



# Report to Academic Advisory Committee of Institute of Physics, Academia Sinica



**Jason Chia-Seng Chang, Director**

**August 3, 2023**

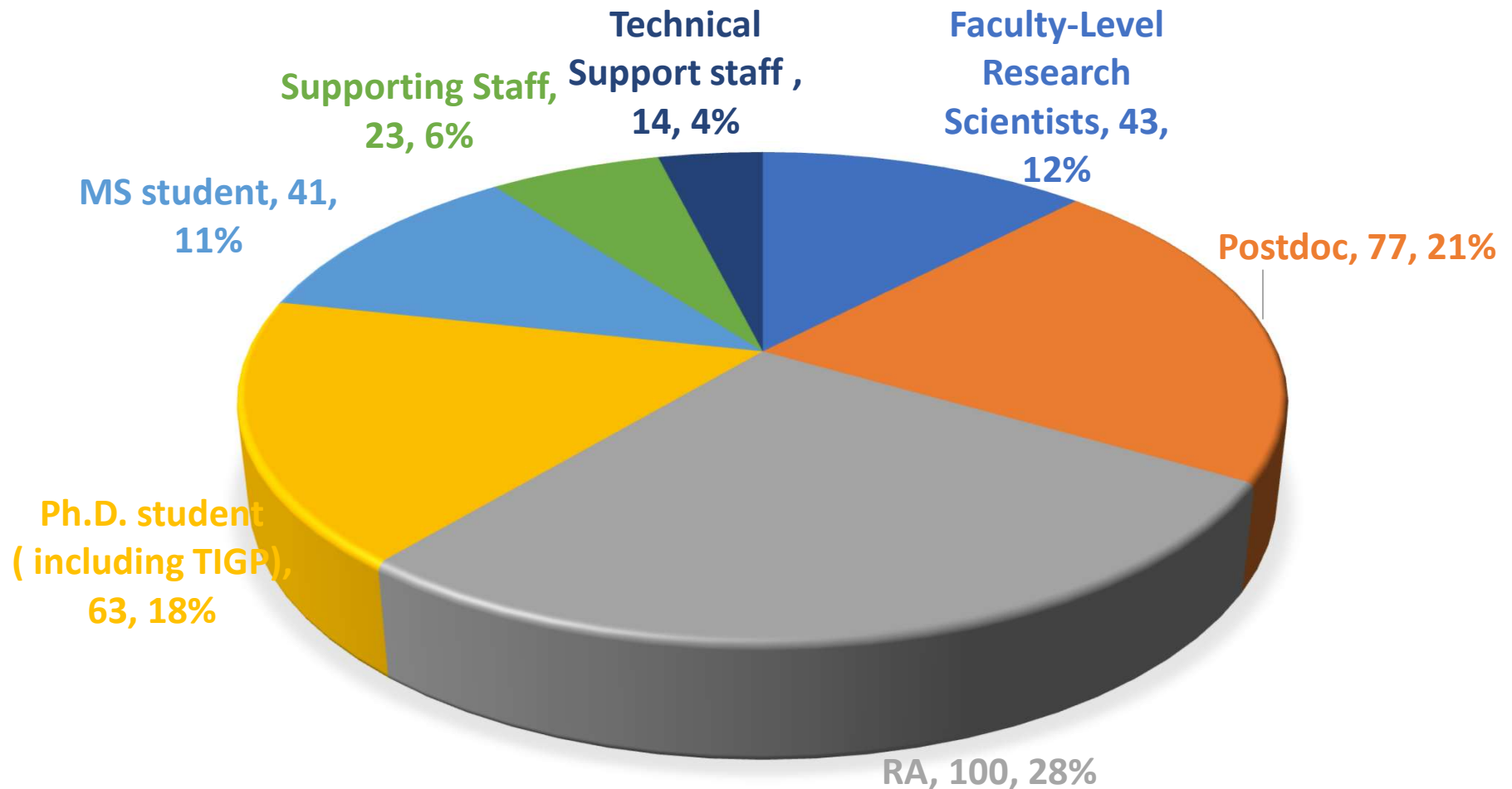
# **Outline**

- 1. Current status**
- 2. Research highlights**
- 3. Responses to last AAC report**
- 4. Challenges and threats**
- 5. Plans**

# Employees of Institute of Physics

- Formal employees (43):
  - Distinguished Research Fellow 8 (Chou, Chen);
  - Research Fellow 15;
  - Associate Research Fellow 7 (WL Lee);
  - Assistant Research Fellow 6
  - Research Scientist 4
  - Associate Research Scientist 1
  - Assistant Research Scientist 2
- Contracted employees (318):
  - Postdoc 77; Research assistant 100
  - PhD students 63; Master students 41
  - Technical staff 14
  - Administrative staff 23

# 2023 Faculty, Students and Staff (total number 362)



# Research Groups

**Medium and High Energy  
Physics (MHEP)**  
**(12 research fellows,  
3 research scientists)**



**Physics of Active and Biological  
Systems (PABS)**  
**(9 research fellows,  
1 research scientist)**

**Quantum Materials Physics  
(QMP)**  
**(15 research fellows,  
3 research scientists)**

# Main Research Topics for MHEP Group

**(12 research fellows, 3 research scientists)**

## - Experimental Research Program

- \* Collider physics
- \* Hadron physics
- \* Neutrino and dark matter physics
- \* Astro-particle physics
- \* Gravitational wave experiments
- \* Detector and instrumentation

## - Theoretical Research Program

- \* Astroparticle physics, nuclear astrophysics and cosmology
- \* Particle physics phenomenology
  - ✓ Flavor and hadron physics
  - ✓ Perturbative and non-perturbative QCD
  - ✓ Beyond the Standard Model
- \* Gravity and quantum information science

# Main Research Topics for QMP Group

**(15 research fellows, 3 research scientists)**

- Electronic and spin correlated physics in quantum materials
- Growths and characterizations of quantum materials
- Low-dimensional and interface physics
- Quantum devices
- Quantum computing
- Clean energy – carbon reduction
- Li-ion battery

# Main Research Topics for PABS Group

**(9 research fellows, 1 research scientists)**

- Collective behavior, bacteria motility
- Microfluidic manipulation
- 3d scaffold, bubbles & foams
- Self-assembly, colloid-polymer
- Polymer dynamics
- Protein/RNA folding
- Colloid dynamics



# AAC Members (2023/1/1~2025/12/31)

QMP	Tai-Chang Chiang	江台章	Department of Physics, University of Illinois at Urbana-Champaign
QMP	Chia-Ling Chien	錢嘉陵	Dept. of Physics & Astronomy, Johns Hopkins University
QMP	Chih-Kang (Ken) Shih	施至剛	Department of Physics The University of Texas at Austin
QMP	Nai-Chang Yeh	葉乃裳	California Institute of Technology
QMP	Naoto Nagaosa		RIKEN Center for Emergent Matter Science
MHEP-Expt	Jen-Chieh Peng	彭仁傑	Department of Physics, University of Illinois at Urbana-Champaign, USA.
MHEP-Expt	Kam-Biu Luk	陸錦標	Department of Physics, University of California at Berkeley, USA.
MHEP-Theory	Keh-Fei (Frank) Liu	劉克非	Department of Physics & Astronomy, University of Kentucky, Lexington KY 40506, USA.
MHEP-Theory	Keith Olive		School of Physics and Astronomy, University of Minnesota
PABS	Yu-Li Wang	汪育理	Department of Biomedical Engineering, Carnegie Mellon University
PABS	Steve Granick		Department of Chemistry, University of Illinois at Urbana-Champaign
PABS	Nigel Goldenfeld		Department of Physics, UC San Diego

# Faculty Recruitment (2019-2023)

Year	Name	Rank	Group
2019	Raman,Sankar 雷曼	Assistant Research Scientist	QMP
	Shih, Hong-Yan 施宏燕	Assistant Research Fellow	PABS
2020	Chang,Yuan-Hann 張元翰	Research Fellow	MHEP
	Yen, Eric 嚴漢偉	Associate Research Scientist	MHEP
2021	Yang,Di-Lun 楊迪倫	Assistant Research Fellow	MHEP
	Fedynitch, Anatoli 安納托里	Assistant Research Fellow	MHEP
	Ke, Chung-Ting 柯忠廷	Assistant Research Fellow	QMP
2022	Hsu,Chen Hsuan 徐晨軒	Assistant Research Fellow	QMP
2023	Hiraiwa, Tetsuya 平岩徹也	Associate Research Fellow	PABS

# Chen-Hsuan Hsu 徐晨軒 (Assistant Research Fellow)

<https://sites.google.com/view/qmtheory/home?authuser=0>



■ **Date of joining:** Sept. 1, 2022

## ■ Education

- ✓ 2014 Ph.D. University of California, Los Angeles (UCLA), Los Angeles, United States
- ✓ 2006 B.Sc. National Tsing Hua University (NTHU), Hsinchu, Taiwan

## ■ Experience

- ✓ 2022-present Assistant Research Fellow, Institute of Physics, Academia Sinica, Taiwan
- ✓ 2022 Researcher, Yukawa Institute for Theoretical Physics (YITP), Kyoto University, Japan
- ✓ 2019-2022 Research Scientist, Center for Emergent Matter Science, RIKEN, Japan
- ✓ 2014-2019 Postdoctoral Researcher, Quantum System Theory Research Team
- ✓ 2008-2014 PhD Student, Department of Physics and Astronomy, UCLA, United States

■ **Research Interest:** The field of theoretical condensed matter physics. The research topics include topological phases of matter, spin-orbit interaction, and Tomonaga-Luttinger liquid phenomena in nanoscale systems. Examples of the physical realizations include quantum dots, nanotubes, nanowires, and topological insulators. In addition to theoretical works, the condensed matter experiments involving the following techniques: pulse laser deposition, solid state synthesis of oxides, SQUID, X ray diffraction, field rotation alignment method, laser cooling, diode laser, and waveguides.

# Hiraiwa, Tetsuya 平岩徹也 (Associate Research Fellow)

<https://theorphysbiolgroup.wixsite.com/oursite>



■ **Date of joining:** April 1, 2023.

## ■ Education

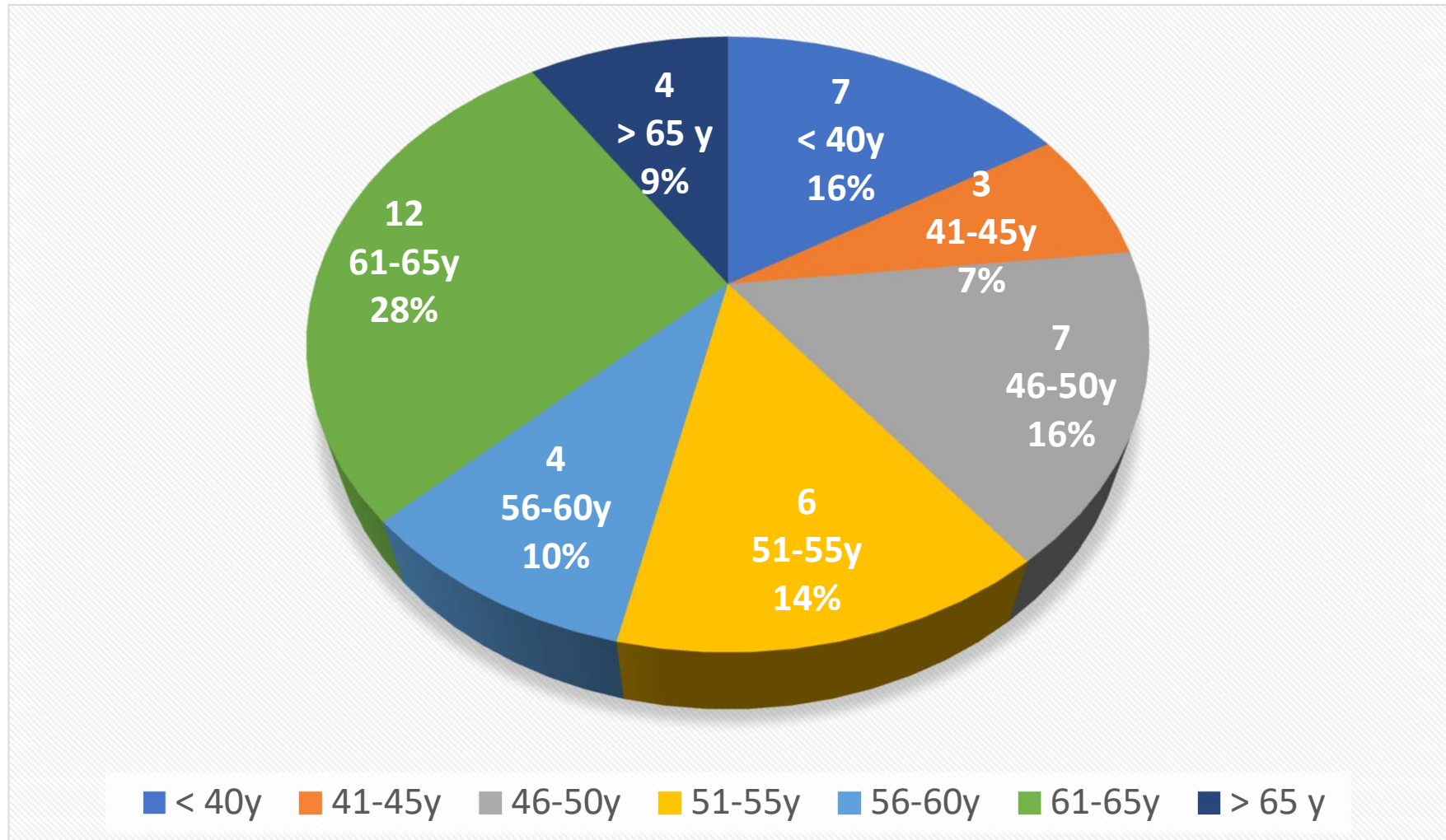
- ✓ 2011/3: Ph. D. of Science
- ✓ 2008/4 – 2011/3: Ph. D. student in Graduate School of Science, Kyoto University
- ✓ 2008/3: Master of Physics
- ✓ 2006/4 – 2008/3: Master course student in Graduate School of Science, Kyoto University

## ■ Experience

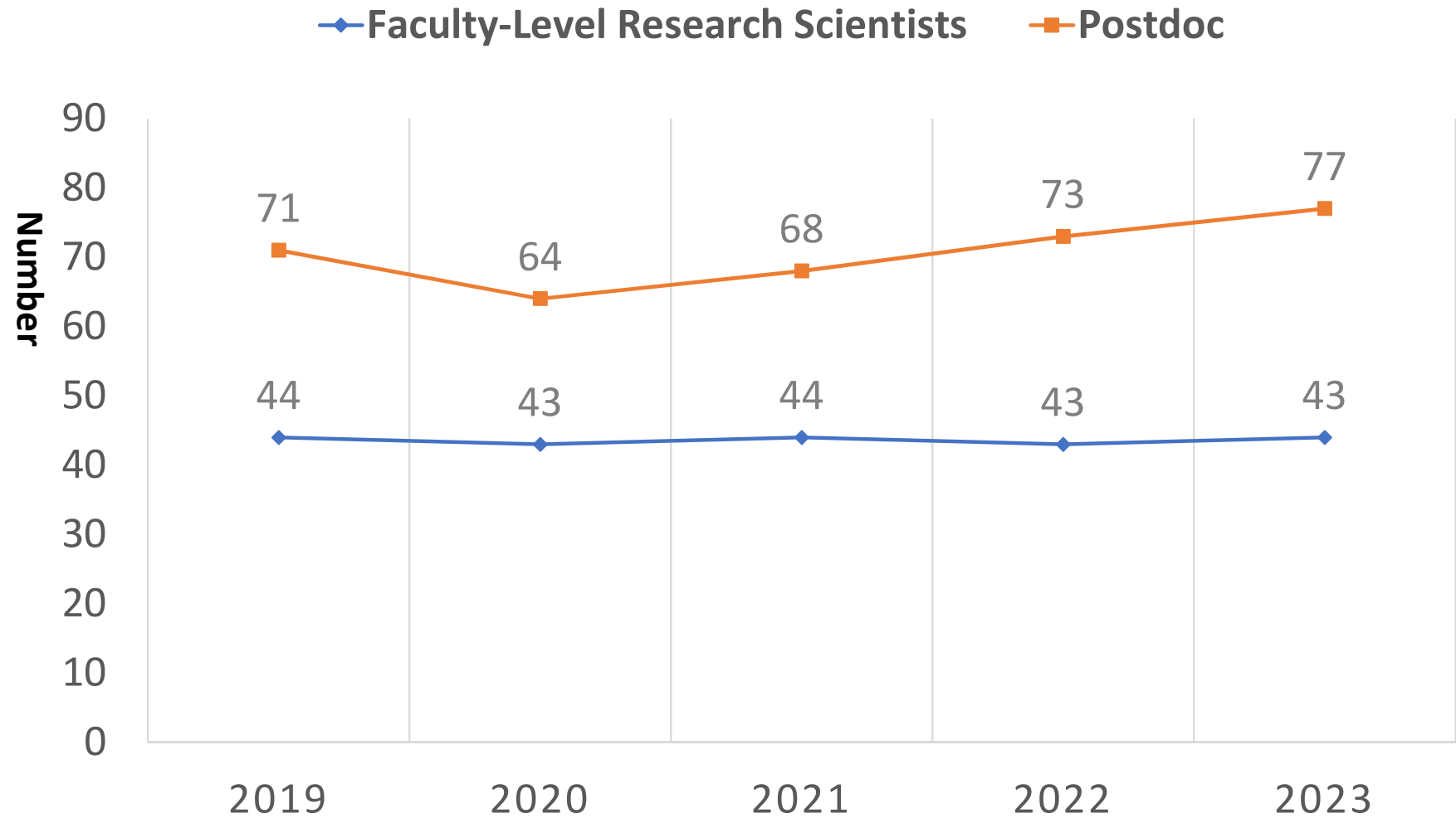
- ✓ 2019/4 – 2023/3: MBI Fellow, Independent group-leader position Mechanobiology Institute, National University of Singapore
- ✓ 2019/4 – 2023/3: Visiting Researcher, Department of Physics, The University of Tokyo, Japan.
- ✓ 2016/4– 2019/3: Visiting Researcher, Laboratory for Physical Biology, RIKEN BDR, Kobe, Japan
- ✓ 2015/4 – 2019/3: Assistant Professor, Dept. of Physics, The Uni. of Tokyo, Japan
- ✓ 2013/10 – 2013: Humboldt Research Fellow, Dept. of Physics, Free University of Berlin, Berlin, Germany

■ **Research Interest:** Physical biology. Mechanobiology. Soft-matter physics, Out-of-equilibrium physics.—Specific subjects of current researches: Theoretical investigations on “dynamic self-organization of living systems”

# Age distribution of Researchers

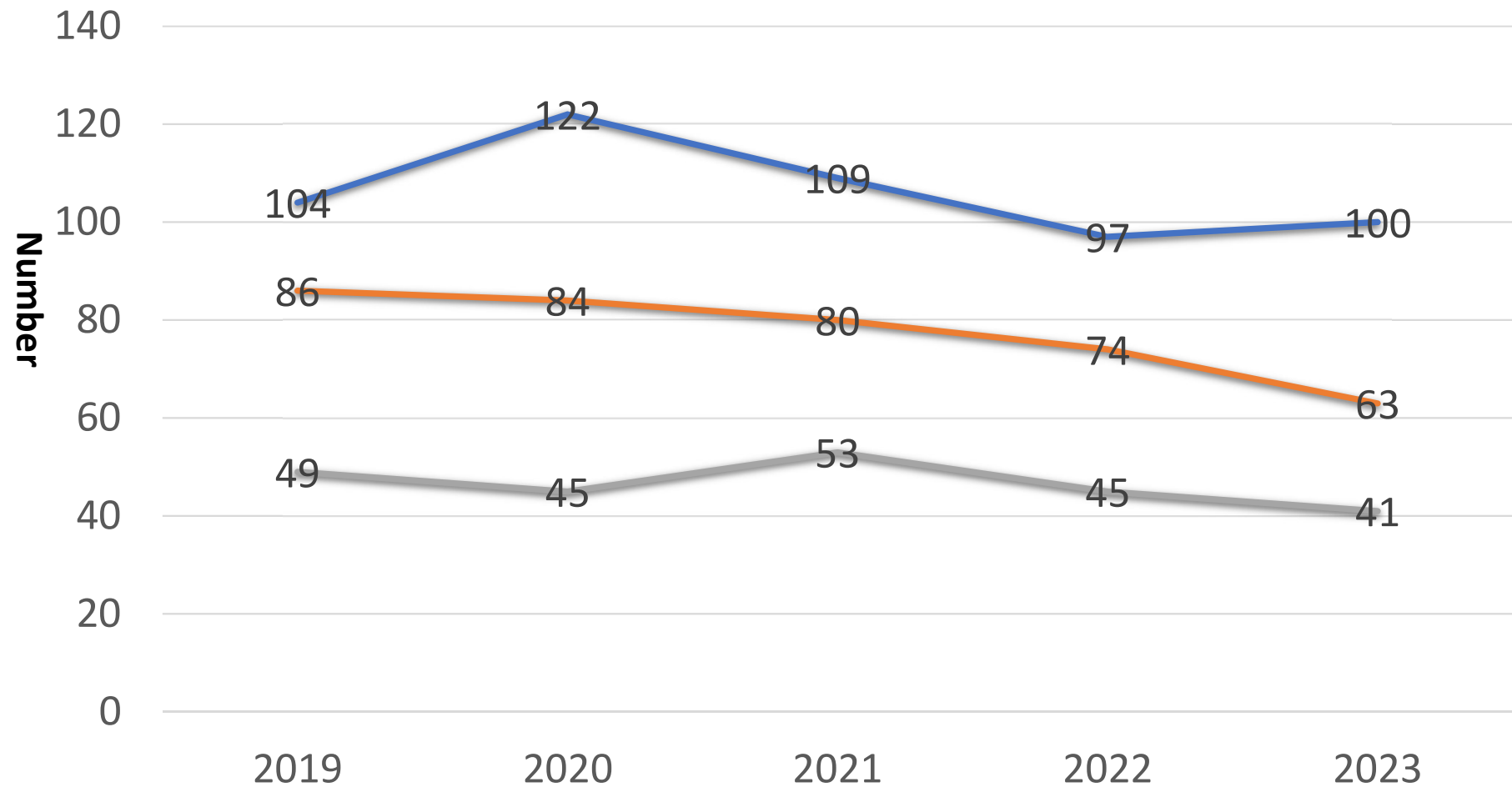


# Numbers of Ph.D Researchers (2019-2023)



# Research Manpower (2019-2023)

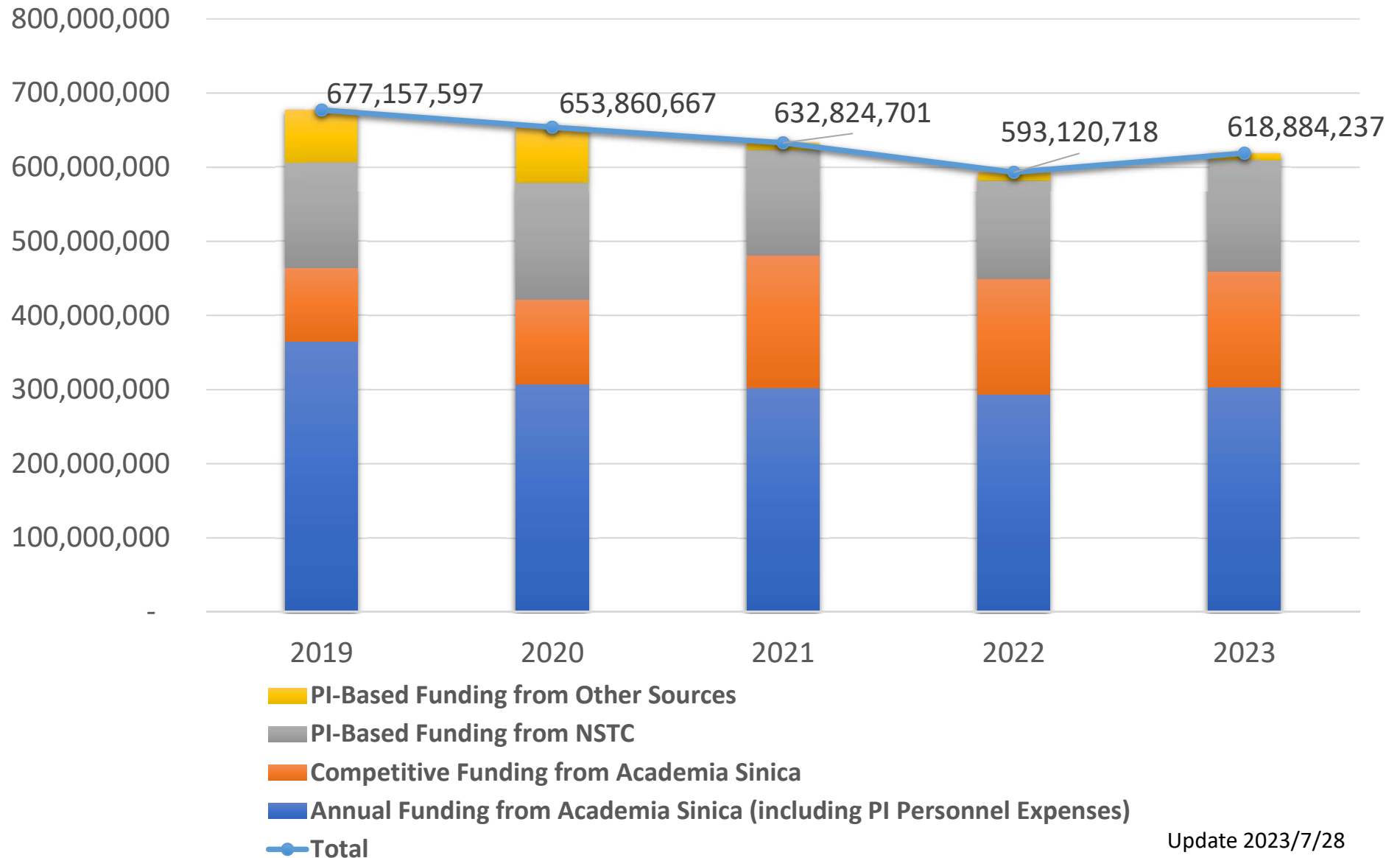
— RA      — Ph.D. student ( including TIGP)      — MS student



# Annual Funding\_含人事費 (2019 – 2023)

(Unit: NTD)

~ 19.6 Million USD /Year (1USD~31.5 NTD)



Update 2023/7/28



# Annual Funding (2019-2023)

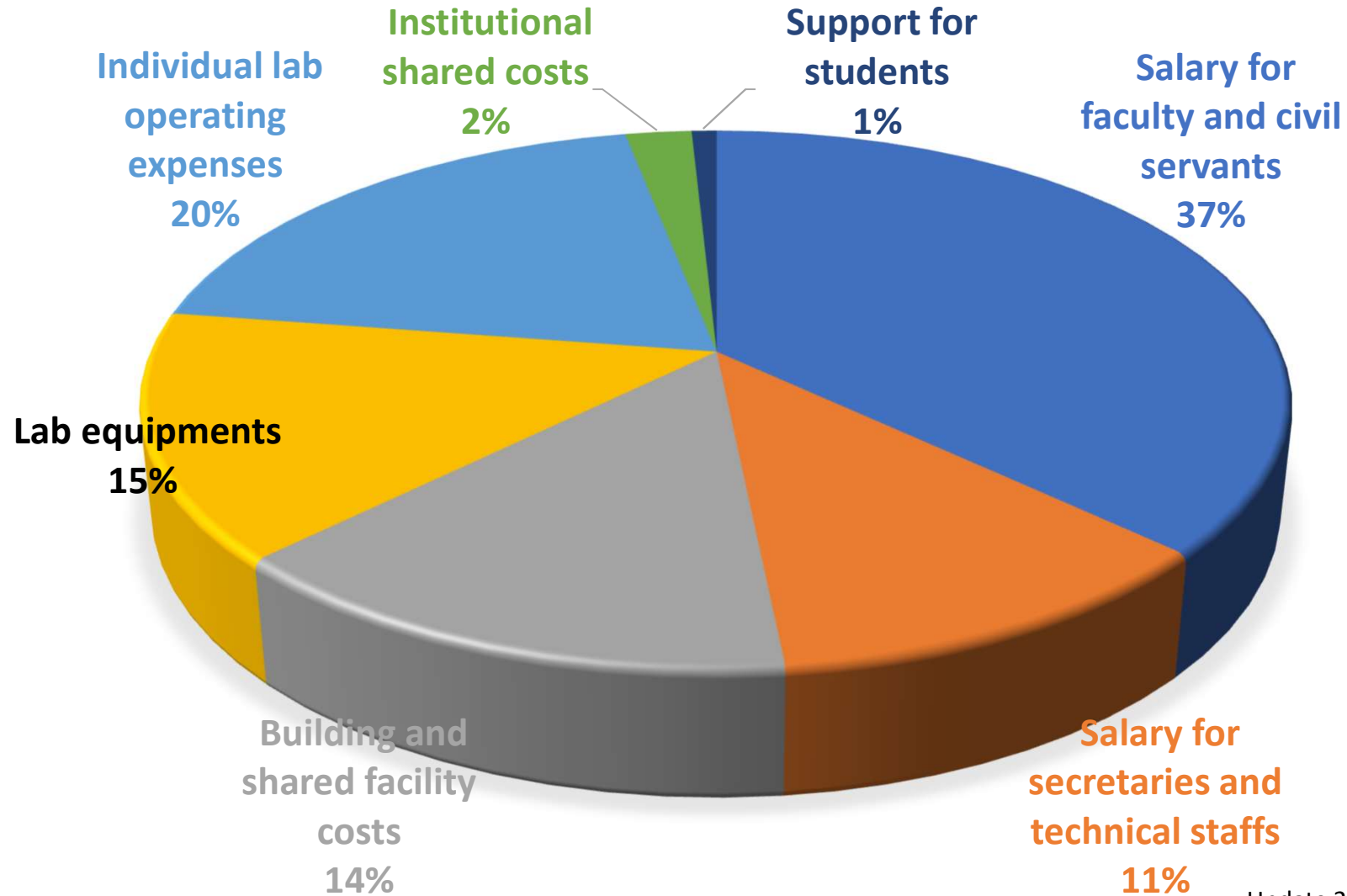
Unit: NTD (1USD ~ 31.5NTD)

Year	Annual Funding from Academia Sinica (including PI Personnel Expenses)	Competitive Funding from Academia Sinica	PI-Based Funding from NSTC	PI-Based Funding from Other Sources	Total
2018	289,230,000	108,879,000	132,823,000	44,824,157	575,756,157
2019	364,563,000	100,323,866	141,552,000	70,718,731	677,157,597
2020	307,832,000	113,292,000	157,922,000	74,814,667	653,860,667
2021	302,445,000	178,760,000	141,953,000	9,666,701	632,824,701
2022	293,360,000	156,469,844	131,975,000	11,315,874	593,120,718
2023	303,129,000	* 156,696,000	150,013,000	9,046,237	618,884,237

\* 3rd phase of MK Wu's project Y2023: NTD 42,000,000 ◦ ( Y2022: NTD 70,000,000 ◦ Y2021: NTD69,000,000)

\* Including Yang-Yuan Chen's AS project (NTD 47,000,000)

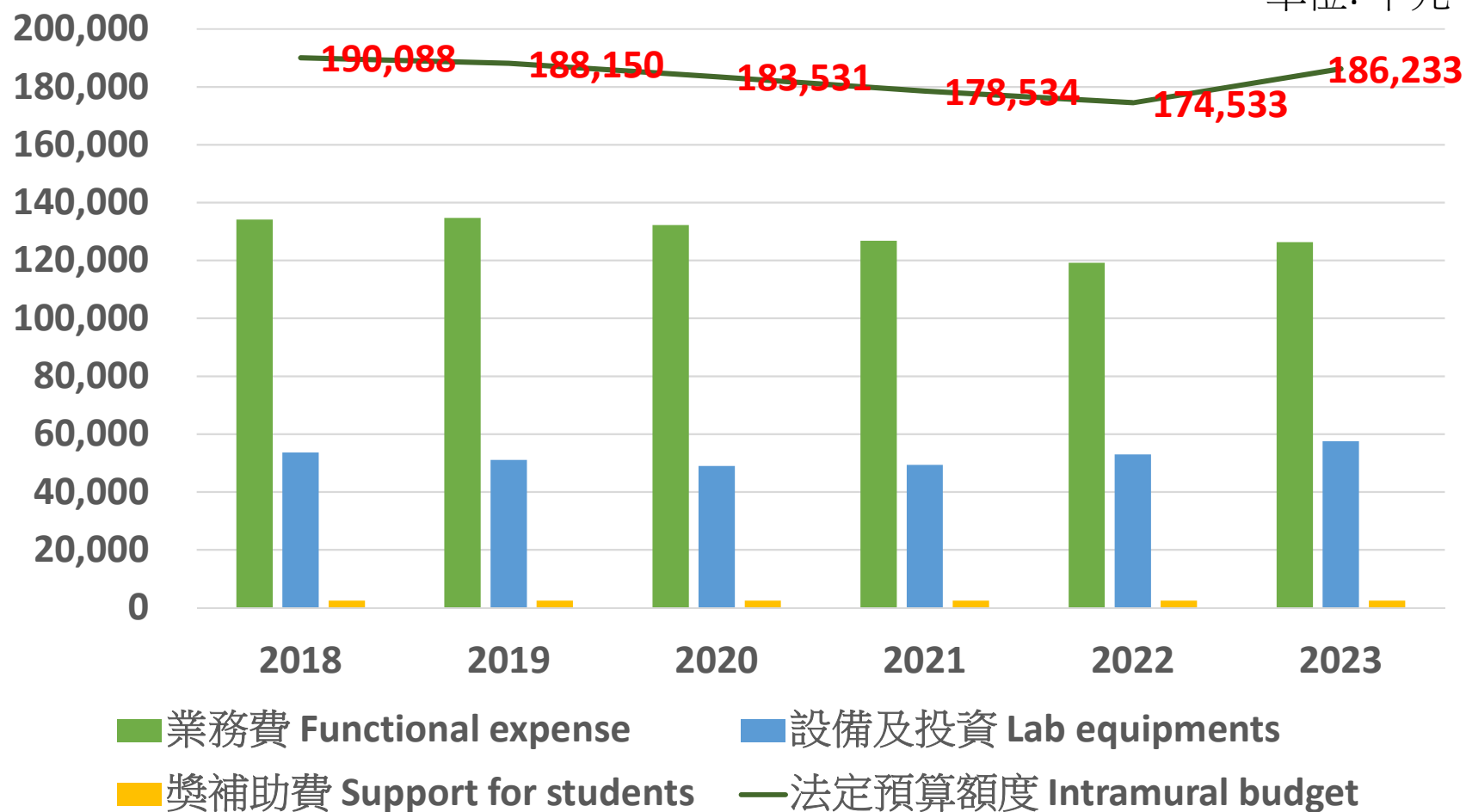
# 2023 Intramural Budget Allocation (NTD 288,805,000)



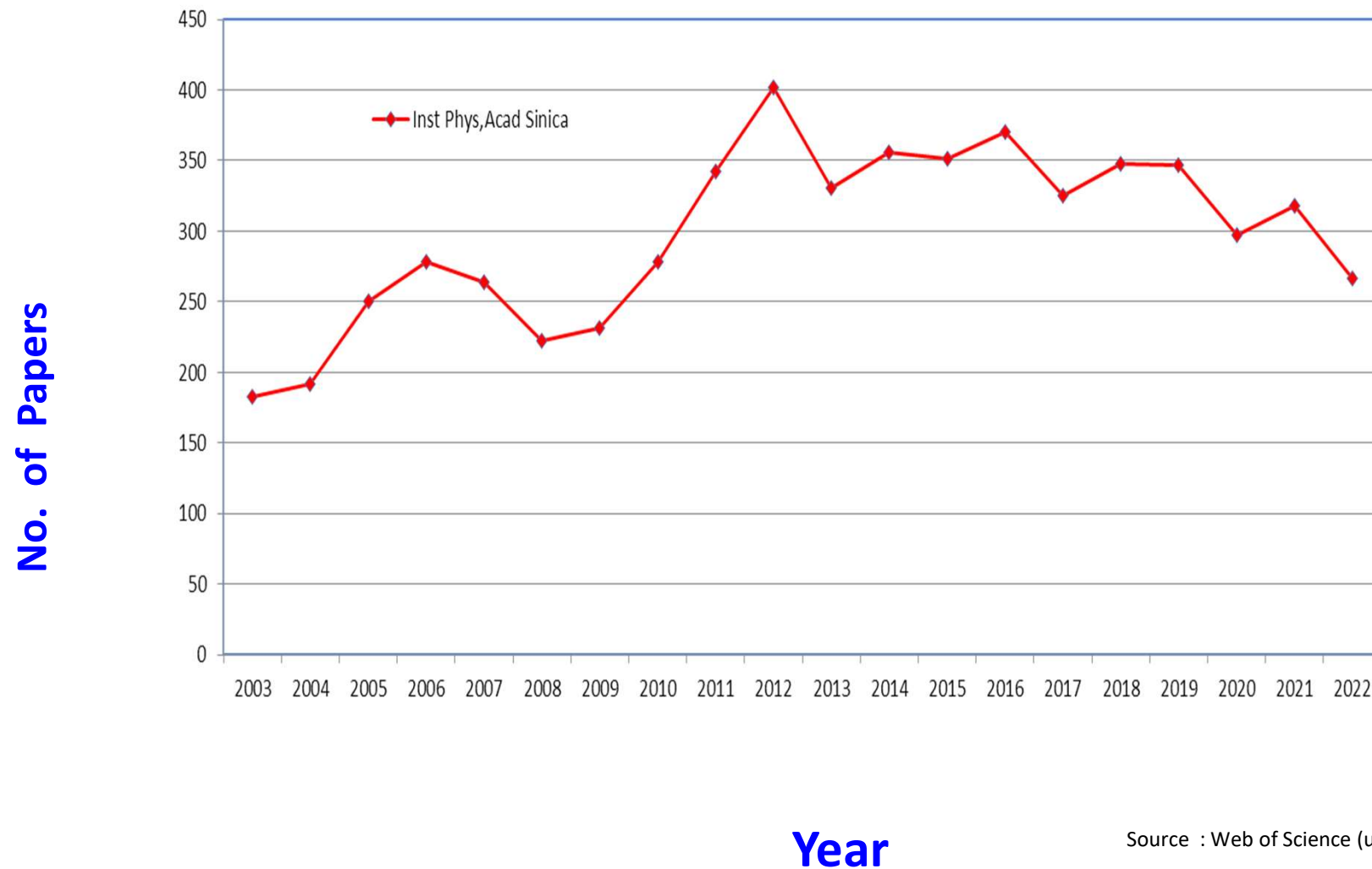
Update 2023/7/20

# Intramural Budget (2018-2023) (Personnel Expense excluded)

單位: 千元

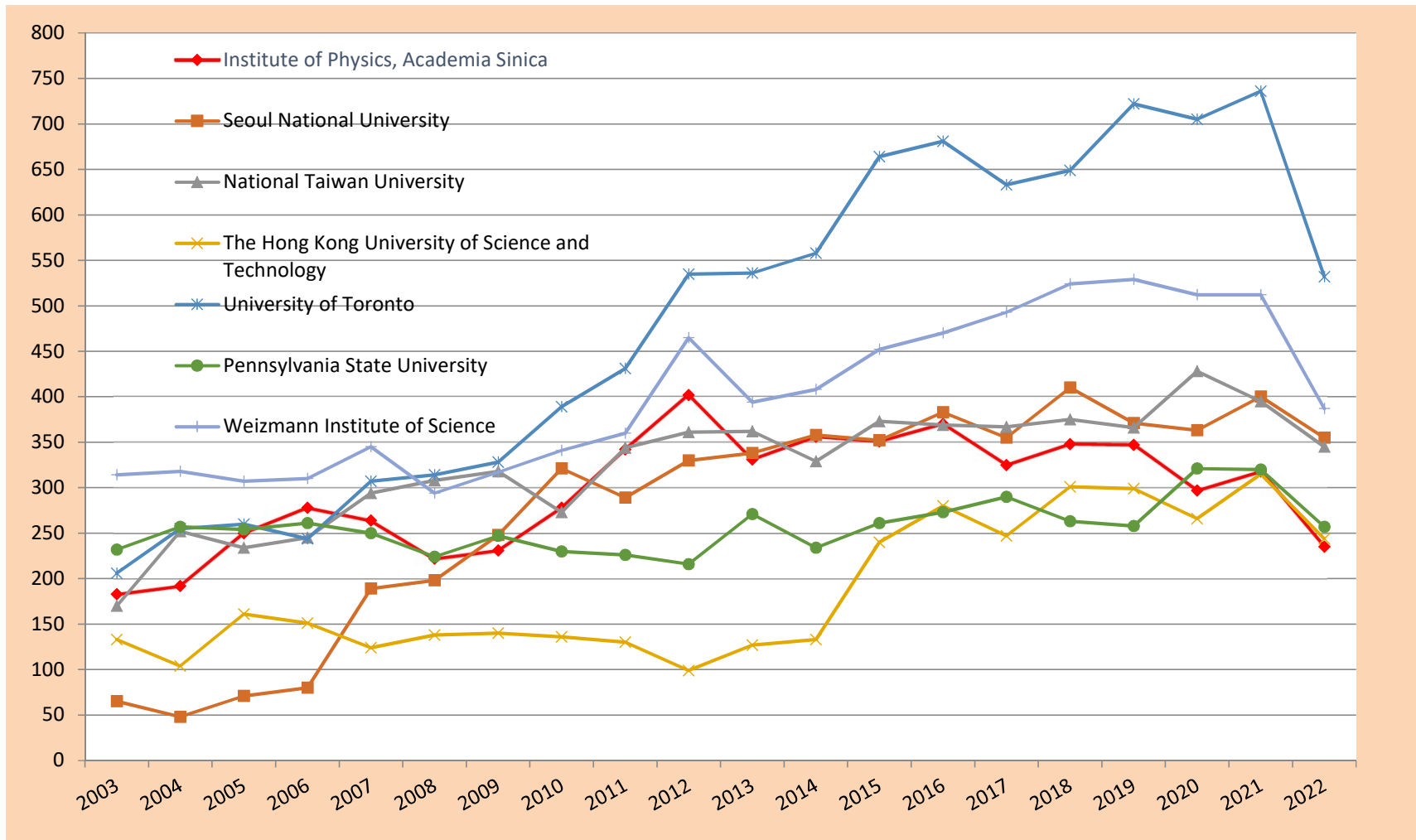


# SCI pub. per year for the last twenty years



Source : Web of Science (updated 2023-07)

# Annual SCI Publication Strength since 2001



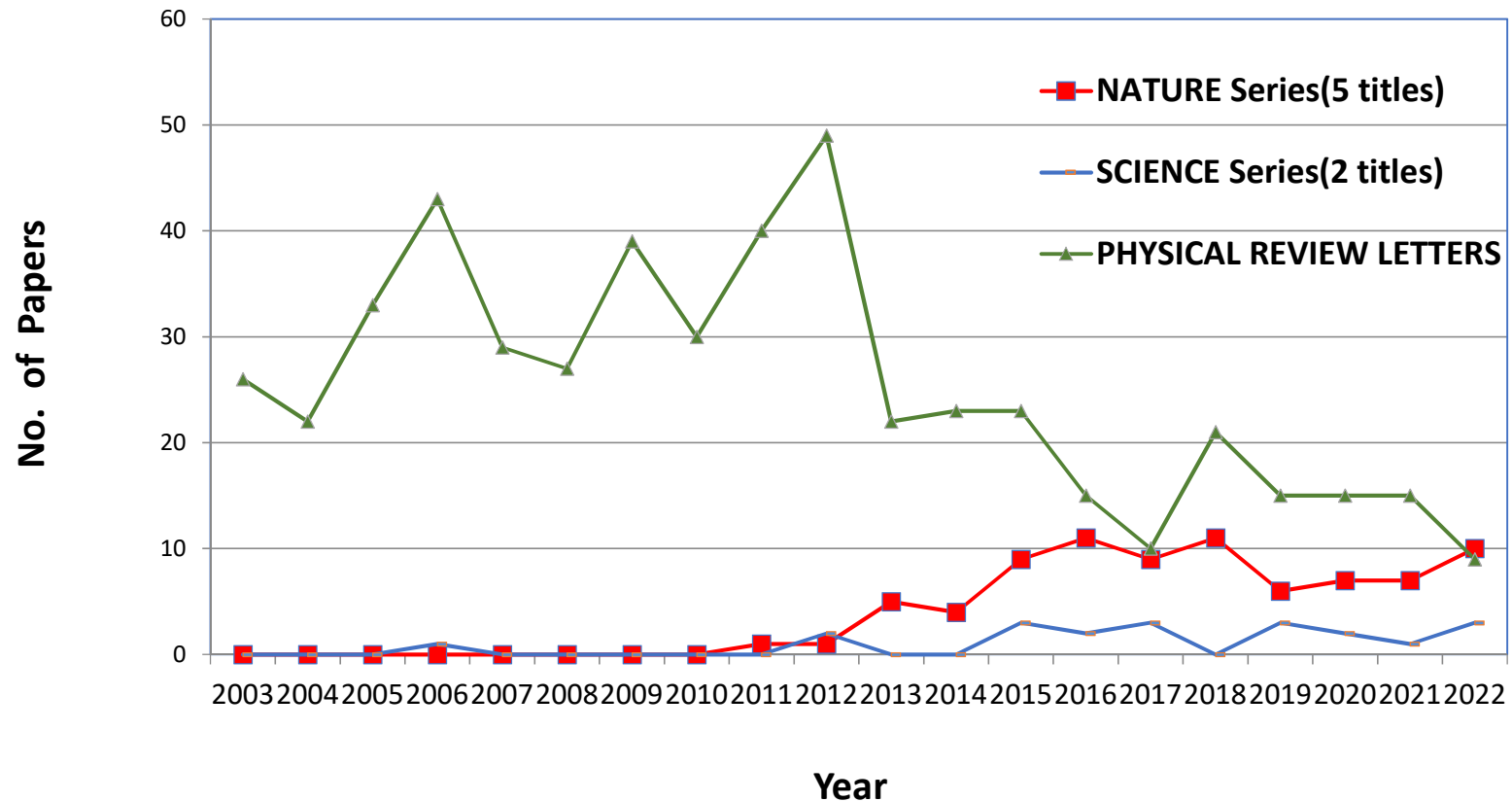
source :Web of Science (updated 2023-07)

# Performance Statistics

No.	Institution	Average Citations per paper 2003--2022	H-index	Average Citations per paper 2018--2022	H-index
1	Institute of Physics, Academia Sinica	34.24	166	18.94	71
2	Seoul National University	30.26	154	16.03	71
3	National Taiwan University	27.21	152	15	68
4	The Hong Kong University of Science and Technology	37.41	160	20.39	77
5	University of Toronto	38.98	214	19.32	91
6	Pennsylvania State University	51.1	210	23.81	78
7	Weizmann Institute of Science	48.87	225	22.45	88

Source : web information 2023-07

# Nature Series 、 Science Series and Physical Review Letters pub. for the last twenty years



*NATURE Series(5 titles) : NATURE 、 NATURE PHYSICS 、 NATURE NANOTECHNOLOGY 、 NATURE MATERIALS 、 NATURE COMMUNICATIONS*  
*SCIENCE Series(2 titles) : SCIENCE 、 SCIENCE ADVANCES*

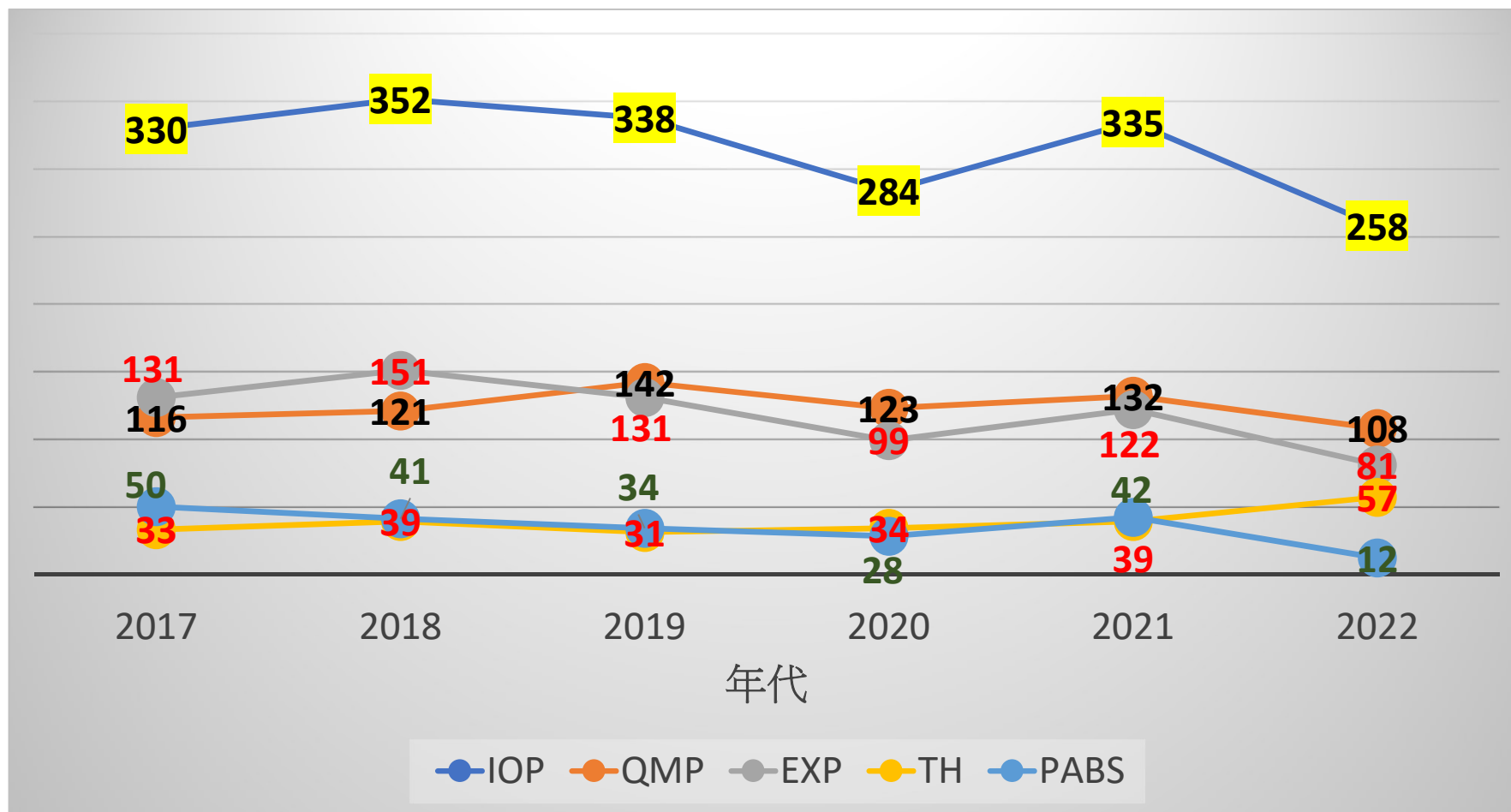
# Intellectual Properties

## Patent, License Fee and Royalty Income (2020-2022)

		2020	2021	2022	Total
<b>No. of Patent (申請專利件數)</b>		6	12	2	20
<b>No. of Patent licensed (獲得專利件數)</b>		2	4	3	9
<b>No. of License (授權件數)</b>		0	1	1	2
<b>License fee (授權金)</b>	Cash (現金)	0	600,000	950,000	1,550,000
	Stock (股票)	0	0	0	0
<b>No. of industrial contracts (合作件數)</b>		1	0	4	5
<b>Contract fees (合作金額)</b>		100,000	0	2,188,000	2,288,000
<b>Royalty income (權利金)</b>		341,764	444,136	243,375	1,029,275



# (2022) Papers of Research Groups



# (2022)WOS publication & CNCI

單位	1. Publication Numbers in Web of Science						2. CNCI					
	2017	2018	2019	2020	2021	2022	2017	2018	2019	2020	2021	2022
IOP	330	352	338	284	335	258	1.34	1.70	1.70	1.75	1.19	1.16
NTU,Dept Phys	369	376	371	433	393	306	1.38	1.24	1.63	1.24	1.21	1.74
SNU,Dept phys & Astron	319	360	324	330	329	251	1.38	1.23	1.66	0.99	1.12	1.75
RIKEN,Phys ,emergent matter ,soft matter,biophys	329	304	338	480	512	374	1.51	1.70	1.56	1.61	1.45	1.39
Weizmann,phys	507	523	531	527	506	336	2.11	1.98	1.70	1.84	1.53	1.44

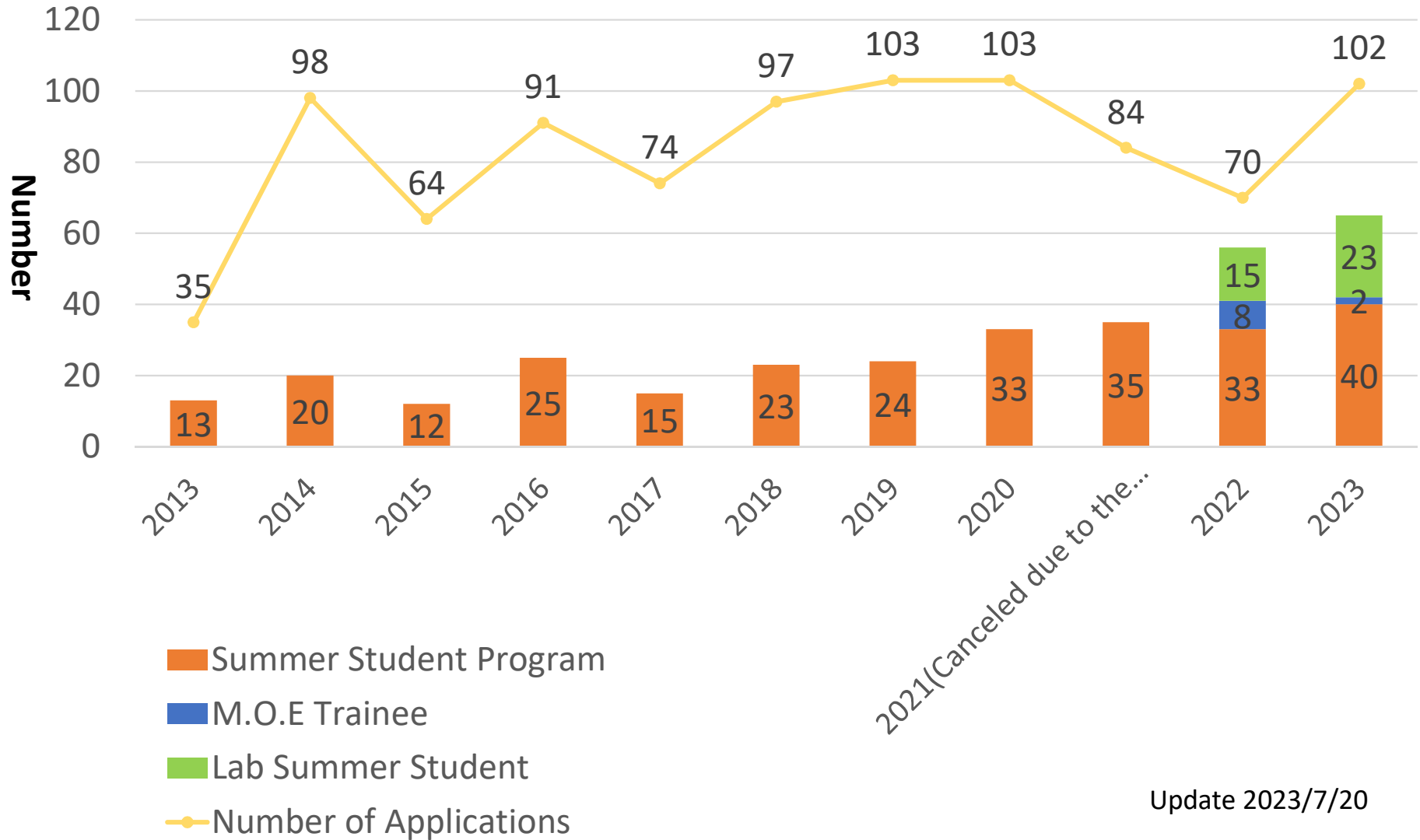
# (2022) Highly Cited papers & Intl. collaborations

	3. % Highly Cited Papers						4. % International Collaborations					
單位	2017	2018	2019	2020	2021	2022	2017	2018	2019	2020	2021	2022
IOP	2.15	2.88	4.31	2.08	1.63	1.7	76.99	81.84	79.02	77.85	73.94	76.14
NTU,Dept Phys	1.97	2.43	2.52	0.97	2.14	4.2	55.62	60.11	61.06	63.02	58.29	63.36
SNU,Dept phys & Astron	0.63	1.4	4.39	1.04	2.58	4.63	62.97	62.29	66.14	63.89	62.26	62.5
RIKEN,Phys ,emergent matter ,soft matter,biophys	3.06	3.01	4.28	3.63	2.48	2.92	48.32	54.85	59.63	56.69	55.28	54.22
Weizmann,phys	4.75	3.29	3.26	2.44	3.48	2.07	78.61	78.92	81.61	81.06	78.89	81.72

## TIGP 奈米學程

指導教授	入學年	國籍	學生姓名
吳茂昆	2018	台灣	Yan-Ruei Chen 陳彥睿
	2020	台灣	Wei-Ming Chen 陳偉銘
	2020	台灣	Yu-Hsuan Su 蘇毓軒
	2020	台灣	Chin-Yi Chung 鐘晉毅
李偉立	2017	印度	Uddipta Kar 烏狄達 (7/19 論文口試)
周家復	2013	德國	Gerhard Blankenburg 薄杰海
	2013	台灣	Liang-Kun Yu 游良堃
	2014	印度	Stalin Karuppiah 司答林 (7/14 論文口試)
	2018	台灣	Tzu-Tsai Chu 朱自在
	2021	巴基斯坦	Ali Abbas 阿里阿巴斯
	2022	越南	Do Tran Que Phuong 陳嫻芳
	2022	巴基斯坦	Ayesha Iftikhar Cheema 馬耶莎
林宮玄	2019	葉門	Redhwan Abdo Qasem Moqbel 銳萬
	2021	台灣	Hao-Yu Cheng 鄭皓宇
林耿慧	2020	台灣	Ting-Jui Chang 張庭瑞
莊天明	2014	印度	Balaji Venkatesan 柏拉澤
陳洋元	2017	台灣	Wei-Han Tsai 蔡瑋瀚
溫昱傑	2021	印度	Syed Mohammed Faizanuddin 菲爾森
蔡日強	2022	台灣	Cheng-En Tsai 蔡承恩
平岩徹也	2022	衣索比亞	Girma Mekonnen Gomoro 紀爾瑪

# IoP Summer Student Program (2013-2023)



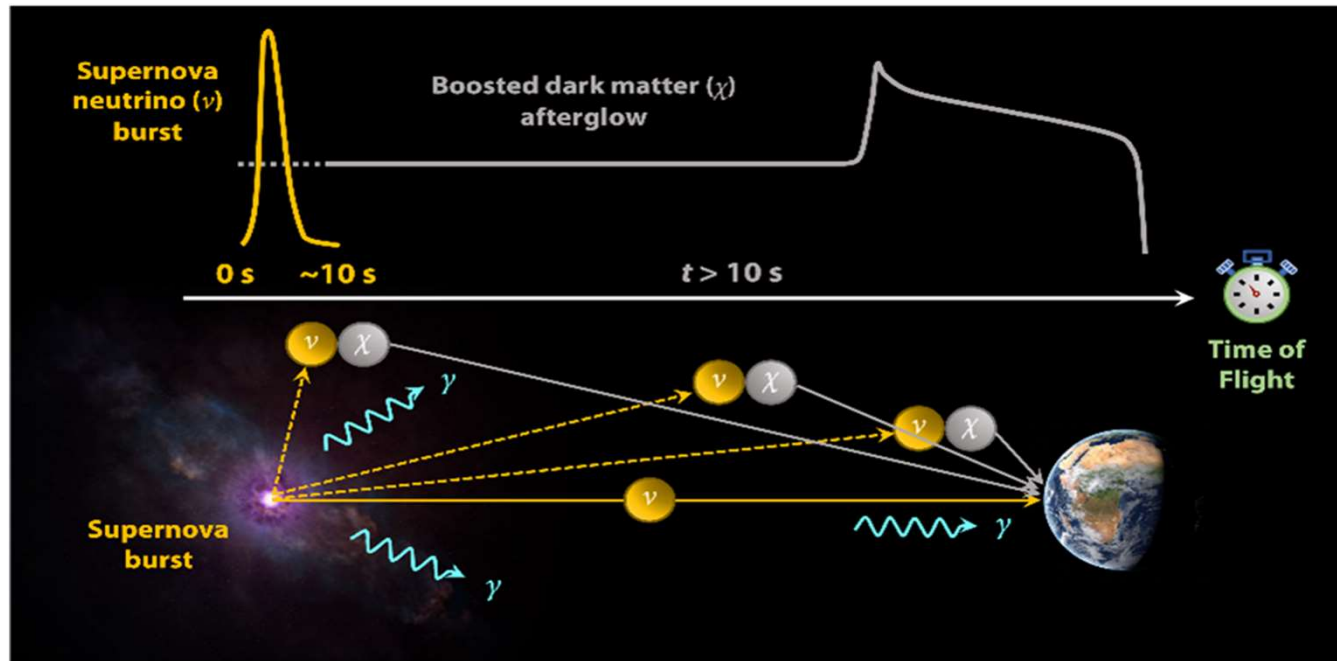
Update 2023/7/20

# *Outline*

1. Current status
- 2. Research highlights**
3. Responses to last AAC report
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# New Experimental Signatures Added to the Arsenal for Dark Matter Searches

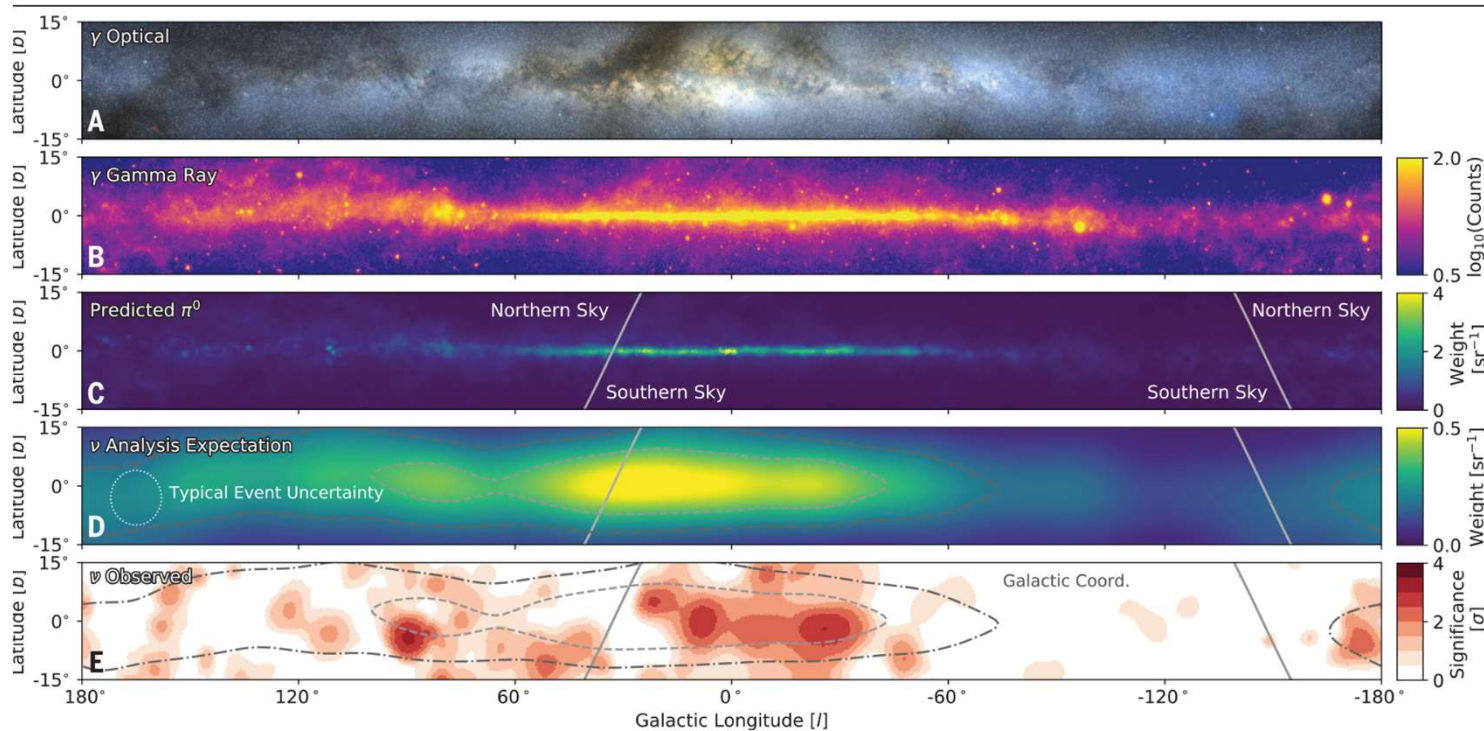
Meng-Ru Wu and Henry T. Wong



A novel concept of using "afterglows" of supernova explosions due to Dark Matter (DM) interactions in detectors as new experimental signatures to Direct DM searches is identified. Supernova neutrinos (SN $\nu$ ) can transfer their kinetic energy to the DM in the cosmos. Upon arrival on Earth, these boosted-DM (BDM) would produce distinctive observables in large detectors. In addition, the Time-of-Flight distribution of the BDM events relative to the initial SNs neutrino burst are smoking-gun signatures for DM. A positive detection of SN $\nu$ -BDM can provide powerful constraints to DM masses and interaction cross-sections.

# Neutrinos from our Galaxy

Anatoli Fedynitch in IceCube collaboration

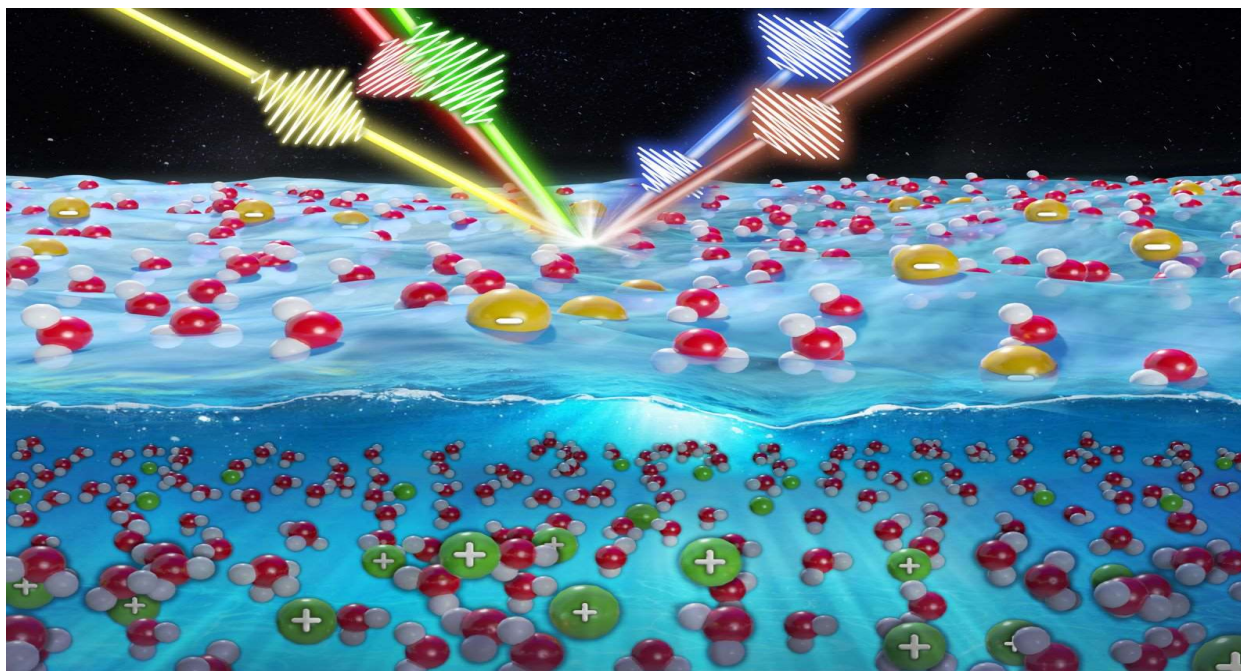


The IceCube Neutrino Observatory has created an image of our Milky Way galaxy using neutrinos. This groundbreaking observation is credited to the international IceCube Collaboration, a consortium of over 350 scientists. These high-energy ( $>500$  GeV) neutrinos were identified by the South Pole-based IceCube Neutrino Observatory. This research concentrated on detecting neutrino emissions from the Milky Way, particularly from the southern sky close to our galaxy's center. Machine learning methodologies were instrumental in enhancing the accuracy of neutrino-induced cascade identification and reconstruction.



# Momentum-varying optical technique unveils interfacial water structure that controls energy transfer and chemistry at interfaces

Yu-Chieh Wen and Coworkers

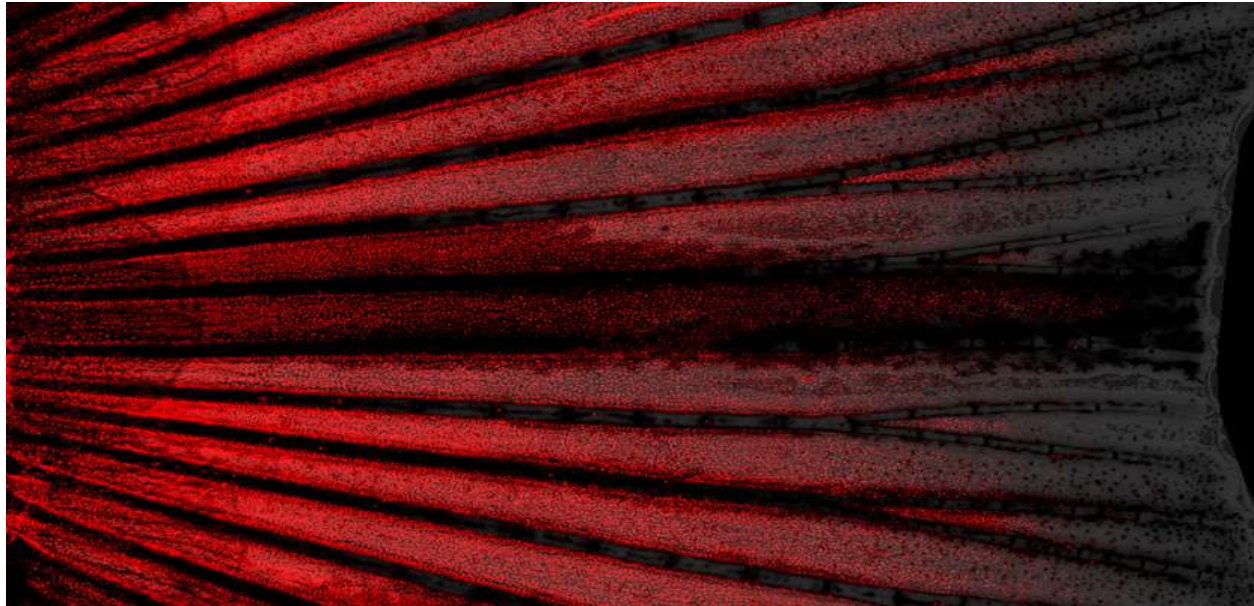


A nonlinear optical spectroscopic scheme with varying photon momenta is developed for retrieving the vibrational spectra of the bonded interface water layer and the ion diffuse layer and, hence, microscopic structural and charging information about aqueous interfaces. This all-optic method offers an in situ microscopic probe of electrochemical and biological interfaces. The study further highlights the opportunities of applying momentum-resolved nonlinear optics to explore surface excitations in bulk backgrounds, which broadens the application of surface nonlinear optics to general condensed matter research.

Sci. Adv. 9, (2023) eadg2823

# Mechanical waves identify the amputation position during wound healing in the amputated zebrafish tailfin

Keng-Hui Lin and Coworkers



For over 250 years, biologists have been puzzled by why highly regenerative animals regrow lost appendages at the rate that is proportional to the amount of appendage loss. A team led by Dr. Chen-Hui Chen at the Institute of Cellular and Organismic Biology (ICOB) and Dr. Keng-Hui Lin at the institute of physics (IOP) discovered a 'mechanical wave' that governs positional sensing during wound healing and regeneration. This unexpected finding has been published in the journal Nature Physics in June 2023.

Nature Physics (2023)

<https://doi.org/10.1038/s41567-023-02103-6>

# Leaders in international projects



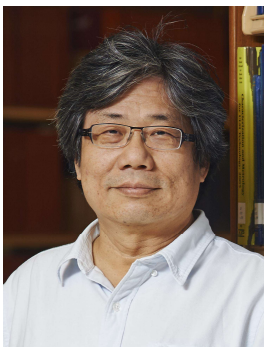
**Data Preparation  
Coordinator for  
ATLAS**

Song-Ming Wang



**Chair of KAGRA Future  
Planning Committee**

Sadakazu Haino



**Human brain  
connectome**

Yeu-Kuang Hwu

# PIs led or leading MoST national projects



**Taiwan TEXONO Program**  
Henry Wong



**Taiwan Instrumentation And  
Detector Consortium (TIDC)**  
Yuan-Hann Chang

# PIs led or leading AS projects



Yuan-Hann Chang

Academia Sinica  
Grid-computing Center



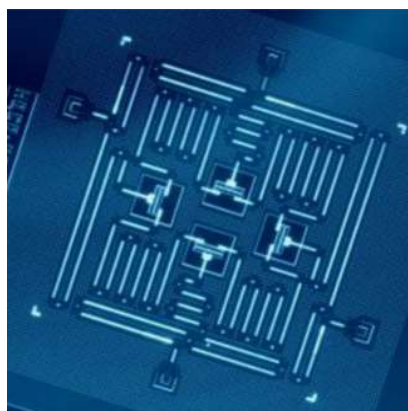
Maw-Kuen Wu

Li-ion battery project



Chii-Dong Chen

Quantum computing &  
communication



Yang-Yuan Chen

CO<sub>2</sub> emission reduction



# Awards and honors (since 2021)

- 2023 Academia Sinica Presidential Scholars Program: Wen-Chen Chang.
- 2023 Confirmation of Certificate: Academia Sinica Grid-computing Centre.
- 2022 Outstanding Research Award, National Science and Technology Council: Henry Tsz-king Wong.
- 2022 Special Contribution Award of the Physical Society of Taiwan (TPS): Chia-Seng Chang.
- 2022 The 2022 AAPPS-APCTP C.N. Yang Award: Meng-Ru Wu.
- 2022 Academia Sinica Presidential Scholars Program: Chii-Dong Chen.
- 2022 Special Contribution Award of the Physical Society of Taiwan (TPS): Hai-Yang Cheng.
- 2021 Fellow, the Physical Society of Taiwan (TPS): Wen-Chen Chang.
- 2021 Academia Sinica Presidential Scholars Program: Yang-Yuan Chen.

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4. Challenges and threats
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# Responses to last AAC's recommendations

## 1. Overall suggestions

### ➤ Stagnant annual budget

Although our budget has been steady in the last few years, it is still manageable considering the higher inflation rate in recent years.

### ➤ Attracting and retaining top talents

In last five years we have employed 7 PIs and 2 Research Scientists.

### ➤ Star-ups and new projects

The “Tax” money has been used to maintain the core facilities, invest new proposal and match the start-ups.

### ➤ Postdoc support

Part of the “Tax” money has been used to subsidize the traveling budget for our postdocs on their recruitments.



# Responses to last AAC's recommendations

## 1. Overall suggestions

### ➤ Moral issues

In last five years we have seven researchers being promoted to Distinguished Research Fellows. We are trying to promote early promotion.

### ➤ Improving diversity

We have established the female young investigator's network in IoP. We have planned to reach out the high school female students by volunteering for giving a public lecture or hosting them to institutional tour visit.

### ➤ Better communication

We have established the monthly faculty gathering and reshaped the style of our bi-monthly colloquium. Currently, we are thinking how to redecorate our open-area settings to stimulate more communication.

# Responses to last AAC's recommendations

## 1. Overall suggestions

- Potential synergy of three research groups

We aim to explore this potential on considering hiring Dr. Yuji Hirono who has been trained in all these categories and through mentoring of our more senior theorists, we anticipated some unexpected exciting results. We will elaborate more of this case in our roundtable discussion.

# Responses to last AAC's recommendations

## 2. Suggestions for MHEP theory group

- Adding a theorist in collider physics  
Since we just recruited two junior fellows in this group, we will put this recommendation on our agenda at fit time.
- ASGC as a local high performance computing center  
We will have a more elaboration on this issue with its updated status and our current plan.

# Responses to last AAC's recommendations

## 2. Suggestions for MHEP experimental group

- PIs participating more than one challenging exp.  
In this regard, for the LIGO program we have jointly appointed Prof. Inoue Yuki from National Central University.
- Supporting the Taiwan Instrumentation Detector Consortium (TIDC)  
A space of over 100 m<sup>2</sup> in our basement has been renovated for this project.

# Responses to last AAC's recommendations

## 3. Suggestions for QMP group

- Adding more theorists

We have employed Dr. Chen-Hsuan Hsu in 2022.

- Making effective use of the clustered system

We have opened this system through the NSTC's TEMC to domestic university researchers and connected Prof. Meng-Kai Lin from National Central University, who is an expert on MBE and ARPES systems. In addition, we have hired a postdoc, Dr. Wei-Chuan Chen to take care of ARPES operation and measurements.

- Adding more shared/core facilities and equipment

We have added the crystal growth facility as one of our core facilities. Techniques of THz spectroscopy and Proximity STEM are developed in individual PT's labs, respectively.

# Responses to last AAC's recommendations

## 3. Suggestions for QMP group

### ➤ Better industrial collaborations

Dr. Chii-Dong Chen is building a scalable quantum computer with coherently programmable superconducting qubits. Dr. Yang Yuan Chen is in charge of an ambitious project to develop a large-scale infrastructure for Tai-power to reduce the carbon dioxide emission from the natural gas power plants. Dr. Maw-Kuen Wu and his team continue their effort to improve the Li-ion battery performance and also construct a mega-watt-hour energy storage system. All these projects has been focusing on commercialization and thus has strong connection with industries already.

### ➤ Encouraging active interaction

In addition to our monthly faculty meeting, We have also established monthly gatherings for research scientists.

# Responses to last AAC's recommendations

## 4. Suggestions for PABS group

- Recruiting students from biology and engineering fields

This has been practiced in many labs in the PABS group through the TIGP NST program and summer intern program. Every year each research group will host a one-day open house for domestic college students, the PABS's usually has a large turnout and received full of praise. We are in the process of reaching out more of departments in biology and engineering.

- Supporting multidisciplinary collaborations

Small amount of the "Tax" money has been equally allotted for group conveners to encourage collaboration within the research group, and IoP management has always been supportive for cross-group projects. For example, the Aiyu project between Yen-Long and Maw-Kuen of QMP group has been highlighted.

# Responses to last AAC's recommendations

## 4. Suggestions for PABS group

- Utilizing group's strength on instrumentation and experimental methods

The recent successful collaboration between Ken-hui's group and Dr. Chen's group in the Institute of Cellular and Organismic Biology has manifested the strength of our PABS group on instrumentation and experimental methods. We are in the process to hire Dr. Yuji Hirono whose recent interest is on non-equilibrium phenomena. It is our hope, his research could stimulate more collaborations within the PABS group and IoP. We will discuss more on this in our roundtable discussion session.



# Responses to last AAC's recommendations

## 4. Suggestions for PABS group

### ➤ Enhancing relationships outside Academia Sinica

We have a long-term friendship with many colleagues in National Central University where biophysics is one of their main emphases. In addition, recently Ken-hui with the encouragement of IoP has initiated and formed the Biophysics Branch in the Taiwan Physical Society.

# *Outline*

1. Current status
2. Research highlights
3. Responses to last AAC report
- 4. Challenges and threats**
5. Plans

## Ongoing challenges

- coping with the pace and change of global scientific and technological landscape
- increasing difficulty in recruiting qualified faculty, postdocs and doctoral students
- aging in every level of researchers
- general grants applications are getting more competitive
- Rapid evolving influence of AI on research

## **Imminent threats**

- losing domestic lead position
- Being isolated in global academic society gradually

# *Outline*

1. Current status
2. Research highlights
3. Responses to last AAC report
4. Challenges and threats
- 5. Plans**

# Plans

- Recruiting proactively and promoting effectively
  - Plot new recruitment schemes
    - e.g. each group will designate a month for recruiting
  - Enhance mentoring and encourage early promotion
  - Encourage to serve in the academic societies

# Plans

- Synergize expertise and resources within each group
  - Invest potentially impactful projects
    - e.g. LIGO proposal
  - Strengthen and Install new core facilities
    - e.g. adding crystal growth facility
  - Develop novel techniques
    - e.g. THz spectroscopy, PSTEM

# Plans

- Synergize expertise and resources within each group

- Synergize various expertise

Besides formal research scientists, we have added institutional specialist, including Midas Chen (Engineering work), Simon Lin (Machine shop), Chih-Wen Yang (QMP), Rachid Mazini (MHEP), Tzong-Tsong Miao (Nano Core), and started a monthly gathering

- Foster interactions cross the groups

Besides the monthly faculty meeting, we also plan to form cross-group theorist meeting



# Plans

➤ Creating an inspiring and internationalized ambiance

- Hire more foreign scholars

We have now three foreign PIs and one foreign research scientist

- Participate international projects

- Establish a bilingual environment

e.g. a task team led by Henry Wong has been formed

- Hold international workshops and symposia

