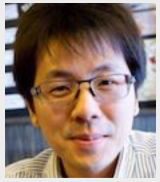
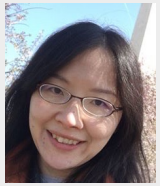
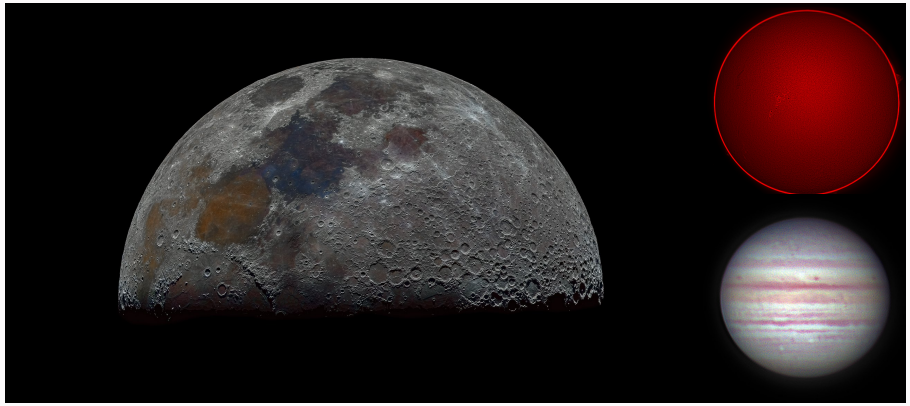
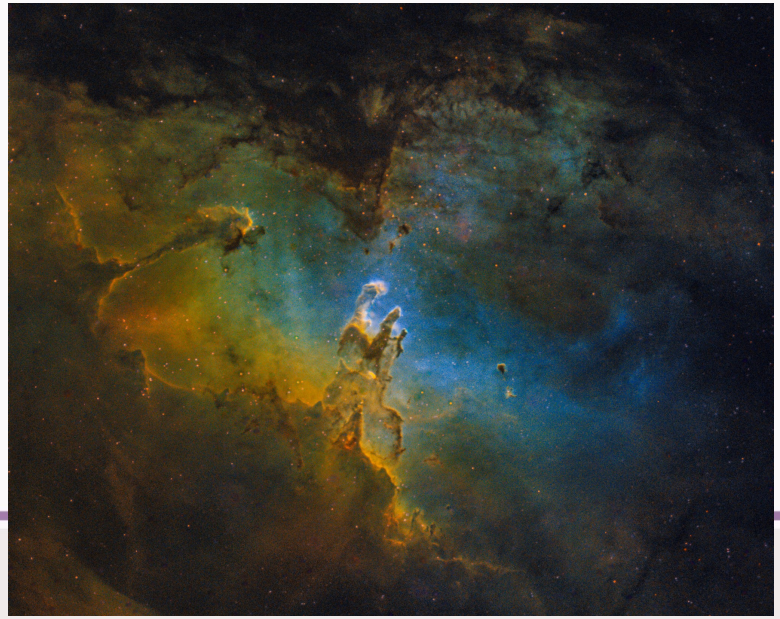
Faculty of Institute of Astronomy, NTHU

	Star and Planet formation	High Energy (Neutron stars/ Blackholes/ Supermassive blackholes/ Supernova)	Cosmology
Observation	Shih-Ping Lai  Hui-Ru Chen   Daniel Harsono  Ing-Guey Jiang	Hsiang-Kuang Chang  Albert Kong 	Tomotsugu Goto 
Theory / Numerical computation		 Kuo-Chuan Pan  Hsiang-Yi Yang	 Andrew Cooper

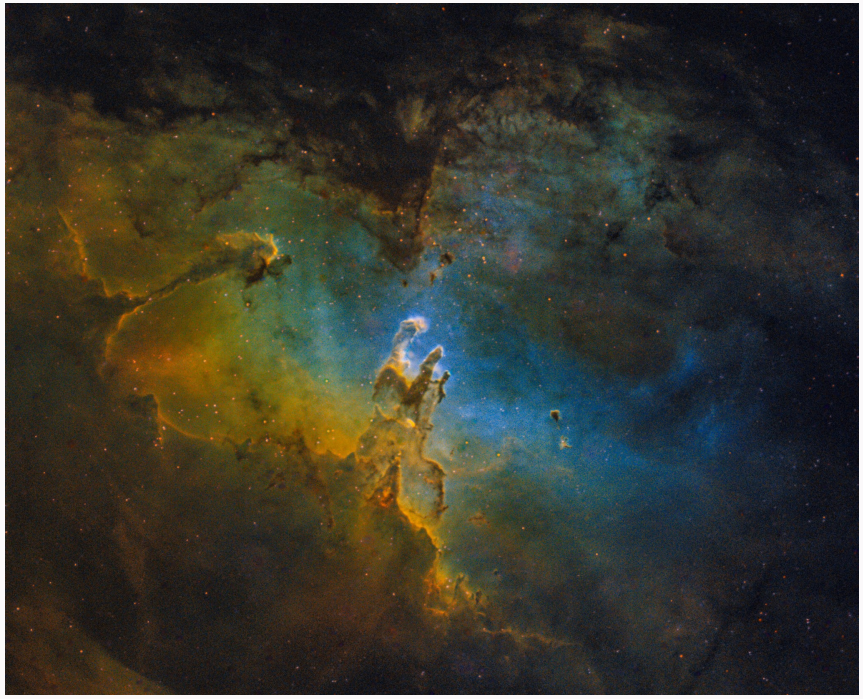
NTHU Observatory
Largest Refractor in Taiwan(25cm)



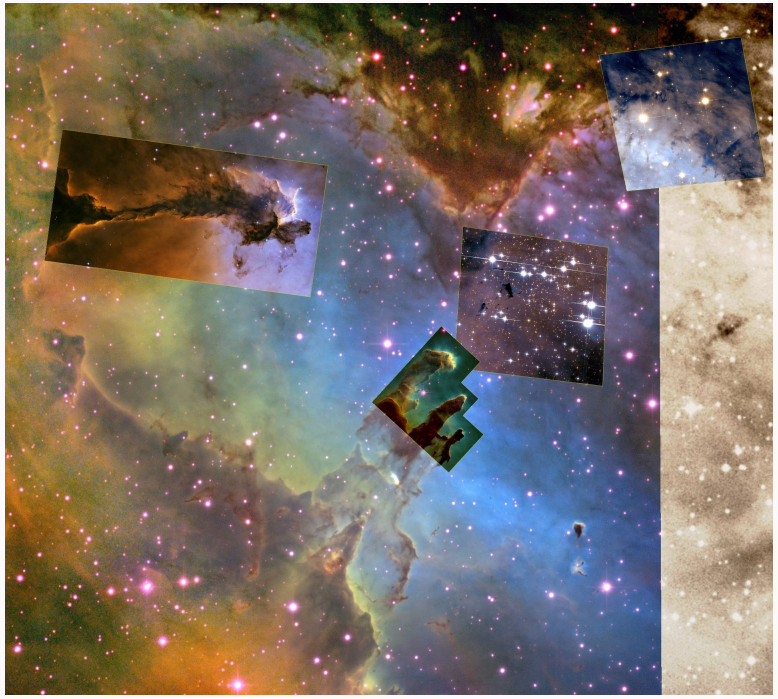


Astrophotography

NTHU Observatory



Hubble Space Telescope



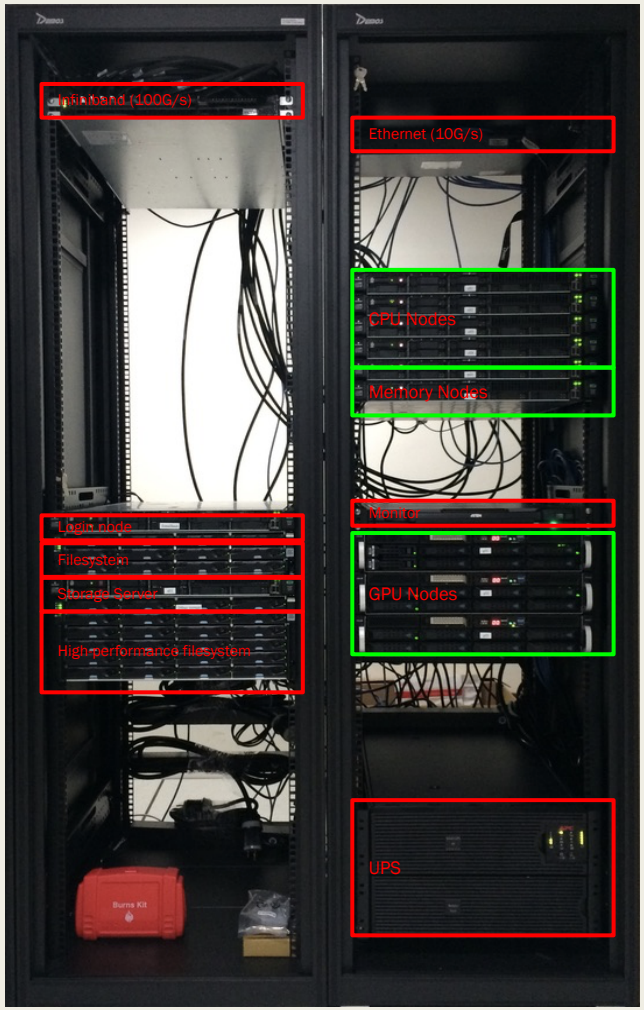
Summary

The CICA cluster is a memory-intensive system optimized for mid-scale research computing, data analysis and the development of astronomical HPC codes in preparation for production runs on larger supercomputers. It comprises 2112 logical cores over 23 parallel computing nodes with 2GB RAM/core, a further 232 logical cores in 3 dedicated shared-memory nodes with a total of 4.3TB RAM, and a further 312 cores in 4 specialized nodes with access to 16 GPUs and 0.9TB of RAM. All nodes are connected with a 100Gb/s Infiniband interconnect and have access to 1.3PB of storage, include a 1.1PB Lustre parallel filesystem.

Nodes

- Head node `fomalhaut`: 2 Intel Xeon Silver 4110, 16 cores, 200G RAM.
- Memory Nodes:
  - `m01` (1536 GB RAM), `m02` (1536 GB RAM)
    - 2 Xeon Gold 6248 2.5GHz CPUs with hyperthreading: 80 logical cores (2x20 physical cores) per node
    - 10TB of SSD scratch space per node
  - `m03` (2015 GB RAM)
    - 2 Xeon Gold 6354 3.0GHz CPUs with hyperthreading: 72 logical cores (2x18 physical cores) per node
- Compute nodes:
  - 23 nodes in total, 3 groups.
  - `c01` to `c04`
    - 2 Xeon Gold 6140 2.3GHz CPUs with hyperthreading: 72 logical cores (2x18 physical cores) per node
    - 196 GB of RAM per node (2.5 GB per logical core)
    - Total 144 physical cores, 784GB RAM
    - 900 GB of SSD scratch space per node
  - `c05` to `c17`
    - 2 Xeon Gold 6240R 2.4GHz CPUs with hyperthreading: 96 logical cores (2x24 physical cores) per node
    - 256 GB of RAM per node (2.3 GB per logical core)
    - Total 624 physical cores, 3.3TB RAM
    - Nodes c05-c13 each have 440GB SSD scratch space per node
  - `c18` to `c23`
    - 2 Xeon Gold 6324 2.8GHz CPUs with hyperthreading: 96 logical cores (2x24 physical cores) per node
    - 256 GB of RAM per node (2.3 GB per logical core)
    - Total 240 physical cores, 1.3TB RAM
  - *Over all cpu nodes*, 2112 logical cores with ~2GB/core (5.3TB total).
- GPU nodes:
  - `g01 - g03`
    - 2 Xeon Gold 6140 2.3GHz CPUs with hyperthreading: 72 logical cores (2x18 physical cores) per node
    - `g01`, `g02`: 2 GTX-2080-ti GPUs, 128GB RAM per node
    - `g03`: 3 GTX-2080-ti GPUs, 384 GB RAM
  - `g04`
    - 2 Xeon Gold 6248R 3.0GHz CPUs with hyperthreading: 96 logical cores (2x24 physical cores) per node
    - 8 GTX-3080 GPUs, 256 GB RAM
  - Total 156 physical cores, 896GB RAM
- Storage:
  - `/cluster` (including home): 96TB RAID6 (6Gb/s Seagate IronWolf)
  - `/data`: 160TB RAID6 (6Gb/s Seagate IronWolf)
  - `/data1`: 240TB RAID6 (6Gb/s Seagate IronWolf Pro)
  - `/data2`: 160TB RAID6 (6Gb/s Seagate IronWolf Pro)
  - `/lfs/data`: 1.1PB ZFS Lustre (8 OSTs, each 6 Gb/s Seagate 18TB Exos; 1 MDT Seagate Nytro SSDs)
- Interconnect: Mellanox EDR Infiniband (100 Gb/s)

Mid-size computer cluster
CICA Cluster (spec)



https://github.com/nthu-ioa/cluster/wiki

Simulating the Universe

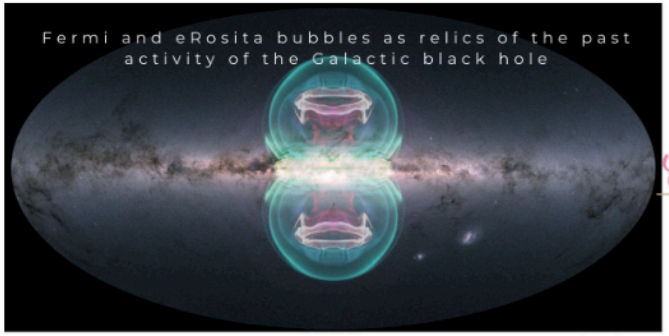
天文研究所 Institute of Astronomy

Menu

- About IoA
- People
- Academic Programs
- Research Groups
- Colloquia
- Achievements
- Alumni Information
- Student Information
- Contact and Directions
- Gallery
- Scholarship
- Downloads

Home

Congratulation! Prof. Karen Yang's recent research is published in Nature Astronomy



Congratulations !

Prof. Karen Yang's recent research result is published in Nature Astronomy!

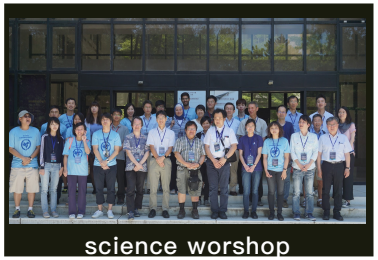
Paper: Fermi and eROSITA bubbles as relics of the past activity of the Galaxy's central black hole

News: Scientists Seek Origin of Mysterious Gigantic Bubble Structures In Our Galaxy

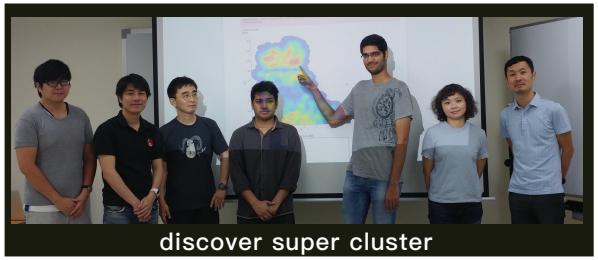
Machine Learning Applications in Astronomy

- Chiu et al. (2021), identifying unresolved objects
- Chen et al. (2021), recognized supermassive blackholes
- …
- Almost all faculty work on machine learning projects

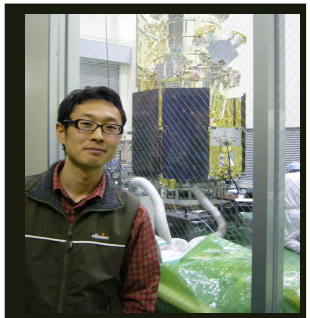
Prof. Goto's cosmology group



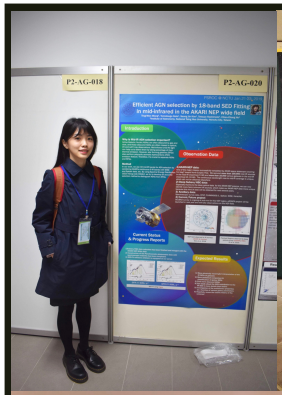
science worshop

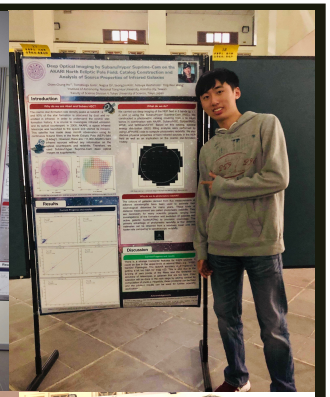


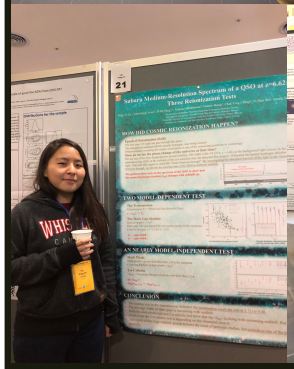
discover super cluster

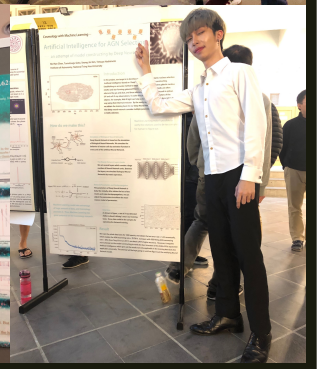


discover super massive black holes







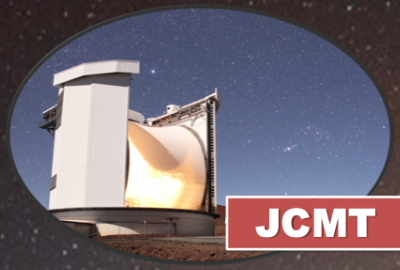


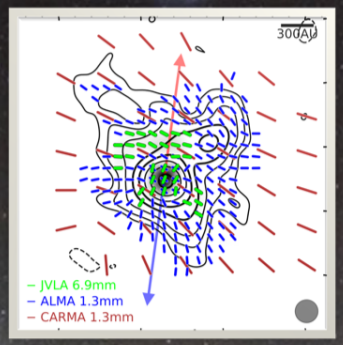
students won poster/oral award

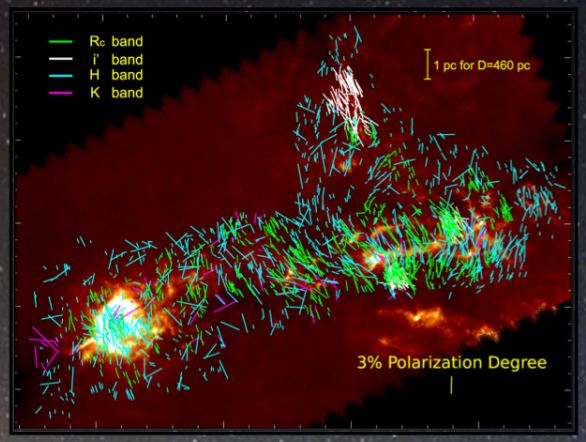
Prof. Shih-Ping Lai
Interstellar Magnetic Field Group

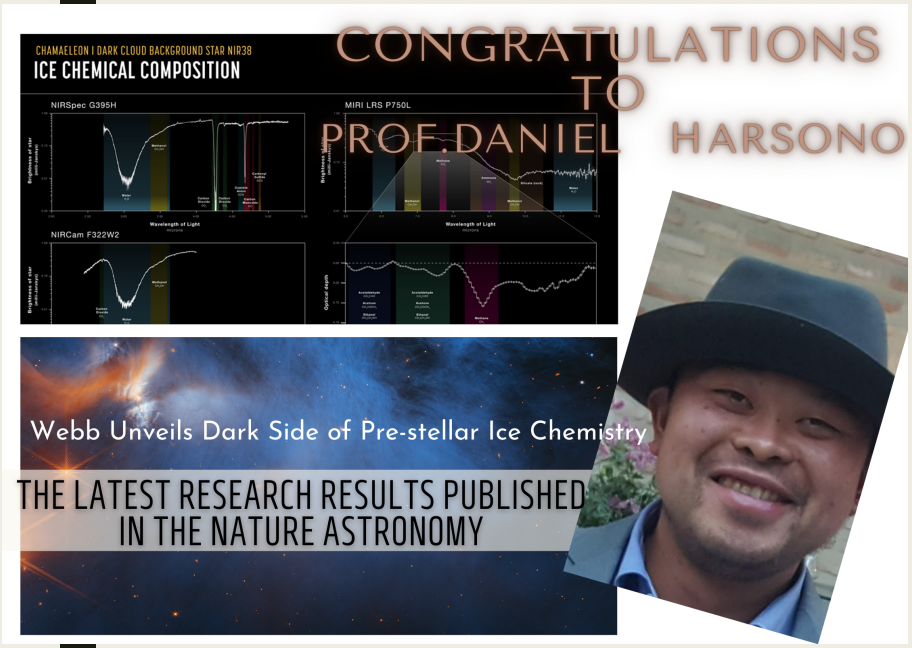
星際磁場研究室

磁場在恒星形成的過程中，
扮演關鍵醒的角色，我們使用
ALMA 與 JCMT 大規模地測量
銀河系恒星形成區的磁場。








CONGRATULATIONS
TO
PROF DANIEL HARSONO
CHAMAELEON I DARK CLOUD BACKGROUND STAR NIR38
ICE CHEMICAL COMPOSITION
NIRSpec G395H
MIRI LRS P750L
NIRCam F322W2
Webb Unveils Dark Side of Pre-stellar Ice Chemistry
THE LATEST RESEARCH RESULTS PUBLISHED
IN THE NATURE ASTRONOMY

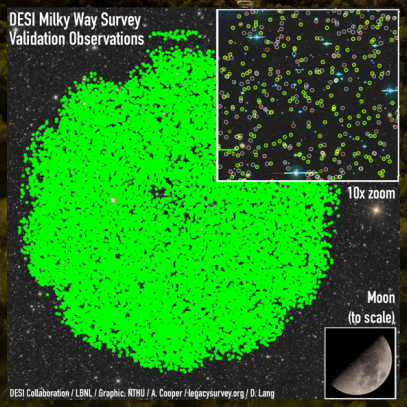

Binarity of a protostar affects the evolution of the disk and planets
Prof. Daniel Harsono the recent research result is published in Nature!
Congratulations

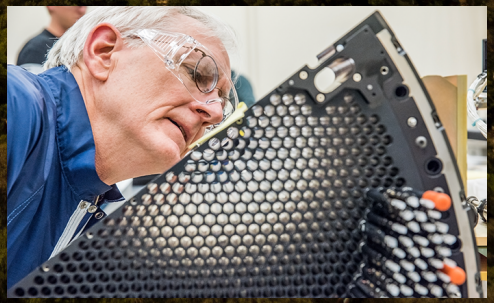

Congratulation!
恭賀何英宏助理教授
研究成果刊登NATURE期刊
ALMA Traces History of Water on Earth Back to the Interstellar Medium
ALMA追溯地球上水的歷史至星際介質

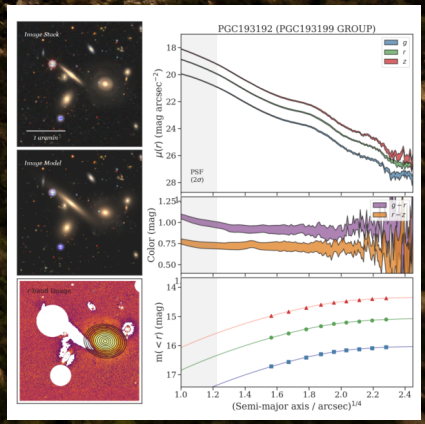
Dark Energy Spectroscopic Instrument (DESI)

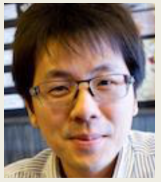
A international collaboration joined through Prof. Andrew Cooper

Take 10 million spectrum of distant galaxies
- formation of galaxies
- dark matter distribution



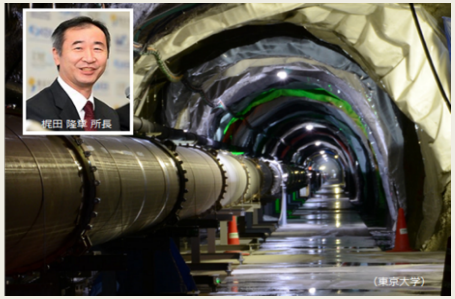




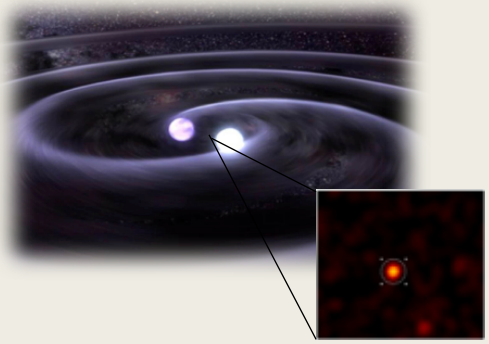


Detecting and Understanding Gravitational Wave~

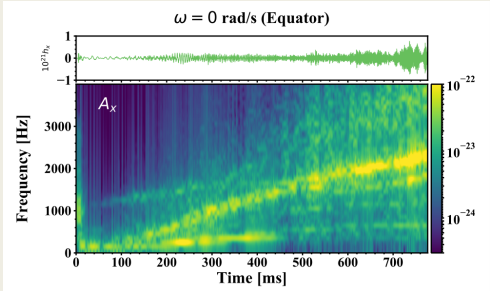
- Prof. Alber Kong's group and Prof. K-C Pan's group have joined the Kamioka Gravitational Wave Detector (KAGRA) collaborations led by the Nobel Physics prize winner Kajita Takaaki.



Prof. Kong searches for the sources of the gravitational waves



Prof. Pan generates the theoretical gravitational wave pattern

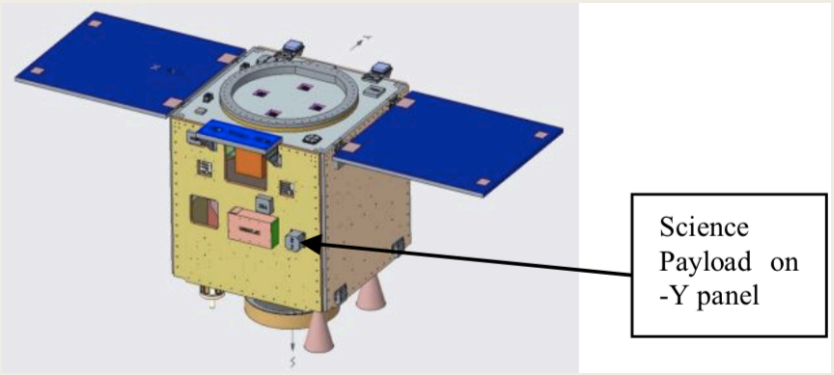


Into the Space!

- Gamma-ray Transients Monitor (GTM): the first space telescope of Taiwan!

Prof. H-K Chang's GTM has been selected as a science payload of Formosat 8B (福衛八號 B) , scheduled to launch in 2025

Science goal: To monitor Gamma Ray Bursts (GRBs) and bright gamma-ray transients from other sources in the 50 keV – 2 MeV energy band.



Numbers of Publications per year

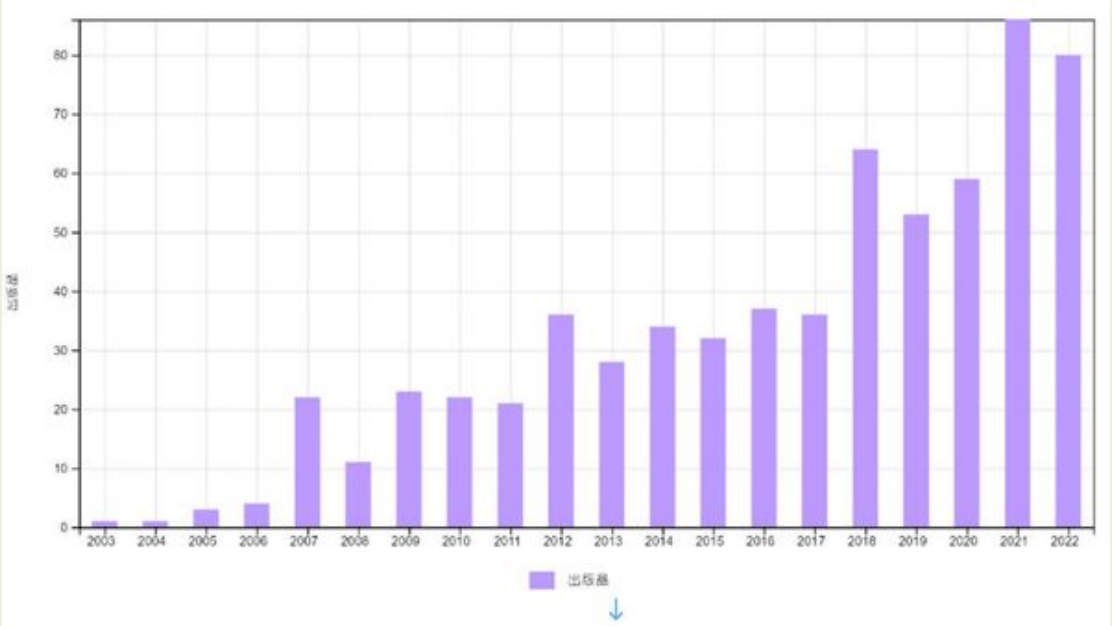


圖 3-1　2003-2022 年每年出版期刊數

Numbers of Citations per year

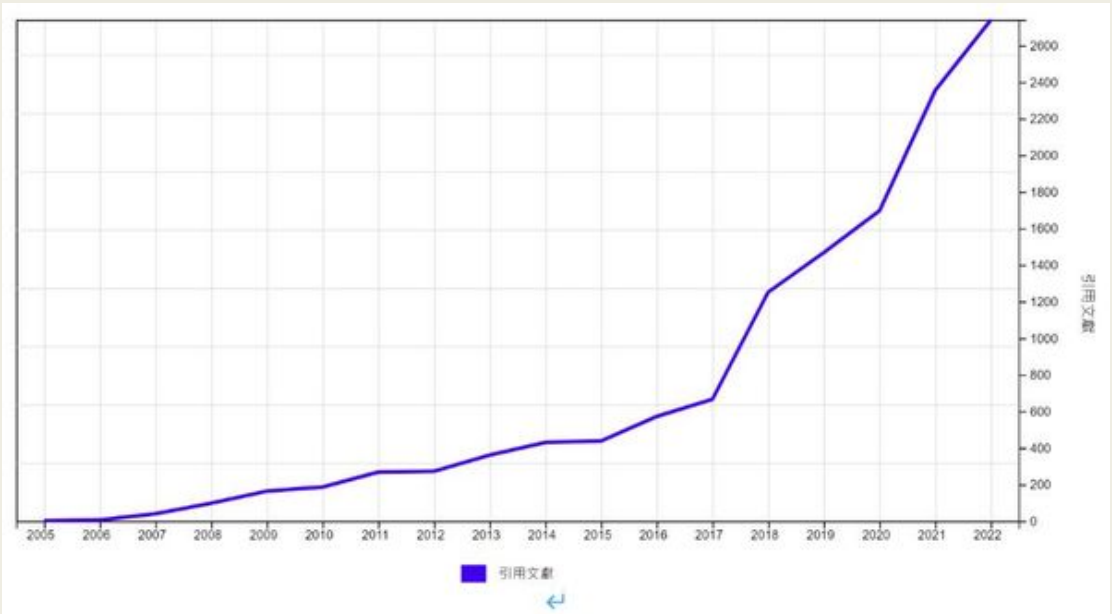


圖 3-2　2005-2022 年每年被引用次數