



NSTC 國家科學及技術委員會
National Science and Technology Council



國科會核心科學計算中心 (NSTCCORE)

<https://nstccore.twgrid.org>

嚴漢偉

中央研究院 物理所 網格中心

2025. 10. 15

9:00 AM → 9:30 AM **報到 Registration**

9:30 AM → 9:45 AM **一、高效能科學運算服務介紹 Introduction of Computing & Storage Services**

- ASGC的服務內容、合作模式介紹，包含以下
- 現況說明、合作模式。
- 介紹科學運算服務平台 (Computing Service Platform) 包含SLURM & DiCOSApp Computing Service (虛擬化SaaS計算服務)、資料服務。

Convener: Dr Eric Yen (ASGC)

9:45 AM → 10:00 AM **二、Account Application & 2FA**

Convener: Dr Eric Yen (ASGC)

10:00 AM → 10:30 AM **三、SLURM 計算服務**

- SLURM 執行工作操作
- SLURM 參數介紹
- 多核心程式編程及操作 Multi-Core Jobs

Convener: Mr Tsung-Hsun Wu (ASGC)

 Introduction on Slur...

10:30 AM → 11:00 AM **四、虛擬化SaaS雲端計算服務 - DiCOSApp**

- 計算資源
- 服務架構
- 軟體部署

Convener: Ms Mandy Yang (ASGC)

 DiCOSApps.pdf

11:00 AM → 11:15 AM **Break**

11:15 AM → 11:45 AM **五、資料服務 Data Service**

- 資料傳輸
- 資料操作

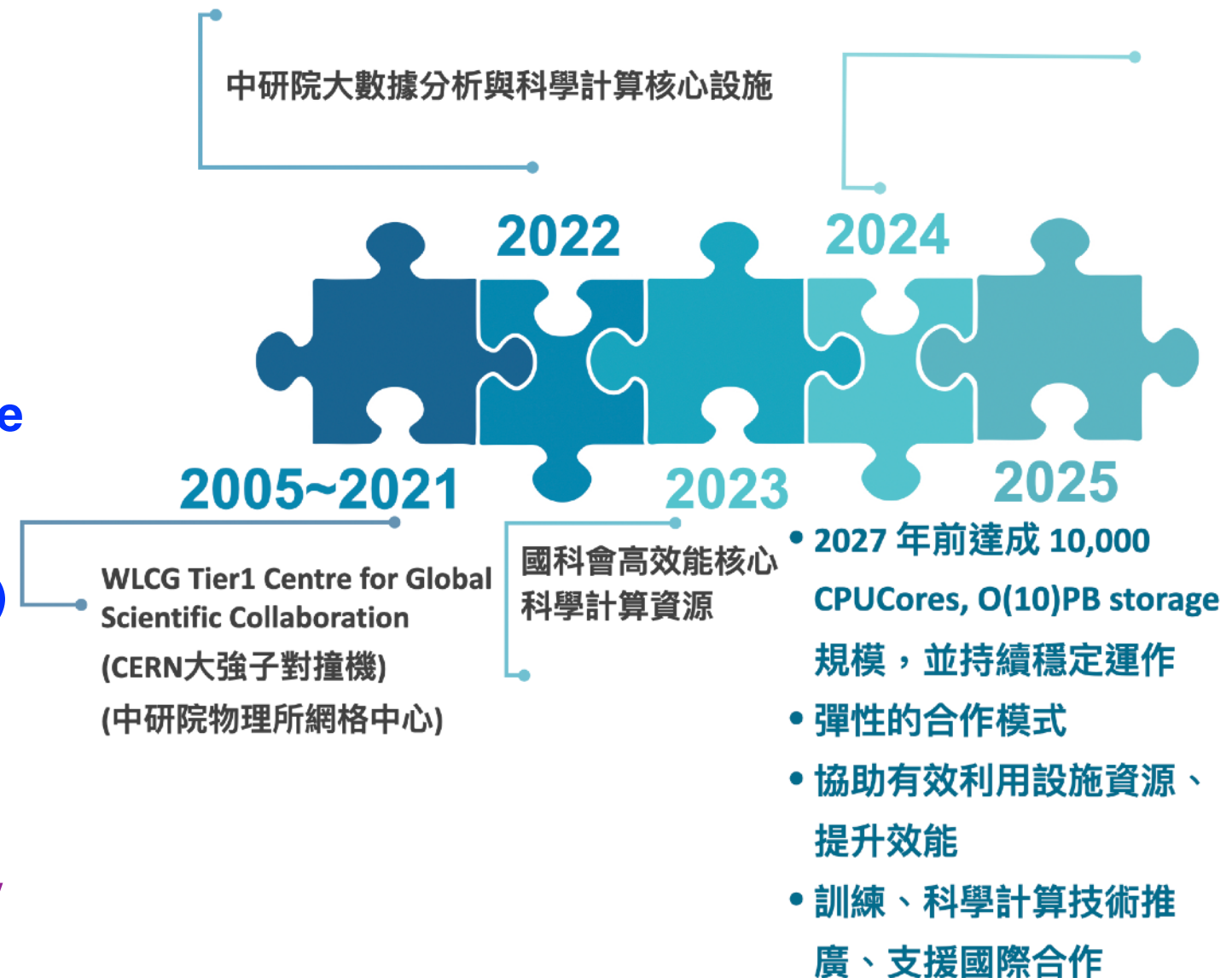
Convener: Mr Siang-Yu Yang (ASGC)

11:45 AM → 12:15 PM **六、使用者經驗分享 & 綜合討論 User Experience Sharing & Discussion**

Convener: Dr Tsan-Jan Chen (Institute of Molecular and Cellular Biology, NTHU)

NSTCCore Goal: Providing a Mid-Size Scientific Computing Services for Accelerating Discovery & Innovation

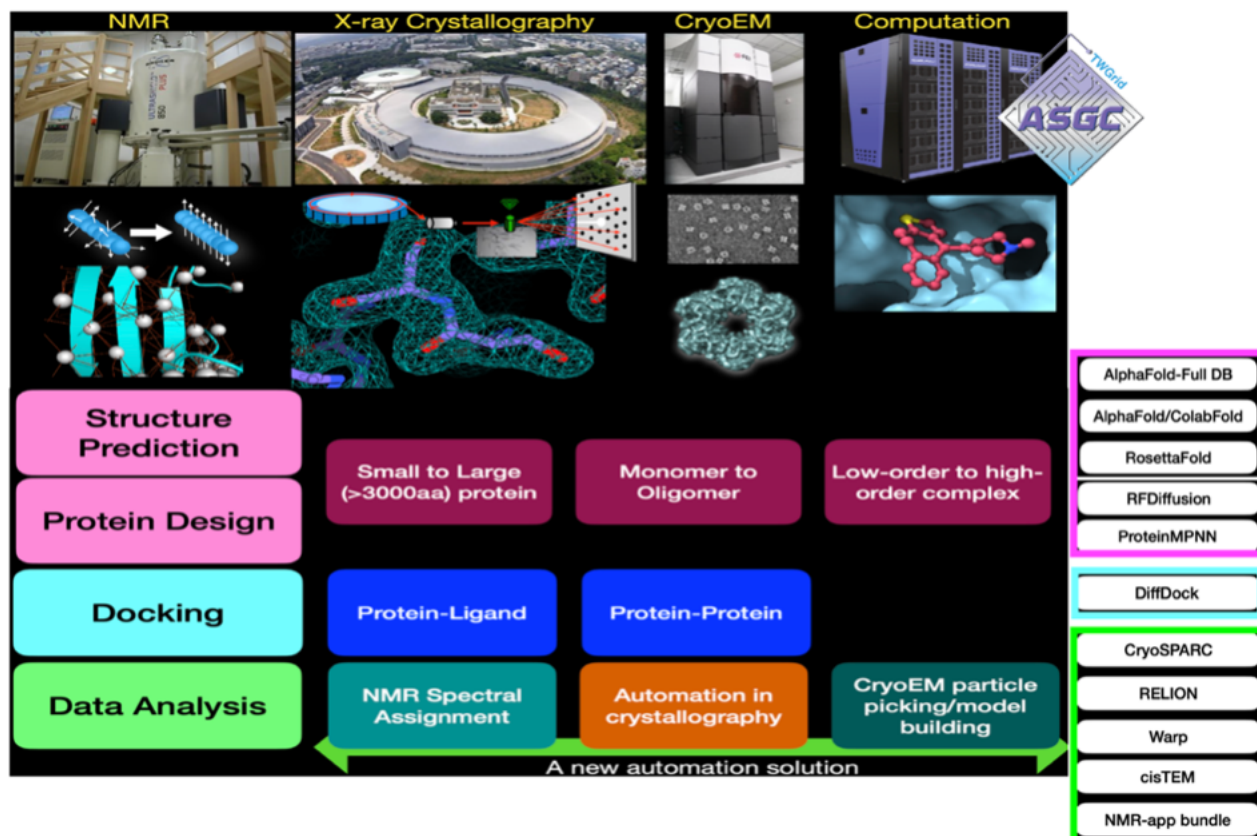
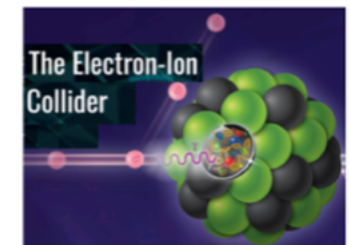
- **Funded by NSTC, June 2023 - May 2026**
 - In association with the core facility supported by Academia Sinica
- **Reliability & Efficiency are the top priority**
- **Serving as your computational research partner, so that scientific groups could focus on sciences**
- **Flexible and customized services: resource arrangement, workflow integration, performance improvement, etc.**
- **Resource scale: able to maintain O(10,000) CPU Cores and O(10)PB Disk storage resources in 5 years**
 - Able to provide O(1,000) CPU Cores parallel computing, GPU and big data analysis
 - Affordable cost and lower than operating by your own
- **Aligning with NCHC, and enhancing the advanced computing ecosystem in Taiwan**



Research Infrastructure Is Advancing With Close Collaboration With HENP and Multidisciplinary

ASGC was founded for the participation to WLCG collaboration in 2005.

From 2006, we have been supporting user communities in multiple disciplines to make better use of available scientific computing resources with efficiency.



Neutrino/MHEP

CryoEM

Quantum Materials Physics

Bioimaging

Physics of Active & Living Matter

Drug Discovery

Astrophysics

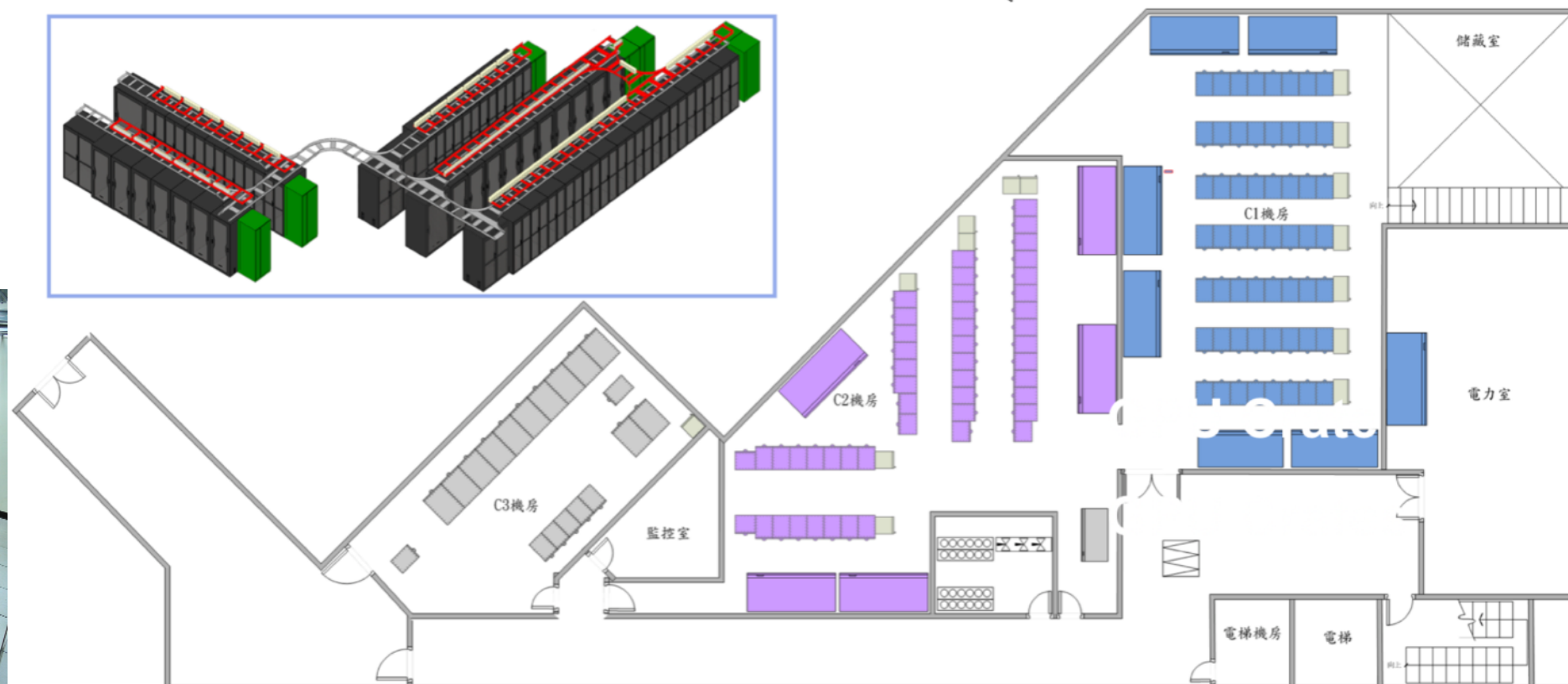
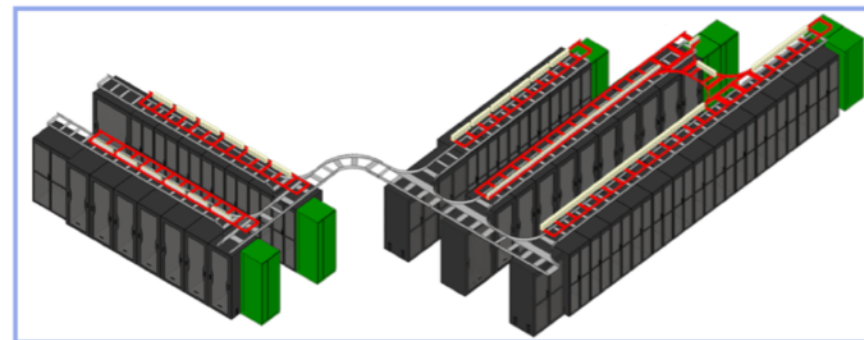
Computational Chemistry

Earth Science

Biodiversity & Ecology

ASGC Data Center

- 2MW, 400 tons AHUs
- 112 racks in ~800 m²
- Operational from April 2005
- 16K CPU Cores, 213 GPU, 27 PB Disk, 500+ host, 5PB transferred/yr
- 2025 procurement plan: 1,920 CPU Cores, 3PB disk, and 1x B6000(8)
- PaaS, SaaS provided with OpenStack (VM) and K8S (Containerization)
- HPC/HTC, Cloud and Data Services



Resources

Cluster	CPU (Spec)	Total CPU Cores/ GPU Boards	GB RAM/ Core	Performance (TFLOP/Server (MPI))	Performance (TFLOP/Core)	Price per Core/Board	Remarks
EDR1	AMD Genoa 9654	3,840	8	6.85	1.1	1.2	1. 20 Nodes now 2. +1,920 cores (AMD 9645) by end of 2025
Intel-G4	Intel Xeon 6448H	512	8	4.3	1	1.4	
A100	8 GPU/Server, 80GB	24				120	
L40S	4 GPU/Server, 48GB	4				70	
4090	8 GPU/Server, 24GB	16				60	
3090	4 or 8 GPU/Server, 24GB	56				40	
V100	8 GPU/Server, 32GB	48				35	
P100	4 GPU/Server, 32GB	16				8	
Disk Storage						1,000 per TB-year	

- 新使用者可有 NT\$ 200 免付費測試使用額度
- FDR5 於 2024/9/1 停止服務，以更高效能且節能的 EDR1, Intel-G4 取代。若有大量且長時間計算需求的使用者，可以專屬租用模式，開啟使用。
- 儲存系統：12 PB Ceph, in (8, 3) erasure coding scheme
 - Free: 3TB shared space/group, 100GB/ user
 - 磁帶櫃儲存系統： NT\$300/TB-Year

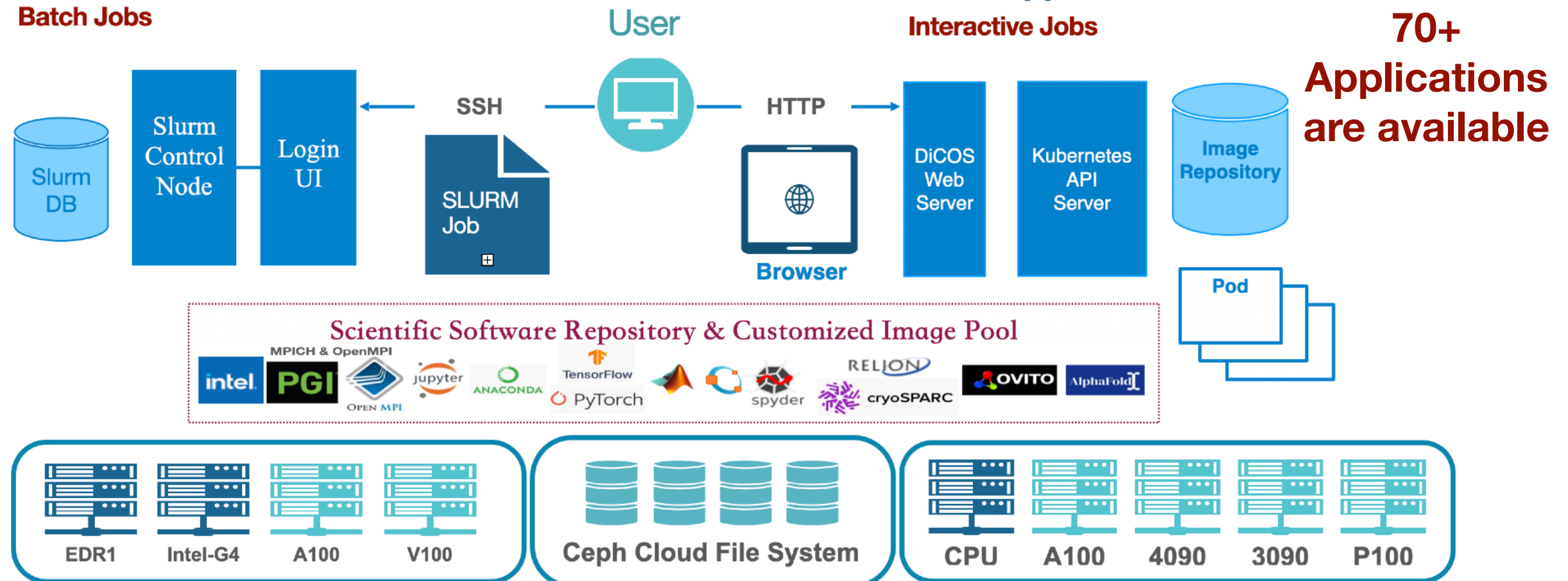
Computing Services:

Optimization of Application and System Efficiency

- HTC/HPC & Cloud Computing Platform
- Integration of computing model and software
- Research data workflow and management
- Information security
- Application efficiency
- Customized IaaS, PaaS, and SaaS

HPC platform
Slurm System Architecture
Batch Jobs

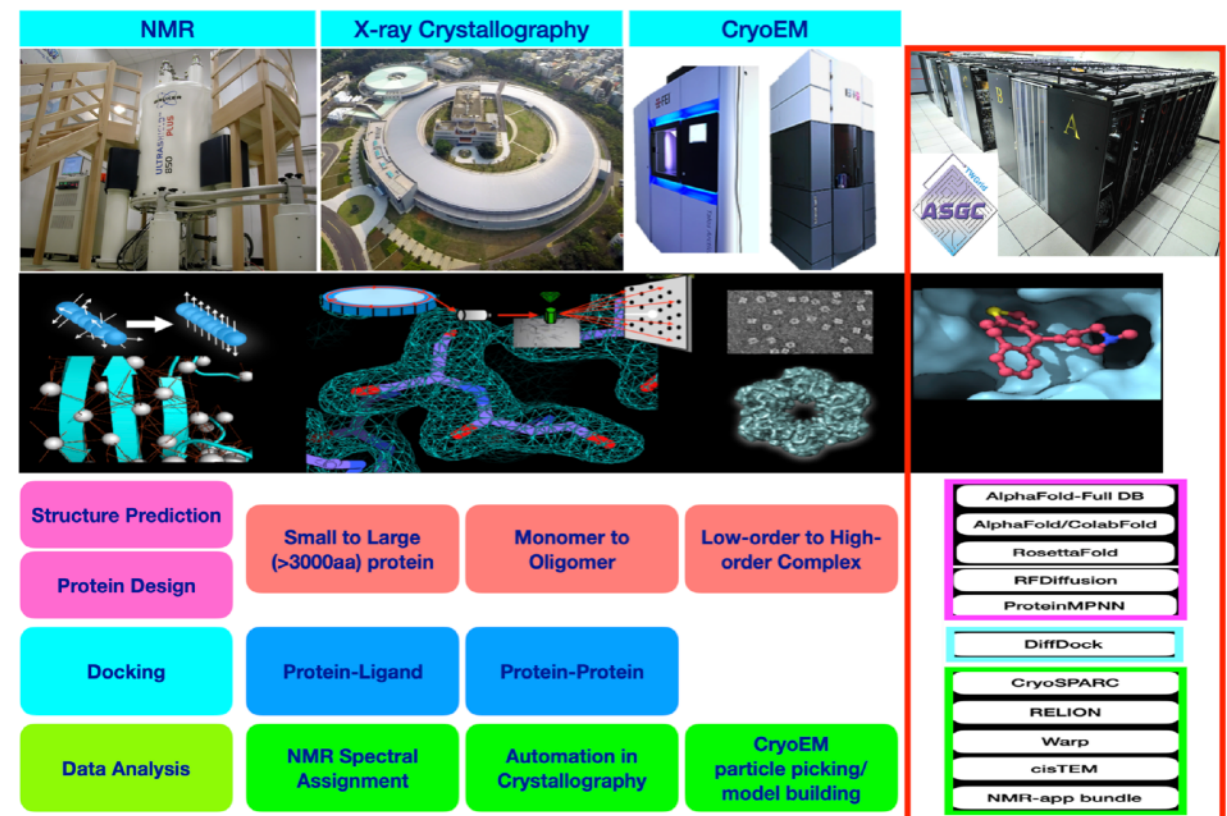
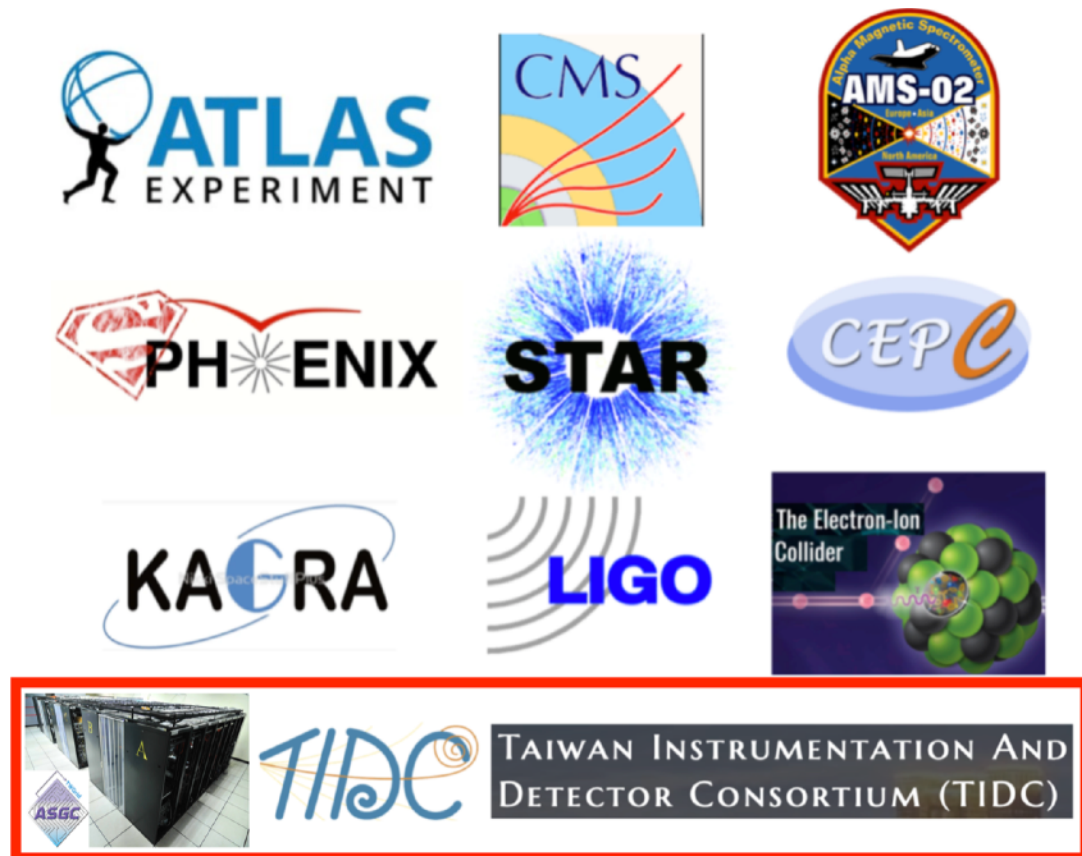
Software-as-a-Service Web-based Cloud Platform
DiCOSApp SaaS Architecture
Interactive Jobs



Flexible Collaboration Model: User-Driven, Service Oriented

- Pay-as-you-go
- Resource Integration: Collocation & Buy-In
- Service Hosting
- Reservation
- Experiment & Collaboration support

- Advanced Service: Web Application and portal, efficiency tuning, workflow optimization, customization, hands-on training
- User Engagement : weekly User Meeting, User Committee, dissemination & outreach



Capacity Building

- **User community engagement with flexible collaboration model**
 - Understanding user requirements and supporting workflow integration
 - (Cross) domain activities: TPS, Chem, TWSIAM, SC, ...
- **Supporting user access to ASGC services easier and enhance application efficiency**
- **Training and workshop/conference: 250+ participants in 2024**
- **Core technology and international collaboration: ISGC**

Work Shops



ISGC 2025 (Mar 16-21)

Basic

- 30min – full day
- Get access, details of using compute, data and SaaS services, w/o hands-on, User Forum

Thematic

- 1 hrs – full day
- Discipline-based Data analysis
- ICT topics: GPU Computing, AI, CPU Trends

Domain-Specific Workshop

- 30min – 3hrs
- Supporting hands-on, w/o ASGC service introduction

Conference

- ISGC (International Symposium on Grids & Clouds, since 2002)
- HEPiX, CHEP (Computing in High Energy Physics)
- APAN (Asia Pacific Advanced Network) 9

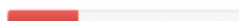
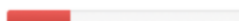
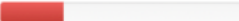
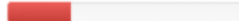
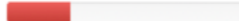
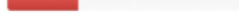
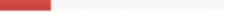
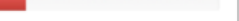
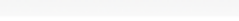
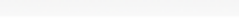
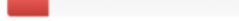
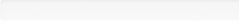
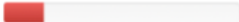
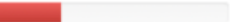
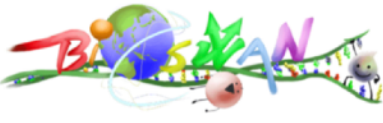
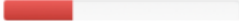
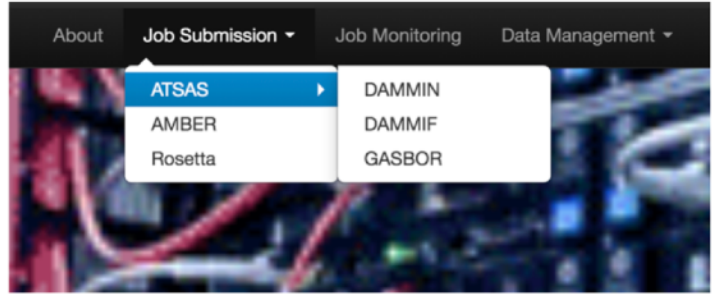


與研究團隊緊密合作，打造永續的 科學計算環境

- 建立可隨計算需求，以及資通訊軟硬體系統與技術持續演進的科學計算環境
 - 整合分析方法(algorithm)、數據與計算資源的高效能系統
 - 新的使用需求，將轉化為新的服務
 - 協助科學研究團隊有效利用可用資源
 - 適當的價格
 - 具備先進技術自主能力的核心設施團隊：參與國際合作
- 提升服務與研究支援：學門、學會、社群、學校/機構
 - 配合各領域/學門研討會，提供 hands-on 教育訓練環境
 - 分享成功案例
 - 推廣與擴展合作範疇
- 合作平台：CECAM-TW, ISGC
 - 協助研究團隊與社群，導入新的科學計算方法
 - 促進跨領域與國際合作

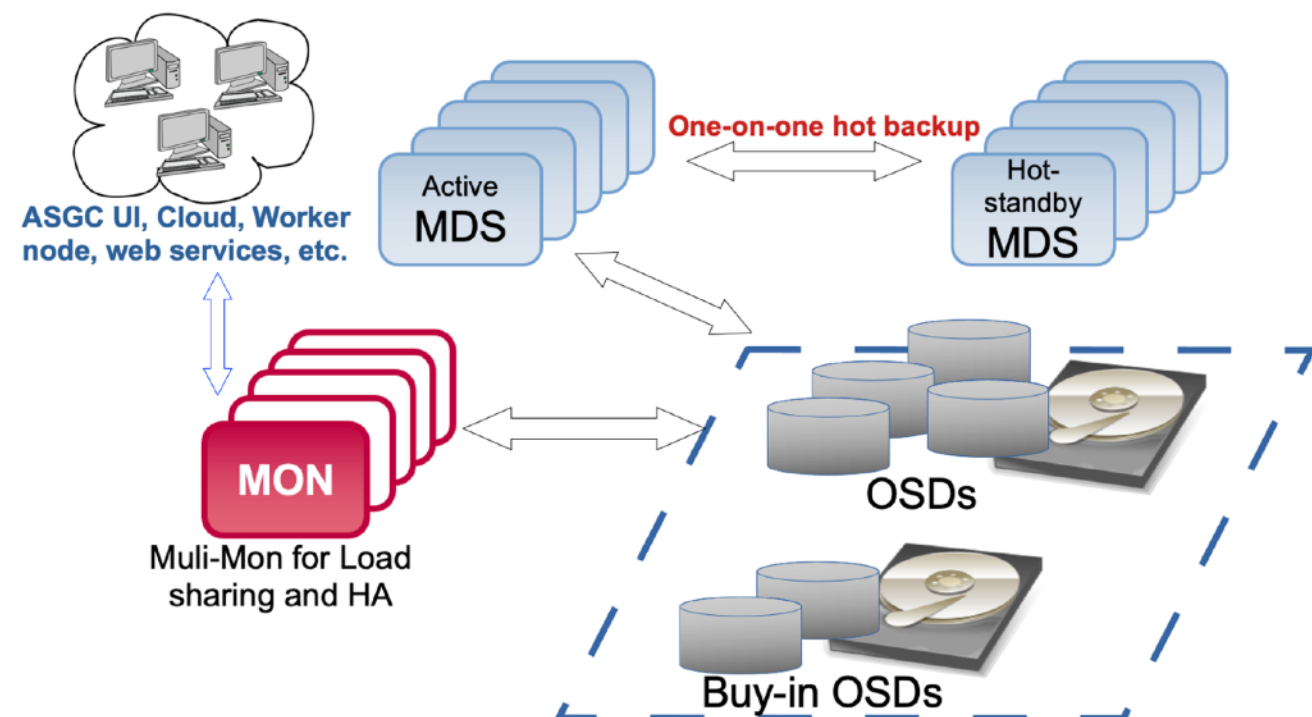
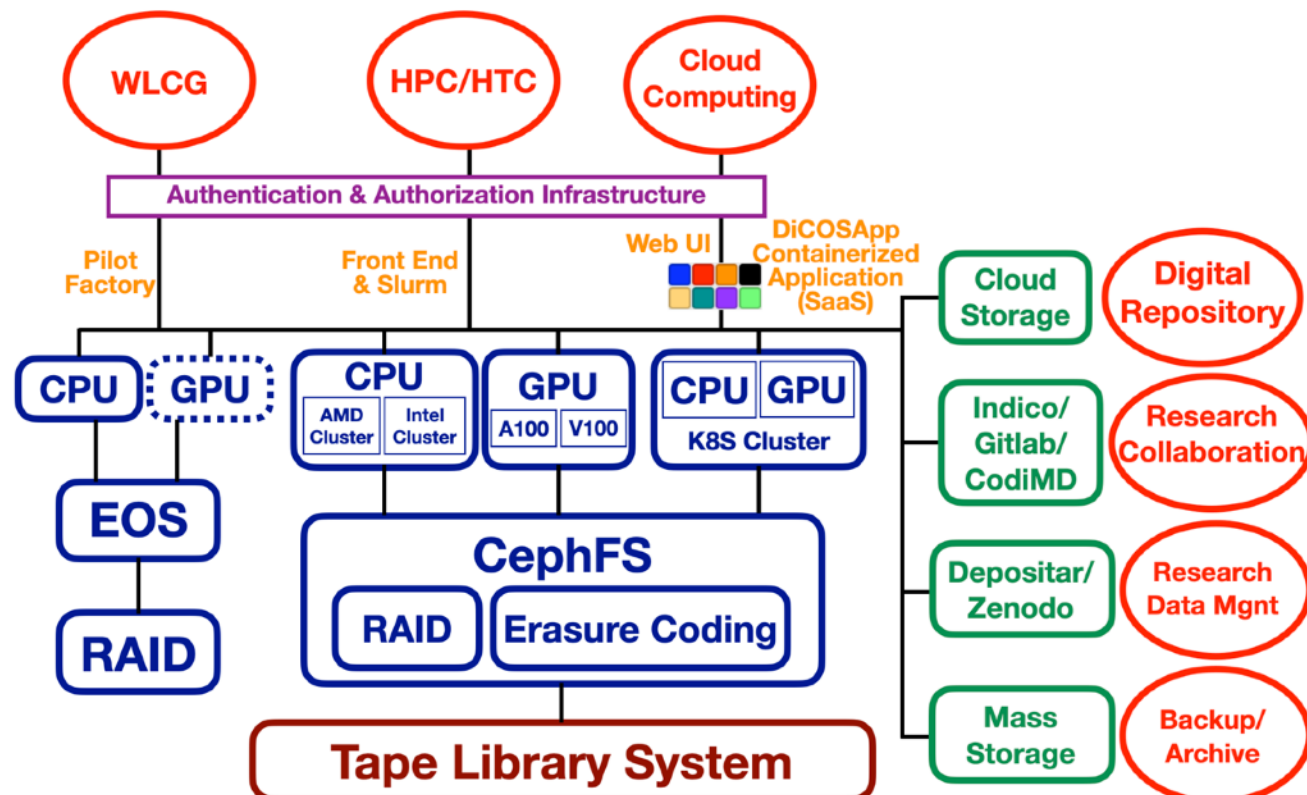


73+ Web Applications Provided (Software-As-a-Service)

 CryoSPARC 32 P100 Version: 3.2 Resources: 83%  Launch	 CryoSPARC 1080ti Version: 3.3.2 Resources: 29%  Launch	 CryoSPARC RTX3090 Version: 3.3.2 Resources: 26%  Launch	 spyder cpu/eman2 Version: Resources: 17%  Launch	 Octave Version: V5.2 Resources: 29%  Launch	 Transfer Data Version: Resources: 86%  Launch
 CryoSPARC RTX3090 Version: 4.0.2 Resources: 26%  Launch	 CryoSPARC RTX3090 Version: 4.1.1 Resources: 26%  Launch	 CryoSPARC RTX3090 Version: 4.4.1 Resources: 26%  Launch	 cisTEM Version: Resources: 86%  Launch	 Ovito Version: Resources: 86%  Launch	 OpenACC Version: GPU P100 Resources: 83%  Launch
 AlphaFold Version: GPU with A100 Resources: 75%  Launch	 AlphaFold (Full DB) Version: GPU with A100 Resources: 75%  Launch	 IMOD Version: GPU with 1080ti Resources: 29%  Launch	 Triton Version: 22.01-py3 (GPU P100) Resources: 83%  Launch	 AlphaFold Version: GPU with RTX3090 Resources: 26%  Launch	 AlphaFold Version: GPU with V100 Resources: 17%  Launch
 RoseTTAFold Version: GPU with rtx3090 Resources: 26%  Launch	 Dynamo Version: GPU with 1080ti Resources: 29%  Launch	 MATLAB Version: R2018b on GPU V00 Resources: 17%  Launch	 Jupyter Lab Version: CPU with Tensorflow v1 Resources: 86%  Launch	 Jupyter Lab gpu 3090 Version: GPU with Tensorflow 3090 Resources: 26%  Launch	 Jupyter Lab GPU 1080ti Version: GPU with Tensorflow v2 Resources: 29%  Launch
 RFDIFFUSION Version: 2023 on GPU V00 Resources: 17%  Launch	 diffdock Version: 2023 on GPU V00 Resources: 17%  Launch	 EvoDiff Version: V100 Resources: 17%  Launch	 Jupyter Lab GPU V100 Version: GPU with Tensorflow V100 Resources: 17%  Launch	 Jupyter Lab GPU A100 Version: GPU with Tensorflow A100 Resources: 75%  Launch	 Jupyter Lab Cryocare GPU Version: GPU with 1080ti Resources: 29%  Launch
 QIIME2 Version: Genome Resources: %  Launch	 Scipion3 Version: P100 Resources: 83%  Launch	 Phenix Version: Resources: 86%  Launch	 Jupyter Lab GPU A100 Version: GPU with Tensorflow v2.6 Resources: 75%  Launch	• Web Portal • Application over Cloud • Jupyterlab • Web Terminal	
 MorphoGraphX Version: GPU with P100 Resources: 83%  Launch	 Deepmd-kit Version: GPU with A100 Resources: 75%  Launch	 Deepmd-kit Version: GPU with V100 Resources: 17%  Launch	 MAML Version: GPU with A100 Resources: 75%  Launch	 LabVIEW Run-Time Engine Version: 2019  Launch	
 Warp Version: rtx4090 Resources: 700%  Launch	 MAML Version: GPU with V100 Resources: 17%  Launch	 PVserver Version: 5.8.0 (GPU 1080Ti) Resources: 29%  Launch	 Paraview Client Version: 5.8.0 Resources: 86%  Launch		
 R studio Version: 10 CPU Cores Resources: 54%  Launch	 PyRoot Version: GPU with 1080ti Resources: 29%  Launch	 qiskit Version: Resources: 86%  Launch	 NVIDIA CUDA-Quantum A100 Version: Resources: 100%  Launch		

ASGC Science Cloud Architecture

- ASGC is operating the scientific computing core facility in Taiwan, as an computing research infrastructure in Academia Sinica with reliability and efficiency
 - Integrating data, algorithm and computing according to the needs of user communities
 - Supporting computing by cluster (Slurm), WebUI and JupyterLab with Ceph storage pool
 - Apart from WLCG, ASGC focus is now supporting multi-disciplinary scientific computing in Taiwan since 2023
 - 201 PI Groups, ~700 users from 31 Institutes/Universities in Taiwan
 - Federation of distributed institute resources
 - Federation of core facilities (including CryoEM, NSRRC, NMR, computing centre, etc.)
 - Finished 5M CPU jobs and 54K GPU jobs in 2024 (not including WLCG)
- Web-based Cloud services & Slurm clusters are provided
 - VM for core services and on-demand worker nodes managed by OpenStack
 - Containerized resources managed by Kubernetes framework - for software on-demand services and part of core services
- Ceph distributed storage system is serving as the common data pool
 - Able to achieve 4.2GB/s throughput, 1.5K op/s rd, 2K op/s wr
 - Erasure coding (8, 3), with 462 OSDs, 51 hosts and multiple MDS & MONs
 - Scalable from O(10)TB in 2012 to 17PB in 2025
 - Tape storage (10 PB by LTO9) is mainly for long-term backup and rarely used datasets (18TB/drive-day wr)



Welcome to ISGC2026 in Taipei

- 15 - 20 March 2026
- Theme: about Data Sovereignty, Trustworthy AI & RI, and Open Science
- Keynote speech, Asia Partner Updates, and workshop/session are major components
 - Security workshop, sessions of HEP, Grid & Clouds, Networking, infrastructure and AI, Hybrid Quantum Computing are typical arrangements. Domain-specific workshop or sessions are also welcomed
 - Environmental Computing Workshop, etc.
- Call for sessions and abstract are open until 17 Nov. 2025
- <https://indico4.twgrid.org/event/64/>
- Contact: ISGC Secretariat
 - vhuang@as.edu.tw



INTERNATIONAL SYMPOSIUM ON GRIDS & CLOUDS (ISGC) 2026

15-20 March 2026

Academia Sinica, Taipei, Taiwan

Trustworthy Infrastructures and AI for Global Open Science

– Enabling Data Sovereignty and Secure Research Collaboration

可信賴的基礎設施與人工智慧，推動全球開放科學 — 實現資料主權與安全的研究合作

CALL FOR ABSTRACTS

<https://indico4.twgrid.org/event/64/abstracts/>

Deadline (截止日期) : 17 November 2025 (2025 年 11 月 17 日)

Home



Call for Abstract



Scientific Topics



NSTCCore Services 聯絡資訊

- **Core Facility Services**
 - <https://nstccore.twgrid.org>
 - <https://scale.grid.sinica.edu.tw/index.php>
- **ASGC Web Site: <https://www.twgrid.org>**
- **Access to ASGC Resources**
 - <https://dicos.grid.sinica.edu.tw/>
- **Contact point: DiCOS-Support@twgrid.org**
- **Gentle Reminder**
 - Please include ASGC (Academia Sinica Grid-computing Center) in the acknowledgement when research outcomes that relied on ASGC resources, services or expertise are presented in your research.