

# 2017

NATIONAL SCIENCE AND  
TECHNOLOGY MUSEUM

Annual Report

1997

2017





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NATIONAL SCIENCE AND  
TECHNOLOGY MUSEUM

Annual Report

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## Letter from the Director-General

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First of all, I would like to say "happy birthday" for NSTM's 20th anniversary.

The National Science and Technology Museum (NSTM) was one of the 12 construction projects set by the Executive Yuan in 1979. It is one of the national cultural facilities and the first national applied science museum. It is also the first national institution for social education in South Taiwan. The Executive Yuan approved the construction of the museum in 1988 and construction was commenced in 1989. Eight years later, the museum was finally launched and started its service in 1997. The first and second directors of the preparatory office and the former directors-general managed the museum diligently and defeated the challenges with impressive courage, leading the museum from its conception, birth, and toddler stage up to now, a grown-up NSTM.

This year (2017) is NSTM's 20th anniversary. I would like to thank the former director-general, Hong-Sen Yan, who is also the former Minister without Portfolio (technology) of the Executive Yuan, the former vice president of National Cheng Kung University, the founder and director of the National Cheng Kung University Museum, and the chair professor of the Department of Mechanical Engineering, National Cheng Kung University, and wrote the book of *My 718-Day Journey as the Director-General of NSTM* as a commemoration. The book focuses on the time when Mr. Yan was the director-general from 2002 to 2004 and describes the history of NSTM, the organizational transformation, the upgrade of exhibitions, changes of





science and technology teaching, and the endeavor for external resources. It discusses the development of NSTM with deep insights and is valuable as an important reference for the history of NSTM.

Ever since NSTM started its service, all staff have been adapting to the changeable social trends for 20 years. With the development of technology and the Internet, we have been improving our professional skills, pooling external resources, taking communities support and utilizing social donations to enhance our services, set a professional example for museums and improve our service quality. Though we have seen the good results of our efforts on each project, we shall not take too much pride in that and will keep working hard for a better outcome.

In 2017, we moved toward the goals of "continuous growth of visitors", "steady increase of financial revenue", and "improvement of overall service quality" by holding special exhibitions, developing interactive experiences, promoting cross-field cooperation, enhancing web social media marketing, expanding visitor services, and introducing international service inspection and certification. What is more, after winning the 4th "Government Service Quality Award" of the Executive Yuan in 2011, we once again stood out among the 160 candidates and won the 9th "Government Service Quality Award" in 2017. We are the only museum institution in Taiwan that has won the Award twice.

Besides, with the constant improvement of the archive management work, we won the 15th "Records Management Quality Award" of the Executive Yuan in 2017. This is a milestone for NSTM's efforts in archive management work and a reward for the staff who constantly improve their work on archive management. As for the "Southern Taiwan Technology Education Green Expo Park Project" subsidized by the Ministry of Education, we set up the "Popular Science Café", "Multiple Measurement Square", "Pavilion of Dream



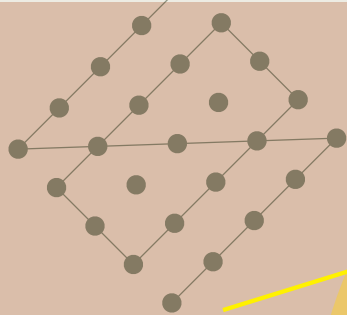
Transport Upgrade", "Green Living Exploratorium", and "Audio Guide System" in 2017. As we believe, when all of the facilities are ready to serve everyone, NSTM will be an amazing educational museum that creates happy and fun memories for the public.

Finally, I would like to express my gratitude for every staff and person who has helped NSTM grow over the past 20 years. Your professionalism, enthusiasm and devotion have contributed to NSTM's growth. In the near future, let us carry on the service spirit of "Every Visitor is a VIP" and compose a beautiful piece and a wonderful story for NSTM. And let us work together to provide the best service for the public and create another milestone for the museum.

Director-General

***Shiunn-Shyang Chen***





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# Annual Performance and Accolades





## Annual Achievements

### Exert the function of life learning and social education in conjunction with the national education policy

NSTM Lanterns of Love project's promotion and science education for disadvantaged school children

The "Lanterns of Love project" has been promoted for 5 years. In 2017, we received a subsidy of NT\$ 3,280,480 for the Program, allowing disadvantaged school children from Taiwan and off-shore islands to receive support and visit NSTM for free.

2017 NSTM Lanterns of Love project served

**276** schools  
**6,218** participants



Seek resources to organize diverse science education activities

In order to achieve the mission of "Training science enthusiasts", we have developed a wide variety of specialty courses and creative art activities targeting people from different age groups.

Various science education activities were held inside and outside NSTM in 2017

**1,746** activities  
**328,123** participants





## Create a "National Disaster Reduction and Environmental Education Park"

With NSTM's unique facilities for environmental education, we have held activities about water saving, electricity saving, photovoltaics, emerging energy technology, the environment, ocean, ecology, and disaster prevention, and provided the public with services of environmental and disaster prevention education.



2017 disaster reduction and environmental education activities served

**55,255** participants

## Expand budget scale to generate more services and value

### Proactive measures to raise revenue and cut down expenditure

In 2017, NSTM raised revenue by NT\$ 221,928,294 and cut down expenditures by NT\$ 49,526,218, totaling NT\$ 271,454,512.

Total amount

NT\$ **271,454,512**

### Pool social resources to improve exhibition service performance

In 2017, 62 joint exhibitions were held by pooling the resources of at least 66 social enterprises.

Total value of social resources raised

NT\$ **101,693,692**



## Development of theme merchandise based on NSTM's collections to increase revenue

Cultural & creative products were developed based on NSTM's collections to highlight their features and significance, as well as increase the revenue of the museum.

2017 cultural & creative products total revenue generated

NT\$ **1,565,284**



## Utilize social human resources to improve overall service performance

In order to offer visitors more comprehensive services, NSTM strives to manage and utilize volunteers, student volunteers and interns more effectively in facilitating the day to day operation of the museum. In 2017, a total of 1,139 volunteers were on duty for 193,535 man hours; student volunteers accumulated 2,753.5 man hours of service; 76 interns accumulated a total of 22,249 man hours. The combined service time rendered by social human resources was 218,537.5 man hours, equivalent to that of 110 full time staffs at NSTM.



Social human resources obtained were equivalent to

**x 110** full time staffs



## In Pursuit of perfection to serve more people and raise more annual revenue

By improving the NSTM's overall environment, service process designs and service quality, combined with diverse exhibits, films, and popular science education activities, we have won the public's hearts and totally served 2,966,516 people in 2017.

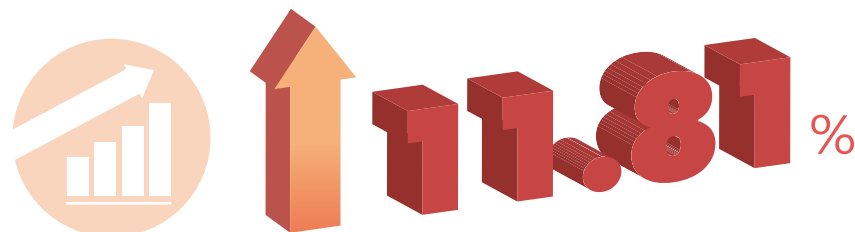
The total number of visitors in 2017 was

**2,966,516**

In 2017, with business management strategies, increased revenue and reduced expenditures, raised income from venue rent and creative products development, we made additional revenue for NSTM funds. Self-raised income was NT\$ 200,466,650, increased by NT\$ 21,168,406 (11.81%) compared to 2016.

In 2017, NSTM's self-raised funds were

**200,466,650** 元





## Honors and Awards

1. Received the Executive Yuan's 9th "Government Service Quality Award". NSTM is the only museum that has won the Award twice.
2. Received the 15th Records Management Quality Award held by the National Development Council of Executive Yuan.
3. Received The 2017 National Excellent Volunteer Group Award.
4. The first museum to obtain the SGS Qualicert Service Quality Certificate in Taiwan.



Received the 9th "Government Service Quality Award" by the Executive Yuan.



The ceremony for the 15th Records Management Quality Award.



Director-general Shiunn-Shyang Chen received the SGS Qualicert Service Quality Certification.



NSTM Volunteer Group received the 2017 National Excellent Volunteer Group Award.



5. The first social education institution to obtain the BS 10012:2009 International Personal Information Management Certificate.
6. Obtained the ISO9001 International Quality Management System Certificate.
7. Obtained the ISO50001 International Energy Management System Certificate.
8. Obtained the ISO/IEC27001 International Information Management System Certificate.
9. Won second place from the Kaohsiung City Institution with Excellent Indoor Air Quality.
10. Received 3rd place for MOEA National Property Administration's "2016 National Property Revitalization Performance" in the Fund Category. NSTM is the only museum to win the award 4 times.
11. The Green Building Label was renewed for another 5 years, helping us achieve our vision of being a "Green Museum".



5 international certification marks: "Service", "Energy Saving", "Information Security" and "Personal Information".



The ceremony for the Excellent Indoor Air Quality Award



The renewed Green Building Label acquired by improving old buildings



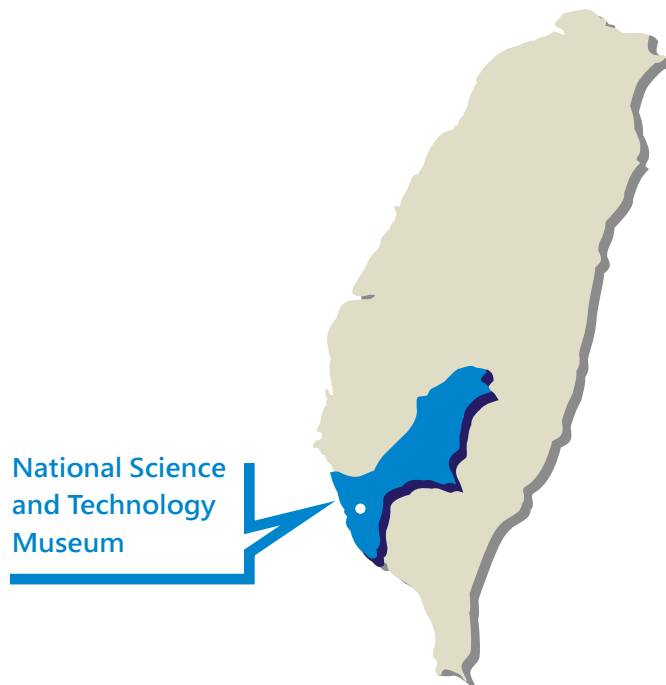
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# History



The National Science and Technology Museum (NSTM) was one of the central cultural facilities constructed in the "Project of County/City Cultural Center Construction" in The Twelve Construction Projects announced by the Executive Yuan in 1979. As the first museum of applied science in Taiwan as well as the first national institute of public education in Southern Taiwan, the focus of the museum is to collect and study scientific and technological objects, hold exhibitions related to science and technology and promote education as well as provide the public with a place for leisure and life long learning.



Located on Jiouru 1st Road, Kaohsiung City (originally City Park No. 6), the museum covers 18.37 hectares of land. The buildings contain a total building area of 20,682.83 m<sup>2</sup> and the floor area is 113,557.69 m<sup>2</sup> (including North building: 97,734.93 m<sup>2</sup>; South complex: 15,258.88 m<sup>2</sup>; LOHAS Energy Conservation House: 563.88 m<sup>2</sup>) with 36.89 meters of structural height.

#### Brief Description of the Preparatory Process

July 1986	The Planning Council for NSTM was established.
November 1988	The Executive Yuan approved the construction plan.
October 2, 1989	Construction of the museum commenced.
January 1, 1997	The museum was officially established with the approval of the Executive Yuan and the Ministry of Education.
July 26, 1997	The south complex was opened.
September 21, 1997	The museum park was opened.
November 9, 1997	The museum was opened to the public.

## North building

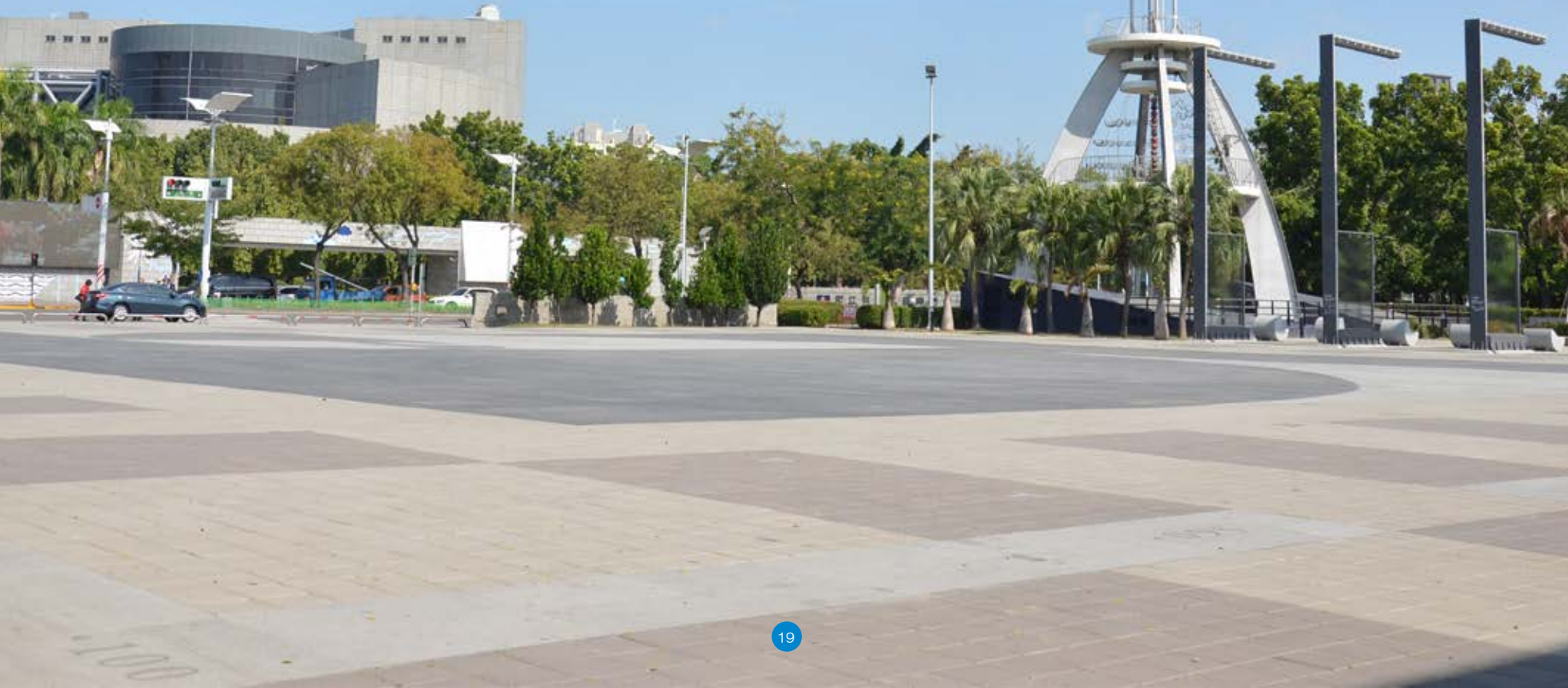
The building covers 15,007.55m<sup>2</sup>. It contains the administration center, permanent exhibition galleries, special exhibition galleries, 3D Theater, Open Storage, Maker: the True Dreamland, NSTM Green Shop and Green Living Exploratorium.





## South complex

The building covers 5,412.61m<sup>2</sup>. It contains the Popular Science Library, Popular Science Café, auditorium, lecture rooms, meeting rooms and Collections Storage. The LOHAS Energy Conservation House was set up in 2009 and sits on an architectural dimension of 262.67 m<sup>2</sup>.








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# Development Missions

- 
1. Establish comprehensive collections policies in order to collect, purchase and maintain relics of technology.
  2. Increase channels for utilizing museum collections and digitize relics of technology.
  3. Implement exhibit update mechanism to phase out old exhibition themes and revitalize the museum exhibits.
  4. Plan science education activities and teaching aids in conjunction with education policies and school resources.
  5. Strengthen public service functions, capitalize on media and community resources to formulate diverse marketing strategies and increase NSTM's visitor numbers.
  6. Improve NSTM's public safety by creating an outstanding environment and enhancing service quality.
  7. Automate administrative tasks and promote an online lifelong learning channel.
  8. Reinforce NSTM's digital services and elevate work efficiency.
  9. Create a digital library and provide different information through the online database; establish themed libraries on the Museum's research topics.
  10. Improve inter-museum exchanges and host academic seminars to improve the standard of research within the Museum.
  11. Set up a Museum Mall that combines technology, recreation and education.
  12. Boost museum attendance and build a world-class museum.

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# Organizational Structure



## Post Allocation

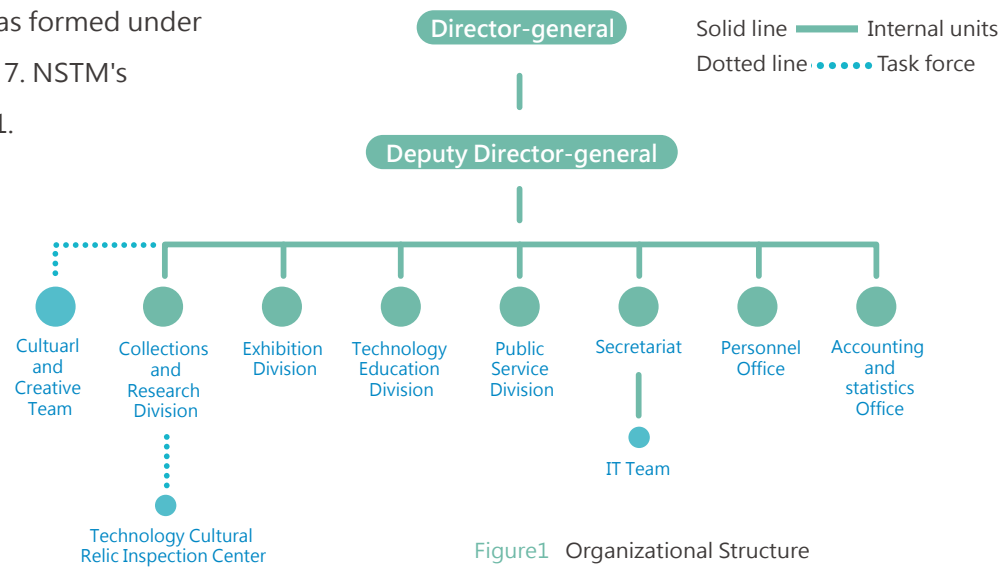
Pursuant to the temporary regulations and staffing structure of National Science and Technology Museum as promulgated by the Ministry of Education with the Letter Year (1996)Tsan-Zi 85504426 on December 30,1996, the National Science and Technology Museum has one director-general and one deputy director-general. Under them, the Museum operates through the Exhibition Division & Technology Education Division, Public Services Division, Secretariat, Personnel Office and Accounting & Statistics Office. Further in the light of the need for development of the Museum, the Information (MIS) Task Force was established on July 16, 1998 and Collection Research Task Force was established on February 1, 2001. Subsequently later on, pursuant to the amendment to the temporary regulations as promulgated by the Ministry of Education with the Letter Tai-Tsan-Zi- 0920113739A dated August 5, 2003, the Collections and Research Division was additionally established on September 1, 2003 and the establishment was approved by the Examination Yuan with the Letter Kao-Tai-Er-I-Zi 09200079281 dated September 22, 2003.

Besides, the Organizational Act of the National Science and Technology Museum was duly enacted under Order of the President of the Republic of China, i.e., Hua-Tsung-I-I-Zi 10100022841 dated February 3, 2012 and was put into enforcement starting from January 1, 2013 under Order Yuan-Shou-Yen-Tsung-Zi 1012260345 of the Executive Yuan (the Cabinet) dated March 8, 2012. Pursuant to the Organizational Act of the National Science and Technology Museum, the Accounting Office was reorganized into the Accounting and Statistics office.

In light of NSTM's development needs, task forces have been formed to promote certain services:

1. The Maintenance Team was established on January 1,2013. In December 2015, the performance of NSTM's "Maintenance Team" was reviewed; furthermore, in conjunction with the personnel number evaluation, the Maintenance Team was dissolved on January 1, 2016, in order to restore the normal manpower of various departments.

2. A Cross-departmental Cultural and Creative Team was formed on March 26, 2014 (abbreviated as CCT) in response to the cultural and creative development needs of NSTM, in turn opening a new chapter in NSTM's cultural and creative development and marketing.
3. In 2015, in response to NSTM's long-term needs in cultural relic restoration and inspection, and to collect technological cultural relics in a more systematic manner, science analysis and restoration technical equipment was purchased, and the Technology Cultural Relic Inspection Center was formed under the Collections and Research Division on April 7. NSTM's organizational structure was shown as Figure 1.





## Posts

### 1. Budget headcount

A total of 84 posts were opened as defined by relevant law and regulations. After the assessment of Ministry of Education in 2017, our budget post openings were as follows: 28 Researchers, 47 Civil Servants, 26 Senior Contract Employees, 20 Junior Contract Employees, 8 Technical Workers, 7 Maintenance Workers, with a total of 136 posts budgeted. The budget headcount analysis is as Figure 2.

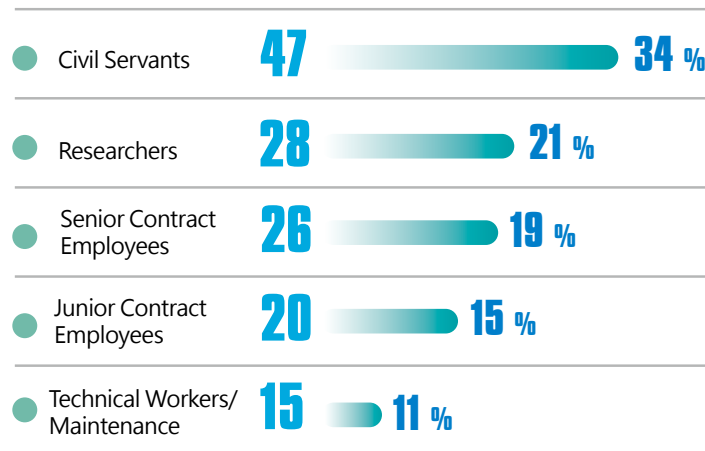


Figure 2 Budget Headcount

### 2. Existing headcount

Our existing headcount (excluding volunteers and commissioned service companies) has a total of 136 people. (64 Males, 72 Females). The female ratio is 53%, while the male ratio is 47%. There were 9 managers (including director-general and deputy director-general: 6 males, 3 females). The ratio of female managers is 33%, while the male ratio is 67%. There were 127 non-managers (58 males, 69 females). The ratio of female non-managers is 54%, while the male ratio is 46%. The managers and non-managers gender analysis is as Table 1.

Table 1 NSTM Managers and Non-Managers Gender Analysis

	Existing Number	Males	Male Ratio	Females	Female Ratio
Managers	9	6	67%	3	33%
Non-Managers	127	58	46%	69	54%
<b>Total</b>	<b>136</b>	<b>64</b>	<b>47%</b>	<b>72</b>	<b>53%</b>

Additionally, there were 28 Researchers (12 males, 16 females), 47 Civil Servants (27 males, 20 females), 46 Senior Contract Employees and Junior Contract Employees (16 males, 30 females), 15 Technical Workers and Maintenance Workers (9 males, 6 females). The personnel gender analysis is as Table 2.

Table 2 NSTM Personnel Gender Analysis

	Existing Number	Males	Male Ratio	Females	Female Ratio
Researchers	28	12	43%	16	57%
Civil Servants	47	27	57%	20	43%
Senior/Junior Contract employees	46	16	35%	30	65%
Technical/Maintenance Worker	15	9	60%	6	40%
<b>Total</b>	<b>136</b>	<b>64</b>	<b>47%</b>	<b>72</b>	<b>53%</b>

## Educational Statistics

We currently have a total of 136 employees, out of which, there are 13 with PhDs, 64 with master's degrees, 53 college graduates, 6 high school graduates or below. Our personnel educational statistics analysis is as Figure 3.

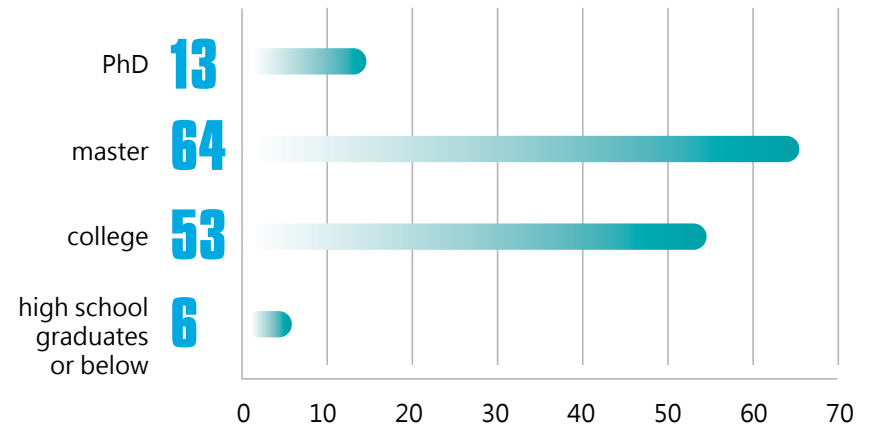


Figure 3 Personnel Educational Statistics

## Researcher Backgrounds

### 1. Researchers educational statistics

We currently have 28 researchers, out of which, there are 12 with PhDs, and 17 with master's degrees. Our researchers' educational statistics analysis is as Figure 4.

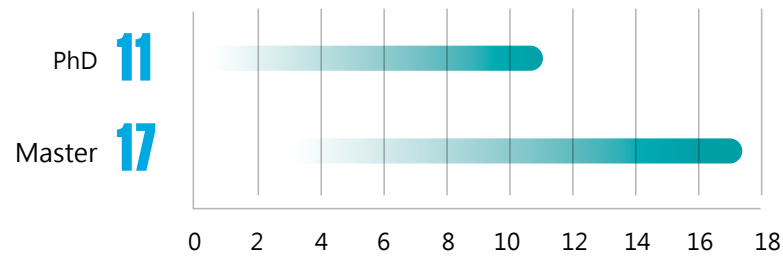


Figure 4 Researchers Educational Statistics

### 2. Researchers academic background statistics

We currently have 28 specialized personnel, out of which, 12 are affiliated with Science and Technology, 6 are affiliated with Education, 1 are affiliated with Design, 9 are affiliated with Humanities and Social Sciences. Our researchers' academic background statistics analysis is as Figure 5.

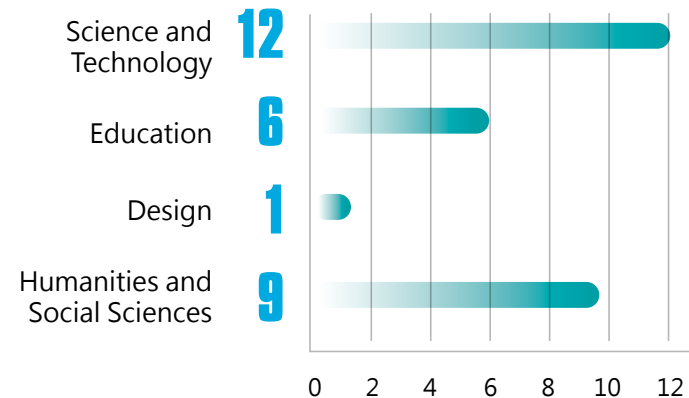


Figure 5 Researchers Academic Background Statistics



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# Collections and Research



Under the principle of sustainable development, the Collections and Research Division has brought together the concepts of "integrating science into daily lives, and integrating daily lives with science" in promoting our key operations. Furthermore, we have applied the scientific spirit of "pragmatism", "rationalism" and "utilitarianism" to conduct the collection, research on important technological items, and the promotion of related activities. Our goal is to reinforce NSTM's professionalism and elevate operational performance.

The 2017 annual operations on item studies and promotion, collection management and applications, artifacts maintenance and inspections, Open Storage, academic exchanges, cultural and creative developments, research outcomes and publication statistics are as follows:

## Item Studies and Promotion

In 2017, NSTM continued the interpretation, research and promotion of our collections and industry items, including the following themes and fields: measurement instruments, engraving printing and typography, lock study, weaving industry, Taiwan sugar industry, communication and media technology industry, and telecom collections. The findings of the study were used in academic papers and educational promotions.

In order to utilize our technological collections and develop with "innovative values", we took advantage of new technology and multimedia and created digital teaching materials, educational videos, and a digital NSTM website based on the museum collections, such as measurement instruments, printing antiques, and telecom collections, to upgrade their accessibility and benefit.



The educational video of "The story of Taiwanese Engraving Printing and Typography"



In terms of the metrology, we carried out 5 interviews with specialists from the metrological inspection field, edited 3 interview videos, created 1 digital teaching material of metrological inspections, and held metrological activities in accordance with World Metrology Day. As for printing antiques, we finished the final report on the "Investigation and Evaluation Plan on Cultural Assets of the Taiwanese Engraving Printing and Typography Industry", the educational video for "The story of Taiwanese Engraving Printing and Typography", and the publishing of *The Journey of Words - The Guide on Taiwanese Typography*.

Besides, we studied the historical development of world locks and lock antiques repairmen, analyzed the designs, and innovatively designed modern locks. We have published 2 SCI academic papers, 2 EI papers, and 3 popular science article. Meanwhile, we accepted the "Proposal to Develop Ancient Chinese Lock Products" commissioned by Beijing Geombot Technology Limited Liability Company, and jointly developed a series of ancient lock products, which helped people understand more about classic antiques.



The Journey of Words- The Guide on Taiwanese Typography



"Maze Locks", jointly developed by NSTM and Beijing Geombot Technology Limited Liability Company



Along with the effective "2017 Telecom and Museum Cooperation Plan", we digitized 5,017 pages of the ancient references, finished photo shooting for the 93 objects exhibited in the Telecom Hall, added descriptions for 115 items, and comprehensively upgraded the Digital Telecom Museum Website functions and visual layout. All of those attributed to the digitalization of the telecom collections, sustainable and full preservation and utilization.



Photo shooting of the collections in the "Telecom @ Taiwan" Hall.

## Collection Management and Applications

Our PDA inventory system was built in 2007 and has been deployed since then. However, it is almost out of date now, so we have been buying and deploying hardware inventory for mobile devices since 2016, connecting to the NSTM management system via Wi-Fi. Apart from our internal inventory, the new service can be used externally. We built the Wi-Fi system for the collection storage in South Wing in 2017. Collections and items, no matter whether they are in the North Wing or South Wing, can be checked via the mobile inventory system.

In 2017, 405 additional items were catalogued into NSTM's existing collections, including 329 donated items, 30 collected item, 46 transferred items. The stored items were given adequate storage conditions in accordance to their materials in order to provide them with a sustainable environment for preservation. In 2017, the annual accumulated number of collections reached 41,282 items. Table 3 illustrates the collection statistics over the last 5 years.

Table 3. Collection statistics over the last 5 years

Item Year	Total	Collected	Purchased	Donated	Transferred	Other	Annual Accumulated Number	Temporary Custody
2013	328	31	0	297	0	28,161	30,182	0
2014	328	25	1	302	0	9,623	40,133	0
2015	341	65	0	243	33	0	40,474	8
2016	403	1	0	326	76	0	40,877	0
2017	405	30	0	329	46	0	41,282	0



New collections for 2017: Award-winning creations from the "2016 National Invention and Creation Award" winner works collected by NSTM

In order to increase the visibility and utilization rate of our collections in 2017, 430 exhibits were displayed in the permanent exhibition hall (excluding telecom relics under our temporary custody), 350 collection items were displayed in NSTM's special exhibitions, 38 exhibits were loaned to other museums, and 250 exhibits were displayed in the Open Storage and Open Storage promotional activities. Table 4 illustrates the utilization statistics of technology artifacts over the past 5 years.

Table 4. Utilization statistics of technology artifacts over the past 5 years

Item Year	Total	Research	Teaching	Exhibition *	Other **
2013	3,372	40	0	2,419	913
2014	4,306	203	0	2,270	1,833
2015	3,893	250	0	2,201	1,442
2016	3,852	254	0	2,206	1,284
2017	4,101	2,020	0	1,747	340

\* Internal/external exhibitions, including Open Storage exhibits and telecom exhibits under NSTM's temporary custody.

\*\* Including digitization, maintenance, inspection, picture loaning, cultural & creative application

## Artifacts Maintenance and Inspection

NSTM has been devoted to collection maintenance and inspection of cultural artifacts, systematic collection of technological antiques, provision of professional advice on the preservation of cultural relics, and training of preservation specialists. We have been playing an important role in South Taiwan's cultural asset maintenance.

In 2017, we used XRF handheld analyzers and non-destructive instruments to conduct 28 inspections and purchased portable x-ray detectors at the end of the year. Along with the training for preservation volunteers and the assistance from external repairmen, we hope to fully present our specialty in artifact preservation and maintenance.

Moreover, there are restoration demonstrations in our Open Storage from Tuesday to Friday, and we have a live show of the restoration process on the TV at the entrance to Open Storage, so that visitors can see how our collections are maintained and repaired outside the Open Storage.

Besides 28 inspections, we conducted 7 charged inspection and maintenance services in 2017. It not only showed our

specialty in the preservation of technological heritage, but also brought in an additional revenue of NT\$ 1,498,900 for the museum and promoted the knowledge and technique on preservation of historic works.



External inspection service

We went to the historical Huji Temple in Madou District, Tainan City, to inspect and repair god statues. The XRF handheld analyzer was used to analyze the facial pigments of the Clairvoyant God. With the information of the pigments, we could proceed the cleansing, reinforcement, and repair of the statue.



We accepted Daxi Wood Art Ecomuseum, Taoyuan commission to help the Shengxing Workshop refrigerate and fumigate the column of Gone in the early period. The photo shows the interns who were practicing the cleansing work of the historic heritage.



Besides, we have held 6 preservation workshops, including 2 microscope workshops, 2 paper archive workshops, 1 watercolor woodblock printing workshop, and 1 thread-bound book workshop. Professional lecturers and restoration specialists demonstrated the process of artifact restoration in class, while the students took part in case studies and restoration projects, which helped them understand the importance of cultural asset preservation.



Students learned the concept and operation of the microscope and used it to observe fibers, starch, pollens, and small bugs.



"Thread-bound Book Workshop" in the Tainan Cultural Center.



"Watercolor Woodblock Printing Workshop" in the Tainan Cultural Center.

## Open Storage

Open Storage was completed in 2009 and incorporated into NSTM's experience facilities in July 2010 and officially opened to the public. Admission to Open Storage is NT\$30 per person (NT\$25 for groups of 20 persons or more). Unlike storage in conventional museums that are normally closed to the public, visitors to NSTM Open Storage are led by tour guides to view collected items closely and understand related tasks such as museum collection studies, collection management and cultural artifacts maintenance, thereby conveying the importance of science, industry culture, preservation and maintenance.



Our researchers promote NSTM collections by exhibiting small items in Open Storage, which helps people understand more about the collections and learn the scientific principles and applications of the historic works. In 2017, we held 12 Open Storage Collection Promotions, with a total of 14,786 visitors. Table 5 shows the statistics of Open Storage in the last 5 years.

Table 5. Service performance of Open Storage over the past 5 years

Year	Number of visitors	Income generated
2013	15,575	169,630
2014	13,993	167,575
2015	16,755	187,655
2016	16,408	107,680
2017	14,786	122,930



Puzzle Box experience activity.



Selected collection exhibition: "Basic Measurement Instruments and Techniques for After-Disaster Applications"



## Academic Exchanges

Adequate themes were chosen from the field of museology, and both domestic and foreign scholars and experts were invited to participate in discussions. During 2017/10/19-20, NSTM, the Graduate Institute of Conservation of Cultural Relics and Museology, Tainan National University of the Arts, National Cheng Kung University Museum, the Department of Theater Arts, National Sun Yat-sen University, and the Chinese Association of Museums jointly held the "2017 International Conference on Museum Evaluation".

3 international speakers and 2 domestic specialists were invited to discuss museum evaluation. Apart from that, 27 museum evaluation papers were presented at the conference. We hoped that the museum community may learn more about this topic by establishing such an exchange and discussion platform. We also hoped that it will be helpful for the theoretical structure and practical application of the museum evaluation in Taiwan. A total of 290 participants were present in the conference.



Professionals and scholars from Taiwan and other countries attended the conference to deliver speeches and discuss research papers

## Cultural and Creative Developments

We set up a cross-division team for cultural and creative product development in 2014, which focuses on designing cultural and creative products, cooperating with other organizations and developing new products, shipping and selling, expanding new markets, self-marketing and managing

legal affairs. The creatively designed products not only present the characteristics and meanings of our collections, but also make our collections more visible to different groups.

In 2017, we developed the following 5 cultural products: "Good Luck Puzzle Box", "Long Life Puzzle Box", "Good Fortune Puzzle Box", "Double Happiness Puzzle Box", and "Peaceful Green" cup bag.

Double Happiness  
Puzzle Box



Good Fortune  
Puzzle Box



Good Luck Puzzle Box



Long Life Puzzle Box



"Peaceful Green" cup bag



So far, the following 48 products are available through our museum shop: Monkey Matchbox Color Pencils Set, Measuring Instrument Tape Set, Collections Poker Cards, Scholar Lock Pen Drive, Cubic Stamp, Standard Meter Key Ring, Roaming Metrology Multifunctional Luggage Strap, NSTM Go Luggage Strap, Safe Travels Luggage Tag, Science of Cooking Sealing Clip, Science of Cooking Cutlery Set, Love Lock, Custom Mug, NSTM Collection Book Card, IDF 3D Postcard, Lead-Printed Hand-Made Postcards, Mammoth DIY Model, Ring of Science, Micro Building Blocks-NSTM North Wing, Micro Building Blocks-Tower of Hope, Micro Building Blocks-Nostalgic Telephone Booth, Pinhole Camera DIY Kit, Happiness Doll DIY Kit, Roaming Collection Board Game, Science DIY-Colorful Wish Lantern, Science DIY-Balloon-powered Car, Science DIY-Leaping Frog, Science DIY-Cube Man, Science DIY-LED Flashlight, Science DIY-Patented Bamboo Toy Gun, Academic Excellence-Fix-orientation Lock, Abundant Wealth-Pullback Lock, Timeless Love-Rotary Lock, Peace and Good Health-Bai Jia Lock, Hand Massager, LED Wristband, Key Shape USB Flash Drive, Custom Wicking Shirt, Adventures in Health Land Exhibition Limited Mug, Meticulous Discretion-Multipurpose Lever Scale and Stationery Set, All-round Perfection-Double Lock, Love Lock, Good Luck Puzzle Box, Long Life Puzzle Box, Good Fortune Puzzle Box, Double Happiness Puzzle Box,

Peaceful Green cup bag, and kaleidoscope. Table 6 presents the annual sales record in the last 3 years.

Table6. Sales figure of cultural & creative products over the last 3 year

Year	Sales figure
2015	1,145,342
2016	1,230,988
2017	1,565,284

## Research Outcomes and Publication Statistics

For the research findings in 2017, a total of 43 journal papers, 47 conference papers, 6 books and 4 related publications were published. NSTM also participated in 27 research projects. The devotion and effort of the NSTM personnel proved to be beneficial to museology-related fields. Table 7 illustrates the research findings and publications over the past 5 years.

This year (2017) is NSTM's 20th anniversary and we invited Hong-Sen Yan, who is the former (Science and Technology) Minister without Portfolio of the Executive Yuan, former Vice

President of National Cheng Kung University, the founder and first director-general of National Cheng Kung University Museum, former director-general of NSTM (from May 29, 2002 to May 18, 2004), and the docent of Department of Mechanical Engineering, National Cheng Kung University, who published *My 718-Day Journey as the Director-General of NSTM* as the commemoration book for NSTM's 20th anniversary. The book carefully narrates the history of NSTM, the organizational transformations, the upgrade of exhibitions, changes of science and technology teaching, and the endeavor for external resources. It not only serves as a reference for the NSTM history, but also an important documentary of the museum industry in Taiwan that presents the ideas of the former NSTM directors-general.

Table7. Research findings and publications over the past 5 years

Item Year	Journal Papers	Conference Papers	Research Projects		Invited to Academic Lectures	Publications					Sympo- siums	Lectures
			NSTM Personnel as Hosts	NSTM Personnel as Participant		Books	CDs	Text Messages	Folded Leaflets	Journals		
2013	28	26	7	3	3	3	0	2	11	2	1	20
2014	25	50	10	6	17	3	0	1	9	2	2	18
2015	27	41	12	6	12	4	0	1	0	2	9	26
2016	26	35	18	17	23	3	2	7	1	2	2	22
2017	43	47	21	6	24	6	0	0	2	2	4	45



New book presentation for the former director-general Yan's publication: *My 718-Day Journey as the Director-General of NSTM*

2017 National Science and Technology Museum

Annual Report

# Exhibitions



In 2017, NSTM introduced a total of 34 exhibitions, renovated and reopened 1 permanent exhibition hall, as well as updated partial exhibition units in 8 permanent exhibition halls. By constantly maintaining the exhibits and quantifying our services, we have achieved a normal exhibit functioning rate of over 96.69%. We also developed the 3D Theater

“alternative content” service project to improve the operational performance of the theater. Refer to Table 8 for the number of exhibitions organized and exhibit hall renovations over the past 5 years.

Table8 Exhibitions organized and exhibit hall renovations over the past 5 years

Item Year	No. of Exhibitions	Permanent exhibit hall renovation		Normal functioning rate of Exhibits
		Complete renovation	Partial renovation	
2013	35	0	4	92.47%
2014	29	3	8	91.85%
2015	33	2	5	92.50%
2016	39	2	6	94.32%
2017	34	1	8	96.69%

## Permanent Exhibition Updates

### 1. Innovating A Better Future

The "Innovating A Better Future" opened on April 8, 2017, is the first exhibition hall with tablets for interactive experiences. 34 innovative R&D technologies in 3 fields of Sustainable Environment, Health LOHAS, and Smart Life conceived by the Industrial Technology Research Institute (ITRI) are exhibited in the hall. A scene of integrated virtual and physical worlds is created using holographic projection, AR, motion sensing, and 360° interaction technologies. Visitors play the role of a new researcher to explore and learn by defeating each challenge in the exhibition hall. The process of guessing the answers to the riddles is very interesting. It is expected that every visitor leaving the hall would have had the opportunity to interact with cutting-edge technology personally. They are the people who can jointly make efforts to create a future world of Sustainable Environment, Smart Life, and Health LOHAS.



Exhibition unit: The Light of the City





Experiencing interaction with tablets

## 2. The Story of Taiwan Agriculture : Select Products from Agricultural Villages

Select Products from Agricultural Villages in the Story of Taiwan Agriculture exhibition hall was updated in July to exhibit the products from 11 units that won the Fine Agricultural Products Awards in 2016, such as the Gan-Qing Nectar from the Jiaokeng Community Development Association, Sinhua District, Tainan City; Guava Cake from the Jinshan Community, Yanchao District, Kaohsiung City; and other innovative agricultural products. The purpose of the exhibition is to promote the development results of the rural villages and make the exhibits more vivid.



Turmeric Teabags provided by Shen Nong Biotech Corporation



Select Products from Agricultural Villages

### 3. Telecom@Taiwan: Telecom Network Infrastructure Area

The Telecom Network Infrastructure Area in "Telecom@Taiwan" is the place where key operation principles of the telecom technology are exhibited. There are one interaction unit and four groups of cultural relics display cabinets. The interaction unit was updated in 2017 to improve interest and variety. The updates are modification of the software, renewal of the hardware equipment, more wooden decorations, as well as an increase and enhancement of lighting effects. They create a more vivid atmosphere for the updated Telecom Network Infrastructure area and visitors can understand more about the associations among the cultural relics in the four groups of display cabinets.

### 4. New exhibits in "Fantasy": Car Assembly, Parabolic Curves, Body Fat, and Animation Principles

NSTM and Assistant Professor Mou Cai-Yun of the Department of Visual Communication Design; Associate Professor Yin Zong-Xian of the Department of Computer Science and Information Engineering; and Associate Professor Gao Jia-Bing of the Department of Child Care, Southern Taiwan University of Science and Technology, jointly participated in the "Subsidy for College by Project for Digital Humanities with Social Education Institutions as the Base" of the Ministry of Education to add the exhibits : Car Assembly, Parabolic Curves, Body Fat, and Animation Principles in "Fantasy". They are helpful for children to learn scientific principles through games and animations.



Animation Principles



Car Assembly

## 5. The Earthquake Disaster Reduction Education and Experience Area

The "Earthquake Chamber" in the "Earthquake Disaster Reduction Education and Experience Area" was renewed and designed in 2017 based on the "3 Steps for Your Life in Earthquake – Drop, Cover, Hold on" and the additional experience of the "2016 Kaohsiung Meinong Earthquake". The dynamic simulation platform provides a sensation of an earthquake right at the scene. With the teaching video and the reminding sound effect, we encourage people to exercise the 3 life-saving steps personally, experience how the earth reacts on the surface in an earthquake, and learn personal precautions and protective measures against earthquakes on the spot.

There are also information for learning seismology, demonstration of earthquake engineering teaching aids for precautions against earthquakes, preparation of emergency rescue kits, and displays for learning of disaster prevention knowledge in the area. Visitors can learn more about earthquakes by texts and demonstration of teaching aids. Activities and lecture courses related to precautions against earthquakes will be available on an irregular basis to help people improve their learning.



Earthquake Chamber



## 6. "Self-Powered Chips" and "Stack Chips" in the Open Sesame Science Exploration Center

The technology converted from the "Self-Powered Ambient Light Integration Technology" of the National Applied Research Laboratories (NARLabs) uses the power supply module of the silicon thin film solar cell and the multilayer 3D-IC technology which are the bases for the following two units:

### (1) Self-Powered Chips

The city became a semi-3D structure with a design of embossment, and an IoT chip model was placed inside to show a city full of IoT chips. Visitors may change batteries and learn how troublesome it is to make these changes frequently for the old type of chips, or they may adjust the sunshine and street light to understand that the self-powered chips of the new type can harvest energy from ambient light to power themselves. By doing so, visitors may experience the applications trend of the new self-powered chips.

### (2) Stack Chips unit

The technique of building blocks and jigsaws is used to present the multilayer 3D-IC technology that NARLabs uses to "stack" the five components of its IoT chip, minimize its size, and improve its transmission rate. Visitors can observe the transmission route of the integrated and traditional tiled chips, and stack the five components personally to understand the difference between them. A magnifier is available to observe the physical pattern of the "traditional" and "integrated" chips.



Self-Powered Chip



Stack Chips

## 7. "Car Driving by Intelligent Transport Systems (ITS)" in "Pavilion of Dream Transport"

Two sets of car driving simulation devices are available for experiencing the Intelligent Transport System (ITS). In this unit, the 8 ITS service items are converted into a game of driving from Kaohsiung to Chaozhou. No matter whether pedestrians, light rail vehicles, car accident, rescue vehicles, bad weather, any vehicle suddenly coming from nowhere, or traffic signals are encountered, the ITS will inform the visitor in advance or remind them in time to help the visitor arrive at the destination safely. Official opened on November 25, 2017 for visiting and experiencing.

In addition to the simulated driving, the functions of the ITS are described in the film projected on the wall, and an experience of interest and knowledge is ensured by combining the driving simulation with the wall projection and dramatic projection mapping effect.



A driving simulation device for ITS experience

## 8. Textile & Clothing Made in Taiwan

The Department of Fashion Styling & Design Communication, Shih Chien University Kaohsiung Campus, cooperates with NSTM on a long-term basis to jointly promote design, innovation, R&D, and application of fashionable dresses and adornments. For this, it sets up a "Sparkling New Stage" in the "Textiles and Clothing" exhibition hall, presenting the clothing designed by the teachers and students. An exhibition lasts for about 1 to 2 months on average and the works are displayed in rotations. Visitors may take this opportunity to understand the achievements that schools in Taiwan make in the fashion designing field.



Textile & Clothing Made in Taiwan

## 9. Fighter in "Air Navigation and Aerospace"

To enhance the exhibition of the "Fighter" unit in the "Air Navigation and Aerospace" exhibition hall, VR technology is integrated to provide visitors with a simulated dynamic flying environment and unprecedented experience of how interesting it is to operate a flying fighter. The exhibition is open to visitors on December 29, 2017 with a service charge.



The Fighter unit

## 10. Nobel Prize Area

The awarding ceremony of the Nobel Prize is one of the greatest events in the scientific and literary communities. The prize is awarded in Stockholm and Oslo every year. The Nobel Prize is established according to the will of Mr. Nobel with the core purpose of "awarding the prize to the persons who make

the greatest contribution to society." The recipients of the Nobel Prize in 6 fields of Physics, Chemistry, Physiology or Medicine, Literature, Peace, and Economic sciences are announced at the beginning of October every year.

The recipients of the current year's and their achievements are introduced in a deep and simple manner. The 2017 Nobel Prize in Physiology or Medicine was awarded to the scientists who discovered the gene controlling the physiologic rhythm in our daily life, and the Nobel Prize in Physics was awarded to the scholars who detected the extremely small changes brought about by the gravitational waves passing the earth. Each year on November, the introduction of the recipients and their contributions is updated in the Nobel Prize Area located at the west corridor on the first floor of the museum. In order to provide better service, we provide the official web address and QR Code of the Nobel Foundation on the exhibition board in the Nobel Prize Area for the convenience of visitors who wish to read more information.



Nobel Prize Area



## Special Exhibitions Curated by NSTM

### 1. The Forest and Me exhibition

The exhibition was held from January 19 to May 28, 2017. It was curated jointly with the School of Forestry & Resource Conservation, National Taiwan University; NTU Experimental Forest; Forestry Bureau and Taiwan Forestry Research Institute, Council of Agriculture, Executive Yuan; and the Wutong Foundation with exploration and understanding of the forestry environment as the theme. In the exhibition, the "sustainable management of forests", the "trace of years in the annual growth rings", and the "application of natural resources in man's world" were presented in a manner of personal experience, real-time interaction, and participation in a theater. Visitors observed the ecology of animals and plants, smelled the odor of the trees, and felt the curing power of nature in the exhibition hall like entering a forest.



Entrance to the exhibition



Opening ceremony of the exhibition

## 2. Explore IoT exhibition

*The Road Ahead*, a book by Bill Gates published in 1995, manifests his macro vision in planning the future life of mankind, brings about the greatest revolution of everyday life in history, and is the fountainhead of Explore IoT exhibition. Kevin Ashton, Director of the MIT Auto-ID, coined the term Internet of Things (IoT) in 1999 and explained the basic meaning of the IoT as "everything can be connected via the Internet." Henceforth the "IoT" opened a door to a new future of technology. Imagine a world where billions of objects can be felt, communicated, shared, and connected via public and private network protocols. Data are collected, analyzed, and used through these associated objects. They are applied to actions and enrich intelligent planning, management, and decisions in the world of IoT.

The "Explore IoT exhibition" reflected the mission of a technology museum. It was held with the themes of communication and connection "between people, between people and objects, and between objects", and embodiment of the IoT spirit. Thanks to the integration of teaching in



Smart Logistics

entertainment, visitors could understand the applications of the information and communications industries, development of the IoT technology, and change of people's living styles in the mobile technology.



Cross-field Elements

### 3. Globalization Under the Eaves: Marriage Immigration in Taiwan

The "Globalization Under the Eaves-Marriage Immigration in Taiwan" was exhibited in five areas with the themes of Taiwan to the World, Local or Not, Time Is Decisive, Taiwan as a Community, and A Foreign Land – My Hometown. A total of 20 exhibition units were presented under these themes. The exhibition was subsidized by the Ministry of Education and co-organized by The Pearl S. Buck Foundation, Taipei, Taiwan. The National Immigration Agency and the organizations of new immigrants also gave their assistance in the exhibition. It was held from January 24, 2017 to September 24, 2017 at the east corridor on the first floor of the museum.

Most of the new immigrants in Taiwan are women. In addition to complicated naturalization procedures, they have to face different adaptation problems such as household expenditure and the upbringing of children. The language is the first problem to overcome for the new immigrants from Southeast Asia, for example, in addition to the difference in dietary habits and values. With this exhibition, visitors could understand how these new immigrants in different corners of Taiwan persistently and bravely play their roles in their everyday

lives and make their dreams come true. It helps more citizens live together with the people from different areas of the world in an attitude of openness, fairness, and respect.



Entrance to the 「New Immigrants in Taiwan」 exhibition



Light and portable tables for easy movement



#### 4. Wow! Somatosensory Adventure 2.0 Exhibition

We cooperated again with NanE Design Corp. Ltd. on December 13, 2016 to hold the "Wow! Somatosensory adventure 2.0 Exhibition". This event aimed to achieve the goal of "integrating teaching in entertainment" continuously and promote the idea of popular science education more actively in order to help people learn and perceive scientific principles in the joyful atmosphere of the museum. In addition to the original Laser Battlefield and overhead long tube slide, Happy Leaping, Gunslinger Showdown, GOGO Racer, and VR Speed Racing units were provided for the exhibition. These were arranged as a guidance for the people to learn that many concepts of technology have been widely applied to daily life. The "Experiential Education" was applied in the exhibition to attract people to the research of technology.



Wow! Somatosensory Adventure 2.0 Exhibition





## 5. BrainMyth

We cooperated with the Department of Psychology (Design Team of the Escape Room ), Kaohsiung Medical University, and Taiwan Applied Psychology Association to introduce an easy, interesting, and brain-activating escape room game. By combining brain science and psychology, the game uses an easy-to-understand and interactive design that can help people perceive invisible or obscure phenomena and knowledge. The game has 2 themes and 6 challenges each.



Visitors accomplished their task under teamwork

The first theme is "The Lost Cuckoo's Nest", an adaption from a classic experiment in the psychology and history of psychiatry. It reproduces the event in which the psychologist, David L. Rosenhan, verified the accuracy of psychiatry diagnosis. The second theme comes from "Did you see it? ". This was an actual psychological case and classic experiment showing virtual campus bullying in the game. The case is pieced together based on the memory of the witness, and the criminal evidence is reviewed for its credibility. The challenges are designed with the confessions of the offender. The game is set up in the special exhibition gallery 4 on the basement floor from November 3,

2017 to February 28, 2018. Visitors can reserve online or wait on site. A fee is charged for entry.

## 6. Art Exhibition Area

We set up special gallery areas at the west corridor on the first floor and in the Art Café on the second floor to make use of our space for the public and enrich their visiting experience. In addition to use for the museum, we open these areas to artists upon request. The works that have been exhibited included traditional Chinese paintings, Chinese calligraphies, oil sculptures, seal carvings, artistic designs, handiworks, pottery, photo collections, and other art works. These exhibitions were held in the hope to apply aesthetics to education and enlighten people on their aesthetic perception in the form of beauty, cultivate their mind into a better disposition, and achieve the goal of inspiring their creative thinking.

The exhibitions held at the west corridor in 2017 included the Tell the World – Li Deng-Yuan's Painting and Calligraphy, Kung, Yi-Fang's Gourd Art, Art of Kaohsiung – NSTM Painting Exhibition, Shape and Color: When Flowers Meet Shadows, Achievements Exhibition of Kaohsiung Art Class, Tian Mei-Quei's Chinese Painting and Calligraphy Exhibition, Exhibition of Wang An-Li and Yang Si-Ting, Painting and Calligraphy Exhibition of Zhou Xiao-Ru and Liu Chen, and Public Welfare and Art Posters Exhibition. The exhibitions held in the Art Café on the second floor included the Egg Sculpture and Calligraphy, Measurement Instruments

Exhibition, Cai Xue-Ping's Amazing Paper Art Exhibition, and Flower Note: A Joint Exhibition of Embossing Art by Zheng Jin-Hong and her students.



Egg Sculpture and Calligraphy



Cai Xue-Ping's Amazing Paper Art



Kung, Yi-Fang's Gourd Art



Shape and Color: When Flowers Meet Shadows

## Intelligent Automatic Maintenance and Management, and Self-made Exhibits

### 1. Construction of an intelligent inspection system

We built an intelligent inspection system for all the exhibition units of the museum at the end of 2017. 30 exhibition units were selected from 7 exhibition halls (4th floor: Science Laureates, Open Sesame Science Exploration Center, Adventures in Health Land, Textiles and Clothing, Pavilion of Dream Transport, and The Diseases Prevention Combat Camp; 2nd floor: Telecom @ Taiwan) for failure detection and auto reporting implementation. Maintenance personnel can use their tablet to receive real-time exhibit failure messages via the intelligent inspection system and solve the problem immediately to improve the service quality of the museum. 20 portable smart buttons are provided for the experiencing facilities or special exhibitions. Volunteers can use these buttons for their reporting. Furthermore, NSTM has systematically coded all the exhibition units of the 18 exhibition halls, and put up the numbers on the spot of the corresponding exhibition unit. Visitors only need to download the NSTM App to give assistance in the reporting of exhibit failures, and can receive an App Gold Coin as a reward.

### 2. Upgraded maintenance resumes

In addition to integrating the function and database of the old Exhibition Inspection System, the intelligent inspection system built at the end of this year provides more functions, including classification of user groups, construction and management of the information on the designer of each exhibition hall, definition ID for abnormalities of the exhibition units, definition of frequently used troubleshooting approaches, management of graphic information and reporting equipment for exhibition halls, sources for reporting exhibit failures, and design of statistic data, etc.



The intelligent sensor installed in the inner mechanism of an exhibition unit



The intelligent inspection system for mobile phones and reception of NSTM visitor's reporting



NSTM App and the screen reporting exhibit failure



Smart networking and reporting button system



### 3. Results of the improvement of employees' professional knowledge: self-made exhibits

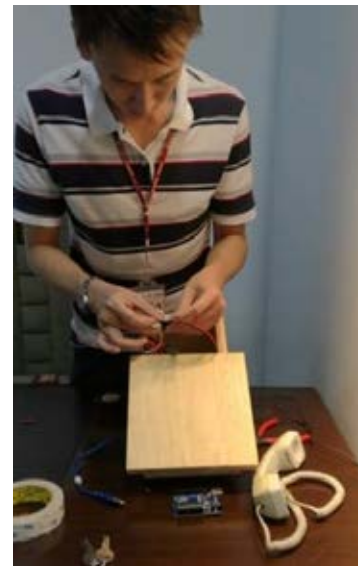
The maintenance personnel learn and grow from the execution of routine works, inter-museum exchange, educational training, and benchmarking learning, and apply them to their work and process improvement practice. Learning by doing is helpful for them to develop their potential. In 2017, the exhibition design and maintenance personnel worked together to make the 4 interactive exhibition units: "Steel Ball Slide (Potential to Kinetic Energy)", "Acoustic Interactive Electronic Clothes", "Room Escape: Look for clues by sounds", and "A Large Kaleidoscope" that presented scientific principles with interactive exhibits. With the support of the professional technique, the maintenance team made exhibition devices on their own and adjusted their steps in the trial and error process to improve their implementation and problem resolution capacities, as well as increase their professional knowledge. These could enrich the exhibitions and provide visitors with the opportunity to operate practically and experience interesting sciences. The portability of the devices may allow them to be used as teaching aids for the students of elementary and junior high schools in the future.



A Steel Ball Slide



Acoustic Interactive Electronic Clothes



Room Escape: Look for clues by sounds



A Large Kaleidoscope

#### 4. Regular inspection of exhibition halls and experiencing facilities to ensure normal operation

A maintenance team is established under the Exhibition Division and a working mode is created for the team. The team members have professional techniques and capabilities. They trust each other and work together closely, and demonstrate their specialties in their involvement and coordination. Maintenance personnel inspect the exhibition units in each hall everyday to ensure normal operation of the exhibits and improve service quality.

Since 2017 via the constructed intelligent inspection system maintenance personnel can entered the identified problems identified during the inspection in their mobile phones in a real-time manner They incorporated the maintenance resumé in the system for analysis of the failures or the exhibit that became abnormal most frequently. Improvements were developed and applied backward to the phase of exhibition design. They are also used as a basis for update of the exhibition units and improvement of the exhibits for their normal operation. The normal operation rate was 96.65% in 2017. It indicates the maintenance for the safety of the experiencing facilities and exhibits as well as the normal operation of the latter, providing visitors with the service quality of safety, comfort, and satisfaction.



Regular maintenance

## Collaboration Exhibitions

### 1. Exhibition of Your Name

KHAM INC. held the Exhibition of Your Name in NSTM. The film was directed by Shinkai Makoto, a famous animation director. It was an animated work causing a great sensation in Japan and Taiwan in 2016 and won many international awards. In the exhibition, every famous scene in the film was introduced and displayed in a storyboard style. It helped visitors feel as if they were in the scene personally, enter Shinkai Makoto's world of film, revived the touching plots of the film, and enjoyed a wonderful summer time. The exhibition was held from June 29, 2017 to September 3, 2017.

Visitors putting themselves in the scene like  
an encounter of two different worlds





## 2. Exhibition of Poo

KHAM INC. held the Exhibition of Poo in NSTM. Combined with knowledge, personal experience, and fun, it changed the "poo", which is closely related to our daily life, from being kept at arm's length and avoided as much as possible, to a funny and cool art work. The interactive game series designed with this theme gave about a brand-new sensory experience, and visitors could learn while being surrounded by different sized poos. It was an exhibition integrating teaching and entertainment. The exhibition period lasted from June 29, 2017 to September 3, 2017.



Exhibition of Poo

## 3. Darling! I am Old : Interactive experiential exhibition for the silver generation

This exhibition is held by the Taiwan Active Aging Association. Continuing the story of its Taipei debut in 2016, it presented the status of aged people, the trend of the silver industry, and the cases showing the wonderful life of the elderly in Taiwan and other countries. The exhibition tried to change the fear of "oldness" and the prejudice against it, and open the gate to a vision of the future. The exhibition was held in the First Special Exhibition Hall from March 24, 2017 to May 24, 2017.



Tools that help us to live healthily, safely, and comfortably



#### 4. Ghibli Exhibition

UdnFunLife CO., LTD. and NSTM worked together to hold the "Ghibli Exhibition" in the First, Second, and Third Special Exhibition Halls from June 17, 2017 to September 17, 2017. 9 animated cartoons: Howl's Moving Castle, Porco Rosso: The Last Sortie, Laputa: Castle in the Sky, Kiki's Delivery Service, Totoro, Pom Poko, Princess Mononoke, Spirited Away, and The Tale of The Princess Kaguya (manuscript), were collected for the exhibition of 23 3D classic scenes and tens of miniature Box Art works. The Studio Ghibli designed all the scenes and exhibits for the exhibition. It also supervised their manufacture, transported them to Taiwan, and reproduced them here.

A scene of the Ghibli Exhibition

## 3D Theater

### 1. Formed the film selection task force to choose the most outstanding 3D films of the year

The movie selection team is responsible for the selection of premium movies for visitors. The movies of Life under the Arctic Sky 3D, Dinosaurs at Dusk, Museum Alive 3D, and Yellowbird 3D were provided in 2017. The theme-based movies can be played in conjunction with special exhibitions or promotion of environmental education. Animated cartoons suitable for parents and children are also available. They are educational, entertaining and highly recognized by visitors.



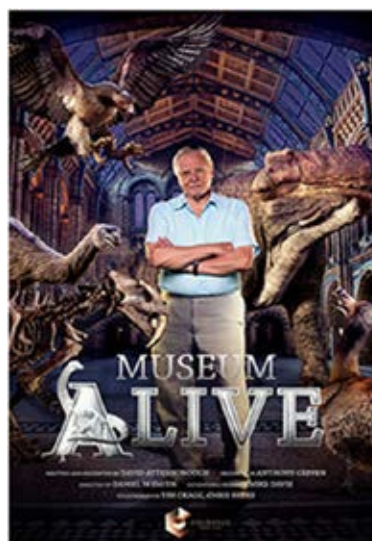
Movie Selection Team Meeting



Life under the Arctic Sky 3D



Dinosaurs at Dusk 3D



Museum Alive 3D



Yellowbird 3D



## 2. 3D Theater Auto Scheduling System

We build a 3D Theater Auto Scheduling System and convert all the music, introduction of the environment, and other video content to playable files. The time for automatic play of the content is planned and set in advance using the system functions. If necessary, a volunteer in the field can operate the newly installed lighting control system to turn on/off the light depending on the actual requirement of the service. These measures may reduce the manpower and time needed for playing the movie at a fixed time and improve the flexibility of the maintenance manpower. They can also reduce the labor cost and error rate effectively by employing remote monitoring technology in conjunction with regular inspection and turn on/turn off the machine in the hope to achieve the intended goals with as little funds as possible.

## 3. Development of the "alternative content" for the 3D Theater

Taking the public as the core and providing them with total services while emphasizing the spirit of "fair sharing", "participation and cooperation", and "openness and transparency", the Labor Worker Recreation Center Hostel of the Labor Affairs Bureau, Kaohsiung City Government, worked together with NSTM to hold an event of "International Day of Persons with Disabilities: We Don't Go to the Movie Today! Experience of Visually Impaired Persons in Theaters" on November 29, 2017. A film of "Master Everything" was played in the 3D Theater. It was a movie with visually impaired persons as the leading characters to show the "Experience of Visually Impaired Persons in Theaters" and demonstrate that they also have the right to go to the theater and enjoy movies. People with normal eyesight were invited to experience empathically together with them.

The event of "We Don't Go to the Movie Today!  
Experience of Visually Impaired Persons in Theaters



## Performance of Services Outside the Museum

### Self-Curated Touring Exhibition

#### 1. "Nanometer: The Invisible Scale" at the National Museum of Natural Science

Nanotechnology has been developed for many years and there have been many new products introduced to the market in the name of nanometer. Though this and other related terms are familiar to the public, they may have scant knowledge about the scientific principles of nanotechnology. With the support of the Nanotechnology Human Resource Development Program, we held a special exhibition focusing on DIY and personal experience from the perspective of the public. Packaging and conversion were used in the exhibition to make nanotechnology more comprehensible and acceptable to visitors and facilitate its promotion as a popular technology. This premium exhibition travelled to the National Museum of Natural Science in Taichung in 2017. Both museums at the national level worked together to promote nanotechnology education for society and the next generation.



Entrance to the exhibition at the National Museum of Natural Science



A corner of the exhibition



## 2. The "Invention Exhibition" at the Macao Science Center

The Macao Science Center (MSC) is dedicated to the promotion of popular science education. It invited NSTM to hold the "Invention Exhibition" there to help people understand more about the technology close to their everyday lives. MSC entrusted and authorized Macau Creative Industry Company Limited to organize the exhibition. It was responsible for the construction on site and operation of the exhibition, while NSTM was responsible for installation, test and display of the exhibits, as well as educational training.

The exhibition was held from March 10 to June 18. It was organized in combination with the innovative inventions of local young people and the popular science education activities, encouraging people to think, invent, and create local innovative works.



The popular science performance designed by MSC



Schoolchildren took a picture with the guests at the closing ceremony

### 3. The "Invention Exhibition" at the Tech Dome Penang, Malaysia

To execute the "New Southbound Policy for Popular Science Education and International Exchange Project: Relocation of the 'Invention Exhibition' ", we entered into an agreement with Tech Dome Penang, Malaysia, to hold the "Invention Exhibition" there from October 1 to December 31. The cooperation matters included that NSTM was responsible for all the exhibits and their installation, removal, packaging, and transport as well as educational training, innovative invention workshops, and exchange activities at the opening and closing ceremonies. The Tech Dome Penang gave assistance in the marketing, promotion, and operation of the exhibition.

This exhibition was a small-scale modular event and it was the first time for NSTM to work with a country of New Southbound Policy. The Tech Dome Penang used local creativity and vitality to develop exhibition manuals and arrange comprehensive educational activities.



A schoolchild was experiencing the innovative collage game



Schoolchildren happily took a picture with the exhibits

#### 4. The "Invention Exhibition" at the Public Library of the Hualien County Cultural Affairs Bureau

To enrich the Public Library of the Hualien County Cultural Affairs Bureau with more information, it arranged a loan exhibition to hold our "Invention Exhibition" of Areas A and B2 from November 28, 2017 to January 26, 2018. This event combines a theme book fair and the education promotion activities in the hope of encouraging people to learn and promote positive reading habits.



The "Invention Exhibition" in the Public Library of the Hualien County Cultural Affairs Bureau



## 5. "Science and Technology for Disaster Reduction" at the National Chiang Kai-Shek Memorial Hall in Taipei

The "Science and Technology for Disaster Reduction" exhibition was held in National Chiang Kai-Shek Memorial Hall in June 2017. The exhibition vividly combined the Handsome Monkey King in the Journey to the West and the Clairvoyant, Clairaudient, Earth God, and other characters in the folktales. Popular, lively, and educational to parents and children, the

exhibition showed profound disaster reduction technologies, including remote sensing images, disaster interpretation, early warning of earthquakes, real-time monitoring of reservoir water levels, flood reporting systems, and disaster potential maps, in a simply way. There were also activities of praying and drawing fortune sticks during the exhibition.

The exhibition was held from June 19 to August 20, 2017. It was arranged together with the exhibitions of disaster reduction technologies held by other ministries or departments, and

could help people understand more about the scientific principles and applications of the disaster reduction technologies.



The "Science and Technology for Disaster Reduction" exhibition moved to National Chiang Kai-Shek Memorial Hall in Taipei



## 6. "Science and Technology for Disaster Reduction" at the Chia-Yi Municipal Museum

The exhibition was moved to Chia-Yi Municipal Museum on September 8, 2017. 10 challenges representing different disaster prevention technologies were designed. With the Journey to the West as the core of the exhibition, they were linked to the characters in traditional novels and folklore religions depending on the property of the disaster to be prevented. For example, the aero-photographic and remote sensing disaster interpretation system was linked to the Clairvoyant, the Earthquake Early Warning System was linked to the Clairaudient, the flooding monitoring and reporting system was linked to the Dragon King, the early warning of large-scale collapse was linked to the Earth God, the global warming was linked to the Bull Demon King and the Mountain of Fire, and so on. When visitors had overcome all the challenges at the 10th challenge station, the Tainhou Temple for prevention of disasters, visitors could cast moon blocks, draw fortune sticks, and be promoted as a "Disaster Prevention Expert."



The "Science and Technology for Disaster Reduction" exhibition at the Chia-Yi Municipal Museum

## True Dream Land

Since the establishment of the True Dream Land in 2015, we have been dedicated to the organization of activities for makers and promoted relevant events and training courses. These efforts have been made to implement the in-depth maker education in the hope to jointly form a maker's ecology system for the public by integrating internal energy and external social resources.

The results in 2017 included Acer CloudProfessor (IoT), wooden handicrafts, jewelries and metalworking creations, 3D printing, and many other courses for makers. We worked with the teachers and professors of the National Pingtung University and the Graduate Institute of Science Education & Environmental Education, National Kaohsiung Normal University, to provide the training courses for seed CloudProfessor instructors. We also assisted the Education Bureau, Kaohsiung City Government, in local disaster prevention education (Maker's Disaster Prevention Workshop). The new cooperative communities include the Wawood, Fametal, Perkūnas Studio, and MakerLab. The "2017 Taiwan Wood-based Materials Promotional Program" that we executed in cooperation with the Taiwan Forestry Research Institute, COA, was highly recognized by the people

in North Taiwan. The Makers' Achievements Series includes the "Woodworking Results Exhibition" and "2017 Makers' Fair" which included the Maker Education Lecture Courses, Booth Demonstration, Maker Workshop, Setup of a Large Kaleidoscope, Kaleidoscope Welfare Workshops, Making and Flight of Large Paper Planes, Paper Plane Workshops, and so on.



Maker promotion activities





NSTM worked with Taiwan Forestry Research Institute, COA, to execute the "2017 Taiwan Wood-based Materials Promotional Program"



Two training courses for a total of 25 CloudProfessor seed instructors



2017 Makers' Fair Workshops



2017 Makers' Fair

## Social Resource Integration Achievements

### 1. Cooperation with the Soil and Water Conservation Bureau of the Council of Agriculture, Executive Yuan to execute the "Rural Rejuvenation Promotion Program"

#### (1) Rural Rejuvenation Promotion Program

We execute this program in cooperation with the Soil and Water Conservation Bureau of the Council of Agriculture, Executive Yuan. We promote the development of quality agriculture and the rural rejuvenation achievements in Taiwan by using The Story of Taiwan Agriculture exhibition hall as the basis. In addition to updating the Taiwan Fine Agricultural Products Showcase in 2017, we provided 6 handicraft DIY courses in rural areas, 4 cultural and creational courses for rural makers, and 17 lecture courses provided by agricultural experts.



Agricultural expert's lecture courses: grouper



Handicraft DIT courses in the rural area: A snowman of sponge cucumber



## (2) Workshops for theme-based narrators

We provided the workshops for the narrators of the exhibition halls in cooperation with the Senior High School of National Kaohsiung University of Hospitality and Tourism. The manager of the exhibition hall was the instructor to help the tenth graders of the Department of Tourism Management use the narration resources of the exhibition halls and learn how to narrate to visitors. The courses were provided from May 20, 2017 to May 21, 2017, and the students practiced at the NSTM during the summer vacation to better their practical capability. A total of 28 teachers and students participated in the event and 2,055 persons were served during the training.



Guide training of narrators



Students demonstrated their narration learning results

### (3) How fun the science is

We implemented this event together with the National Pingtung University. The manager of the exhibition hall helped the freshmen of the Department of Science Communication, National Pingtung University, learn about the exhibition and took this opportunity to develop education promotion activities. The event was implemented on January 7 to improve the depth and scope of the students' knowledge on the agriculture in Taiwan, and visitors were also invited to experience such knowledge. A total of 60 students participated in the event.



Chickens and ducks: Learn about poultry and livestock in Taiwan by discovering cards



Not Difficult to Me: A painting game was designed with inspiration of the Phalaenopsis in the exhibition hall. Visitors could observe, explore, and use agricultural elements to make their own bookmarks

## 2. Diversified Promotion Programs for 2017 Soil and Water Conservation

### (1) Soil and Water Conservation and Debris Flow Prevention Area

We organized 183 "Soil and Water Conservation Go!" promotion events (twice every Saturday; reservation is available to schools on workdays) with 2,347 participants.



Soil and Water Conservation Go!



Teachers' workshop in the Morakot Environmental Science Café



Workshop for soil and water conservation personnel



Promotion activity in May: Soil and Water Conservation for Disaster Prevention



## (2) "Soil and Water Conservation for Disaster Prevention" exhibition moved from NSTM

The exhibition was moved to 3 agencies and schools, and 2 teaching projects were developed for it. 540,358 persons participated in the event.

First phase: National Chiang Kai-Shek Memorial Hall in Taipei from June 16, 2017 (Friday) to August 20, 2017 (Sunday)

Second phase: Tzu-Chi Foundation, Tainan Branch, from August 25, 2017 (Friday) to November 5, 2017 (Thursday)

Third phase: National Library of Public Information in Taichung from November 17, 2017 (Friday) to March 4, 2018 (Sunday)



Press conference at the opening ceremony at the National Library of Public Information



Visitors in Tzu-Chi Foundation, Tainan Branch





DaAn Elementary School in Zhushan township of Nantou

### (3) Mobile teaching aids for soil and water conservation: Promotion of the "Decoding Game I & II"

The "Decoding Game I & II" : "Storm" and "Flood" were open to senior high schools or below to borrow in the second semester of 2016 and the first semester of 2017. A total of 99 schools and 2 governmental agencies borrowed these aids for up to 9,797 persons.



JianAn Elementary School in Daan district of Taipei

#### (4) Development of 3 innovative teaching aids and materials

##### ● Singing & Dancing: "Soil and Water Conservation Warriors"

The personnel of the Recovery and Reconstruction after MORAKOT exhibition hall wrote the lyrics, choreographed, played instruments, as well as shot and produced the film. It has been uploaded to YouTube and can be used for every soil and water conservation promotion activity or as a tool for children of the elementary schools and kindergartens to learn singing and dancing.

Link:  
<https://goo.gl/a6x74N>



A performance at the award ceremony of the Soil and Water Conservation Bureau

##### ● Card game: "Seed vs. Enemy"

This is a game designed and produced by Wang Yin-Ling and Li Yu-Rong from the team of the Recovery and Reconstruction after MORAKOT exhibition hall. They were inspired by the board game of "Saboteur". The game is inspired with the "Ticklish Tree" as the background and used for extended learning of the picture book.

##### ● Environmental education picture book: "Ticklish Tree"

This is a picture book with graphic and descriptive creations of Xu Cai-Wei and Wang Jian-Xun from the team of the Recovery and Reconstruction after MORAKOT exhibition hall. 1,000 books have been published. Their promotion will be continued in 2018.



The "Ticklish Tree" was a creation of Xu Cai-Wei and Wang Jian-Xun from the team of the Recovery and Reconstruction after MORAKOT exhibition hall



The "Seed vs. Enemy" was a design of Wang Yin-Ling and Li Yu-Rong from the team of the Recovery and Reconstruction after MORAKOT exhibition hall



### 3. The 2016 Gathering of the Outstanding Schools in the Construction of Disaster Prevention Campuses

The Ministry of Education has subsidized senior high schools or below for construction of disaster prevention campuses since 2011. A total of 301 schools in 22 counties and cities were subsidized till 2016, the 6th year of the subsidization. To learn from the achievements of other schools, exchange experience in construction of disaster prevention campuses and pass it on, the Ministry of Education organized the "2016 Gathering of the Outstanding Schools in the Construction of Disaster Prevention Campuses" in NSTM on Friday, April 21, 2017. The achievements of the project were presented in an interactive way and a list of

outstanding schools was determined in the afternoon.

The students of the Kaohsiung Municipal Chung-Cheng Industrial High School which has the only traditional hand puppet show club in Taiwan were invited to give a hand puppet show. The students integrated disaster prevention elements in their show and made it more meaningful. The students of the Kaohsiung Shu-Te Home-Economics & Commercial High School also performed a lively dance with passion and integrated the educational idea of disaster prevention in their dance.



Pan Wen-Chung, the Minister of Education, presided at the opening ceremony on April 21



AR experience of disasters at mountainsides

#### 4. 2017 National Disaster Prevention Day Event

The activities for the National Disaster Prevention Day this year focused on the frequent earthquakes, typhoons, and floods in recent years in Taiwan, and were held with "Maker Education", "Technology Heritage", and "Virtual Reality" as the core. The challenging "When the Earth Trembles: Earthquake and Large-scale Collapse" was designed for visitors to experience it.

7 interesting challenges were designed in combination with the "Recovery and Reconstruction after Morakot Exhibition", "Earthquake Disaster Reduction Education and Experience



VR experience unit of earthquakes and disaster prevention

Area", "True Dream Land", "Open Storage", and "Flying House" exhibition halls, including a VR experience of the 3 Steps for saving Your Life in Earthquakes, AR Terrain Sandbox experience, "Fly Through Xiaolin": a six-axle dynamic flying experience of after-disaster reconstruction, earthquake-resistant building DIY, and makers' disaster prevention achievements. These activities could help people understand important disaster prevention knowledge.



## 5. The Brain: The Biology of Mind

The 21st century is the Century of Brain. Though scientists have given every effort to explore this organ of the highest position, and consuming the most energy of the body, knowledge of the brain is still limited so far. To celebrate its 30th anniversary, the National Museum of Natural Science (NMNS) held the "Brain: The Biology of Mind " to explore the brain biologically. The exhibition was moved to NSTM after it had been completed on February 28, 2017. It showed a collection of research findings and instructions of more than 10 professors from National Tsing Hua University, National Yang Ming University, National Taiwan University, Hsuan Chuang University, China Medical University, National Central University, and other colleges, and was held with the support from HTC Electronics, NeuroSky, PI Bioelectronics, and other corporations. The dynamics of the industries, governments, and scholars were gathered here to hold this event of knowledge, entertainment, technology, and enlightenment. The exhibition provide a touchable, experienceable, and imageable space that can even be taken seriously in the future, and visitors can understand the "brain issue" and became aware of themselves through the game. The exhibition was comprised of 7 units: Structured Brain, Sensory Brain, Perceptual Brian, Rational Brain,

Changing Brain, Pulsing Brain, and Subtle Brain. It was held from October 14, 2017 to February 28, 2018.



The opening ceremony of the "Brain: The Biology of Mind" exhibition

Annual Report

# Technology Education



Centered on "Bringing technology closer to life, and improving life via technology", we have held various science-themed educational events to cultivate schoolchildren's science knowledge, provide multiple resources for science learning, and create the right environments for technology education. All of those are set for the goal: "Training science enthusiasts". In 2017, we held 1,746 science-related events, with a total of 328,123 participants.

In order to promote popular science education and to create a fair, shared learning platform, we organize science-themed events according to different age groups. Aside from elementary school and junior/senior high school students, we also set up "Scientific Courses for Toddlers" for preschoolers. For adults, parent-children and senior groups, we have "NSTM Creative Life School" and "Technology Senior Alumni Association". In 2017, we held 111 courses and served 6,982 participants in total. In order to strengthen scientific experiential learning, various science education activities were organized, and interactive experience activities were developed by combining the fundamental concept of science to enhance the fun of learning popular science. In 2017, we held 764 live teaching events and served 183,507 participants in total. The diverse learning model was adopted to promote popular science, where a variety of external activities, seminars, lectures and other relative activities were held

to increase the diversity of the events and expand the scope and breadth of our services. In 2017, we held 217 events and served 84,787 participants in total. Table 9 illustrates the number of technology education events from 2013 to 2017.

Table 9. Number of technology education activities from 2013 to 2017

Type Year	Study activity		On-site activity		External service		Lecture		Seminar		Other		Total	
	Sess- ions	Partic- ipants	Sess- ions	Partic- ipants	Sess- ions	Partic- ipants	Sess- ions	Partic- ipants	Sess- ions	Partic- ipants	Sess- ions	Partic- ipants	Sess- ions	Partic- ipants
2013	986	34,225	1,502	206,250	96	48,481	32	4,112	0	0	7	3,619	<b>2,623</b>	<b>296,687</b>
2014	1,004	36,672	1,270	229,329	139	59,931	36	4,768	1	520	5	1,886	<b>2,455</b>	<b>333,106</b>
2015	765	29,375	906	193,700	157	106,831	40	6,593	2	114	7	185	<b>1,877</b>	<b>336,798</b>
2016	734	26,197	680	197,407	137	99,913	36	4,410	9	298	0	0	<b>1,596</b>	<b>328,225</b>
2017	727	27,370	754	183,507	149	105,858	27	4,961	6	308	34	6,119	<b>1,746</b>	<b>328,123</b>



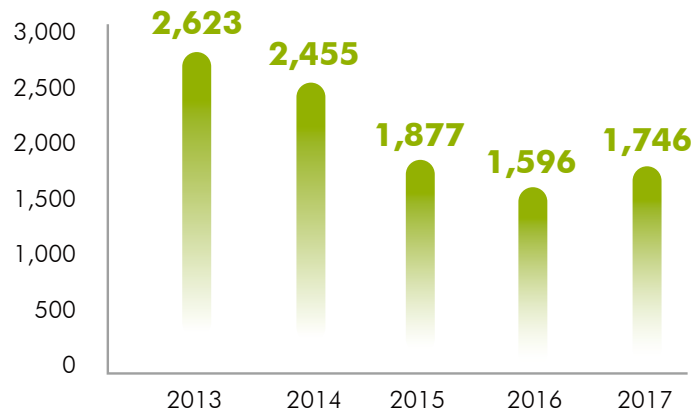


Figure 6 Total number of sessions in the last 5 years

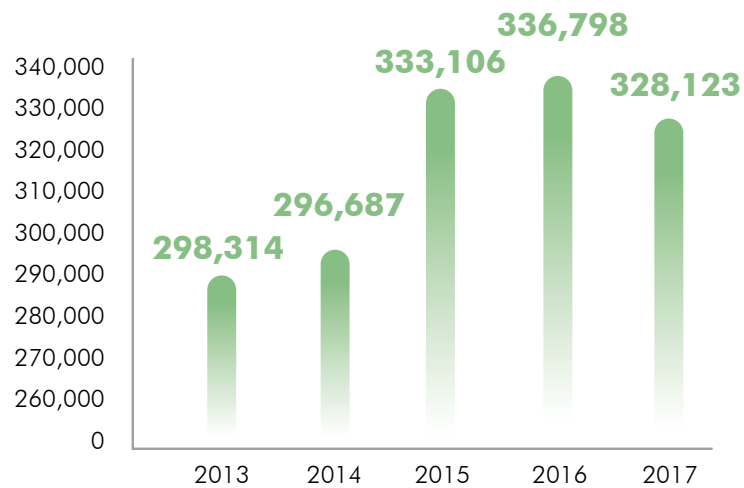
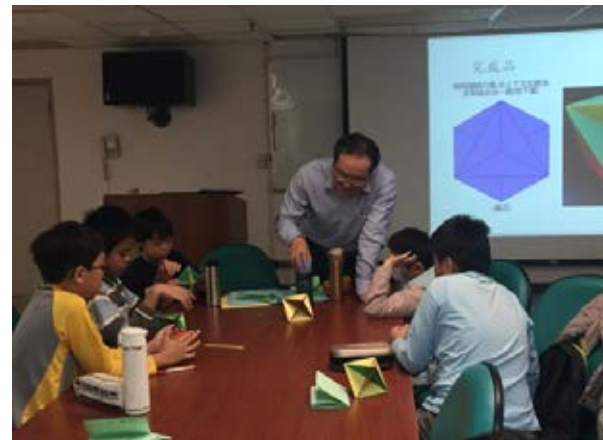


Figure 7 Total number of participants in the last 5 years

## Science Themed Activities

### 1. Winter/Summer vacation science camp

In order to enrich the lives of students during summer and winter vacations, NSTM promoted a diversity of science education courses to improve the scientific knowledge and discipline of our national students via a variety of science experiences. These activities include power machinery, physics and chemistry, science literacy, aesthetics, life science, astronomy and other courses. We also offer free learning for the 5% specific student groups. In 2017, we held 176 sessions and served 5,388 participants in total.



Summer camp: Geometry: Space Adventures

## 2. Weekend learning courses

In order to cultivate basic scientific knowledge and discipline of students, NSTM has integrated applied science resources to develop science courses, including: family courses, biological experiments, robotics, astronomy, power machines, aesthetics and crafts, children's creative arts, physics and chemistry, etc. Furthermore, 5% of the vacancies were reserved for specific student groups, and hold weekend courses such as the Weekend Science Feast from March to June, and from September to December (spring term and fall term). In 2017, we held 97 sessions and served 1,348 participants in total.



"Weekend Science Feast": Collapsing can experiment and straw blowgun making

## 3. Reservation of activities for school and educational groups

In order to improve basic scientific knowledge in students, NSTM planned the "NSTM Fun Science" hands-on activity series by integrating our experience exhibits and exhibition hall resources. NSTM Fun Science is available to school and educational groups to conduct field trips (reservation is required). The activities are divided into lower, intermediate, and advanced elementary school levels, junior high school level, environmental, students with visual impairments, and hard-of-hearing students education activities. We aim to serve students from different backgrounds and offer chances for fair, shared learning. In 2017, we held 229 sessions and served 9,442 participants in total.



"NSTM Fun Science": CD UFOs

#### 4. Hands-on science

In order for the students and public to learn basic scientific knowledge through exhibitions and experiments, NSTM held Hands-On Science events, guiding the public into the realm of scientific learning via hands-on activities. This year's experience activities included "Interactive Science Teaching Aid Experience", "Nanoscience Promotion", "Summer Term Optics Experiments", and "Brain-Live Activities", etc. Furthermore, external resources were integrated to conduct popular science experiences, including co-organizing the "Food Nutrition and Safety Weekend Events" with the Department of Nutrition and Health Science, Fooyin University. In 2017, we held 746 sessions and served 183,507 participants in total.



Summer Term Optics Experiments



Singapore Science Study Tour

#### 5. The New Southbound Policy and the science and education activities

This year, we followed the New Southbound Policy for Popular Science Education and International Exchange Project by holding the 2017 Singapore Science Study Tour. This is the first time we cooperated with an overseas museum to hold science camps and visit the Science Demo Lab at National University of Singapore, Lee Kong Chian Natural History Museum, and the Ecogarden at Science Center Singapore. We have held it twice and served 24 students in total.

## Scientific Creativity Competition

### 1. National energy technology contest

In correspondence with the energy technology education promotional policies from the Ministry of Education, the NSTM held the "Energy Science and Technology Creative Design Contest" and "MOE Energy Education Program Result Exhibition" in collaboration with the MOE Energy Education Program Office. The events included: National Energy Technology Creative Practical Competition and MOE Energy Education Program and competition result exhibition. In order to promote the philosophy and details for the Energy Science and Technology Creative Design Contest, 6 briefing sessions were held, attracting 309 teachers and students from 309 teams to participate in the event. At the end of the competition, 218 contestants from 42 teams received awards.

The MOE Energy Education Program Result Exhibition "2017 Best Energy Creativity-Creative Technology Innovation Exhibition" includes the annual results from 6 energy technology educational alliance centers under its office, 2 Energy Technology Education Centers and 19 energy technology education promotion schools.

Moreover, interactive experience activities including an energy technology DIY challenge and Energy Quick Fire Quiz were also held. The exhibition was held for 19 days and served 40,610 people.



MOE Energy Education Program Result Exhibition opening ceremony



Energy Science & Technology Creative Design Contest



## 2. "Project on Creative Maker Education Competition and Exhibition", commissioned by the Ministry of Education

In order to increase students' interest in maker education, we have integrated various resources, worked with each individual maker education center and held the "Creative Maker Education Competition", which helped the participants learn how to solve problems. We also held the "Maker Education Teaching Plan Design Competition", creating a platform for learning and exchanges of maker education teaching materials. Through this Plan, we have further promoted MOE's "Innovative Maker Education Plan", introducing the maker spirit to everyone and increasing their interest in creative thinking.

## 3. Hand Launch Glider Flying Competition

In honor of the Wright Brothers in designing the first manned heavier-than air air-craft in 1903, as well as promoting aerospace science, NSTM held the 7th "Hand Launch Glider Flying Competition" during 12/16-17 aimed at senior and junior high school students. The event adopted the method of making-on-

the-day, competing-on-the-day with the categories of "Straight Flight" and "Endurance Flight", while taking into consideration the creativity and scientific principles of flight. It was aimed at training students in developing, designing, thinking, and problem solving abilities. On the day of the game, a total of 139 teams in the senior high school group participated in the competition and Taipei Municipal Jianguo High School received 1st place. In the junior high school group, a total of 117 teams participated in the competition and Chiayi Prefectural Taibao Junior High School received 1st place.



The 7th Hand Launch Glider Flying Competition awards ceremony - First place in junior high school group



The 7th Hand Launch Glider Flying Competition awards ceremony - First place in senior high school group

#### 4. Robot competition

In promotion of cross-industry integration and utilization of scientific knowledge, as well as the motivation in learning and student participation in robotics, Esunra invited the NSTM to organize the 2017 FIRST LEGO League and FIRST Tech Challenge creative robot competition. The competition was participated in by a total of 2,500 people, including 470 contestants from 89 teams, their families and the audience.



2017 FLL and FTC Creative Robot Competition.



## Environmental Education Promotion Activities

### 1. LOHAS Energy Conservation House promotions

With our environmentally certified halls, we promote the "Energy-Saving and Carbon-Reduction" initiated by the Bureau of Energy, MOEA. Through the physical demonstration of a "LOHAS Energy Conservation House", lectures and activities, we introduced tips for saving energy to the visitors. In 2017, we held "Energy-Saving Partners" Volunteer Alliance Seminars, "Saving Energy with A-guang Winter and Summer Camps", "Energy Saving and Environmental Education Courses", and "Saving Energy - Interactive Exhibitions and Demonstrations". We have



Energy Saving and Environmental Education Course.

served 4,024 participants.

### 2. "NSTM Visit Experience" activities

We strove for the subsidy from the Environmental Protection Administration, Executive Yuan, to execute our environmental education plan at environmental education sites. With our various teaching resources and environmental education for school trips, we help students learn green energy and apply the core ideas to daily life, increasing their awareness of resource protection. We have received 10 school groups from Chiayi County, Tainan City, Kaohsiung City and Ryukyu Township, Pingtung County, with a total of 379 participants.



"NSTM Visit Experience": Wave power generation



### 3. "LOHAS and Energy Saving" activities

Focusing on "water saving" and with local environmental issues and geographical conditions, we strove for the subsidy from the Water Resources Agency, MOEA, and the resources from the Water Resources Bureau, Kaohsiung City Government, holding activities for the "Love Water, Save Water Month". We hope to shape the awareness of water saving through lively and interactive teaching aid activities. In 2017, we held 13 sessions with a total of 5,190 participants.



"LOHAS and Energy Saving": What is in 1 cubic meter of water

### 4. "NSTM Tour" activities

We strove for MOE's 2017 Environmental Learning Center and School Trip Promotion Plan, aiming to provide priority application for the remote primary schools and junior high schools. The plans include "Green Discovery – LOHAS Tour and Experience" and "Discover the Environmental Issues". With practical courses such as "Nature Feast – Frogs in Taiwan" and "Green Magic-the Pot Clocks", we lead students to a better understanding of Taiwan tree frogs and other issues related to ecology, water resource usage, and environmental sustainability. In 2017, we held 10 events with a total of 408 participants.



"NSTM Tour": Nature Feast – Frogs in Taiwan

## Specific Ethnic Group Activities

### 1. Remote area disadvantaged group activities

In order to care for disadvantaged students, the NSTM strove to obtain the sponsorship of the Shui-Lai Chen Foundation in holding the "Scientific Banquet Event: Science Papago" project, sponsorship of Kinghong Foundation in holding the 2017 "Multicultural Science Education" promotion collaboration project, and science education banquet events for the children of new immigrants and students living in remote townships. NSTM held 42 sessions and served 1,866 people in 2017. Additionally, we obtained the sponsorship of the Motech Culture and Art Foundation in holding the Solar Energy Journey event for elementary schools in remote regions of Tainan. We held 6 sessions, and served 240 people this year. For the Creative Energy and Technology Exhibition for remote schools, we held 6 sessions and served 208 participants.



Scientific Banquet Event: Science Papago

### 2. Adult education learning activities

In establishing the principle of a community popular science learning center, the NSTM exclusively held the 24-hour museum courses: "NSTM Creative Life School" series learning activities. The activities were aimed at adults to establish an all-day-long knowledge-sharing environment, providing adults with an opportunity to receive lifelong education. We held a total of 33 sessions, and served 319 people in 2017.



"NSTM Creative Life School" bouquet.

### 3. Senior series courses

We offer "LOHAS Activities" for seniors and elders, helping them with life-long learning activities. Retired people are also eligible for the courses. The participants can benefit from the Smartphone and the internet course, the Chinese Massage and Health course, and so on and so forth. Relaxing and pleasant activities are incorporated based on adult learning characteristics to make the courses more lively, professional and diverse. In 2017, we provided 15 courses and served 409 participants.



"Technology Senior Alumni Association": Smartphone easy access to the Internet

### 4. Scientific courses for toddlers

We offer a popular science education series for toddlers including Popular Science Reading, Cub Scouts, Toddler Maker, and Toddler Scientific Diet units. They are blended in life education, cultivating young children to learn science with a curious mind. We have provided 10 sessions with a total of 410 young children. Apart from that, we also held "Exhibition Halls are Classrooms" customized DIY activities. Through exhibition introductions, science DIY and experiments, toddlers can experience science and diverse cultures. In 2017, we provided 14 sessions with a total of 530 toddlers.



"Scientific Courses for Toddlers": Cub Scouts unit.





Globalization Under the Eaves and We Are the One - Technology and Science Fair

## 5. Various cultural courses for new immigrants

In order to create a fair, shared platform for educational resources and to promote multiculturalism and science education for new immigrants, we strove for the subsidy from MOE for the "Globalization Under the Eaves and We Are the One-Technology and Science Fair" plan, including "Multicultural Exhibitions with a Technology and Science Tour-School Visits", "Talent Development for New Immigrants-Parent and Children Cultural and Creative Activities", "Reading under Various Cultures-Parent and Children Bicultural Activities", and "Exotic Cultures-Cuisine Fair". We also launched multicultural DIY activities centered on Vietnam, China, Indonesia, Thailand, and Cambodia. We held 39 events and served 2,686 participants in total.

## 6. Customized curricula

NSTM developed customized courses and new activities in order to satisfy the demands of junior high school curricula or other special educational activities. NSTM held 23 whole-class honor classes for junior high schools, and served 703 people in 2017.



"Science Practice Room": Cooking eggs without fire



## Academic Exchange Activities

### 1. Guangdong Science Week-popular science activities

In order to broaden cross-strait science education, to learn from each other about popular science education site management, and to enhance the communication and cooperation, we planned an interesting science demonstration and performed in the Science Center in Guangzhou, China, 2017.



Guangdong Science Week-Popular science activities

### 2. Workshop for physics teachers from high schools in Nanjing

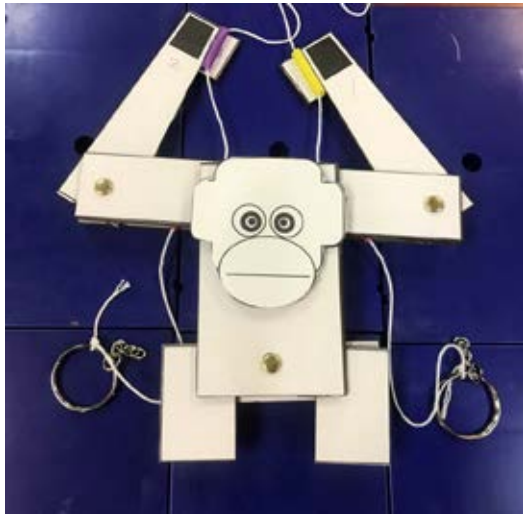
In order to create a platform for science teachers, we invited current primary school teachers from Nanjing, China, to our innovative technology teacher workshop with science DIY activities from May 17 to 25, 2017. There were 25 participants in total. The cross-strait exchanges and learning feedback are our reference for future informal science education improvement.

### 3. Guangzhou Popular Science Alliance

In order to increase exchanges of popular science education, the Guangzhou Popular Science Alliance entrusted us to hold a popular science education exchange in September, 2017. We arranged field trips for science exploration, utilizing Kenting's unique resources with the combination of popular science education and the local culture. The designed technology activities helped inspire innovative thinking in the 14 total participants.

## Development of Teaching Materials and Plans

In order to develop experience learning and increase learning benefits, we have made an effort on designing and developing teaching materials and plans. This year, our science learning center created 7 teaching plans, including "Convex Lens and Image Formation" and "Synthesis and Dispersion of Colored Light", 5 teaching plans for school trips, including "The Curious Squid" and "Monkeys on Trees", and 6 teaching plans including "Natural Seed Keychains" for environment education and



"Monkeys on Trees" teaching aid

"Piezoelectricity" for nanotechnology. In 2017, we finished 19 plans.

## Project-type Programs

### 1. MOST subsidized the project of development and promotion for nanotechnology & biotechnology digital resource

In order to provide multiple learning modes and help everyone understand the principles and applications of nanotechnology and biotechnology, in the first half of this year, we executed MOST's "The project of the nanotechnology Innovation education promotion (3/3)" and "The project of development and promotion for nanotechnology and biotechnology digital resource". We promoted nanotechnology and biotechnology by various activities, including creating digital learning resources, managing marketing via social media, and holding various popular science promotion activities, so as to enhance participants' technological literacy. In 2017, we held 32 nanotechnology and biotechnology promotion activities

with a total of 5,482 participants.



Nanotechnology and biotechnology promotion activities

## 2. MOST subsidized for the project of development and promotion for robot & programming digital resource.

In order to help everyone learn the principals and experience application of robots and programming design, in the second half of this year, we executed MOST's "The project of development and promotion for robot & programming digital resource" through various activities, including building a "Robots and Programming Design" platform for knowledge sharing and providing digital resources for interactive learning, managing marketing via social media (such as Facebook and blogs), combining the created teaching materials, teaching aids, animation and videos to hold DIY experiments, teaching aid experience, teacher workshops and science camps. In 2017, we held 16 robotics and programming promotion activities, with a total of 8,459 participants.



Promotion of Robots and Programming Design

## 3. K-12 Education Administration, MOE, commissioned the "2017-2019 Science Education Resource Promotion Program"

Based on the success of the 2016 Science Education Resource Promotion Program, we continued to take the K-12 Education Administration's commission to promote science education with our museum resources from 2017 to 2019, so as to achieve the following three goals: developing and integrating teaching resources, providing students with innovative and convenient learning resources, and enhancing the empowerment and cooperation between teachers.

In 2017, we designed optics and electromagnetism teaching plans, and took tutorial videos for junior high school teachers and students. We also held 12 workshops for a total of 364 teacher participants, and offered teaching resource packages for 243 classes. Additionally, we co-organized the "Advanced Courses for Natural Science Tutors from the Compulsory Education Advisory Group" and the "2017 Physics Education Society of the Republic of China Joint Meeting and Workshop" with a total of 60 teacher participants. We held 30 optics-related activities at weekends and "Amazing Optics" events with the Department of Photonics, National Sun Yat-sen University, with a total of 8,116 participants. Particularly, we organized 14 "Optics



and Mechanics-Creative Science Camps" in communities and remote regions with a total of 2,893 participants. Last but not least, we offered 5 training courses for a total of 170 volunteers.



Optics and Mechanics-Creative Science Camp

#### 4. TTIDA "2017-2018 EM Radiation Dissemination and Experiencing Activities"

In order to meet the need for EM radiation dissemination and the promotion of the EM radiation exploration area in the Telecom @ Taiwan exhibition hall, we received funds from the Taiwan Telecom Industry Development Association (TTIDA) and promoted popular science knowledge of EM radiation. Starting from the experiments and exploration of the electrical

and magnetic principles, the activities were held to help people understand the application of EM radiation in daily life and its safety.

In 2017, we held 16 activities for 8 days including the promotion at the EM radiation experiment station of "Military Officers and Children" with a total of 4,933 participants. We have also provided 2 workshops with 70 teachers involved and teaching resource packages for 63 classes with a total of 1,563 participants. Moreover, we have organized 13 "EM Radiation Parent-Child Science Camps" for communities and remote regions with a total of 3,037 participants. We offered 6 training courses for a total of 205 volunteers to help spread scientific knowledge in communities. We organized 3 science school camps at school with 1,553 participants in total and co-organized 2 workshops for a total of 745 teacher participants.



EM Radiation Parent-Child Science Camp

### 5. MOE subsidies for the "Cross-Field Experience, Learning for Life: Project for Cross-Field Value-Adding in National Social Education Institutes Development" for construction of the Green Life Discovery Hall

We followed the "Cross-Field Experience, Learning for Life: Project for Cross-Field Value-Adding in National Social Education Institutes Development" in 2017 and completed the construction of the "Green Life Discovery Hall". Centered on "cross-field" and "value-adding", we promote environmental education with a focus on localized green technology and environmental issues. Apart from the four indoor exhibitions of photovoltaic, wind power, LED lighting, hydrogen and fuel cells, we also arranged an area for interactive green energy teaching aid experiences and another one for DIY activities. We will develop and sell green energy-related products to increase NSTM's operating efficiency and to enhance people's awareness of environmental education.

### 6. Cooperation with TTIDA on seminars for remote regions and learning plans for elders

In order to provide remote region students and elders access to technology, we have promoted sharing learning resources. Since November 2017, we have cooperated with TTIDA and organized "Flying Telecom" seminars for people in remote regions and "Telecom for Seniors" projects. Those seminars and projects feature the museum's exhibitions and interactive teaching aids. Topics include communications and aero-technology. We held 4 sessions and served 122 participants.

## 7. MOE subsidizes the "Promote Senior Citizen Self-Directed Learning Group & Lifelong Learning Activity Pilot Project"

We have promoted MOE's "Senior Citizen Self Learning Group & Lifelong Learning Activity Pilot Project" and trained potential leaders for senior Self-Directed Learning groups. Our professional training helps the potential leaders obtain qualification. The project includes beginner training, advanced training, practice and evaluation, and enhance workshops, etc. The students receive 82 hours of training in total. In 2017, we have had 80 students for training, and 30 of them obtained the qualification with certificates. Apart from that, in order to enhance the professional skills of elder education qualified educator and the officers who work for the county and city governments, and to level up teaching and service quality, we held 2 seminars on senior education with a total of 156 participants.



Meetings for MOE's senior education project

## Popular Science Lectures

### 1. MOST sponsored the "Sunday Science Reading Master" popular science lectures

In order to promote science education for the public, MOST has subsidized National Cheng Kung University, NSTM, National Kaohsiung University of Applied Sciences, and the National Center for High-Performance Computing for holding scientific lectures since 2003. In 2017, we offered 14 lectures in the International Auditorium, South Wing, with 2,846 participants in total. The lectures were live-cast and available online for those who could not join in person.



"Sunday Science Reading Master" lectures

### 2. NSTM co-organized the "Health Science Master at NSTM" project with the Taiwan Association for Promoting Public Health.

Under the vision of "Everyone is Welcome - A Museum You Will Want to Re-visit All the Time" and in conjunction with the concept "Making technology closer to life and improving life via technology", the aim is to pursue health science knowledge with the public and achieve the mission of implementing social education and promoting public health. In 2016, a total of 6 events were conducted, with the presentation topics centered on "food" regarding body health, diets, and the global food crisis. We have received 1,203 participants in total.



"Health Science Master at NSTM" lectures



## The Popular Science Library

### 1. Library service

The Popular Science Library is located on the first floor, South Wing, and has an area of 1,350 square meters, with a general reading area and a comprehensive collection area. The reading area provides journals, audiovisual services, and general readings. There are 9 major scientific categories, 5 main topics and displays related to exhibitions in NSTM. Besides that, there is a children's area, popular science comic area, and audiovisual area. The library is the first science-themed library in Taiwan. Outside the reading area is the area for newspaper reading.

Based on the concept of a "Green Museum", the Popular Science Library strives to root itself in people's life and become a learning center for everyone, broadening the visitors' education and learning horizon. The library has a total of 47,669 books, mainly science and museology related. Besides the science database, there is an education database, news database, and journal database. Because of the internal and organizational adjustment, the library has been moved to the Technology Education Division from the Collections and Research Division since April, 2017. Table 10 shows the number of visitors in the last 5 years.

Table10 The number of visitors in the last 5 years

Year	Visitors
2013	11,860
2014	15,850
2015	19,323
2016	27,831
2017	28,111



Popular Science Library



Storytelling of popular science

## 2. Popular Science Communication Center

In order to spread science knowledge fast and effectively, to help people differentiate correct information from wrong, to enhance national competitiveness and to achieve the aim of life-long learning, the MOE entrusted us to execute the "Museum-level Popular Science Communication Center Construction Program". We set the library as the base to build the museum-level popular science communication center. The goals of the popular science communication center this year are space integration and hardware upgrading, training for popular science communication specialists, popular science knowledge sharing and the maximization and optimization of information delivery. In 2017, we held 6 science movie learning events and 4 popular science communication courses with a total of 292 participants. We also took part in the 2017 Innovative Popular Science Forum with National Taiwan Science Education Center and National Museum of Natural Science, shared the live broadcast of the opening ceremony, tweeted popular scientific videos, and participated in scientific demonstrations. All of the above have maximized the effectiveness of spreading innovative science.



"Popular Science Communication Center" science video learning event

### 3. Popular Science reading activities

In order to promote parent-child reading and learning and to enhance popular science education for parents, we have utilized our library's rich resources and promoted the Popular Science Library with various themes. In 2017, we held 33 science reading activities and served 1,009 participants. In summer, we and the Kaohsiung City Publishing Association jointly held the "Uncle Fat Story-telling at Popular Science Library" and "Fun Game at Popular Science Library" 4 times with 304 participants in total. In order to increase people's interest in reading popular scientific journals and magazines, we held 3 science knowledge reading activities with 70 participants, and 18 toddler active-learning and reading activities with a total of 512 parents and children. In order to increase the interest in utilizing library resources and to provide multiple choices for families, we held 2 "Blowing Bubbles" interactive story-telling and science demonstration activities with 80 participants in total. We also newly launched our "Little Librarians at Popular Science Library" and have held 8 activities with a total of 295 participants. In 2017, we held 68 reading promotion activities with 2,270 participants in total.



"Little Librarians at Popular Science Library" activity



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# Visitor Services



## Visitor Services

### 1. Enhancement of marketing and services to improve the visit rate

The number of visitors is a key performance indicator for the museum, as well as a demonstration of the performance goals. Faced with the changing outside environment, besides continuing to update and innovate our merchandise, NSTM also adopted diverse marketing channels by combining social/civil resources, and we are actively developing potential visitors and disadvantaged groups. In terms of visitor services, NSTM has provided a diversity of guided tour services and activities, improved service quality and conducted community events to maintain our customer base, in turn establishing a good interactive mechanism. The audience satisfaction rate was 94.47% this year. About 2,334,430 visitors come to the museum (inside the museum) and create another historical track record. The number of visitors is growing and increasing steadily in comparison with the statistics (2,280,268 visitors) from the previous year. Number of visitors served from 2013 to 2017 as shown in Table 11.

Table 11 Number of visitors served from 2013 to 2017

Unit: Person

Item \ Person Item		2013	2014	2015	2016	2017
Exhibition Hall	Permanent Exhibition	1,340,613	698,550	609,597	870,923	811,766
	Paid Special Exhibition			36,286	132,264	62,654
3D Theater		131,535	113,575	86,300	119,579	127,373
2nd and 3rd Special Exhibition Halls		131,761	157,223	284,324	316,632	481,412
Experience Activity		141,974	135,585	170,175	157,466	145,767
LOHAS Energy Conservation House		6,087	5,923	5,578	5,287	3,122
Open Storage		15,575	13,993	16,755	18,214	14,786
Popular Science Library		85,846	103,614	60,479	77,964	78,239
Leased Area		115,296	118,570	127,501	106,205	114,700
Outdoor Plaza		302,166	575,581	574,584	475,734	494,611
Total in Museum		<b>2,270,853</b>	<b>1,922,614</b>	<b>1,971,579</b>	<b>2,280,268</b>	<b>2,334,430</b>
External services (Taiwan)		399,783	334,720	437,754	424,639	572,126
External services (Overseas)		0	0	195,079	454,598	59,960
Total (Taiwan)		<b>2,670,636</b>	<b>2,257,334</b>	<b>2,409,333</b>	<b>2,704,907</b>	<b>2,906,556</b>
Total (incl. Service Overseas and in Taiwan)		<b>2,670,636</b>	<b>2,257,334</b>	<b>2,604,412</b>	<b>3,159,505</b>	<b>2,966,516</b>



A stream of people coming to visit the Ghibli Exhibition

## 2. "ibon" online ticketing service and e-commerce ticketing system

The ibon machine and the newly developed QIOSK ticketing service platform that Q-WARE Systems & Service Corp. set up for 7-11 convenience stores belonging to the President Chain Store Corporation are products of Q-WARE Systems & Service Corp. We continuously enter into a Multimedia Terminal Platform Service Agreement and a Multimedia Terminal Service & Trading Agreement with Q-WARE Systems & Service Corp. to build a cooperative ibon ticketing mechanism in Taiwan. We hope, with this system, to increase the ticketing service channels, help people buy tickets more conveniently, reduce the number of people buying tickets from the ticket booth, and have more multimedia marketing approaches.

In addition to offering the consumers who scan their cards in the Museum the Scan and Consume option from the iPass ticketing machine, we will set up a new automatic ticket machine for the exhibition hall on the first floor in 2018 and plan to introduce mobile payment to disperse the crowds instead of standing in a queue for tickets during your holiday.



"ibon" discount promotion via media

### 3. A service culture treating every visitor as a VIP guest

We are the only museum that has won the Government Service Quality Award twice in the Museum category.

We are the only museum that has passed the SGS Qualicert Service Quality Certification in the Museum category.

The service culture of treating every visitor as a VIP guest is the highest spirit of service that we are committed to. We brought the mystery shopper audit system into practice in 2011. From the inter-museum evaluation under Mystery Shopper 1.0 and the outsourced professional inspection under Mystery Shopper 2.0 to the International service certification under Mystery Shopper 3.0, we have constantly made improvements and finally passed SGS certification on October 2017 with effectively increased response and service capabilities of the employees. We are the only museum that has acquired the SGS Qualicert certificate in the Museum category in Taiwan.



SGS Qualicert Service Quality Certification Mark unveiling ceremony



Thanks to the continuous endeavor in the innovation of exhibition and education activities, simplification of the procedures for internal and external customers, construction of an innovative cloud co-editor mechanism, improvement of the software for the creative ticketing and other services, optimization of the indoor and outdoor environment, as well as air quality, regular audits of the ISO9001 quality management system, and service rendered to all visitors enthusiastically, we stood out above more than 160 competitors and won the 9th Government Service Quality Award in 2016, following the 4th Government Service Quality Award in 2011, and became the only museum that has won this award twice in the Museum category. We will make more efforts to realize our three core spirits of fair share, participation and cooperation, and openness and transparency to expand our cooperative exchange platform and promote cross-field cooperation among different ethnic groups, institutions, and cultures.



Awards ceremony for the 9th Government Service Quality Award



## Public Relations and Marketing

### 1. Utilize media resources, develop marketing channels

In accordance with our 3D marketing network concept, we have developed and maintained good relations with reporters from print, network, broadcast and television. Moreover, NSTM has maintained good interaction with educational experts over the years, thereby gradually establishing a relevant database. Also, NSTM has actively provided the latest and most relevant information on the museum's popular science promotional events, thus enabling the formation of a positive cycle in the industry, while word-of-mouth and proactive promotions have improved the marketing performance every year. NSTM issues press interview notices and news releases from time to time. In total, 65 press interview notices and news releases were issued over the year, and the "NSTM Newsletter" was also sent to the media regularly to establish a feedback mechanism for media exposure. In turn, this is used as the basis for selecting outstanding media for placing our advertisements.

In 2017, over 48 advertising media procurements and



promotions were conducted, resulting in media exposure in China Times, United Daily News, The Commons Daily, Taiwan Times, Life Times, Mandarin Daily News, Comment News Website, CHN, Fengmin Radio, FMHit Radio, KISSRadio, CNA, SuperFM98-5, China Daily News, Happyradio and other NSTM-friendly media, etc. In addition, NSTM compiled and submitted 12 editions of the "iPass Events Calendar to the Bureau of Cultural Affairs, Kaohsiung City Government" . 30 special exhibitions and marketing activities were held throughout the year.



Elementary and secondary school fair in Kaohsiung City



20th NSTM anniversary ceremony

## 2. Utilize social media, conduct real-time information updates

Due to the popularity of social media, we established a Facebook page in October 2009 with the address: <http://www.facebook.com/ilovenstm>, and have amassed 63,678 fans as end of 2017, which is 16% more in comparison with the 54,832 fans in 2016. We relay information to our Internet fans via NSTM's FB, which includes permanent exhibitions, special exhibitions, science education events, selected collections, seminars, relevant images and writings, videos, as well as science, environmental education, and science education news. We wish to bring forth applied science and the vision of a green museum in both an educational and entertaining manner. Number of visitors served with Internet information as shown in Figure 8.



Facebook page of NSTM

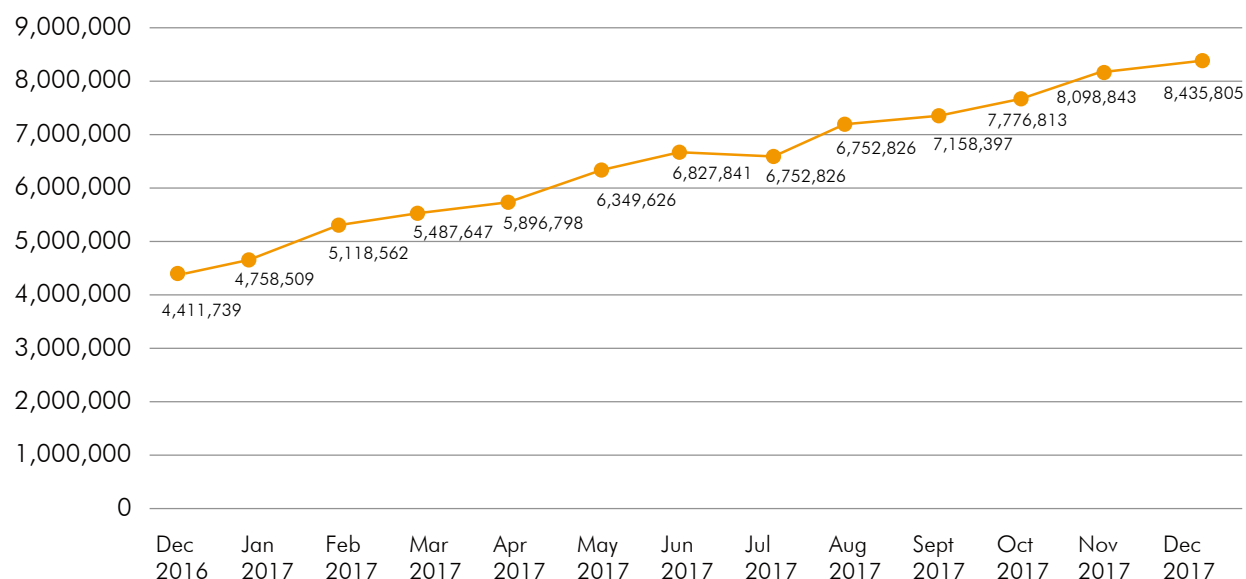


Figure 8 Total number of visitors served with Internet information



### 3. Organize holiday art festivals by combining technology and art

In integrating art and technology, improving the performing art quality and artistic sense of the southern regions, the NSTM has held creative performing art events on holidays, enabling visitors to enjoy music, drama, and other performances aside

from learning new technologies, in turn bringing artistic education closer to life and introducing knowledge and sensibility to everyday life. In 2017, 4 events were organized and participated in by 800 people.

Students from the Commercial Design Department of Shu-Te Home Economics & Commercial High School showed their installation art "Pokemon Go" at the plaza in front of the theater.



The recorder team members from Kaohsiung City Alian Junior High School played in the "Kaohsiung Crazy Arts Summer Festival 2017 – Magic City" activity



## Guided Tour

### 1. Provide quality tours, enrich the tour experience

In correspondence with our exhibitions, we provide the public with a diversity of guided tour services, which include: group guided tours, active guided tours, robot demonstrations, and "periodic guided tours" specific to each different exhibition and exhibition hall. Guidance and narration services were rendered to 8 exhibitions and special exhibitions in 2017, including "The Forest and ME", "Globalization Under the Eaves-Marriage Immigration in Taiwan", "Brain-The Biology of Mind", "Explore IoT", "Telecom@Taiwan", "Adventures in Health Land", "Innovating A Better Future", and "Recovery and Reconstruction After Morakot". A total of 1,293 narrations were provided for these exhibitions and 2,780 different guidance services were rendered for 141,117 visitors.



Illustration: Guidance and narration in Innovating A Better Future



Guidance and narration in the "Recovery and Reconstruction After Morakot" exhibition hall

## 2. Establishment of NSTM tour guide system- Specialized personal tour guide

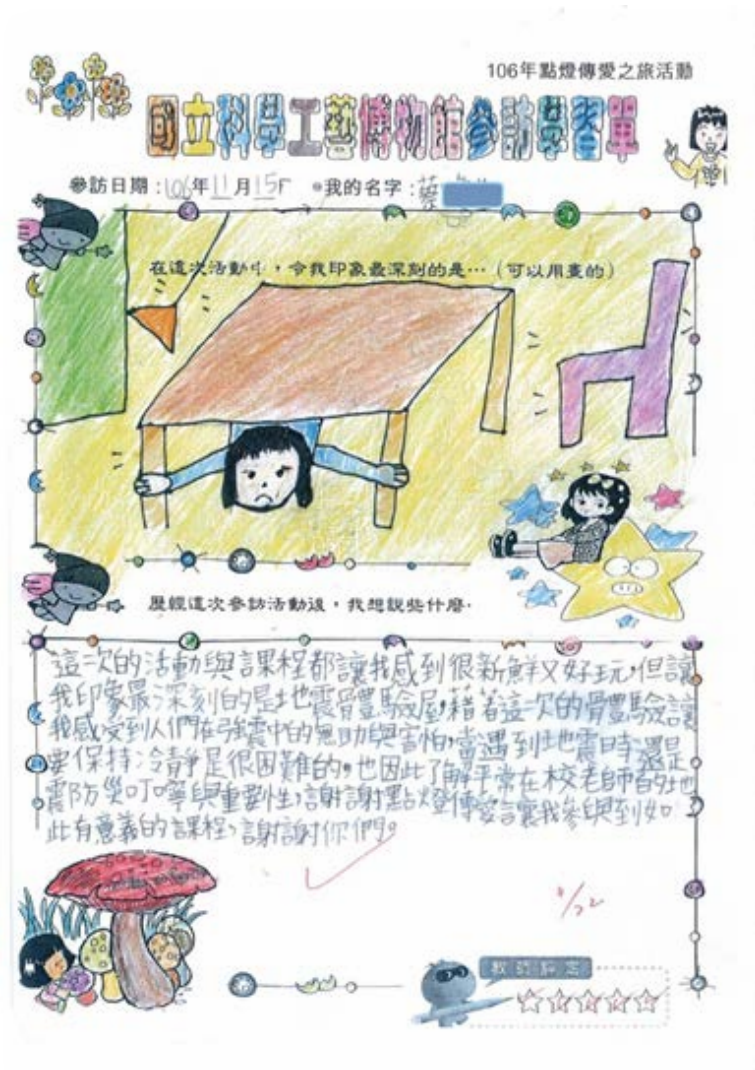
With the support of our IT team, a museum environment guiding system has been installed to provide mobile phone guidance and narration services in the museum, including a Chinese guidance service for the LOHAS Energy Conservation House and Popular Science Library in the South Complex and Open Storage in the North Complex, 3D Theater, and 16 regular exhibition halls. Visitors only need to download the app of the environment guiding system and the NSTM Tour Guide Pack, and then start the Bluetooth locator function to visit freely in the North and South Complexes of the museum. Additionally, Chinese, English, and Japanese narration services have been rendered for "The Story of Taiwan Agriculture", "Textile and Clothing", and "Adventures in Health Land" from this year. GPS located Chinese, English, and Japanese narration services are also available for 5 exhibitions of "The Tower of Hope", "Sublimation", "Armillary Sphere", and "Solar Art", and "Multiple Measurement Square". We hope to create a smart narrator next to the visitor to help him/her visit the museum freely.

## Resource Utilization

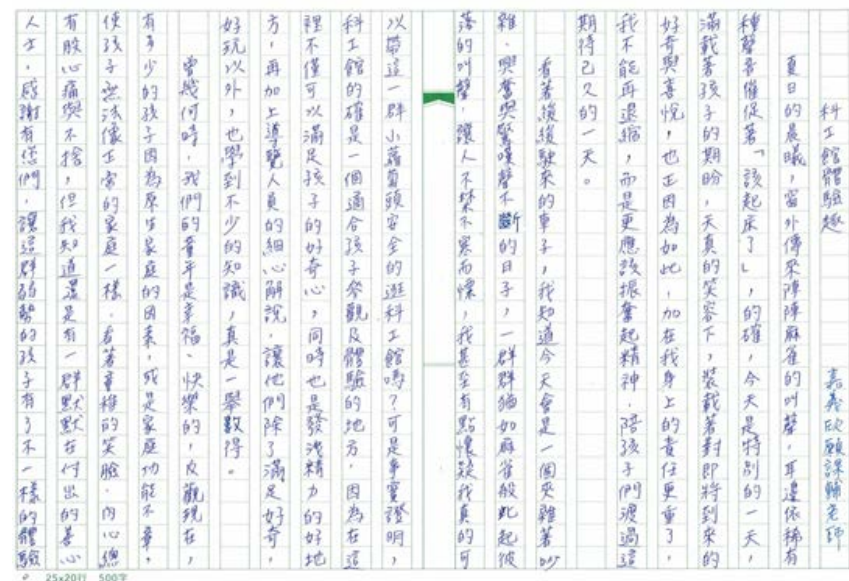
### 1. NSTM Lanterns of Love

In order to shorten the gap between the rich and the poor, and implement scientific education, we promoted the "2017 NSTM Lanterns of Love" welfare program for the disadvantaged, accepting donations of social welfare enthusiasts for NT\$ 10,000 per lantern to financially supporting the economically disadvantaged students in visiting the museum. This further facilitates the goal of the museum, social resources, and education integration.

Through the "2017 NSTM Lanterns of Love" event held this year, we received a donation in the amount of NT\$3,280,480 (including NT\$300,000 from the Ministry of Education), served 276 schools, and arranged 6,218 teachers and student to visit the museum free of charge. The museum education like this gives an opportunity to root science and gratitude among the students from remote villages. It helps spread the power of love from society and gives a chance for the children to bring their role into full play in the future.



The learning result of a student after visiting the "2017 NSTM Lanterns of Love" Program



The learning result after visiting the "2017 NSTM Lanterns of Love" Program



Tou-Bian Elementary School in Taiping District, Taichung City – The Green Fairies in the Mountain



## 2. Adequately utilize social resources to aid disadvantaged groups

To help students from remote villages share the resources of the museum, Chunghwa Telecom, the Taiwan Telecommunication Industry Development Association, and the National Science and Technology Museum jointly initiated a program of "Love and Care for Disadvantaged Students from Remote Villages" to help them have a day of vitality and knowledge and make their dreams come true by fully subsidizing their visit to the museum. Two phases of visits were provided in 2017. 669 teachers and students from 12 schools participated in the event.



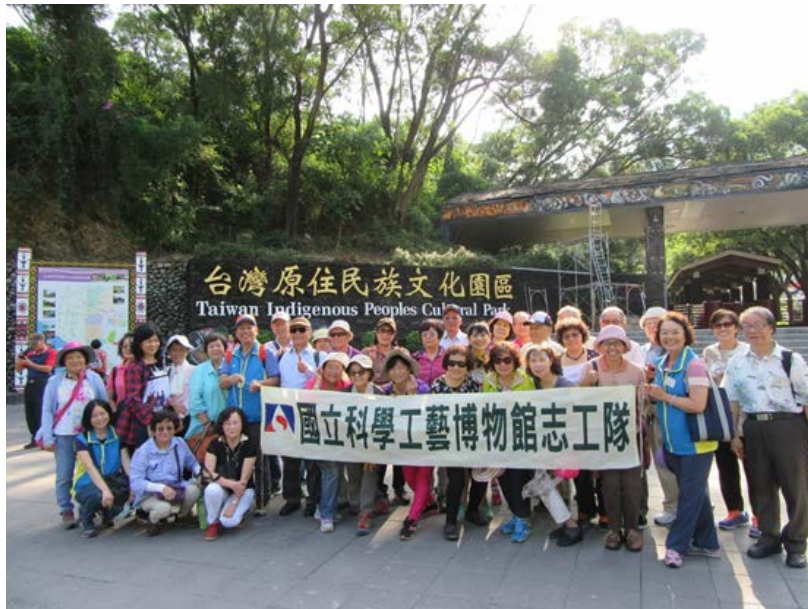
Love and Care for Disadvantaged Students from Remote Villages

## 3. Utilize social manpower resources, improve overall performance

NSTM is the first applied science museum in Taiwan and the center of science education promotion in South Taiwan. Facing limited manpower, we ask for social human resources for provision of service according to the Volunteer Service Act. The scope of service includes reader services, collection maintenance, collection management, maintenance services, educational activities, exhibition services, Chunghwa Telecom exhibition services, theater services, audience services, volunteer administration, guided tours, nursing, information desk, promotion, group cafeteria, energy-saving house projects, general affairs, and gardening. A total of 1,139 volunteers with an accumulated 193,535 service hours rendered services for the museum by the end of 2017. Three discussion meetings of 180 volunteer team leaders and 1 Volunteer Praising Ceremony and Dining Party with 986 participants were held.



Since 2012, we have aided in the establishment of the "NSTM Volunteer Foundation". The source of the fund primarily comes from volunteer donations, and flea market charity events held at our gift shop halls on the first Sunday afternoon of each month. The funds were used for volunteer gift money, consolations, volunteer travel, as well as charity donations in accordance with the annual balance. The fund balance for 2017 was NT\$ 418,153.



Annual volunteer trip

#### 4. Provide services opportunities, encourage students in volunteer services

In correspondence with the implementation of the national 12-year education policy, since 2012, the scores of service learning (volunteer service) in diverse learning performance has been considered an important factor. In encouraging students to commit to volunteer services and providing service opportunities, NSTM amended the "Rules of Student Social Services of National Science and Technology Museum", which was implemented in June 2012. We conduct educational training once per month. All students enrolled in junior high schools or above are eligible to apply. In 2017, there were 689 students participating in social services with a total service time of 2753.5 hours in the current year.

## 5. Conduct community events, building good community relationships

Since the Building Good Community Relationship Plan was approved in an NSTM meeting in November 1997, we have held related activities every year. The activities combine social resources to cater to the needs of the community and maintain good public relationships with local residents. The plan also engages in community development by incorporating community residents as an integral part of NSTM's support resources, in turn generating excellent interaction with local communities and enhancing NSTM's image among them.

Three different types of activities were held in 2016

1. Movies for the residents of the neighborhood: This was a 6-day event from February 14 to February 19. A total of 3,125 residents came for the movie, representing an increase of 1,915 participants in comparison with 1,210 during the winter vacation from January 31 to February 6, 2016.
2. The Making of Tyrannosaurus Wilson and Wow! Somatosensory Adventure 2.0 Exhibition were held for 2 days from February 18 to February 19. These special exhibitions attracted 990 visitors, representing an increase of 108 visitors in comparison with 882 on January 23, 2016.

3. The movies for the residents of the neighborhood in the second half of the year were originally provided from July 26 to July 31. Since there was a typhoon on July 31, the movie on that day was postponed to August 6. A total of 1,884 residents came to the movies.



Sign-up for good neighborliness activities

## 6. Museums from China exchange experiences to generate new cooperative opportunities

The teams from the technology museums in different provinces of China came to visit NSTM one after another in recent years. The teams of superintendents from the technology museums in Inner Mongolia, Shanxi, Anhui, and Shandong visited us in 2017, and a total of 8 teams were received. All of them highly recognized our capability in the operation of educational activities and planning of exhibitions. To continuously promote cross-straits cooperative interaction between the museums, we have held many discussion meetings for exchange of opinions to acquire firsthand information from the visitors, in addition to providing in-depth guidance and exhibition hall experiencing activities. We also presented the results of our endeavor in the collection, display, science education, and operation, and provided the opportunity for future cooperation between both parties.



The team from Hefei City of Anhui Province visited the "Pavilion of Dream Transport" exhibition hall

## 7. Joined International Museum Association to lay a firm foundation for the New Southbound Policy

To support the New Southbound Policy, we invited the committee members of the Asia-Pacific Network of Science and Technology Centres (ASPAC) and the CEOs of the major science centres and museums in the countries covered by the New Southbound Policy to visit us in July 2017. We briefed these honored guests and guided them to visit the exhibition halls and help them understand more about our available resources. They expressed their high recognition of our vivid and vigorous exhibition techniques and expected more opportunities for mutual cooperation in the future.

We participated in the Science Centres World Summit in Tokyo, Japan, in 2017. This is a great event of the world science centres organized every three years. We made paper presentations and promoted our traveling exhibition to facilitate the international marketing for NSTM. In the future, NSTM intends to build on the foundation of international cooperation to reinforce our touring exhibitions and international promotion of science education activities as a key national science museum of the New Southbound Policy, thereby increasing the international exposure

of NSTM's touring exhibitions. Furthermore, the aim is also to implement diverse management and expand the economic benefit of exhibitions, as well as to foster substantial international collaborations for the sake of broadening our international perspective in the Asia-Pacific region.



CEOs of the ASPAC visited NSTM





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# Green Museum



Providing the public with a friendly, comfortable and pleasant environment

In 2017, NSTM continued to strive toward the ideal and vision of being a green museum by upholding our sustainable development philosophy in order to exert out function of educating the public about technology education. From the 4 major aspects of "Sustainable Environment", "Sustainable Society", "Sustainable Culture", and "Sustainable Economy", we aim to promote sustainable development strategies including environmental protection, fulfilling our CSR, enhancing cultural heritage and sound finance. Our implementation status and results in the current year are as follows:

## Sustainable Environment Aspect

The aim of Sustainable Environment is to make NSTM a friendly, comfortable, and enjoyable environment for visitors. The items of implementation include 4 topics: "energy-saving & carbon reduction", "green building improvement", "green consumption", and museum outdoor learning".

Major achievements include: Annual renewable energy generated (90,000 kWh), annual green procurement reached 97.71%, museum-based ecological curriculum developed, and 2 ecological summer camps were held based on new curriculum.





Zero Distance Love – Telecom Tour for Remote Village Schoolchildren.

## Sustainable Society Aspect

The aim of Sustainable Society is to fulfill our social responsibilities, pursue social justice, and develop diverse participation in order to receive recognition and support from the public, communities, and other domestic/foreign museum communities. The 3 sub-programs include: Developing a Diverse Audience Program; Promoting Community Collaboration Program; Environmental Education Enhancement Program.

The major achievements include: Accumulating 63,678 fans on social media, showing a 16% growth compared to 2016. "Hand-in-Hand, Side-by-Side" welfare project for the disadvantaged received funding of NT\$ 3,280,480, which was utilized completely. 3 environmental education enhancement courses were held, total number of participants was 183.

## Sustainable Culture Aspect

The aim of Sustainable Culture is to improve the transmission and innovation of culture via our collections research, exhibitions, and educational events. The program includes the 3 topics of "Cultural Asset Preservation", "Green Education", and "Green Exhibition". The 3 sub-programs include the collection and research improvement project, green education promotion project, and the green exhibition and assessment project.

The major achievements include: Digitization of 200 collected pieces; 28 artifacts analyses; held 141 collection promotion and preservation events; developed 5 creative pieces of merchandise for the museum. In terms of green education promotion, NSTM held 25 specialized personnel training sessions, and over 123 water-saving, electricity-saving, solar photovoltaic, new energy technology, environment, ocean, ecology, and disaster prevention sessions, with 55,255 participants.

In terms of green exhibitions, NSTM launched the "New Agricultural Technology Experience Pavilion-Plant Workshop", "Story of Taiwan's Agriculture", updated the "Climate Change Exhibition Hall" and "Forest and Me-Sustainability, Longevity,



"The Forest and ME Exhibition" won the Gold Level with the Green Checklist

Impact on Mankind" special exhibition, Typhoon Morakot Recovery Exhibition Hall and Soil and Water Conservation area, Passage of Wind-Wind power exhibition and outdoor solar power exhibition, etc. The aim is to transform NSTM into a quality educational facility for environmental education, and we achieved a total visitor number of approximately 1.06 million people. In addition, NSTM completed 6 green exhibition assessments, with 5 exhibition halls attaining "Gold" status and one exhibition hall achieving "Diamond" status.



## Sustainable Economy Aspect

The aim of Sustainable Economy is to conduct cost control, reduce operational costs, and establish a well-rounded financial mechanism. The items of implementation included the topics of "Resource Recycling" and "External Resource Utilization". The sub-program was to increase revenue and decrease expenditures.

The major achievements in this regard revenue for 2017 was NT\$221,928,294, which was NT\$ 84,729,443 more than the estimated target of NT\$137,198,851. Expenditure reduced in 2017 was NT\$ 49,526,218, which was NT\$ 7,672,714 more than the estimated target of NT\$41,853,504.

NSTM also launched the membership program, accumulated 13,832 iPass transactions. Moreover, we have recruited 35 corporate members including: Han-Hsien International Hotel, Urban Hotel 33, McDonald's Taiwan, Formosa Plastic Group – Kaohsiung Office, Mandarin Daily News, and E United Group.



Increasing external resources and utilization via including business member.



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# General Affairs and Environment



## General Affairs Management

### 1. Public Procurement to Conserve Public Funds

As for the outsourcing and contract awarding cases to the amount of more than NT\$100,000 in 2017, the accumulated budget for invitation to tender was NT\$108,945,891, the accumulated contract awarding amount was NT\$104,590,064, and a total of NT\$4,355,827 was saved. There were 255 procurement cases to the amount of more than NT\$10,000 and less than NT\$100,000. The requested amount was accumulatively NT\$1,119,886, and the settled amount was NT\$10,948,316, indicating a total saving of NT\$242,570.

### 2. Interest Income Resource Widening

In order to increase interest income and utilize fixed deposit more flexibly, in addition to the existing 401 NSTM account of operational funds in a fixed deposit with the Agent Institutions of the National Treasury (Taiwan Business Bank, Eastern Kaohsiung Branch), NSTM also has fixed deposits at Chunghwa Post. Currently, the total amount of fixed deposits, including deposits in the Taiwan Business Bank and Chunghwa Post is NT\$161,000,000. The interest generated in 2017 was NT\$1,355,014. In 2016, NT\$1,350,000 in rent income was generated from base stations established by 5 telecom companies. Furthermore, NT\$77,000 was generated by auctioning scrapped products to actively increase income by widening resources.





### 3. Improve archives Management Quality

2017 is the year of milestones in the management of our archives. Thanks to the endeavor of our employees and the improvement in the management of archives for so many years, including the archive management planning and training, registration and cataloguing, appraisal and sorting, archive preservation and storage facilities, archive application and value-added promotion, and informatization of documents and archives, we were finally rated by the Ministry of Education as "Excellent" in the archive management operation and recommended to participate in the 15th Records Management Quality Awards. This was not only an achievement of all the employees who invested their resources in the archive management, but also recognition of our archive management team for their improved operation and performance.



The awarding ceremony – NSTM received the 15th Records Management Quality Awards

### 4. Emphasis on the performance of internal control

We continued internal control in 2017 and signed the 2016 Internal Control Effectiveness Statement and announced it on our website. Other achievements include the amendment of the Regulations on Setup of Internal Control Task Forces, the establishment of the 2017 self-evaluation and internal audit plans, execution of self-evaluation and audit, and proposition of 7 deficiencies and reform suggestions. We also upgraded our internal control system to version 7.0 according to the "Regulations on the Internal Control and Monitoring in the Government" amended by Letter Yuan-Shou-Zhu-Zong-Gui-Zi

No. 1050600776A and the "Sample Making Principles for the Commonality of the Internal Control (Incl. Cross-Functional Integration) in the Government" established by Letter Yuan-Shou-Zhu-Zong-Gui-Zi No. 1050600786, December 30, 2016, of the Executive Yuan.

## Electromechanical Operations

### 1. Saving energy to fulfill the Green Museum concept

Based on the "Four Savings" principle implemented during the period from 2007 to October 2017, we have achieved the planned goals by saving 31.34% of electricity, 18.0% of water, and 37.95% of fuel.

Thanks to the improvement of the performance in all aspects of the operation in 2017, we set up the new permanent exhibition hall of "The Story of Taiwan Agriculture" and it was rented more frequently. The power consumption was increased for the Ghibli Exhibition, and a large LED screen of "The Window to Technology" was newly installed. The total consumption of power increased during the period from January to November in 2017, compared to the same period in 2016. The annual average temperature rose

and the power consumption for air conditioners increased. Since the ice storage at night was insufficient on holidays, more ice machines were used, and the power consumption increased as a result. For these, a more flexible power supply measure was taken for the air conditioners to thoroughly implement the power-saving and carbon-reduction policy. The power consumption statistics analysis over the Last 10 years are shown in Figure 9.

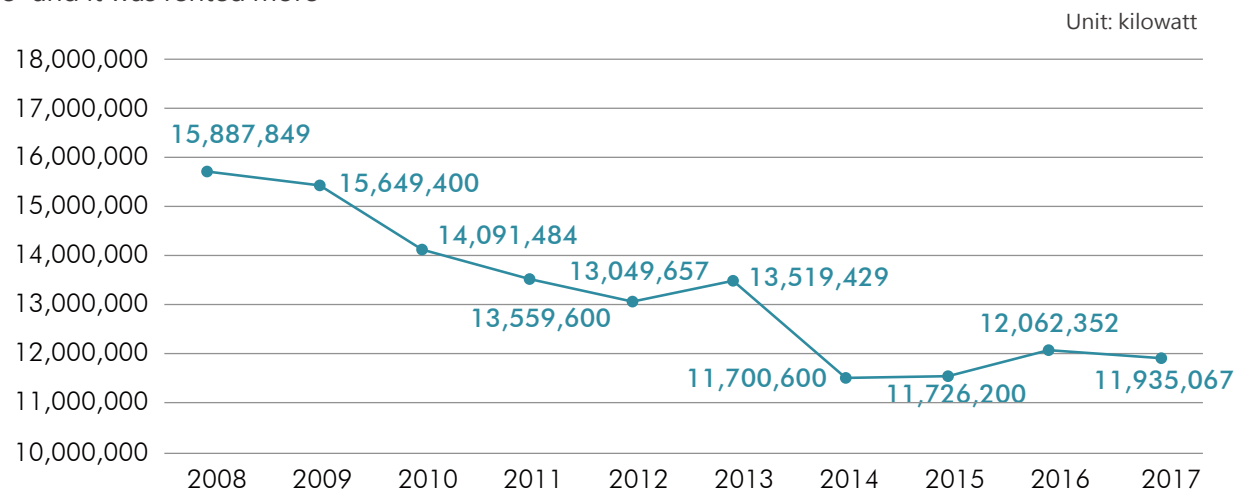


Figure 9 Power consumption over the last 10 years

## 2. Occupational disaster prevention preparedness

Our "Occupational Safety and Health Code of Practice" and "Occupational Safety and Health Management Program" were submitted to the Labor Standards Inspection Office of the Labor Affairs Bureau, Kaohsiung City Government, for reference and announced on February 24, 2017, after they were discussed at our Museum Affairs Meeting and approved by the Director-General. The first work discussion meeting was held on March 17, 2017. The representatives from different divisions and offices were requested to promote occupational safety and health tasks at their respective meetings. They were also asked to give assistance in supervising and directing the responsible person of any place for any regular or pre-operation inspection and recording of the items specified in the occupational safety and health self-inspection list.

In 2017, we mounted additional crash material to existing acute angles and potential hazards on each floor of the building (with the assistance of our repair and maintenance personnel), removed acute angles (existing potential hazards) from all the buildings of the museum (with the assistance of our mechanical and electrical personnel), requested lifelines for aloft work (with the assistance of our repair and maintenance personnel),

mounted additional electricity leakage breakers, anti-lightning devices, ground wires (devices) to mechanical equipment (including the pantry room of each office and division) (according to the recommendation of the Labor Standards Inspection Office), marked underground cables and made new drawings (e.g. re-wiring of the underground cables under the Cross Square due to construction of the Popular Science Café in the South Complex), prohibited the use of dangerous equipment (e.g. damaged aerial life vehicles unable to remain stable), thoroughly inspected the evacuation routes (e.g. planning of the evacuation routes for special exhibition halls), and formulated "Construction operation safety notification form" (bring attention to the contractors about any precautions or potential hazards).



Removal of acute angles (existing potential hazards) from all the buildings of the museum



Lifelines for aloft work



### 3. Improve the efficiency of public facilities

Many houses and facilities were damaged unexpectedly due to the attack of typhoons, frequent earthquakes, and the abnormal climate (sudden drops in temperature) in 2017. For this, the repair and maintenance team inspected and improved all the buildings internally and externally. The team members maintained the outdoor facilities for the safety of the users, were thoughtful and made improvement for the indoor service and demand of the visitors, checked all the buildings and solved the water seepage/leakage problems. Thanks to these endeavors, we are allowed to use the Bronze Level Green Building Mark continuously, and passed external audit under the ISO50001 Energy Management System certification for three consecutive years.

#### (I) Improvement of outdoor public safety facilities

- (1) The regular wall painting and flooring maintenance work were outsourced in the form of an open contract to ensure efficiency, quality, and reduction of funds in 2017.



A. PVC floor tile repair: For leveling and beauty of the flooring inside the museum



B. Improvement of earthenware bricks: removal of broken bricks to avoid injury to visitors



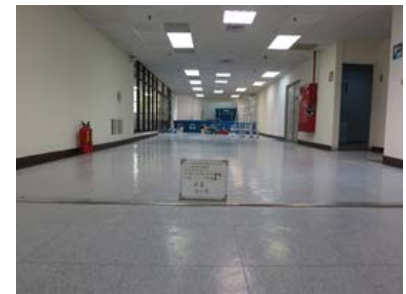
E. Repair of environment-friendly seats: beautification of the environment-friendly seats made by recycled items



C. Improvement of interlocking bricks: prevention from sinking of the flooring to avoid stagnant water or stumbles



F. Repair of oil-contaminated walls: repair and beautification of heavily contaminated walls



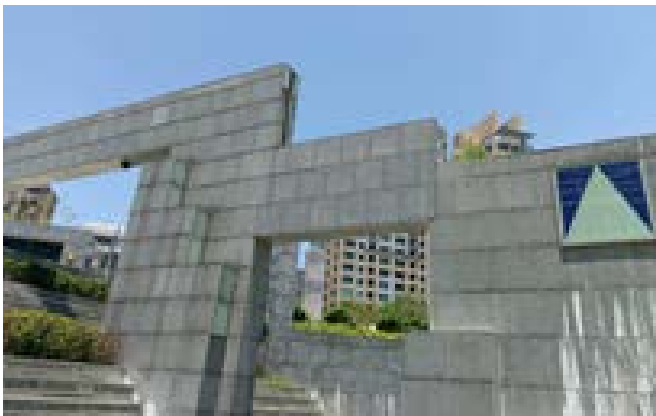
D. Improvement of scrubbed pebble finish: improved the broken access ramp and the appearance of the museum



G. Filling of existing outdoor flooring gaps: the filling material was washed away by rainwater and the marble flooring became loose as a result. The gaps were filled again to fix the marble.



(2) Improvement of the outdoor damaged stone material: the stone came off the wall in front of the Bow and Arrow Well and the outer wall of the machine room behind the well. The scaffold was put up urgently for public safety of the pedestrians. Repair was made at two places.



(3) An additional road for buses and a dissemination sign along the motorcycle access on Jiaomin Road-An additional road and a dissemination sign were provided to meet the requirements of the local people. The road was paved, and crash barriers were set up to protect the safety of the road users.



- (4) Improvement of the stone on the outer wall of the South Complex-The 2016 medium-term subsidization was continued to renew the outer wall of the South Complex and fill the gaps. The stone was fixed firmly with stainless steel anchors to avoid looseness and hazards.



- (5) Improvement of the glass door in the front of the lobby to avoid nipping the hands of the children-Protective strips were mounted to solve the nipping problems for children. The four door leaves at the entrance were improved effectively.



## (II) Anti-leakage and indoor repair

Flood control and water seepage/leakage repair

- (1) Fluorescent marking of the falling and discharge heads for easy inspection and cleaning.





(2) Improvement was made at 14 places: improvement of the waterproof podium on the roof in Area C/E; improvement of the expansion joints against leaks on the roof in Area A; improvement of the drain on the roof of the South Complex; leak-tight engineering for the gully on the roof of the Auditorium in the South Complex; leak-tight engineering for the wall of the Children Science Center in the basement; additional water pumping and draining facilities and leak-tight engineering with an agent for the terraces on the 4th and 6th floors in Area C; an additional waterproof podium attached to the floor of the lift machine room on the 7th floor in Area D; leak-tight engineering for the ceiling of the Green Shop ; improvement of the water-resistant capability of the roof on the 8th floor in Area D; water diversion along the passageway beside AB103; water diversion engineering for the floor of the machine room on the 5th floor in Area A; improvement of water-resistance capability of the inlet/outlet pipe on the 7th floor in Area D; and improvement of the water-resistance capability of the inlet/outlet pipe on the top floor of the South Complex.



Roof in Area C



South Complex roof



Terrace in Area C



Green Shop

(3) Repair of the box office for special exhibitions: the outdoor box office in Area C is used for special exhibitions. It was substantially repaired due to water leakage and damaged material. The engineering included leak-tight treatment, repair of the ceiling, renewal of the flooring, repainting of the walls, rewiring of the electric cords, and so on, to improve the ticket selling quality.



Repair of the box office for special exhibitions

(4) Improvement of the angle of the stone seats on the public passage – The acute angles of the stone-wood row seats were improved with wooden covers to ensure safety, robustness, durability, and beauty.



The acute angles of the stone-wood row seats improved with wooden covers

(5) Investigation, protection, and improvement of the acute angles in the building – Investigation was made by different personnel to find out potential hazards due to acute angles in different areas of the building. Discussion about appropriate improvement measures was made to minimize the potential hazards to visitors.



- (6) The safety net attached to the ceiling above the escalator on the 6th floor-The aluminum grid ceiling was reinforced against frequent earthquakes. A safety net was attached to protect visitors from being hurt due to a falling ceiling.



The safety net attached to the ceiling above the escalator

- (7) A breastfeeding room set up in the Reference Reading Room in the South Complex-The internal space of the reading room was reviewed and adjusted, and a breastfeeding room was set up there to meet the requirements of gender equity.



A breastfeeding room set up in the South Complex

- (8) Termite control with agent in the South Complex – Investigation was made to discover the termite problem and biological control measures were used for the improvement. Follow-up actions were taken regularly to ensure effectiveness of the control.



Termite control with agent

- (9) The laser rangefinder, wall detector, and thermal imager were purchased for the construction and repair affairs of the museum. These can be used for measurement, water leakage inspection, and temperature detection.



Wall detector



Laser rangefinder

### (III) Improvement of capability and service quality

- (1) Improvement of old buildings to renew the (Bronze Level) Green Building Label.

The Bronze Level Green Building Label, for which application was made in 2014, was going to expire. We applied for the renewal examination and passed it successfully. The effective period of the Green Building Label was extended for another 5 years.



The Bronze Level Green Building Label is renewed by improving old buildings



## (2) Sharing of resources and organization of the archive application exhibition

The 2017 Archive Management Application Exhibition was planned and arranged to meet the requirements of the competition for the Records Management Quality Awards. The result was highly praised by the visitors.



The Archive Application Exhibition in the lobby on the first floor

## 4. Honors and awards

The following awards were received by the Secretariat in 2017:

- (1) The third place in the Foundation Category of the 2016 Activation and Utilization Performance of State-Owned Public Property as rated and selected by the National Property Administration, Ministry of Finance.
- (2) The Records Management Quality Awards of the 15th Records Management Quality Awards sponsored by the National Development Council, Executive Yuan, was received; NSTM was the only museum receiving this award.
- (3) Passed external audit under the ISO50001 Energy Management System certification for three consecutive years.
- (4) Passed the BS10012:2009 PIMS (Personal Information Management System) certification.
- (5) Passed the ISO 27001:2013 re-examination by continuously implementing the ISMS (Information Safety Management System).
- (6) The effective period of the (Bronze Level) Green Building Label was successfully extended for another 5 years.



Trophy of the 15th Records Management Quality Awards

## Cross-Field Value-Adding Project

In order to innovate and re-create social education institutions in terms of management philosophy and form, in turn transforming national museums in Taiwan into a contributing force during the "social innovation" process, the MOE proposed the "Cross-Field Experience, Learning for Life: Project for Cross-Field Value-Adding in National Social Education Institutes Development", which will be implemented from 2014 to 2017.

NSTM's "Southern Taiwan Technology Education Green Expo Park Project" is also proposed based on goals including environment, culture, economy and sustainable social development. The implementation of the project serves to connect other museums in southern Taiwan and combine private resources in an effort to promote internationalization. Moreover, the aim is to broaden people's horizon, facilitate developments in the tourism and recreation industry in Kaohsiung, as well as to improve the quality of the surrounding environment and industrial/commercial development. Most importantly, we strive to create an interesting, knowledgeable museum theme park where people of all ages can learn freely and have fun joyfully.

The "Southern Taiwan Technology Education Green Expo Park Project" included 3 sub-projects of "Happy Green Park", "Happy Taiwan Industry" and "Telecom & Innovative Digital Value (Incl. Bridging to New Generation)". The "Popular Science Library Café", "Multiple Measurement Square", "Pavilion of Dream Transport upgrade", "Green Living Exploratorium", and "Audio Guide System" were set up and opened to the public in 2017. These make NSTM a green-environmental education park of social education.



Multiple Measurement Square

## IT Operations

### 1. The official website was revised to a responsive website for different mobile devices

As the number of people using mobile devices (e.g. smart phones and tablet PCs) is increasing, and the regular data analysis shows an annual increase of the people using their mobile devices to browse our website, we revised our website in August 2017 and introduced RWD (Response Web Designed) technology. No matter whether PCs or mobile devices are used to browse the website, the webpage can adapt itself to the size of the screen and display the most suitable configuration with support of the RWD to provide users with a friendly operation environment.



### 2. Acquired AWDG 2.0 AA for NSTM website

We followed the AWDG ( Accessible Web Development Guidelines ) 2.0 to revise our website in 2017. We made the first application on August 28, 2017. After we made two submissions and two improvements within the specified time frame, we finally met the standard and the level AA badge was acquired successfully on September 13, 2017.



Acquisition of the level AA badge according to the AWDG 2.0

### 3. Revision of the online continuing education registration system to integrate all the continuing education events of the museum

The original science education registration system was thoroughly revised in May 2017. The RWD (Response Web Designed) technology was introduced to integrate the educational events provided by other offices and divisions. The events were classified into a "Science Education Event", "Collection Promotion and Workshop Event", and "Makers' Exhibition Event" according to the nature of the event. The new system was renamed "Continuing Education Registration System" at <http://serv.nstm.gov.tw>.

### 4. Self-developed Archive Service Website and Online Document Inquiry System

The IT team developed the Archive Application & Service Website (<http://edocapply.nstm.gov.tw>) this year to provide an area for people to view, retrieve, read, transcribe, and duplicate the archives and documents of the museum. The website was developed with the support of the RWD (Response Web Designed) technology. The webpage can adapt itself to the size of the screen and display the most suitable configuration to provide users with a friendly operation environment.

This service website features combination with the spirit of the "Service for the People". Users can make an online application

for the retrieval of documents. In other words, people who want to retrieve the documents of the museum only need to connect their PC or mobile device to the Archive Service/Archive Online Application of the website at home, complete the application form, and submit it

序次	活動時間	活動系列及活動名稱	對象 / 領域	年點	報名費	活動名額	剩餘名額
1	11/19 ~ 11/19 09:30 ~ 12:30	Scratch基礎程式教學--1119a-5	國小學生 資訊	其他 活動時間與地點(本館二樓特展廳內)	500	6	5



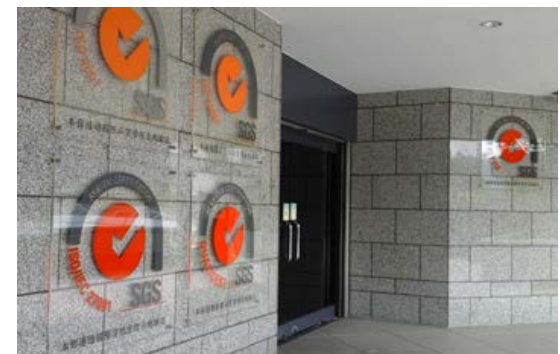
for approval. The progress of the application can be updated at the backend of the management system, or users can check the progress from the Archive Service/Application Progress. No telephone or email is needed at all to save time waiting during the administration process.



Self-developed Archive Application & Service Website

## 5. Implementing the ISMS (Information Safety Management System) and passing the ISO 27001:2013 re-examination

The Ministry of Education upgraded the information safety level of its subordinate agencies (institutions) to Level B in 2015 according to the "Information & Communications Safety Responsibility Grading Regulations for MOE, its Subordinated Agencies (Institutions), and Schools." We have dealt with all the matters to be completed by a Level B unit according to the "Information & Communications Safety Responsibility Grading Regulations for Governmental Agencies (Institutions)". In addition, we introduced the ISMS in 2 core information systems and acquired the ISO 27001:2013 certificate in 2016. We continuously implemented the ISMS this year and asked SGS to conduct an external audit of the museum again in June 2017. We passed the re-examination successfully.



Information safety management for quality assurance

## 6. Establish the PIMS (Personal Information Management System) and acquisition of the BS10012:2009 certificate

Considering that people's personal information may need to be collected via our outbound service system and inbound administration system, we introduced the PIMS this year to build a robust personal information protection system for the museum, and collect, process and use personal information according to relevant international standards. Personal information was inventoried using the "Personal Information Online Inventory System" this year. According to the statistics, there were 45 administration processes for our personal information processing behavior and storage, and 128 behaviors and 43 data entries were derived from each process. 12 entries

of personal information that were related to the public were selected out of the 43 data entries and summarized in the "List of Personal Information Files Open to the Public". The result was announced on our website. We incorporated the "Personal Information Management Related to Registration of the Continuing Education Organized by the Technology Education Division and the Membership Card Application to the Visitor Services Division" in the scope of the certification. We asked SGS to conduct documentation and an on-site review for the BS 10012:2009 Personal Information Management System certification, and acquired the certificate on June 27, 2017. The certificate's awarding and logo unveiling ceremony was held on July 25, 2017, demonstrating a glorious moment of the museum.



BS 10012:2009 certificate awarding and logo unveiling ceremony

**2017** National Science and Technology Museum

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# Budget Execution



## Annual Balance

The total revenue from execution results of NSTM in 2017 was NT\$396,913,000. The main source was the social education institution development grant of NT\$196,446,000, which occupied 49.49% of the total revenue. Self-raised funds was NT\$200,467,000, occupying 50.51% of the total revenue. Out of which, cooperative Education Income of NT\$59,651,000 took the top, occupying 15.03% of the total revenue. The second highest was the income from service Income of NT\$51,510,000, occupying 12.98% of the total revenue. The rest in order were: Additional Income of NT\$38,615,000, occupying 9.73% of the total revenue; asset-use and royalties Income of NT\$28,169,000, occupying 7.10% of the total revenue; educational Promotion Income of NT\$13,059,000 occupying 3.29% of the total revenue; other income of NT\$6,458,000, occupying 1.63% of the total revenue; donation income of NT\$3,005,000, occupying 0.75% of the total revenue.

Business costs and expenses of NT\$453,010,000, occupy 114.13% of the total revenue; other business expenses of NT\$1,234,000 occupy 0.31% of the total revenue. Our annual shortage amount was NT\$57,331,000, this was attributed to the fact that operational funds must be depreciated and amortized. On the income side, the self-raised ratio of NSTM in 2017 was 50.51%.

Table 12 2017 Income statement

Unit: Thousand NT\$

Item	2017 Yearly budget Amount	2017 accounts Amount	2016 accounts Amount
<b>Business Income</b>	<b>268,495</b>	<b>359,281</b>	<b>333,133</b>
Service Income	39,250	51,510	54,923
Exhibition Halls	15,000	20,702	22,599
Special Exhibitions	14,500	17,976	18,684
Theater	6,050	8,745	8,725
Experience Facilities	3,700	4,082	4,909
Popular Science Card	0	5	6
Cooperative Education Income	20,699	59,651	37,214
Educational Promotion Income	8,520	13,059	10,700
Social Education Institution Development Grant (A)	196,446	196,446	196,446
Additional Income	3,580	38,615	33,850
<b>Other Business Income</b>	<b>33,605</b>	<b>37,632</b>	<b>42,611</b>
Interest Income	1,600	1,869	1,898
Exchange Gains and Losses	0	17	0
Asset-use and Royalties Income	31,157	28,169	35,207
Donation Income	0	3,005	2,847
Breach and Fine Income (including reparations)	40	2,806	532
Miscellaneous Income	808	1,766	2,127
<b>Total Income (B)</b>	<b>302,100</b>	<b>396,913</b>	<b>375,744</b>
Business Costs and Expenses	385,429	453,010	430,243
Service Costs	215,547	265,463	242,456
Cooperative Education Costs	11,191	29,447	32,732
Educational Promotion Costs	5,785	10,235	6,712
Management Costs and General Expenses	152,906	147,865	148,343
Other Business Expenses	240	1,234	2,368
Miscellaneous Expenses	240	1,234	2,368
<b>Total Expenses</b>	<b>385,669</b>	<b>454,244</b>	<b>432,611</b>
Yearly Surplus (Shortage-)	-83,569	-57,331	-56,867
Government Current Grants Ratio(A)/(B)	65.03%	49.49%	52.28%
Agency Current Self-Raised Ratio 1-(A)/(B)	34.97%	50.51%	47.72%
Self-Raised Income	105,654	200,467	179,298

Source: Annual Budgets, Financial Accounts



## Annual Capital

The total amount of annual capital budget in the fixed asset was NT\$115,818,000, which included NT\$62,732,000 from government support, NT\$52,075,000 from self-raised funds and NT\$1,011,000 from project grants from the Ministry of Science and Technology and other agencies.

Table 13 2017 Fixed Asset Facility Improvement / Expansion Balance Sheet

Unit: Thousand NT\$

Projects	Available Budgets	Yearly Accounts
Fixed Asset Additions	117,857	115,818
Government Support	65,754	62,732
Self-Raised Funds	52,103	52,075
Project Grants	0	1,011
<b>Total</b>	<b>117,857</b>	<b>115,818</b>

## Past Revenues, Expenditures, Budgets and Final Accounts

Table 14 Past Revenues, Budgets and Final Accounts

Unit: Thousand NT\$

Item Year	Budgets					Financial Accounts				
	Total	Social Education Total Institution Development Grant	%	Self-Raised	%	Total	Social Education Total Institution Development Grant	%	Self-Raised	%
<b>2013</b>	315,354	206,165	65.38	109,189	34.62	306,495	205,717	67.12	100,778	32.88
<b>2014</b>	280,823	196,446	69.95	84,377	30.05	312,904	196,446	62.78	116,458	37.22
<b>2015</b>	283,867	196,446	69.20	87,421	30.80	328,514	196,446	59.80	132,068	40.20
<b>2016</b>	278,857	196,446	70.45	82,411	29.55	375,744	196,446	52.28	179,298	47.72
<b>2017</b>	302,100	196,446	65.03	105,654	34.97	396,913	196,446	49.49	200,467	50.51

Source: Annual Budgets, Financial Accounts

Table 15 Past Expenditures, Budgets and Final Accounts

Unit: Thousand NT\$

Item Year	Budgets					Financial Accounts					
	Total	Recurrent Expenditures	%	Capital Expenditures	%	Total	Recurrent Expenditures Staff Costs	Recurrent Costs	%	Capital Expenditures	%
<b>2013</b>	435,635	424,825	97.52	10,810	2.48	383,037	123,916	248,313	97.18	10,808	2.82
<b>2014</b>	435,237	382,168	87.81	53,069	12.19	423,384	125,236	245,857	87.65	52,291	12.35
<b>2015</b>	417,573	377,443	90.39	40,130	9.61	422,780	124,285	258,304	90.49	40,191	9.51
<b>2016</b>	476,097	371,511	79.88	104,589	20.12	536,713	126,819	305,792	80.60	104,102	19.40
<b>2017</b>	503,526	385,669	76.59	117,857	23.41	570,062	128,863	325,381	79.68	115,818	20.32

Source: Annual Budgets, Financial Accounts



2017 National Science and Technology Museum

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# Chronicle of Events



Date	Summary	Proposing Unit
01/01-04/05	"The Invisible Scale-Nano Exhibition" was moved to the National Museum of Natural Science.	Exhibition Division
01/11-03/01	We held "Kung, Yi-Fang's Gourd Art" in the Art and Culture Exhibition Area on the first floor.	Exhibition Division
01/16-03/20	We organized and held the "Metrology Instrument Exhibition" in the Art Cafe on the second floor.	Exhibition Division
01/17-	Our "Earthquake Disaster Prevention and Education Area" was upgraded and opened to visitors in the Open Sesame Science Exploration Center.	Exhibition Division
01/19-04/20	Yinia Sci-Art held the "Tyrannosaurus Wilson Dinosaur Exhibition" in our Fourth and Fifth Special Exhibition Halls.	Exhibition Division
01/19-05/28	We organized and exhibited "The Forest and ME" exhibition in the Second and the Third Special Exhibition Halls.	Exhibition Division
01/25	The Ministry of Education approved our "New Southbound Policy for Popular Science Education and International Exchange Project", and agreed to subsidize it with funds of NT\$ 9,250,755. The project includes the following three sub-projects: the exchange program for the special "Invention Exhibition", the "Program of Participation in the International Exchange of 'Rice Exhibition' ", and the "Science Camp Event - Singapore Science Center Exchange Program".	Exhibition Division
01/28	Taipei Songshan Feng-Tian Temple displayed "Bicycle Generators" in the museum as a lighting rite at the opening ceremony.	Technology Education Division



Date	Summary	Proposing Unit
02/15	The <i>Technology Museum Review</i> was incorporated in the TCI-HSS (Taiwan Citation Index - Humanities and Social Sciences) by the National Central Library. The rank of the periodical was upgraded from fifth to fourth.	Collections and Research Division
03/01	We signed the "Proposal to Develop Ancient Chinese Lock Products" with Beijing Geombot Technology Limited Liability Company.	Collections and Research Division
03/03-03/31	The Kaohsiung International Pastel Association exhibited "Arts and Crafts in Kaohsiung and NSTM" in the west Art and Culture Exhibition Area on the first floor. The pastel paintings centered on humans and objects of the museum.	Exhibition Division
03/03-12/31	We provided training for South Complex leaders according to the 2017 "Pilot project of promoting elders to make their own groups for lifelong learning activities", including briefings on the program, interviews, and primary training courses.	Technology Education Division
03/04	Our museum and ESUN ROBOT ASSOCIATION host the 2016-2017 FLL (FIRST LEGO League) and FTC (FIRST Tech Challenge) for the Taiwan Robot Tryouts	Technology Education Division
03/04	We conducted the first session of Parent-Child Day at the National Science and Technology Museum of 2017.	Personnel office
03/04-03/12	We cooperated with the Taiwan Forestry Research Institute, COA, to execute the "2017 Taiwan Wood-based Materials Promotional Program" and provided carpentry courses in the Taiwan Forestry Research Institute, COA.	Exhibition Division
03/06	We and the Wengao City God Temple in Penghu signed the project for the "Repairing Program for the Listed Relics of Wengao City God Temple in Magong City, Penghu County" .	Collections and Research Division

Date	Summary	Proposing Unit
03/10-06/18	We and the Macao Science Center commissioned the Macao Creative Industry Co., Ltd. to enter into a special exhibition lease agreement, and move the "Invention Exhibition" to the Macau Science Center.	Exhibition Division
03/11-05/14	We and the Cloud Gate Dance Theatre co-hosted the "Dancing Buka Frog Interactive Art Exhibition" in the Fantasy World exhibition hall in the basement floor.	Exhibition Division
03/11-05/14	TTIDA sponsored us for the "2017-2018 EM Radiation Dissemination and Experiencing Activities" to promote the EM radiation issues. From the principles of electricity and magnetism to the application of EM radiation in everyday life and its safety, all the activities were held in a large space.	Technology Education Division
03/13	We held a rewards ceremony and a dinner party for our volunteers. 15 volunteers received the Ministry of Education Award (Diamond Medal), 15 received the Ministry of Health and Welfare Award, and 18 received the Museum Excellency Award. 68 volunteers were awarded the Grand Medal of Honor, 99 were awarded the Gold Medal, 56 were awarded the Silver Medal, 43 were awarded the Support Award, and 109 won the Diligence Award.	Visitor Services Division
03/16	We and udnFunLife Co., Ltd. entered into an exhibition agreement for the "Ghibli Exhibition" and executed it accordingly.	Exhibition Division
03/19-11/12	Our museum and the Taiwan Association for Promoting Public Health conducted 6 total sessions of "Master of health and science is at the National Science and Technology Museum" together in 2017, based on the topic of "Food".	Technology Education Division
03/20-05/20	"Iron Man: the Combination of Wen-zong Zhong's Egg Sculptures, Calligraphy and Wood and Steel" was exhibited in the Art Cafe on the second floor.	Exhibition Division

Date	Summary	Proposing Unit
03/24-05/24	We and the Taiwan Active Aging Association jointly organized the "My Dear, I'm Old" exhibition in the First Special Exhibition Hall on the second floor.	Exhibition Division
03/27	The Ministry of Education visited us regarding our file management effective in 2016. It rated the museum as excellent, awarded us NT\$ 500,000, and recommended us to participate in the 15th Institutional Archives Management Award.	Secretariat
03/29	We added a new "Self-powered Chip" unit to the Open Sesame Science Exploration Center, and an "Artificial blood" animation to the "Heme Model" unit in the Science Laurel Wreath Hall.	Exhibition Division
03/29	We and the Tainan Municipal Administration of Cultural Heritage signed the "2017 Tainan Municipal Administration of Cultural Heritage's Stone Artifacts Project".	Collections and Research Division
03/31	We participated in the "Scientific Carnival" organized by Renai Primary School in Pingtung County.	Technology Education Division
03/31	We set up a robot classroom in Room S109 in the NSTM South Complex.	Technology Education Division
03/31	We, the Water Resource Agency, and the Water Resource Bureau, Kaohsiung City Government, jointly held the opening ceremony for "Love Water, Save Water, Happy Children's Day" in The Month of Love Water, Save Water, and the obstacle games for the "Go for Saving Water".	Technology Education Division
04/01	The Main Administration of the Popular Science Library was moved from the Collections and Research Division to the Technology Education Division.	Technology Education Division

Date	Summary	Proposing Unit
04/01-04/04	"Wow! Somatosensory Adventure 2.0 Exhibition" newly featured the "Let's Brainstorm".	Exhibition Division
04/01-04/30	The "2017 An-li Wang and Si-ting Yang Water Color Painting Exhibition" was held in the Art and Culture Exhibition Area on first floor.	Exhibition Division
04/01-12/31	Cooperating with the national energy education promotion policy, our museum and the Energy Technology Talent Fostering Plan Office, Ministry of Education, collaborated to conduct the "2017 Energy Science & Technology Creative Design Contest". Our museum also hosted the exhibition "Best Creation - Creative Energy Technology Achievements" at the hall on the first floor and in Songshan Cultural and Creative Park.	Technology Education Division
04/07	We cooperated with the Industrial Technology Research Institute on "Innovating A Better Future" and held regular exhibitions in Sanfang hall on the 6th floor.	Exhibition Division
04/11	Four committee members visited us for the 9th Government Service Quality Award. We received the finalist certificate, briefed the committee members, and underwent a written review and field audit.	Visitor Services Division
04/20	Pei-xiu Wu, Director of our Exhibition Division, and Dr. Khong Yoon Loong, CEO of Tech Dome Penang, signed an overseas exhibition agreement for the "Invention Exhibition".	Exhibition Division
04/21-04/23	Our museum, the Ministry of Education, and the Education Bureau, Kaohsiung City Government, organized the "2016 Gathering of Outstanding Schools in the Construction of Disaster Prevention Campuses". Pan Wen-Chung, the Minister of Education, delivered a speech at the opening ceremony on April, 21.	Exhibition Division



Date	Summary	Proposing Unit
04/21-07/09	Our collections in the Open Storage were displayed for the "Nostalgia on TV-TV Industry Collections exhibition".	Collections and Research Division
04/22	We took part in the "2017 World Earth Day: National Coastal Cleanup and Low Carbon Carnival" held by the Kaohsiung City Government.	Technology Education Division
04/26	We participated in the "57th Science Fair" commissioned by the Pingtung County Government.	Technology Education Division
04/29-05/07	Our museum and Education Bureau, Kaohsiung City Government cooperated to conduct "the 57th Kaohsiung City National Science Fair for Elementary & Secondary schools" and was exhibited at the fourth and fifth exhibition hall.	Exhibition Division
04/29 - 07/14	We used our equipment to hold two sessions of the "Paper Archive Preservation Workshop" with the support of our volunteers, helping file managers from other institutes and schools form the concept of archive preservation and maintenance so as to promote archive management.	Secretariat
05/02	We held "Learn from Nature: Xiaoru Zhou and Chenshu Liu's Calligraphy and Painting Exhibition" in the Art and Culture Exhibition Area on the first floor.	Collections and Research Division
05/09	Our quality management system passed the ISO9001:2008 certification for three consecutive years.	Visitor Services Division
05/11	We entered into a cooperation agreement with Perkūnas Studio to promote makerspace exhibitions and educational events together.	Exhibition Division

Date	Summary	Proposing Unit
05/17-05/24	We participated in the 2017 Guangzhou Science and Technology Week and Cross-Strait, HK-Macau Science and Technology Exchange Program. Yi-zhen Chen and Yu-xin Chen from the NSTM demonstrated popular science in the Guangdong Science Center.	Technology Education Division
05/23-10/01	The "Xue-ping Cai's Creative Paper Art" was exhibited in the Art Café on the 2nd floor.	Exhibition Division
05/27	We cooperated with Shih Chien University's Department of Fashion Styling and Design Communication to organize a runway show in the Textile & Clothing exhibition hall.	Exhibition Division
06/02-06/29	We cooperated with Shih Chien University's Department of Fashion Styling and Design Communication to organize the "Struggle by Struggle" fashion design show on the Sparkling New Stage, Textile & Clothing exhibition hall.	Exhibition Division
06/03	We entered into the "South Fashion and Textile Industry Exhibition Agreement" with the Labor Education and Life Center, Labor Affairs Bureau of Kaohsiung City Government.	Exhibition Division
06/13	Led by our Director-General, Chen Xun-xiang, and the Director, Wang Liang-quan, the team went to the 9th Government Service Quality Award ceremony and received the award.	Visitor Services Division
06/19	Our information security management system passed the ISO27001:2013 re-examination.	Information Technology Team
06/19-08/20	We and the Administration Office of National Chiang Kai-shek Memorial Hall jointly held the "Science and Technology for Disaster Reduction" (in Taipei).	Exhibition Division

Date	Summary	Proposing Unit
06/19-09/17	We and udnFunLife worked together to hold the "Ghibli Exhibition" in the First, Second, and Third Special Exhibition Halls.	Exhibition Division
06/20	We entered into a cooperation agreement with MakerLab to promote makerspaces and related educational events.	Exhibition Division
06/27	We passed the SGS audit and verification with our PIMS (Personal Information Management System), and successfully obtained the BS 10012:2009 international certificate.	Information Technology Team
06/29	We assisted the Directorate-General of Personnel Administration, Executive Yuan, with the "2017 Special Human Resource Practice Seminar" in NSTM South Complex.	Personnel office
06/29-07/27	We and Shih Chien University's Department of Fashion Styling and Design Communication jointly held the "Jun-jie Huang's Fashion Show" on the Shining Stage in the Textile & Clothing exhibition hall.	Exhibition Division
06/29-09/03	Kham Inc. held "Exhibition of Your Name" in the Fourth Special Exhibition Hall on the 1st basement floor.	Exhibition Division
06/29-09/03	Kham Inc. held "Exhibition of Poo" in the Fifth Special Exhibition Hall on the 1st basement floor.	Exhibition Division
06/30-08/18	The "Leaping" unit was removed from Wow! Somatosensory Adventure 2.0 Exhibition while the "Gunslinger Showdown", "GOGO Racer", and "VR Speed Racing" were added to the Exhibition.	Exhibition Division
07/03-07/16	Ms. Mei-qiu Tian applied for the "Mei-qiu Tian's Ink Painting Exhibition" in the Art and Culture Exhibition Area on the first floor.	Exhibition Division

Date	Summary	Proposing Unit
07/04-08/20	A young farmer experience event called "Climate X Agriculture" was organized in the Climate Change exhibition hall in conjunction with the Story of Taiwanese Agriculture. This activity attracted 3,070 participants.	Exhibition Division
07/05-08/18	We handled the "Three-year Science and Education Resources Promotion Plan" organized by the K-12 Education Administration, Ministry of Education, and cooperated with communities and colleges to promote popular science in Penghu County, Taitung County, Hualien County and Taichung City.	Technology Education Division
07/15-08/13	The International Society for Optics and Photonics, the Optical Society of America-National Sun Yat-sen University Student Branch, and NSTM jointly held the "Magical Light-More Than Just Light" game with challenges to defeat.	Technology Education Division
07/20-08/20	NSTM and the Kaohsiung City Business Association for Publishers jointly organized the "2017 Southern Taiwan Reading Festival and the 3rd Kaohsiung Bookfair".	Visitor Services Division
07/27-07/29	NSTM and Sony Taiwan co-hosted the "5th Sony Creative Science Exhibition".	Technology Education Division
07/27-09/29	We worked with Shih Chien University's Department of Fashion Styling and Design Communication to hold the "Penglai.com" fashion design show on the Shining Stage in the Textile & Clothing exhibition hall.	Exhibition Division
08/09	The National Development Council informed us about the award of the "15th Institutional Archive Management Gold Prize" on August 9, 2017.	Secretariat



Date	Summary	Proposing Unit
08/09-08/26	We promoted science education events for the New Southbound Policy by organizing two phases of the Singapore Science Study Tour for teenagers, parents and children.	Technology Education Division
08/11-08/27	We held the exhibition of "MOST-A-Thon FIN@NSTM" organized by the Ministry of Science and Technology. Themed on the result of the "Frontier Transformation Project", the exhibition introduced energy and nanotechnology through games, interactive activities and teaching materials, and attracted almost 20 thousand visitors.	Exhibition Division
08/15-08/25	Conducted Love Angel vote of 2017	Personnel office
08/18	We received a formal letter from NanE Design Corp. Ltd. to inform us of the SGS Qualicert Service Quality Certification for our long tube slide.	Exhibition Division
08/26-08/27	Our museum and Family Education Center. Department of Education, Kaohsiung City Government cooperated to conduct Grandparents Day activities, including illustrated books reading and science DIY.	Technology Education Division
08/31	The National Education Radio entrusted us to execute the "Project of the 'Story of Voice' Exhibition" and signed a labor contract.	Exhibition Division
09/01-09/03	Our museum conducted "Floral Art and Fly with Dreams: 2017 NSTM Maker Expo". Activities during the expo included a Maker education exchange session, Professor Takaaki Sonoda building a 4-meter tall kaleidoscope with our staff, and Takuo Toda, Chairman of the Japan Origami Airplane Association, folding a giant paper airplane and launching it on the top floor of our museum.	Exhibition Division

Date	Summary	Proposing Unit
09/08-12/03	Our "Science and Technology for Disaster Reduction" was exhibited in Chiayi Municipal Museum.	Exhibition Division
09/13	Our museum's website passed its 2.0-level inspection and obtained Web Priority AA Accessibility Approval.	Information Technology Team
09/14	Our updated NSTM APP was released on Google Play and the APP Store.	Exhibition Division
09/15	Our museum passed Qualicert service quality certification and became the 1st certified museum in Taiwan.	Visitor Services Division
09/21-09/22	Our museum joined the "International Disaster Prevention Festival" held by Kaohsiung City Government and programmed a disaster prevention promotion booth displaying the prevention of debris flows and earthquakes.	Exhibition Division
09/21-09/24	Our museum conducted the "2017 National Disaster Prevention Day Activity-When the earth quakes" challenge game.	Exhibition Division
09/24-12/10	Our museum and National Cheng Kung University cooperated to conduct the 2017-2018 "Session plan for the Sunday reading technology master series", which was subsidized by the Ministry of Science and Technology. A total of 8 sessions were successfully conducted in 2017.	Technology Education Division
10/01-12/31	An "Invention Exhibition" was exhibited in the Tech Dome Penang for execution of the "New Southbound Policy: Popular Science Education International Exchange Plan" by the Ministry of Education.	Exhibition Division
10/03-12/24	The "Pressed flower art creation exhibition by Jin-Hong Zheng and students" was exhibited at the art and culture exhibition area on the west side of the first floor.	Exhibition Division

Date	Summary	Proposing Unit
106/10/14-107/2/28	Our museum hosted "Brain-The Biology of Mind" with the National Museum of Natural Science and exhibited it in the fourth and fifth exhibition halls (tickets required).	Exhibition Division
10/19	NSTM Director-general, Chen Hsun-Hsiang and Chief of Secretariat, Chen Chi-Hsia lead the team to attend the awards ceremony of the "15th Records Management Quality Awards for Government Organizations" conducted by the National Archives Administration, National Development Council.	Secretariat
10/19-10/20	Our museum, the Graduate Institute of the Conservation of Cultural Relics and Museology, Tainan National University of the Arts, National Cheng Kung University Museum, the Department of Theater Arts, National Sun Yat-sen University and the Chinese Association of Museums cooperated to conduct the "2017 International Conference on Museum Evaluation".	Collections and Research Division
10/20	We completed the revision of the museum website and introduced HTTPS to enhance transmission security. The website was updated to <a href="https://www.nstm.gov.tw">https://www.nstm.gov.tw</a> .	Information Technology Team
10/27	Our museum was honored and rated as 3rd place in the 2016 National Property Revitalization Performance "Foundation or institution group" by the Ministry of Finance.	Secretariat
10/27-10/28	Our museum and the Education Bureau, Kaohsiung City Government hosted the "Kaohsiung 36th Primary and Junior High Schools Science Lawn Party" together	Technology Education Division
10/27-10/28	Our museum hosted the "2017 International Conference of AR/VR in the museum" with the Southern Taiwan University of Science and Technology.	Exhibition Division

Date	Summary	Proposing Unit
10/30	Our museum self-made 4 exhibitions, including the "Steel Ball Slide" exhibition, "Acoustic interactive electronic clothes (also called ultra-instrument interactive clothes)", "Room escape - Look for clues by sounds" and "Large kaleidoscope".	Exhibition Division
106/11/03- 107/02/28	Our museum hosted "BrainMyth" with the Department of Psychology, Kaohsiung Medical University and exhibited it in the fourth exhibition hall.	Exhibition Division
11/08- 11/19	The Kaohsiung China Floral Art Association exhibited "Shape and Color – When Flowers Meet Shadows" at the art and culture exhibition area on the west side of the first floor.	Exhibition Division
11/09	The book launch party of the work from our former director general, Hong-Sen, Yan: <i>My 718-Day Journey as the Director-General of NSTM</i> .	Collections and Research Division
11/10	We conducted the 20th anniversary and the opening ceremony of the "Explore IoT exhibition".	Exhibition Division Visitor Services Division
11/17	Our museum signed a cooperation agreement to move "Nanometer - The invisible scale" with the Department of Education, Kinmen City Government.	Exhibition Division
11/17- 11/19	The 2017 "Kaohsiung primary, junior high and senior high schools sustainable urban and rural areas" display was exhibited at the circular courtyard on B1.	Exhibition Division
106/11/17- 107/03/04	Our museum and the Soil and Water Conservation Bureau, Council of Agriculture, Executive Yuan cooperated to conduct "Soil and Water Conservation for Disaster Prevention" for exhibit in the National Library of Public Information.	Exhibition Division



Date	Summary	Proposing Unit
11/20	We completed the establishment of a smart patrol system in the museum and integrated it into the civil notification function in our NSTM APP.	Exhibition Division
11/21	We offered free trial coffee before the opening of the "Popular Science Café" in the south wing.	Visitor Services Division
11/21-12/05	Eight students, from the Department of Vision Design, National Kaohsiung Normal University, including Pei-Lan Huang, conducted "Public welfare and shared arts-A poster creation exhibition" in the art and culture exhibition area on the first floor.	Exhibition Division
11/24	The "earthquake warning system" displayed in the "Earthquake education experience area" in the Technology Hall on the fourth floor was renewed and opened for visits. The exhibited item, the "Palert" earthquake warning system costing NT145,000 was donated by San Lien Technology Corp.	Exhibition Division
106/11/24-107/1/18	The associate professor of the Department of Fashion Styling and Design Communication, Shih Chien University, Hui-Zhen Huang, conducted "The beginning-clothing creation exhibition" in the Textile & Clothing Hall in our museum.	Exhibition Division
11/25	We renewed the display in the Pavilion of Dream Transport, as well as established and opened "Car driving by Intelligent Transport Systems (ITS)" for visits and experiences as the 2017 cross-origin value added plan of the Ministry of Education.	Exhibition Division
11/27	The construction of "Green Living Exploratorium" in the outdoor area on B1 of the north wing was completed. This exploration hall is based on "cross-origin" and "value added", and promotes environmental education by focusing on regional and localized green technology and environmental issues.	Technology Education Division

Date	Summary	Proposing Unit
11/28	Our museum signed a cooperation agreement and conducted the donation ceremony with the National Land Surveying and Mapping Center, Ministry of the Interior and Aerial Survey Office, Forestry Bureau, Council of Agriculture, Executive Yuan.	Collections and Research Division
11/28-12/29	Our "Invention Exhibition" was exhibited in the Hualien County Cultural Affairs Bureau Library.	Exhibition Division
11/29	Our museum signed a cooperation agreement to move "Nanometer - The Invisible Scale" with the Howard Beach Resort Kenting.	Exhibition Division
12/05	Our volunteer team was honored with the 2017 National Outstanding Volunteer Team by the Ministry of Health and Welfare and awarded one medal and NT\$23,000.	Visitor Services Division
12/05	The construction of the "Popular Science Café" and "Multiple Measurement Square" in the NSTM south wing was completed. This area, integrated with functions of the neighborhood, is a "value-added" multi-function rest facility with purposes including popular science promotion and educational learning.	Collections and Research Division
12/07-12/14	We completed the production of the film "So that's how it is!" of the Popular Science Broadcast Center. This film was broadcast in the "2017 Popular science fair - Popular science broadcast innovation forum" and was highly recognized by the audience.	Technology Education Division
12/08	Our museum signed a contract for "The interpretation, reuse and database establishment of relics and digital images of Taiwan Sugar" with Taiwan Sugar Corporation.	Collections and Research Division

Date	Summary	Proposing Unit
12/09	Our museum, the National Museum of Natural Science, and the National Taiwan Science Education Center completed the simultaneous inauguration ceremony of the Popular Science Broadcast Center through an internet connection.	Technology Education Division
12/12	Our museum hosted the awards ceremony of the Ministry of Education's 2017 Education voluntary service and museum tour. Visitors included awardees of Diamond and Golden quality awards, delegates from outstanding voluntary service groups, and guests from different institutions.	Visitor Services Division
12/14	"2017 Taoyuan Creation and Science Education Professional Empowerment Education Visit". A total of 28 principals from primary schools from Taoyuan City attended this maker workshop and experienced the lessons lectured by Professor Cloud.	Exhibition Division
12/16	Our museum and the Department of Special Education, National Pingtung University, cooperated to conduct a collaborative and innovative development center research plan for teachers from Guangdong and Taiwan. 39 students from the Department of Special Education, Lingnan Normal University attended "Maker trend - Research on how the STEAM empowerment project enhances the professional competency of students majoring in special education before employment."	Exhibition Division
12/16-12/17	There were a total of 117 teams in the junior high school group and 139 teams in the senior high school and vocational high school group signing up and participating in the seventh "Hand Launch Glider Flying Competition".	Technology Education Division
12/19	The flight simulator in the Air Navigation and Aerospace Exhibition Hall- Fighter was renewed to a VR simulator and opened for experience after completion.	Exhibition Division

Date	Summary	Proposing Unit
12/19	We conducted the "2018 Neighborhood Activity Planning Meeting" at Han-Hsien Yang-Ming Restaurant and awarded the certification of merit to 14 chiefs of villages.	Visitor Services Division
12/27	The display in Telecom @ Taiwan Hall "Telecom network structure" area was renewed and opened for visits after inspection.	Exhibition Division
106/12/27-107/04/08	"Science and Technology for Disaster Reduction" was moved back to the long hall on the sixth floor for exhibition after its exhibition in Chiayi Municipal Museum.	Exhibition Division
12/29	Our museum signed the cooperation agreement of the exhibition "Fashion over a century-Taiwanese women's clothing" with the Taipei Economic and Cultural Representative Office in the U.S., Ministry of Foreign Affairs.	Exhibition Division
106/12/29-107/06/03	Our "The Forest and Me" exhibition was displayed in Chongqing Science and Technology Museum. NSTM Director-general, Shiunn-Shyang Chen, Director of Exhibition Division, Pei-Hsiu Wu, Executive Officer, Zone-Jhe Jheng, and the organizer, Shih-Wen Kao attended the opening ceremony conducted on January 2, 2018.	Exhibition Division



2017 National Science and Technology Museum

Annual Report

# List of NSTM Personnel



## STAFF

(In Alphabetical Order)

## Director-general

CHEN,SHIUNN-SHYANG

## Deputy Director-general

TSAI,HSIEH-TSH

## Secretary

SU,YI-HSIANG

## Collections and Research Division

Director: LIN, JONG-I

CHEN,SHU-CHING / CHENG,TING -FANG

HSIAO,KUO-HUNG / HUANG,CHENG-CHONG

HUANG,JUN-FU / HUANG,WAN-WEI

LIN,LI-CHUN / LIU,CHING-HO

TSAI,CHIA-JUNG / TSUI,YA-TING

WANG,YAO-HUI / WANG,YUN-YING

WU,CHING-TAI

## Exhibition Division

Director: WU,PEI-HSIU

CHEN,MEI-TSEN / CHUANG,CHUN-LIN

CHUANG,SHENG-TENG / HONG,WAN-JHEN

HUANG,CHI-HONG / HUNG,HUANG-KAI

JHENG,ZONE-JHE / KAO,SHIH-WEN

LI,HSING-LIN / LI,JU-CHING

LIN,CHAO-HUNG / LIN,CHEN-YIN

LIN,JIAN-LIANG / LIN,SHIS-TANG

LIN,SHU-CYU / LIN,WEN-HSIEN

LU,THAO-RONG / SU,FANG-YI

SUN,HUNG YU / SUN,YI-JEN

TSENG,HUI-CHANG / WANG,TSUNG-CHI

WU,SU-HUA / WU,YU-CHUN / WU,YUN-JU

YAN,LI-WEN / YANG,CHIN-HAO

## Technology Education Division

Director: CHANG CHIEN,CHIH-TING

CHANG,JIA-HWAI / CHANG,MEI-CHEN

CHEN,CHENG-CHIH / CHEN,CHING-YING

CHEN,YI-CHEN / CHEN,YU-HSIN

CHENG,CHIEN-CHI / CHENG,JUI-CHOU

CHUANG,TING-YU / HO,SHU-MIN

HONG,JHIIH,MING / HSIAO,DER-REN

HUNG,HSUEH-CHIN / JIANG,SHU-FANG

KUO,HONG-BIN / LAI,YI-JIE

LIN,CHIH-CHENG / LIN,PEI-YING

LIN,SUNNY-S / LIU,CHIH-YUNG

LIU,JIA-RU / MAI,HSIU-WAN

TSENG,JUI-LIEN / WANG,YU-HUNG

YANG,YI-TING / YEH,CHIN-YU

### Visitor Services Division

**Director:** WANG,LIANG-CHUAN

CHANG,SIN-YI / CHEN,HSIANG-CHUNG

CHEN,I-WEN / CHEN,JUO-HAN

CHENG,CHUN-HSIANG / CHENG,HSIEN-JEN

CHIU,PING / CHU,PEI-YING

CHUNG,YING-SHIUE / HSIEH,YA-WEN

HUANG,HUI-TING / HUANG,PEI-YU

HUANG,SHIH-TING / LAI,JUO-NAN

LEE,CHIA-FEN / LEE,KUAN-CHING

LIN,HUI-CHUAN / LIN,SZU-YUAN

LIU,FUN-RU / LIU,JIN-YI / LO,SZU-YI

PU,CHING-CHING / TSAI,FAN-YI

TSAI,PEI-YING / TSAI,YUNG-LIN

TSENG,I-HSUN / TU,MEI-FANG

WU,YI-NA

### Secretariat

**Director:** CHEN,CHI-HSIA

CHEN,LIN-YUAN / CHEN,TAI-WEI

CHOU,WAN-RONG / GER,TZU-HSIANG

HORNG,JING-YI / HSIAO,SHIH-MING

HUANG,PO-SHIN / JU,YUAN-CHING

KUO,CHUNG-HAO / LEE,CHIEN-HSING

LEE,HOUNG-JYH / LEE,SHUN-HSIUNG

LI,CHANE-WEN / LI,JHENG-DA

LIAO,MIN-LING / LIN,WEN-CHIH

LIN,YAO-TING / LIU,CHIN-HUNG

MO,HSIUNG-WEI / OU,HUI-LING

SU,PEI-JHEN / SU,YU-JEN

SUN,MING-SHENG / TSAI,CHENG-TE

TSAI,MENG-CHE / WANG,CHU-LIN

WU,CHENG-CHAN / WU,CHING-YUN

WU,TING-FANG / YANG,LI-WEI

YANG,MEI-HUI / YEH,CHIA-HSING

YOU,SHUN-PING / ZOU,JIA-PING

### Personnel office

**Director:** KUNG,CHING-WEN

CHEN,YI-TING / HUANG,HSIN-YI TAI,MENG-CHUN

### Accounting and Statistics Office

**Director:** TSAI,YA-WEN (during 2017/1/11-9/15)

**Director:** FU,CHEN-MEI (assumed office on 2017/9/15)

HUANG,SHU-JUNG / LIU,SHU-YI

YANG,TE-WEI

## VOLUNTEERS (In Ascending Order)

0860397	TSENG CHIUNG-HUI	0860575	HSU CHI-FU	0860760	HUNG MEI-YING	0861044	WANG,JIAN-HUA
0860456	KUO SHU-TUAN	0860578	HUNG SU-CHEN	0860770	LO YUEH-HSIU	0861046	SUN LU-HUA
0860474	CHUANGT MEN-CHU	0860580	FU,YU-CHUAN	0860781	CHANG KUO-WEI	0861059	LIU,LING-YU
0860487	CHEN JIA-SHIANG	0860585	HUANG KUEI-FENG	0860809	TSENG PAO-HUI	0861082	HUNG,HSIU-CHUAN
0860502	TSAI NENG-SHENG	0860586	TSENG SHU-LING	0860825	LIAO,ZHEN-XING	0861096	SHIAI SHAO-ERE
0860511	CHIU YU-MEI	0860587	LIN LIANG-HSIU-YUAN	0860841	KONG FUN-CHUAN	0861101	LIN,CUI-DUAN
0860512	LEES-M	0860594	TZING-KUN LIN	0860845	KU BAIR-HWA	0861103	CHEN SUE-HUA
0860513	SHUN SHU-SHAN	0860599	CHUANG MEI-CHING	0860852	SHAO YU-TANG	0861154	LEE SHU-CHING
0860530	CHEN YANG-YU	0860609	CHANG,YAN-LING	0860865	LAI RONG-JER	0861158	HONG KO-MENG-LI
0860539	CHUANG YU-CHUNG	0860616	SHIH BO-SONG	0860876	CHUNG WU-LING	0861165	HONG KANG-NAN
0860541	CHAO LI-FENG	0860670	CHEN CHENG-HSIN	0860883	HUANG HUI-LIEN	0861172	WANG CHIN-CHENG
0860545	HUANG SHU-HUI	0860673	CHANG SHU-MEI	0860929	LEE TZU-CHI	0861173	PENG LAI-YU-HUA
0860546	CHIANG CHIN-CHU	0860705	WANG,CHUN-LIAN	0860945	CHENG CHIN-KUEI	0861174	HSIEH A-MEI
0860549	ZHENG SHOU-YAN	0860707	LAI,HENG-HUA	0860979	SHAN,SHOU-JU	0861177	HUNG HSIN-HUA
0860550	YANG LEE-JU	0860712	LIANG CHIN-O	0860995	YANG TSAI	0861179	YEN YIN-IZU
0860551	TSENG WEN-CHEN-YING	0860714	YANG KUEI-TAO	0861001	KU KUEI-LI	0861188	LOR CHUN-LIN
0860554	CHEN TSUNG-TAR	0860715	YANG HSUEN-O	0861004	HUANG CHIUNG-FANG	0861194	TSUI AI-YEN
0860557	SHEN MEI-LING	0860716	CHENG SU-FEN	0861006	CHEN KAO-LI-CHU	0861195	LI,JIN-LIN
0860559	ZHENG,XIU-ZHEN	0860718	CHEN,SHU-YAN	0861014	LEE HSIU-CHIN	0861207	SHIH HUI-CHING
0860561	TSAI LI-SHU	0860743	LIN CHAO-YIN	0861018	LIANG YU-YING	0861233	HUANG KWEN-FENG
0860574	HE,YI-TING	0860753	CHEN NING	0861039	LEE CHUN-JUNG	0861242	CHEN I-LUN



0861256 CHEN PAO-CHU	0861629 CHANG MAI-LING	0861762 HSU FENG-HSIANG	0870110 CHEN,JIN-RUI
0861278 TU PI-LIEN	0861630 HU CHIN-CHAI	0861763 LI HSIAO-LIN	0870111 LEE YA-LINE
0861283 YANG GAO-GUI	0861640 WANG HUI-CHING	0861765 HUANG SHIH	0870117 CHEN CHUNG-SHENG
0861287 TSAO YU-HSIU	0861645 TSOU HSING-YING	0861781 CHOU CHEN-MEI-WEN	0870127 SU TENG-KUEI-YING
0861296 WU YUEH-CHEN	0861649 YANG HSIU-YNUN	0870001 LIN,HUI-ZHEN	0870130 WU HSIN-HUI
0861314 WANG,SHU-CHING	0861652 HUANG MEI-LAN	0870010 LIN,XIU-BEI	0870131 WU TUAN-MEI
0861320 LI TERANG-CHUAN	0861653 LIN SHAN	0870012 SHIH PAO-HSIU	0870138 SU CHIN-TSUNG
0861327 CHEN LIANG-PAI	0861658 HSIEH TSAI LEE-FENG	0870016 YE,YUE-YING	0870141 HO YUAN-PIN
0861335 SHIH CHUAN-CHUAN	0861672 CHENG CHIN-CHAI	0870027 LI SING-HONG	0870144 YANG SHU-FEN
0861339 LEE FANG-YING	0861673 LIU,CHUN-TSENG	0870033 HUANG CHIU-HSUEA	0870149 SHIEH CHI-HUI
0861358 LIANG CHIN-WEI	0861674 HSIEH SHIANG-ER	0870039 KUO WEN-CHEN	0870150 YU,SHUN-YI
0861370 CHOU FANG-HUA	0861675 LIN HUI-MEI	0870058 LIN SHU-WAN	0870152 SHIU LI-CHUAN
0861400 LIN,HSIU-HUA	0861676 CHUANG PAO-AI	0870059 ZENG,SHU-SHEN	0870190 TSAI CHIN-CHIH
0861410 LIU,XIU-YING	0861677 LI,SU-CHEN	0870061 YU CHEN PI-LIEN	0870199 CHEN LI-CHU
0861416 WU WEN-CHING	0861678 LEE SHIH-FANG	0870070 HUANG TSAI-FZNG	0870202 CHANG HSIU-CHIN
0861419 CHOU HUI-LIEN	0861690 CHOU HUA-KUEI	0870071 TSAI,YU-CHEN	0870208 LIN KUEI-CHEN
0861421 WU CHING-HUNG	0861694 CHUNG HUI-LAN	0870075 LIN EN-HSIUNG	0870226 CHEN MEI-HUEI
0861500 HUANG SU-SHIA	0861695 CHEN SU-CHIN	0870077 LIN CHUEN-MEEI	0870229 YANG SHU-HUA
0861540 CHIH CHEN-KNEI-YING	0861703 CHEN YOUNG-CHING-MEI	0870078 CHEN,LI-HUA	0870230 WANG JEN-HSIU
0861553 SU SU-HUI	0861717 GU,LI-CHIN	0870084 CHEN,LI-YU	0870231 CHUANG CHIA-NU
0861560 LIN HSIU-FANG	0861718 LIU,YUE-JIAO	0870085 HUANG LIN-LIANG-HUI	0870242 LEE LING-FEN
0861589 CHAN PEI-YING	0861732 HUANG SHU-JU	0870088 CHEN LI-HUA	0870243 TSAI TENG-YEH
0861590 LEE LI-HSIANG	0861759 CHEN MAY-LIE	0870091 LIN WU-MEI-LAN	0870244 CHEN MEI-CHU
0861619 LIN PSAI-FA	0861760 WENG,RUI-MEI	0870103 TSAI SHU-HSIEN	0870246 LIN HUI-YANG

0870248	LEE SHU-CHEN	0870429	CHENG YEN-PIN	0880054	LU,LI-RONG	0890018	LIANG,LI-ZHU
0870263	WANG YA-LI	0870431	LIN KUEI-MEI	0880055	TAI CHING-MEI	0890019	LIN,GUI-FEN
0870281	CHU,JUI-FANG	0870446	HONG,QING-XIN	0880058	CAI,ZHEN-FEN	0890021	LIN,YU-CHIUNG
0870290	WANG JUI-HAN	0870451	WEN,XIN-LAN	0880064	TAI CHIEN-HUI	0890022	YANG LI-CHU
0870294	KAO FEN	0870453	CHAO LI-KUEI	0880078	LIN CHEN-MING-SHOW	0890023	CHEN CHUN-TAO
0870300	CHANG SU-YING	0870459	CHEN YANG-SHOW-CHING	0880082	LEE HSIU-HSIANG	0890047	CHEN JIAN-LONG
0870306	ZHENG,LI-XIANG	0870465	HU XU, XIU-QIN	0880086	LIN SHU-CHEN	0890062	LIU CHIN-YEH
0870315	LEE HSIU-HUA	0870467	WEI CHANG CHIU-JUNG	0880087	PAO CHIUNG-YING	0890065	WU HSIU-LIN
0870316	SHIH LI-HUA	0870483	GUO,MING-ZHEN	0880093	HUANG,YU-LI	0890073	HUANG HAI-PING
0870318	WU PEI-HSUAN	0880002	ZHANG,MEI-FENG	0880097	SUN YU-CHU	0890074	CHANG HUI-HSIEN
0870322	CHUANG PI-YUN	0880004	SU HUI-MIN	0880123	HUN SHU-YING	0890075	HUANG SHIH-LIAN
0870330	ZENG,YAN-HUA	0880007	YU JUNG-SHIN	0880138	CHEN CHAI-CHIN	0890080	TSAI JUAN-LI-CHUAN
0870332	HSU WANG-LI-YU	0880010	LIOU SHOU-YING	0880161	CHEN NENG-YU	0890083	LUO,YU-MEI
0870333	WANG LEE-BAO	0880013	YANG LING-FEI	0880179	ZHENG WU,YING-LUAN	0890084	TSENG SHU-HUI
0870338	KUO MEI-JU	0880017	CHUANG CHUN-HUA	0880185	WANG,PIH-SIA	0890086	LU,XIU-ZHU
0870348	LIN,QIN-JUAN	0880019	LIU MING-CHU	0880195	HUANG HUNG HSIU-CHIN	0890097	YANG HSUEH-CHIH
0870362	WEN CHIU-CHU	0880029	WU CHIN-TUAN	0880197	WU,YE	0890109	KUO HSUEH-LU
0870372	ZHANG,MEI-YUN	0880034	WU CHIN-JUI	0880236	WANG FENG-YI	0890111	LIU CHEN-CHEAN
0870402	YU JUI-CHIA	0880037	CHAO PI-LIEN	0880241	LAN MEI-CHU	0890119	TSENG YEN-HSIN
0870403	WEI YANG-HSIU-HUA	0880040	WU SU-SHIH	0890006	CHEN HSIEN HUI-LI	0890129	CHANG,YUN-HUA
0870411	LIN SU-LING	0880041	TIAN CHEN,MEI-ZHU	0890008	CHU LI-YU	0890132	CHEN,HUI-CHEN
0870413	QIAN,LI-ZHEN	0880045	LIU KE-SHIU	0890009	YU CHEN-YUEH-HSIA	0890133	CHENG,HUI-LING
0870415	LI,YUAN-XIAN	0880046	WU,SHU-YUE	0890010	WANG CHIN-HUAN	0890140	CAI JIA-JUAN
0870428	LIANG,ZHU-YAN	0880050	SU LEE-CHIN	0890013	LI HUI-CHEN	0890145	CHAO JUI-CHU

0890147 TING MEI-HUI	0900049 LIN MIN-YI	0900152 KUO YU-LING	0930003 CHOU SHIU-CHU
0890150 HSU,HSIANG-MEI	0900050 CHEN AI-LING	0900158 TU YUAN,LI-DE	0930005 CHANG SU-CHIAO
0890151 WANG,CHIUNG-YUN	0900052 CHIANG TAI-CHEN	0910018 XU,YA-TING	0930007 HUANG MING-HUA
0890153 HO,SHU-LIU	0900053 PENG,CHIH-CHIANG	0910039 HOU WEN-FU	0930009 HSU LI-HSIA
0890155 DU SHU-FANG	0900055 HSU SHU-YING	0910040 CHOU YU-CHIAO	0930010 FAN CHENG-YI
0890158 CHEN TSAN-CHI	0900074 HUANG HOU-HSUEH-YUEH	0910043 HUANG CHING-MEI	0930011 CHEN HUI-HUA
0890163 LIU MAM-NING	0900085 WANG YU-CHUNG	0910044 TSUI YU-YU	0930012 HWANG GWO-SHENQ
0890189 KUO FANG-MING	0900086 ZHAO,ZI-WEI	0910047 HUANG MEI-YING	0930013 YU CHIU-YI
0890195 CHEN CHIN-MEI	0900089 CHEN YUEN-HSIA	0910051 LIU GUO-CHIEN	0930014 CHEN LI-CHOU
0890197 WU, JIAN-LANG	0900090 TUNG MEI-CHU	0910052 SUN JUI-HUNG	0930016 SU PAI-WEI
0890198 LEE LING-FIENG	0900094 WU MEI-CHIN	0910053 CHEN MING-HUANG	0930017 CHAN MEI-CHU
0890199 WU SU-HUA	0900098 CHENG CHUANG-CHUEI	0910054 YANG MEI-LI	0930018 CHEN HSIUNG
0890202 HSUEH TUNG-PAO	0900109 WANG,JUN-KAI	0910085 LEE CHIN-YUAN	0930020 CHIANG AN-NAN
0890203 CHANG MANG-LING	0900125 HUANG FENG-CHIEN	0910088 KUO CHIU-TAO	0930021 TSAI SU-CHEN
0900004 XU,TIAN-DE	0900126 CHENG I-CHEN	0910090 CHEN CHIN-CHUEH	0930022 CHOU SHENG-CHING
0900006 LIM SHU-LI	0900127 CHEN CHI-YUAN	0910091 SU YUNG-PING	0930023 CHENG LI-LAN
0900008 FENG SHU-JUNG	0900130 LEE CHI-HOU	0910094 LIN ENG-MIN	0930024 LIN BI-CHEN
0900009 CHEN MEI-HUI	0900133 YEH HSIEN-WEN	0910096 WENG,MEI-CHU	0930025 CHANG YUEH-YUN
0900010 LEE,YU-YAN	0900134 CHANG CHIN-YON	0910098 HUANG CHIEN-CHENG	0930026 LEE YU-HSIA
0900014 ZHAO SHU-ZHEN	0900139 LIN HUANU-SHU-HSIA	0910099 CHANG CHIN-CHENG	0930027 HUANG SHENG-TS
0900024 LIU YU-HUA	0900141 HSIEH MEI-CHEN	0910100 HUANG LIEN-HSIANG	0930030 LEE MU-HWA
0900027 LIEN CHING-YUN	0900144 LIN,SHI-LANG	0910104 TENG CHIN-HSIANG	0930031 KUO CHAO-HSU
0900034 CAI,QIU-YING	0900146 HSU SU-CHEN	0910110 LAI KE-NAN	0930032 LI WANG LI-YU
0900048 HSIEH PAO-HUA	0900151 CHEN KU-LAN	0930002 CHEN YUEH-HSIA	0930036 WANG,HSIU-CHING

0930043 HIAO LI-YING	0930111 HUANG HSUEH-CHIAO	0940036 CHEN YU-YING	0950015 JU, JIA-LING
0930044 LI LI-FENG	0930119 YANG LING-CHEN	0940037 CHEN HSIU-FENG	0950019 CHEN, CHUN-ZHU
0930045 WANG CHEN-SHOW-WONG	0930120 SHAO YI-CHAO	0940038 CHIU CHI-SHENG	0950020 TUNG SHU-CHEN
0930046 LEE CHAO-FEN	0930124 WU CHEN, SU-YU	0940040 LI, BI-MEI	0950023 CHU LIEN-HWA
0930048 TSENG YEN-MEI	0930127 LIU LIN CHAO-HUA	0940042 PAN MEI-HSIANG	0950025 WANG CHAO-YUAN
0930053 SHYU HUEY-LI	0930131 LI WOEI-YANG	0940045 SHIH WAN-YI	0950026 CHEN LIN
0930055 HSU CHING-HUA	0930134 CHEN TLU-CH	0940050 CHEN HSIU-CHU	0950027 WU HUAN-JAN
0930060 CHEN, SHU-NU	0930138 CHANG LIEN-CHU	0940051 YANG MAY-JU	0950028 CHEN CHIH-YUAN
0930061 WANG YA-CHIH	0930139 YU KU-YUNG	0940052 YU LEE-MEI	0950030 TSENG CHUAN-SUNG
0930062 CHANG JUNG-CHUN	0930142 SHEN MING-CHIN	0940058 HUANG WEN-HSIUNG	0950031 LU KAI-CHUAN
0930065 LIU FONG-HSIUNG	0930147 LI YU	0940061 QIU, LIN-YUE	0950034 LEE BAO-NAN
0930072 JIAN, ZHENG-NAN	0930150 LIN JUI-MEI	0940063 TUNG WAN	0950036 ZHANG, LI-MEI
0930073 CHEN, NAI-JU	0930151 SU JUI-CHUAN	0940064 HOU CHUN-HUA	0950039 HUANG YU-LAIN
0930074 SUN HUYU-LE	0930153 LIN PI-CHAO	0940067 WEN CHI-CHEN	0950041 HSU CHIEN-CHENG
0930075 LIN, WU-NAN	0930154 HUANG TSAI-YUN	0940070 LIN HSIU-LING	0950044 LU, YA-HUI
0930076 WEI, JIN-HUI	0940001 CHEN, LI-E	0940080 HUNG YI-WEN	0950045 SUN, YU-HUI
0930078 LIN SHU-CHUAN	0940002 LIU WANG-WAN-MAN	0950001 CHOU LIN-CHIU-HSIA	0950046 HUANG, HUI-LING
0930081 YIN WEI-HUNG	0940003 SU CHENG-CHIAO	0950003 CHEN LIN-CHIN-LUN	0950047 LIN, CHUN-HUI
0930087 TSAI LI-HSIANG	0940007 CHIU, YU-LUN	0950004 YU, SHU-ZHAO	0950048 SHI XIAO, SEN-ZHI
0930088 GU, YONG-JIE	0940008 CHUNG CHIG-YEN	0950005 HUANG SHU-YEN	0950049 LEE CHIAJO
0930095 LIN, CHIH-CHUNG	0940010 SHIH LING-TZV	0950007 KUO KUEI-CHU	0950051 SU JU-SHU
0930097 HUANG HSUEN-FENG	0940027 LIN PEI-YU	0950008 CHANG YUEH-YING	0950054 LEE YU-CHIN
0930102 DAI KO-LI	0940029 YANG SHU-YING	0950009 HUANG CHIN-PEN	0950055 TSAI LI-MAN
0930109 LU SHU-CHEN	0940033 CHUNG, JUI-HUA	0950014 LIN CHIN-MEI	0950058 LIN, GUAN-RONG



0950059 CHEN LINH-LI	0950116 TSAI SU-CHEN	0950175 CHENG,HSIU-CHING	0960054 CHEN,MEI-YIN
0950061 TSAI CHIA-YEN	0950119 ZHOU,AI-YING	0950176 LIU CHUN-YUEH	0960057 CHEN NAN-SHENG
0950062 WU KUEI-MEI	0950122 LIN LONG-MIN	0950177 CHENG MING-HSANG	0960060 XU,YING-YU
0950063 TSENG FONG-O	0950125 CHEN LIOU-JIN-YING	0950181 TSAI HSIU-MEEI	0960063 CAI,JIN-ZHANG
0950066 WENG,XIU-MIAN	0950128 HOU JHAO-WUN	0950185 CHEN TENG-CHAO	0960072 YANG HSUEH-FEN
0950067 CHEN SHEN	0950129 WU SU-CHING	0950186 CHAO CHENG-CHIEH	0970004 WENG TZU-SHUAN
0950068 CHEN AI-LING	0950131 HUNG LI-HWA	0960001 MA SAI-FEN	0970006 LIN JIA-HONG
0950071 TSAI SHU-YUAN	0950134 HUNG JU-RUNG	0960002 TANG CHIU	0970027 LIN MEI-LING
0950076 LEE MING-HUI	0950136 TSO TSUNG-YI	0960005 CHEN,XIAN-YI	0970032 HONG,ZHEN-SHAN
0950077 WANG CHIA-TSENG	0950139 LU DU-MEI	0960009 CHEN,YI-MING	0970033 YAO CHU-LI-HUA
0950078 CHANG HSIAO-HIS	0950140 RUAN,ZHONG-QING	0960010 XIE,YING-DONG	0970034 HON MI-SHOW
0950079 YI CHEN-YU	0950144 SUNG LONG-SHENG	0960012 CHEN,SHENG-XIONG	0970035 CHEN SIANG-SYUE
0950080 LAI SHU-YING	0950145 LIN SEN-TIEN	0960016 HSI CHING-PING	0970038 HSU SHIH-CHENG
0950081 CHUANG,HSIU-LI	0950147 LIAO,YU-CANG	0960017 WANG HSIU-CHU	0970039 HSIAO LI-CHING
0950084 HSIEH MEI-YING	0950151 HUANG,HE	0960020 YANG ZN-YUAN	0970040 YU CHIEH
0950089 KUO CHIUNG-CHU	0950153 HUANG YU-HSIN	0960022 TSAI JU	0970041 TSAI CHIA-YI
0950090 LEE MEI-YUEH	0950154 CHOU PO-SHIUN	0960023 CHEN NENG-CHI	0970042 CHEN SHU-FEN
0950096 LIU SHU-HUI	0950156 LIU MEI-MAN	0960029 PAN JIN-LONG	0970043 HU,JUI-HUI
0950098 LIU WEN-CHI	0950157 SU,GUANG-ZI	0960034 HSU KUEI-HUA	0970045 HSU CHIA-CHUAN
0950099 LEE LI-YUN	0950159 CHANG,KUEI-YING	0960040 WANG YU-HSIANG	0970051 CHEN HSIAO-HUAN
0950104 LIU CHING-HIN	0950163 CHEN YI-LI	0960042 SHEN YANG-CHENG	0970052 CHOU HUI-LING
0950105 ZHANG,RONG-LAN	0950165 SU,XUE-MEI	0960045 HUANG TZU-CHUAN	0970055 TESNG YUEH-HSING
0950112 CHEN,XIU-YAN	0950166 WU FU-I	0960048 CHUNG YAN-SUH-JAU	0970062 CHAO HIS-CHING
0950113 HSIEH PEI-CHU	0950174 YU CHIU-TAO	0960053 WANG CHIU-HSIANG	0980002 YIN JIAN-CHUNG

0980005	CHIANG YU-YUN	0980050	LIN MEI-FEI	0990003	CAI,QING-XIAN	0990044	HSU CHIH-MING
0980007	CHEN YU-CHIN	0980053	LIN KUNG-SHU-MAN	0990004	LAI,KUN-YI	0990045	CHANG LI CHIEH-YIN
0980012	CHEN,JIE-PING	0980054	KUO KUEI-LAN	0990005	TSENG,YU-LUN	0990046	CHEN YUNG-CHIANG
0980013	LI YUN-YIN	0980061	CHUNG MEI-LEE	0990006	CHEN,CHUN-HSIUNG	0990047	CHOU YEONG-CHI
0980014	CHANG CHIEN-CHUN	0980066	YANG,BI-FEN	0990010	JIN,CUN-SHAN	0990048	CHEN SHUI-WANG
0980015	CHEN,SHAN	0980067	LIN SHANG	0990011	XIE,ZHI-LING	0990050	CHEN YI-CHUN
0980016	CHIANG HSIU-MAN	0980074	CHANG,LI-CHING	0990012	CHEN,YAN-ZHU	0990051	CHEN WAN-FU
0980017	LIN MEI-LAN	0980081	CAI,CAI-LING	0990013	TUNG CHENG-LIANG	0990053	CHENG RUEY-SHAN
0980018	CHIANG HUI-CHIN	0980082	ZHANG,MEI-JIN	0990015	LEE YI-HOUN	0990054	HE,XIA-ZHI
0980021	WANG NITA	0980083	LIU,YU-YING	0990016	JIANG,HUI-TIAN	0990056	LEE YURN-CHONG
0980022	CHOU LING-CHUAN	0980084	LEE LI-YING	0990017	QIU,JIN-CHENG	0990057	LIN SHOU-SHAN
0980025	HSU MEI-JEN	0980085	CHANG CHAW-YANN	0990019	HSU,HSIN-CHU	0990058	LIU CHIN-CHIH
0980027	HU SHU-CHEN	0980086	LIN,XIU-LUAN	0990020	HUANG KUN-TSE	0990059	HSU,YUEH-YING
0980028	CHEN,WEN-SHAN	0980087	HSU HSIEN-TANG	0990021	CHEN HSIU-HUA	0990060	HUANG CHIN-HUEI
0980031	CHOU CHIU-LAN	0980089	LIN CHUN-SHIA	0990024	SHI,XIU-ZHEN	0990062	LIN HUI-LI
0980032	LIU,XING-LIAN	0980090	YEH,PAO-CHIH	0990025	KUO CHING-MEI	0990063	LIU YEN-CHUN
0980033	LIU HSIANG-JU	0980091	CHEN HONG-SHING	0990026	LEE MIAO-CHEN	0990064	HUANG JEN-TSUNG
0980034	WANG,LI-MEI	0980092	YE,MEI-MAN	0990028	LU FU-MEI	0990065	YAN SHU-ER
0980036	LIN DAR-NAN	0980093	CHANG HSIU-LAN	0990029	CHEN,MEI-YING	0990066	TSAI HSUEH-HSIANG
0980038	HUANG SU-MEI	0980095	CHUANG CHEN-CHIN-YUEN	0990030	CHU YU-FANG	0990067	HSU KUEI-JEN
0980039	YANG HSIU-YING	0980096	CHEN LEE-HUA	0990031	TONG,MING-CONG	1000001	LO YU-HUA
0980042	CHEN TZU-JIUN	0980100	PAN FU-TSUN	0990040	CHANG MING-SUNG	1000003	HSIAO CHIN-CHAO
0980045	CHEN,ZI-LING	0980101	CHANG CHIEH-YUN	0990042	LIU,YU-LAN	1000005	YEH PAI-MEI
0980046	PENG HUI-CHEN	0980102	LEE SHU-FEN	0990043	WANG,ZHENG-NAN	1000006	HSU SHU-CHUN

1000007	CHENG CHEN-SU-LUAN	1000036	FANG SHU-LING	1000072	WEN HUI-YEN	1000110	YEH,HSIU-JUNG
1000008	CHENG CHI-MING	1000037	TSEN HUI-CHAO	1000073	YEN CHING-KAO	1000116	HSU SU-CHEN
1000009	TSENG YEN-HUANG	1000039	TSAO EN-TE	1000074	ZHENG,BO-XIONG	1000117	WU,CUI-HUA
1000010	WEI CHIN-SHUN	1000040	WU CHIU-HUAN	1000075	YU MING-HO	1000118	HUANG YU-CHUAN
1000012	KUO YU-CHING	1000041	HSU MING-FU	1000076	GUO,ZHEN-ZHEN	1000119	LIN YU-YING
1000013	WANG LUNG-YUAN	1000043	ZHUANG,ZAN-LI	1000078	LEE TI-PEI	1000120	YANG CHING-YUN
1000014	YUAN YA-CHIN	1000044	LIN RONG-BIN	1000080	HUANG PO-HSIANG	1000121	CHANG,LI-CHUEH
1000015	JUAN YUEH-YUN	1000045	FENG YU-KUEI	1000081	PAN CHIEN-MEN	1000122	CHEN,XIN-JIAO
1000016	CAO,CHIN-YUN	1000046	LIN SHIU-SHIA	1000084	LI,YAN-XIANG	1000123	LIN,DE-YU
1000017	ZHUANG,JIN-ZHI	1000047	WU SHIU-CHU	1000087	HUANG MEI-CHI	1000124	ZHOU,LI-YUE
1000018	HUANG SU-HUA	1000048	CHEN MAI-YEN	1000088	CHEN CHUN-KUANG	1000125	LIN LI-CHENG
1000019	CHEN PI-ER	1000049	SONG,LI-ZHU	1000090	HSIEN,YU-CHIN	1000127	HUANG WEI-PING
1000020	TAI CHEN-YUAN	1000050	CHAN CHIN-YUEH	1000091	LEE,HSIU-CHU	1000128	SHEN MEI-FENG
1000022	CHANG FU-SHAN	1000053	LIU MEI-HSUEH	1000093	YANG WEN-CHUAN	1000129	SHEN,MEI-JIN
1000023	LAI,MING-HONG	1000054	CHEN YUAN-MING	1000095	GUO,YI-QING	1000130	PENG,GUANG-TANG
1000025	HUANG HUI-HIS	1000055	CHUNG LO-CHUN-YING	1000097	LO CHIEH-TSUN	1000132	LUO,JIN-DAO
1000026	WU,JIN-GUI	1000056	HU CHIA-LIN	1000099	KUNG LEE-SU-FEN	1000134	LEE SHAO-MEI
1000027	LIAN,SHENG-LIN	1000057	LI,JIN-LING	1000100	KUNG TING-HUI	1000136	XIE,GUAN-ZHENG
1000028	YANG,YI-AN	1000058	SHI,YI-TING	1000101	YU CHIH-HUA	1000139	RUAN TANG,FENG-JIAO
1000029	WU TSUN-NENG	1000059	KUO HSIANG-JUI	1000103	HUANG YANG-CHIH-HUI	1000141	CHEN,PI-CHU
1000030	HUANG YI-CHENG	1000062	TAI HSIU-CHIN	1000104	YANG,CHAO-QUN	1000142	LU,SHAO-YU
1000033	LIU,RUI-YU	1000064	CHANG MAY-CHING	1000105	LI,DE-XING	1000143	LU,JIN-DUAN
1000034	CHU MAN-CHEN	1000070	CHIU HSUEH-LING	1000107	LIN,BI-ZHU	1000144	SHI,NAI-YING
1000035	HSIEH HO-MING	1000071	YAN,YU-RU	1000108	YANG HSIU-CHAO	1000145	CHIU,SUE-CHEN

1000146	WANG,TE-SHENG	1000173	ZHANG,YU-MEI	1000206	TAN,HAI-LIN	1010019	HSU,MING-HSIU
1000147	ZHENG LIN,XIU-ZHU	1000174	WANG PAI-KUNG	1000207	LU,ZONG-MING	1010020	SHI,YU-YING
1000148	LAI,HE-JING	1000177	CHEN,RUI-YING	1000208	LI,YUNG-CHI	1010022	YANG,SEN-GUI
1000149	LU,JIAN-CHENG	1000178	CHUANG,YUNG-JEN	1000210	ZHU,ZHEN-SHE	1010023	WU,SHU-YUAN
1000150	WANG LI,BI-XIA	1000181	SU,TUNG-CHUN	1000211	FU,CHUN-YING	1010024	CHEN,ZHEN-MEI
1000151	CHEN,QING-SONG	1000182	LIN,CHING-YING	1000213	HU,RUEI-SHIAN	1010025	TSAI,MIAO-YUEH
1000152	CHENG,LI	1000183	LI,MING-JANE	1000216	TSAI SHU-CHIN	1010026	SU,YUE-LI
1000153	CHANG PAI-LIEN	1000184	LI,QING-XIAN	1010001	LI,CHUN-HUI	1010029	ZHANG,ZHUO-XIAN
1000154	YE,RUO-YI	1000185	CHEN,ZHI-SHENG	1010002	HUANG,SHU-LING	1010030	WA,CHAO-JUNG
1000155	HUANG LI,CHUN-QIN	1000186	WEI,JU-HSU	1010003	LU,JING-XIAN	1010031	CHIU,PEI-DE
1000157	WU,YIN-TIAO	1000187	KO,NAI-HUA	1010005	CHOU,YU-CHING	1010032	CHEN,MEI-CHING
1000159	TUNG,WEN-SHIANG	1000188	LIAO,YI-CHUN	1010006	LO,CHIN-HUNG	1010034	JUAN,LU-CHIANG
1000160	ZHENG,XING-XING	1000189	HUANG,MEI-LAN	1010007	WANG,ZAI-FU	1010035	CHEN,JING-KUAN
1000161	WANG KUANG-HSIEN	1000191	HUNG,JUNG-YI	1010008	WANG CAI,MEI-HUI	1010036	XU,XIU-FEN
1000162	HU,QIU-MEI	1000192	CHEN,YI-HUI	1010009	ZHENG HUANG,YU-XIU	1010037	JIANG,RUO-ZHEN
1000163	WU,KUEI-HSIANG	1000193	CHANG,FENG-CHEN	1010010	CHEN,YI-LONG	1010039	CHEN,YUN-JUAN
1000165	LIN HOU,XIU-ZHU	1000195	WU,PI-YUN	1010011	YE,HUI-MIN	1010040	LIU,HSING-KUEI
1000166	LU,XIU-ZHU	1000197	HSU,JIN-WEN	1010012	HUANG,XIAO-ZE	1010042	SHI,FANG-JIN
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NSTM Exhibition second volunteer	10,000	Ms. Zhuang, Qi-Zhen, Mr. Lin,Rui-zeng, Mr. Lin,Wei-liang,	10,000
Mr. Xu,Wen-li	10,000	Miss Qin,Li-Wei	
Y-FANG SEALING MACHINE LTD	10,000	Miss Guo,Li-juan	600
CSC Group Education Foundation	20,000	Ms. Chen,Mei-Ling	10,000
Wu Zunxian cultural and educational Foundation Foundation	20,000	Miss Chen,Ming-xia	10,000
Southern Wen Ci Foundation Foundation	10,000	Ms. Chen,Jin-mei, Ms. Zhong,Li-yue, Mr. Lan,Yong-qing	10,000
Mr. Chen Qichuan Chuan Culture and Education Foundation	100,000	Ms. Cai,Li-Feng Ms. Zeng Wen,Zhen-Ying	
The Corporate Body of Yuan Dao Cultural & Educational	10,000	Mr. Chen,De-lin	10,000
Taiwan Yun Dow Buddhism Cultural Exchange	304,810	Miss Chen,Yu-ying	10,000
Chung-hsing Preschool	20,000	Ms. Chen,Ching-Mei	10,000
Kao Two Senior Jaycees Club	60,000	Outstanding Cram School	10,000
Kaohsiung Private Childhood Greenland Kindergarten	40,000	Fubon Life Insurance Co.Ltd/ Chen Tzu-Han	18,000
Chyan-Nang Kindergarten	10,000	Fuhua Machinery Co., Ltd.	30,000
Chin Min Cram School	10,000	Ms. Yang,Gui-Tao, Ms. Xie,Xiang-E	10,000
Wen Bin-Xiang, Chi-Shih Charity	10,000	Ms. Chen Yang,Qing-Mei, Ms. Lin,Chun-Mei	
Lin Ya Police Friends	10,000	Ms. Wang,Ya-Li, Ms. Lin,Su-Ling	
Miss Zhang, Qiu-xiang	10,000	Ms. Huang Lin,Liang-Hui, Ms. Xie,Bao-Hua	
Ms. Zhang,Min	10,000	Hua Wei International Co., Ltd.	6,000
Miss Zhang,Shu-fen	10,000	Ward excellent and excellent limited company	10,000
Mr. Zhang,Jin-Cheng	10,000	NSTM Friday on the theater volunteer	10,000



Sunfar Computer Co., Ltd.	1,010,000	Ms. Chung Mei Lee	10,000
Mr. Huang,Kun-Yu	10,000	Ms. Zhong Luo,Chun-Ying	10,000
Mr. Huang,Yi-Sheng	10,000	Jim Way Enterprise Co., Ltd.	20,000
Sin An Seen Kindergarten	10,000	Wei, Cheng-Chun	10,000
Xinzhuang National Primary School President Chen,Yu-Ru	1,000	Wei, Jie-Yu	10,000
Mr. Yang,Xiong-guang	10,000	Wei, Ming-Wei	10,000
Men Hwa Metal Co. Ltd.	10,000	Mr. Luo,Guan-Fu	10,000
Manpower Intermediary Limited	10,000	Miss Su,Sheng-qing	10,000
Mr. Ye,Chong-Han, Mr. Ye,Ding-Yuan	10,000	Mr. Su,Jin-zong	10,000
Slam literature cram school	20,000	Orchid dance club, Ms. Zhong,Yue-Lan	1,000
Taiwan Tobacco Co., Ltd.	100,000	LEONG SI CHONG	4,370
Ms. Liu, Xiu-Mei, Ms. Wang, Li-Zhu, Ms. Chang, Li-Hsing,	10,000	Ms. Zhen, ○○	10,000
Ms. Wu,Qiu-ju		Ms. Zhen, ○○	10,000
Mr. Liu,Gui-Xu	10,000	○○ Healthy exercise	5,000
Confirm instruments Co., Ltd	10,000	○○ Computer Co. Ltd (Privitization)	10,000
Kwan Fung Industrial Co., Ltd.	10,000		
Huiguang Yali company	20,000		
Mr. Cai,Ji-Xiong	10,000		
Cheng, Yu-Ting	10,000		
Cosmos Language School	30,000		
Shu-Te Home Economics and Commercial High School	10,000		
Shin Fong Packing Enterprise Co., Ltd.	10,000		
Ms. Xie,Qiu-xiang, Miss Chen,Zi-yun	10,000		

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Annual Report



ANNIVERSARY

 國立科學工藝博物館  
NATIONAL SCIENCE AND TECHNOLOGY MUSEUM

