newfound expertise and laid the foundations of an IC demonstration factory. In 1977, Taiwan's first IC production line was launched, and within six months, it achieved a 70% yield rate, surpassing even the original RCA plant's 50% yield rate. The first batch of Taiwan-made ICs for electronic watches was produced the next year, which made a splash and transformed the nation into the world's third-largest electronic watch exporter.

Encouraged by this success, ITRI took a step forward and birthed United Microelectronics Corporation (UMC) in 1980—one of the earliest to make its home in Hsinchu Science Park—and transferred its 4-inch wafer technology and its team of researchers to the spin-off company. UMC, too, flourished in the wake of its creation, but global technology protectionism posed a challenge for Taiwan to acquire overseas technology.



Taiwan's first 4-inch wafer manufacturer, UMC, was spun off by ITRI in 1980.

Undeterred, ITRI decided to initiate the very large-scale integration (VLSI) project. Notably, it was also around the same time that Morris Chang started his tenure as ITRI President. Within two years of the project's inception, the VLSI demonstration factory became a reality.

In 1987, ITRI spun off a chip manufacturing facility, transferring fabs, equipment, technologies, and 98 professionals to the company. This venture was none other than the now world-renowned Taiwan Semiconductor Manufacturing Company (TSMC). Having a dedicated foundry to produce chips for other semiconductor companies was a new concept at the time. This IC OEM model allowed IC design companies to commission TSMC to produce their designs without the need for costly fabs, spurring the establishment of numerous new IC design companies in Taiwan. In 1989, ITRI spun off Taiwan Mask Corporation, further lowering the manufacturing cost of IC products and streamlining procedures, which bolstered market competitiveness. As the 1990s dawned, Taiwan's semiconductor industry had developed a complete industry chain.

ITRI continued its pursuit of excellence in the world of semiconductors. In 2010, ITRI established Asia's first 3D IC R&D laboratory equipped with a comprehensive through-silicon via (TSV) process for 12-inch 3D ICs. Collaborating with the world-leading semiconductor IP design company Arm in 2021, ITRI set up an innovative IC design platform. ITRI also launched the Southern Rainforest Project to develop materials, components, equipment, and

applications and cultivate talent in compound semiconductors, spurring growth in automotive power and green energy electronics.



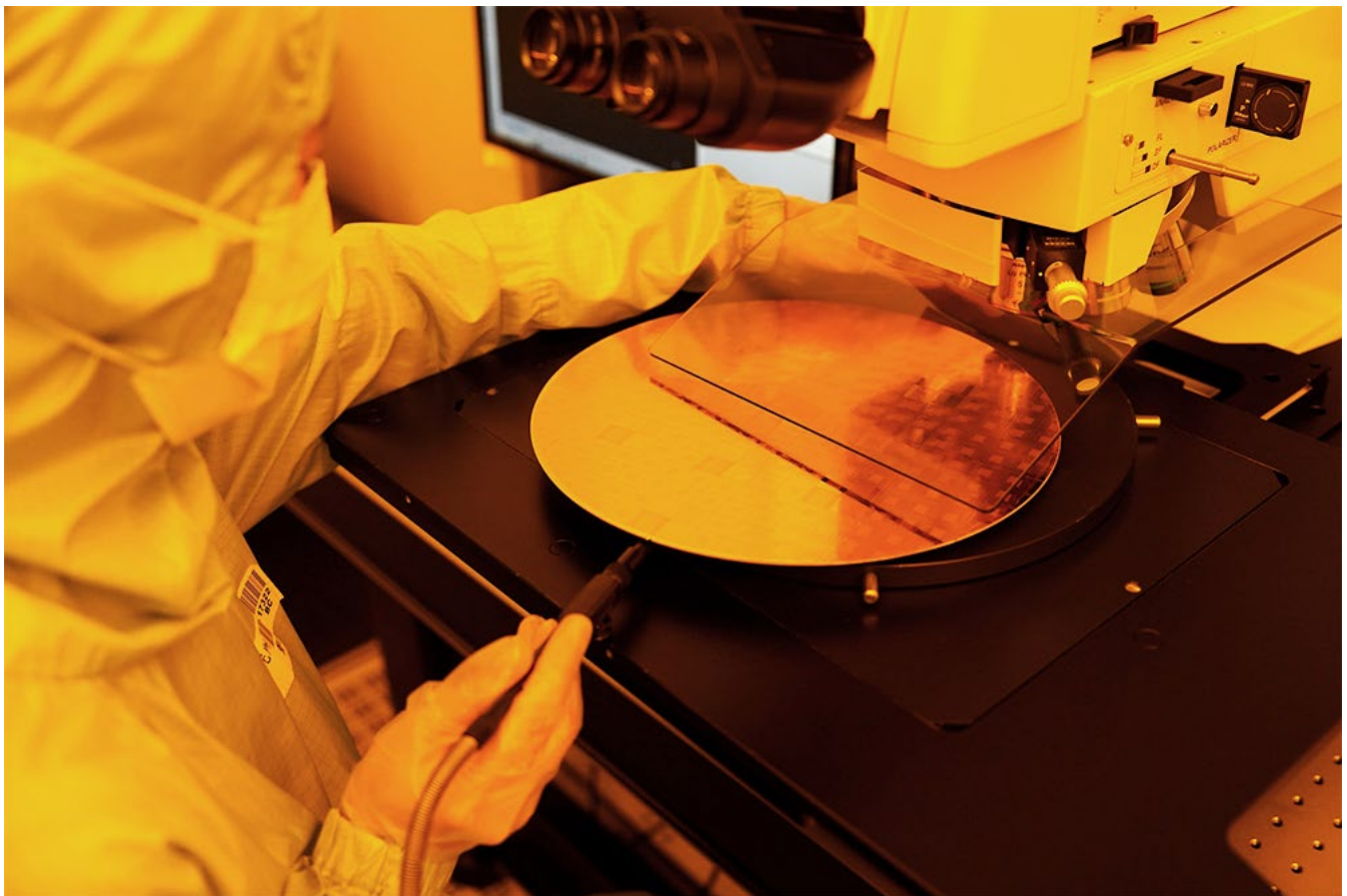
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**» Feature**

ITRI to Strengthen Taiwan-UK Semiconductor Collaborations



ITRI looks to offer consultation services for advanced packaging pilot lines and pre-production evaluations to strengthen supply chain resilience.

The newly established Department for Science, Innovation and Technology (DSIT) in the UK recently released its National Semiconductor Strategy. According to the Strategy, the British government plans to invest 1 billion pounds over the next decade to support the semiconductor industry. This funding will improve access to infrastructure, power more research and development, and facilitate greater international cooperation.

Dr. Shih-Chieh Chang, General Director of Electronic and Optoelectronic System Research Laboratories at ITRI had an initial exchange with DSIT. During the exchange, Dr. Chang suggested that Taiwan could become a trustable partner for the UK and that the partnership

might leverage collective strengths to create mutually beneficial developments. Dr. Chang stressed that ITRI looked forward to more collaboration with the UK on semiconductors to enhance supply chain resilience. While the UK possesses cutting-edge capabilities in semiconductor IP design and compound semiconductor technology, ITRI has extensive expertise in semiconductor technology R&D and trial production. As a result, ITRI is well-positioned to offer consultation services for advanced packaging pilot lines, facilitate pre-production evaluation, and link British semiconductor IP design companies with Taiwan's semiconductor industry chain. "The expansion of British manufacturers' service capacity in Taiwan would create a mutually beneficial outcome for both Taiwan and the UK," said Dr. Chang.

The UK has increased collaboration with Taiwan on semiconductors over the last few years. In 2020, the Compound Semiconductor Applications (CSA) Catapult signed a memorandum of understanding with ITRI, paving the way for a long-lasting collaborative partnership. The Department for Business and Trade (DBT) is also focusing the Digital Trade Network in Taiwan to increase the UK's capability to support semiconductor trade and investment.

Dr. Chang indicated that possible collaboration can be forged to align the goals of the UK's National Semiconductor Strategy and the expected positive impact. ITRI, he suggested, could assist in establishing relevant pilot lines by introducing necessary resources to address existing gaps or offering consultation services covering design, packaging, and testing prior to mass production. This would help reduce the UK's reliance on external suppliers and thus create job opportunities. To minimize the risk of supply chain disruptions, the linkage of Taiwan's complete semiconductor industry chain might significantly enhance the UK's resilience in the global market as more comprehensive solutions can shorten time-to-market for innovative products and accelerate overall industrial development.

Other than the collaboration with CSA Catapult on GaN semiconductor technologies, ITRI partnered with a renowned British semiconductor equipment manufacturer in 2021, resulting in achievements in areas such as HBLED, MEMS, Micro LED, silicon photonics, and nanoscale analysis. In the same year, ITRI worked with a leading British semiconductor IP manufacturer to jointly build a platform that assists startup companies in leveraging key patents to develop competitive new products. Based on these fruitful results, ITRI hopes to expand its collaborative efforts with the UK in 2023, creating win-win opportunities for both sides.





» Spotlight

ITRI Assumes Chairmanship of RIN and Spearheads Talent Exchange within RIN

ITRI, having been engaging in international collaborations spanning diverse sectors including semiconductors, green energy, and advanced materials for years, has recently achieved significant milestones through its membership in the European Association of Research & Technology Organizations (EARTO), the largest R&D association in Europe. Notably, ITRI has taken on the role of chairing EARTO's international research community—the RTOs International Network (RIN)—and spearheaded RIN's initiative for talent exchange. Furthermore, ITRI has secured the honor of hosting the 2024 EARTO RIN CEO Meeting in Taiwan.

Stephen Su, ITRI Senior Vice President and the new RIN chairman, stated that given RIN's role as one of the world's most crucial platforms connecting vital R&D institutions worldwide, ITRI aims to deepen connections between industry, academia, and global stakeholders. This effort will nurture collaborative opportunities and elevate Taiwan's standing as a trustable partner in global technological innovation endeavors. ITRI's innovative technology and robust industrialization capabilities are poised to play a central role in achieving these objectives.



At the 2023 RIN CEO Meeting, Professor Iain Stewart, the inaugural chairman (right), passes on the symbol of chairmanship to Stephen Su (left), the second RIN chairman.

Under the leadership of ITRI President Edwin Liu, an agreement for talent exchange has been signed with National Research Council (NRC) President Iain Stewart, marking the inaugural talent exchange agreement within RIN. This agreement entails plans for personnel exchange visits starting this October, with a focus on green energy, material development, medical care, and semiconductor domains. Profound interactions with NRC can be anticipated in terms of increased exchanges of international talents and technological collaborations.



ITRI President Edwin Liu (left), and NRC President Iain Stewart (right), display the first RIN talent exchange agreement they initiated.

Moreover, as the EARTO RIN CEO Meeting has historically taken place in Europe and Canada, ITRI's privilege as the first Asian host represents another significant milestone for Taiwan. The presence of RIN executive members in Taiwan is expected to bolster Taiwan's global visibility, nurturing further international collaboration, talent exchange, and business prospects.

RIN operates as an organization under EARTO and is dedicated to promoting international collaboration in research, development, and innovation. It has 16 RTO members, including prestigious institutions such as Fraunhofer, CEA, and the National Institute of Advanced Industrial Science and Technology (AIST), among others. Visit the official [EARTO website](#) to learn more.



» Spotlight



Grapes & Green Tech: Agro-Tech Reshaping Vineyard Cultivation

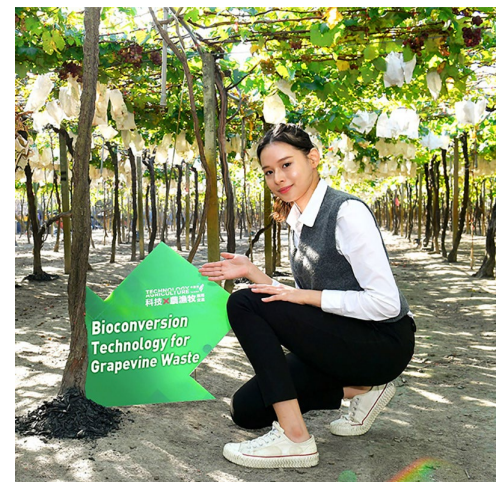
Grape wine has long been one of the most beloved alcoholic beverages worldwide, with continuously rising demand around the globe. Productivity in vineyards, however, is facing challenges due to climate change and the declining and aging rural population. Furthermore, consumers are showing a growing interest in wines that are environmentally responsible.

To address these issues, ITRI has proposed a solution that integrates three of its green technologies: ecological material production equipment, intelligent LED illuminating modules, and hybrid unmanned vehicles for pesticide spraying. The outcome not only enhances grape harvest and product value but also saves energy and reduces carbon emissions within the sector.

Transforming Pruning Waste into Valuable Ecological Materials

Erlin Township has the highest density of wine grape cultivation and wineries in Taiwan. One of its most important annual activities is the removal of old wood and other pruning residues, which come in large volumes. The most common disposal method for these pruning wastes is burning, but this approach not only causes air pollution but also increases carbon footprints.

ITRI and the local government have therefore co-developed ecological material production equipment which can transform pruning wastes into value-added vinegar and functional biochar. The vinegar serves both as soil fertilizer and insect repellent, enhancing soil quality while reducing the use of pesticides. The functional biochar, with its far-infrared properties, protects grapevine roots from cold damage and significantly mitigates the impact of winter on harvests. With this technology, Erlin alone has reduced its annual carbon emissions by approximately 56,000 metric tons.



Vine prunings are transformed into biochar and vinegar that can protect roots, promote soil quality, and repel insects and diseases.

Smart Lighting to Boost Sweetness & Conserve Energy

In addition to its efforts in vineyard debris processing, ITRI has developed an intelligent LED illuminating module for fruit optimization. This illuminating system incorporates intelligent circuits that enable growers to adjust the light intensity and spectrum based on grapes' different growth stages. By utilizing this system, wine grapes' sweetness level, typically around 15 to 17 degrees, can be raised to above 20 degrees, resulting in wines with more pronounced and captivating flavors. Moreover, farmers using this system can enhance grape yield and quality without the need to constantly replace lamps, while cutting the electricity bill by half, as this system consumes over 50% less power compared to traditional light sources. Apart from its application in vineyards, this system has also been employed in cultivating eustoma, Taiwan's largest export flower. This technology not only boosted the number of buds per spur by 50% but also enabled farmers to adjust their production and shipment cycles based on market price fluctuations.



The intelligent LED illuminating module provides different lighting to enhance fruit sweetness while lowering growers' electricity bill.

Hybrid Unmanned Vehicle Enhancing Labor Productivity

Recognizing the physical burden on grape farmers, ITRI has introduced a gasoline-electric hybrid vehicle for pesticide spraying. This vehicle can be operated remotely at a distance of over 100 meters and has a load capacity of 500 kilograms of pesticides. In addition to efficient remote pesticide application, the vehicle also allows for precise spraying. The operator can

monitor the process through a screen and adjust the spray boom's height accordingly. In about 15 minutes, the vehicle can cover an area of approximately 970 square meters, significantly enhancing productivity and efficiency in grape farming.



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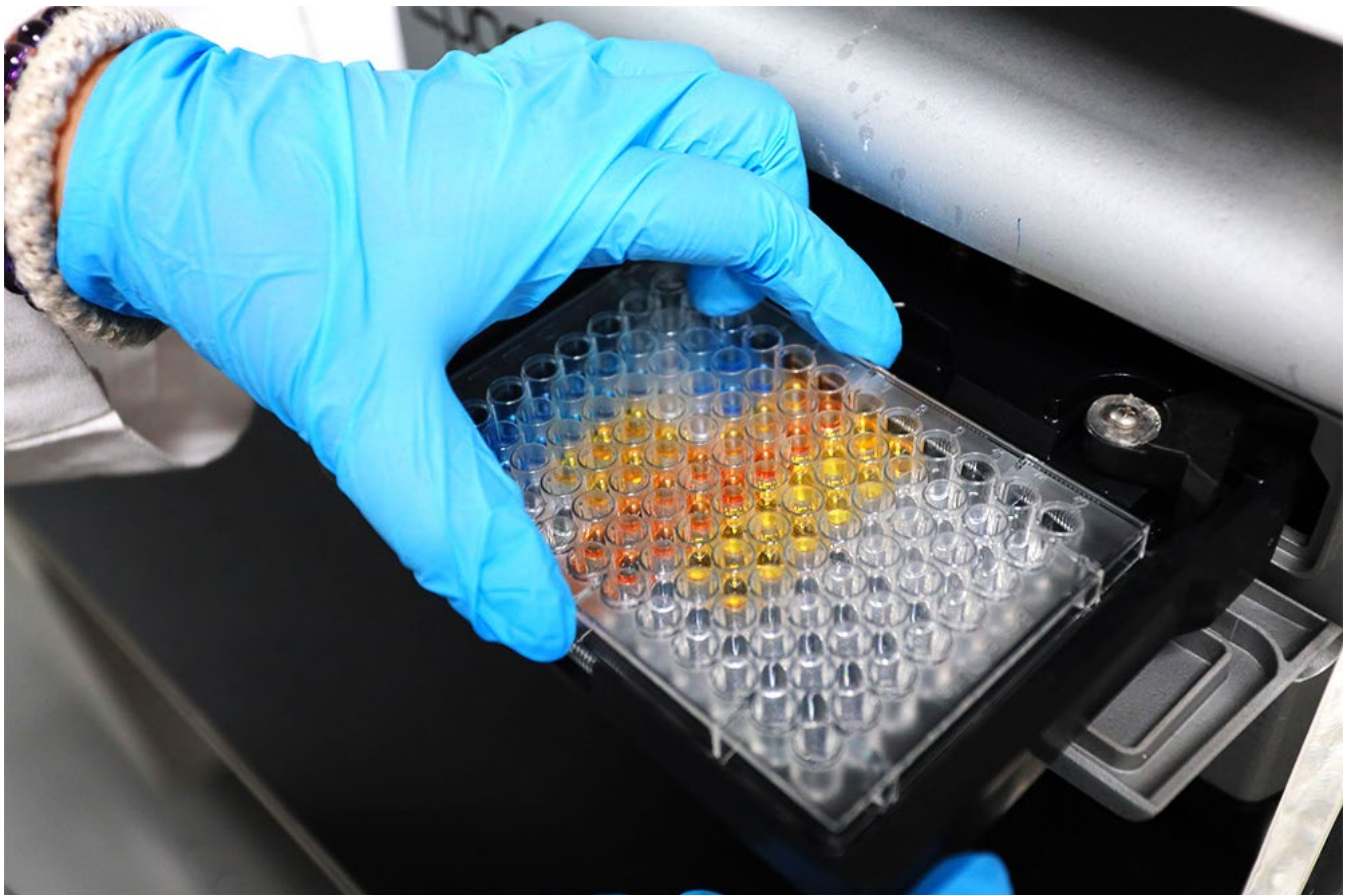
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» Spotlight

Unexpected Ingredients for Enhancing Beauty Products: Geothermal Bacterial Byproducts

As consumers become more environmentally conscious, the demand for sustainable and eco-friendly options in the beauty industry has seen a significant rise. ITRI's geothermal bio-ingredients offer an environmentally-conscious beauty solution that addresses this need. The incorporation of geothermal bacterial byproducts in hair and skincare products has proven to greatly enhance their penetration and absorption rates, reducing the reliance on synthetic chemicals that can be harmful to both humans and the environment.



The geothermal bacterial byproduct is an effective natural ingredient for hair and skincare products and has displayed great potential for wide application.

During ITRI's geothermal research trips along Taiwan's east coast, including Taitung and Green Island, the research team stumbled upon an unexpected discovery that sparked the idea

that the key to improving beauty products may lie in the hot springs. “We isolated more than 10 strains of thermophilic bacteria from these high-temperature environments. Among those, one strain stood out, producing byproducts with keratinase activity capable of breaking down the major proteins that constitute our hair and outer skin layer. It is also this protein that poses a barrier to the absorption of hair and skincare products,” revealed Dr. Chieh-Lun Cheng, a researcher at ITRI’s Green Energy and Environment Research Laboratories.

Recognizing the limitations of existing products, the team embarked on their research. After confirming the effects of these geothermal bacterial byproducts on dove feathers (which have a similar composition to human hair), the researchers further tested them on human hair and skin. The results proved transformative: the geothermal byproducts not only facilitated the breakdown of disulfide and peptide bonds in hair and skin but also increased the penetration rate of skincare products by 28 times compared to conventional methods.

The influence of geothermal bacterial byproducts extended beyond skincare. Hair treatments, including perming and coloring, also demonstrated notable improvement by incorporating the byproducts.

Dr. Cheng elaborated, “Beyond their keratinase capability, the strengthening effect of these byproducts on hair structure is truly remarkable. As these bacteria thrive in high-temperature environments, the heating process during hairstyle or color changes creates suitable conditions for our bacterial byproducts to loosen hair for restructuring or recoloring. After the products are washed off, the disulfide and peptide bonds reform, creating an even more robust hold. This nature’s gift not only rivals conventional chemical solutions but also delivers healthier, more resilient hair.”



Perms on Damaged Hair: The one on the left, done using geothermal bacterial byproduct, showcases a bouncy and glossy outcome, in contrast to the perm on the right, which utilized chemical products.

The geothermal bacterial byproduct has undergone rigorous testing for skin irritation by AMA Laboratories, an established company expert in safety testing, and has been deemed safe to use. It has been patented and registered in the international cosmetic ingredient database for broader applications. Leveraging its expertise in transitioning these discoveries from the laboratory to the commercial market, ITRI is presently collaborating with industry partners in Taiwan to expand production scale. Furthermore, ITRI is actively seeking international partners to tap into the global market of skincare and hair products.



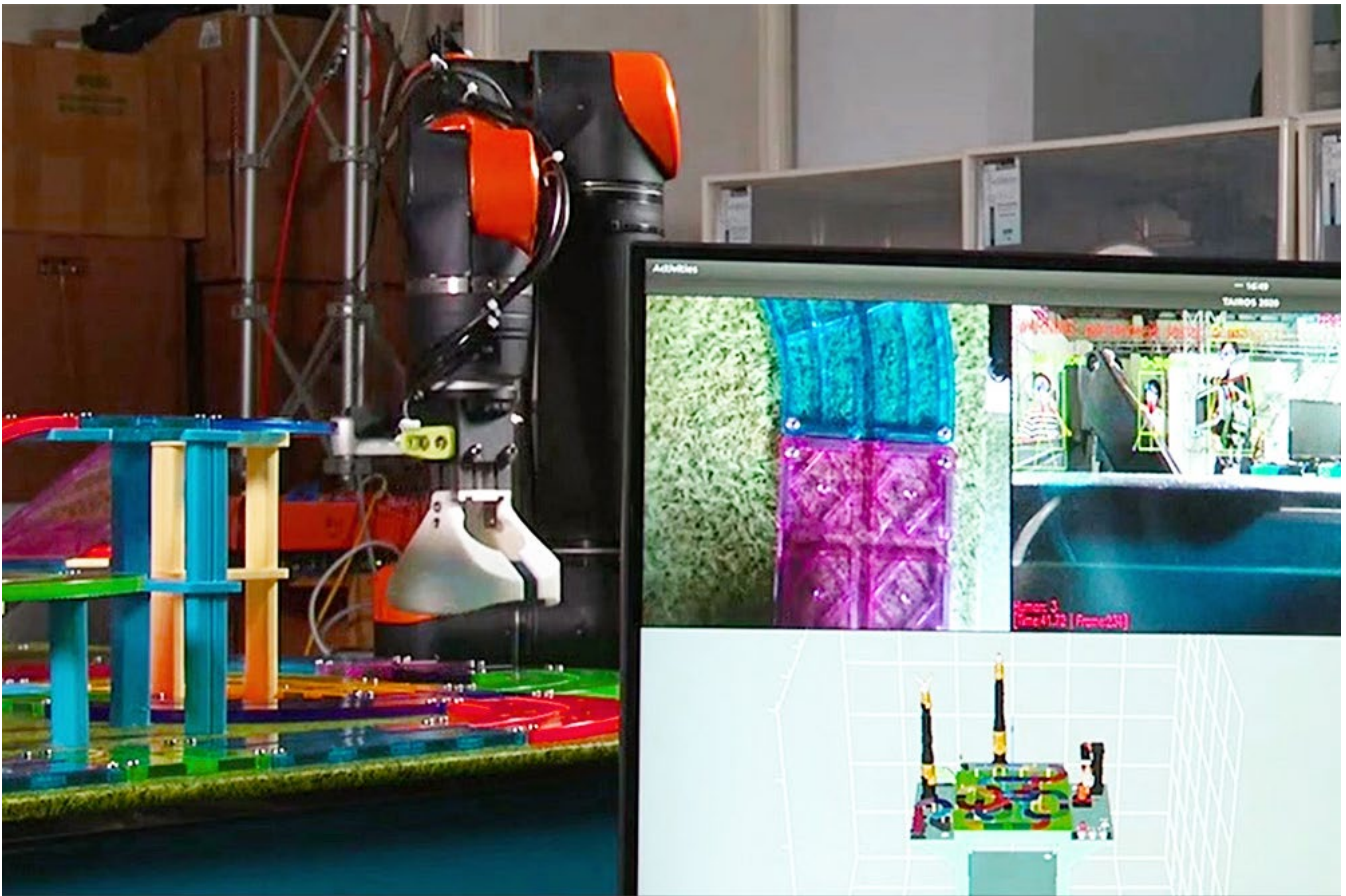
» Collaboration



ITRI Joins HARTU Project to Drive European Industries towards Collaborative Manufacturing

ITRI is actively engaged in Handling with AI-enhanced Robotic Technologies for flexible manufacturing ([HARTU](#)), an EU-funded project focusing on collaborative manufacturing. Combining the forces of 12 European and two Taiwanese companies and research institutions, the project aims to enhance production line efficiency and drive European industries towards collaborative 5.0 models using AI and robotics. Leveraging expertise in mechanical and mechatronic systems, ITRI is developing crucial technologies within HARTU, including grasp and release mechanisms for fixtureless grasp planners, and contact-rich assembly learning for fixtureless part handling.

“By integrating advanced robotics technologies into production lines, we can continuously enhance production efficiency,” said Dr. Shu Huang, Division Director of ITRI’s Mechanical and Mechatronics Systems Research Laboratories. “Within HARTU, ITRI is focusing on refining multi-robotic manipulation for contact-rich assembly tasks, with hand-tool assembly being one of the key use cases. Our goal is to introduce AI-enabled robotic technologies into assembly systems to present an innovative manufacturing platform and validate HARTU-developed components,” said Huang.



ITRI is focusing on multi-robot collaboration technologies to enhance robots' abilities in manipulating and assembling objects of diverse sizes, shapes, and materials.

HARTU project coordinator Iñaki Maurtua highlighted the trend towards mass customization and the project's role in addressing it. "The growing demand for a wide range of products in smaller quantities, coupled with e-commerce services, has driven the need for more flexible manipulation tasks," noted Maurtua. "HARTU addresses this necessity by introducing innovative gripper concepts and AI learning techniques, enabling production lines to adapt to parts that vary in size, shape, and characteristics," he stated.

HARTU is a three-year project that commenced in 2023. Funded by the EU's key funding program Horizon Europe, HARTU researchers are targeting specific manufacturing scenarios to optimize flexibility and production line efficiency using innovative robotic components. Participants in the project include Tekniker, the German Research Centre for Artificial Intelligence GmbH (DFKI), Philips Consumer Lifestyle, Taiwan's hand tool manufacturer Infar Industrial, and many more.



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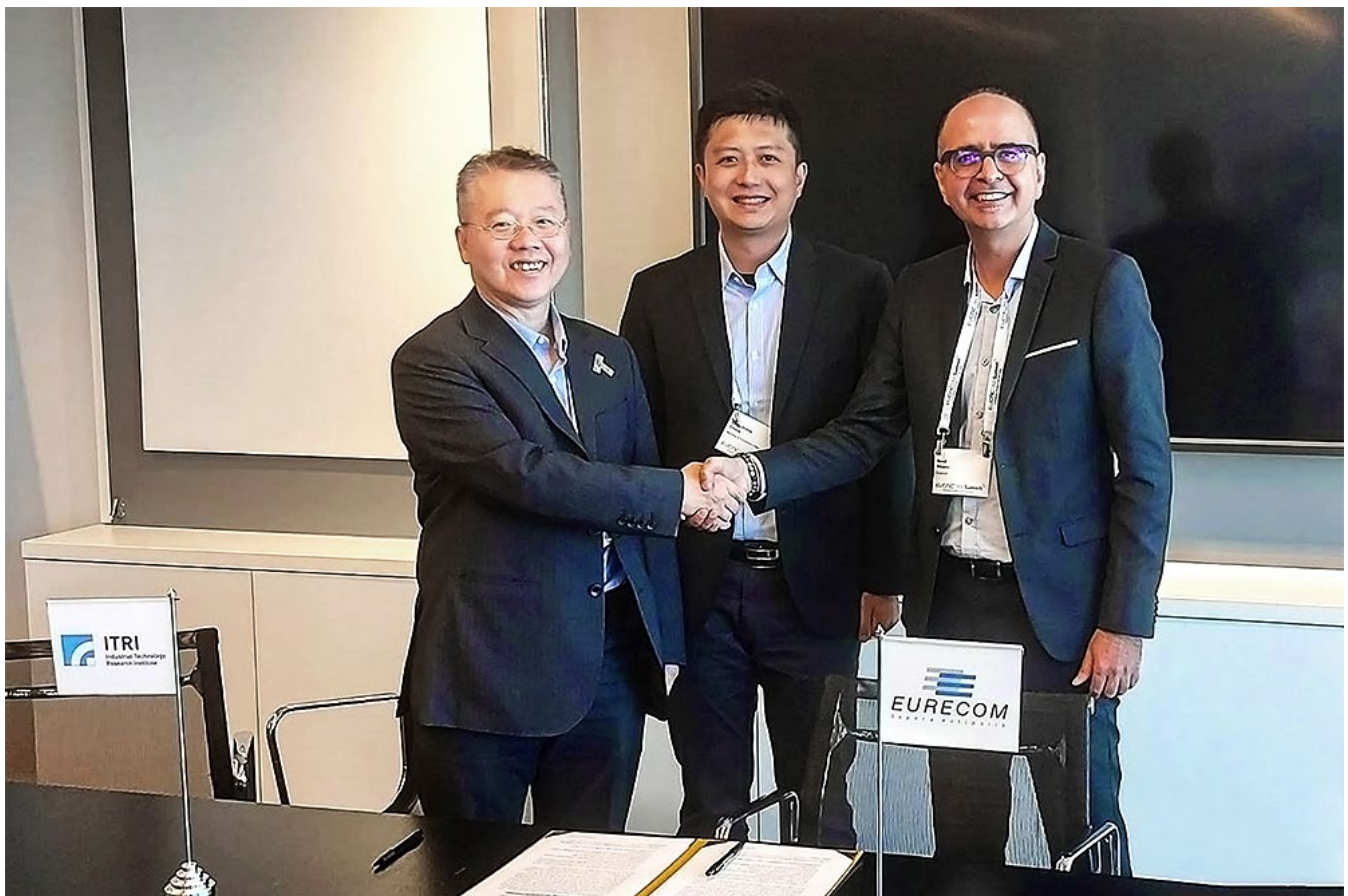


» Collaboration



6G Cooperation MoU Signed between ITRI and EURECOM

ITRI participated in the 2023 EuCNC & 6G Summit in Gothenburg, Sweden and signed a memorandum of understanding (MoU) on 6G technologies collaboration with leading French research institute EURECOM on June 9. Under the MoU, the two parties would collaborate on areas including joint communication and sensing (JCAS), reconfigurable intelligent surface (RIS), AI-native networks, and Open RAN Network architecture. The cooperation is expected to introduce opportunities for industries, academia, and research institutions in Taiwan to participate in the EU's 6G project proposals and early-stage verification and testing.



The MoU is expected to bring new opportunities for Taiwan-EU cooperation on 6G technologies.

The MoU was signed by Dr. Pang-An Ting, General Director of ITRI's Information and

Communications Research Laboratories, and David Gesbert, Director at EURECOM. Under the MoU, both parties will work together on exploring the opportunities in 6G technology through regular exchanges of talents, seminars, and joint research proposals.

Dr. Ting indicated that the collaboration aims to bring new opportunities to Taiwan's industries through the joint development of advanced technologies. Potential areas include JCAS technology which facilitates the integration of radar perception for the base station industry, RIS technology which meets the energy-saving and low-power consumption requirements of leading communication companies, and Open RAN architecture which enables seamless software and hardware security interconnectivity. Dr. Ting expects that the deepened partnership with the EU in technological and industrial development will empower Taiwan to grasp key technology in 6G and position itself at the forefront of the market.

EURECOM, which has been training engineering students from universities for thirty years, boasts cutting-edge research and innovation in digital science including communication technology. Navid Nikaein, Professor at EURECOM and Co-founder of OpenAirInterface, anticipates that 6G will become a crucial field in the future with the continuous evolution of the industry. This year, Prof. Nikaein was invited to Taiwan as a speaker at the 2023 Open RAN Workshop and was impressed by the research capabilities and vision of ITRI. He believes that through the collaboration with ITRI, both parties will bring in new 6G technologies.

The 2023 EuCNC & 6G Summit, themed "6G for a Green and Digital Transition," took place from June 6 to 9 at the Swedish Exhibition and Congress Centre. The event serves as an annual gathering in the field of communication systems and networks in Europe and provides an excellent platform for countries across the world to demonstrate their latest technological developments. ITRI participated as a member of the Taiwan MOEA DoIT delegation for this event, and successfully showcased its R&D achievements in JCAS, RIS, AI-native networks, and Open RAN ecosystem.

» Activity



ITRI and 7-Eleven Introduce New Unmanned X-STORE 7



Exploring the 'Grab-and-Go' Experience at X-STORE 7

ITRI and 7-Eleven have collaborated to build “X-STORE 7,” a 24-hour unmanned convenience store using AIoT technologies. Situated at ITRI’s headquarters, X-STORE 7 integrates ITRI’s Grab & Go System Service that includes smart shelves and a variety of AI sensors, creating a business model conducive to rapid scale-up.



ITRI's Grab & Go System Service helps businesses track inventory levels and customer behavior, enabling smart assortment and agile stock replenishment.

Dr. Pang-An Ting, General Director of ITRI's Information and Communications Research Laboratories, said, "We integrated smart shelves with AI technologies such as weight sensors, infrared-light curtain, ID confirmation, and customer positioning technologies to fully grasp consumer preferences and digitalize store management." He added that this "not only aids businesses in streamlining operations and addresses labor allocation challenges, but also caters to the shopping needs of remote and under-resourced areas."

7-Eleven highlighted that X-STORE 7 is the first unmanned convenience store in Taiwan to operate independently without the need for assistance from an adjacent store. The smart shelves and ledger system allow for efficient inventory monitoring, sales tracking, and identification of customer hotspots, with just one remote worker managing these tasks in real time. Customers can simply display a QR code from the 7-Eleven app to enter, pick up or return items without the need for baskets or carts, and finalize purchases at a dedicated checkout area before exiting.



The smart shelves and ledger system enable efficient inventory monitoring, sales tracking, and customer hotspot identification.

Compared to existing cashier-less stores which mainly rely on capital-intensive computer vision, X-STORE 7's sensor-driven approach significantly reduces computation complexity and camera-related costs, creating a business model favorable to rapid expansion and deployment, and expanding the potential for smart commercial applications.



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» Activity

Creating Low-Carbon & Energy-Saving Campus

New Green Building Accelerates Net-Zero Targets



A new building in ITRI's Kuang-Fu Innovation Campus was granted a national green building certification.

According to the 2022 Global Status Report for Buildings and Construction, CO₂ emissions from buildings and construction hit a new high that exceeded pre-pandemic peaks, signaling the urgency to decarbonize the sector by 2050. To lower the carbon footprints of buildings, ITRI has led by example and created campuses that not only offer comfort and convenience but also feature energy conservation and smart technologies.

Recently, one of ITRI's buildings on the Kuang-Fu Innovation Campus received the Certification of Taiwan Green Building Label, which represents the highest level of building energy efficiency rating. This achievement marks ITRI's seventh national green building

certification.

General Director at ITRI's Office of Administrative Service Jen-Hui Tsai revealed the Institute's know-how in constructing energy-saving campuses. Tsai stated, "Going net zero is not only a part of social responsibility but also a competitive edge for any organization. We have incorporated a range of versatile ITRI-developed technologies across our campuses to ensure environmental sustainability. Our success in achieving green building certification can be attributed to three key strategies: **Green Building Design, High-Efficiency Equipment & Systems Construction, and IoT Management System.**" Let's delve into these strategies further.

Green Building Design

By simulating wind fields and the sun's path, the buildings include natural ventilation and lighting in their design to reduce the electricity consumed by air-conditioning and illumination.

For water savings, outdoor surfaces adopt permeable pavement materials and rely on raft foundations to collect surface water and rainwater for the watering of lawns, while wastewater from water dispensers, handwashing basins, and air-conditioning systems is recycled and reused for heat dissipation, supplying cooling water, and flushing toilets. Through these practices, ITRI campuses are able to significantly reduce the total water use.

High-Efficiency Equipment & Systems Construction

The Kuang-Fu Innovation Campus Buildings 1 and 2 applied ITRI's Active Magnetic Bearing Centrifugal Chiller to their air-conditioning. The chiller operates during off-peak hours to store ice, and during peak hours supplies the meltwater to the air conditioner to reduce power consumption. In tandem with a shared air pressure circulation management system, the energy use of the two buildings can be regulated as efficiently as possible.

In addition, ITRI is actively engaged in renewable energy. Through collaborative research and development with industries, ITRI has established solar photovoltaic systems integrated with real-time monitoring systems. This initiative enhances electricity generation efficiency and allows for more flexible power load dispatching.

IoT Management System

To keep track of campus energy use and stay alert to utility damage, ITRI introduced its own Energy Information Platform for IoT management. The platform monitors power consumption and analyzes consumption patterns, detecting hot spots and providing instant notification upon abnormality.

ITRI also established an intelligent water network monitoring system. Smart water meters and facility sensors were installed to monitor real-time consumption, predict demand, and detect leakage. This allows faster inspection and repair to reduce loss.



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» About Us



Industrial Technology Research Institute (ITRI) is one of the world's leading technology R&D institutions aiming to innovate a better future for society. Founded in 1973, ITRI has played a vital role in transforming Taiwan's industries from labor-intensive into innovation-driven. To address market needs and global trends, ITRI has launched its 2035 Technology Strategy and Roadmap that focuses on innovation development in Smart Living, Quality Health, Sustainable Environment, and Resilient Society.

Over the years, ITRI has been dedicated to incubating startups and spinoffs, including well-known names such as UMC and TSMC. In addition to its headquarters in Taiwan, ITRI has branch offices in the U.S., Europe, and Japan in an effort to extend its R&D scope and promote international cooperation across the globe. For more information, please visit <https://www.itri.org/eng>.

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