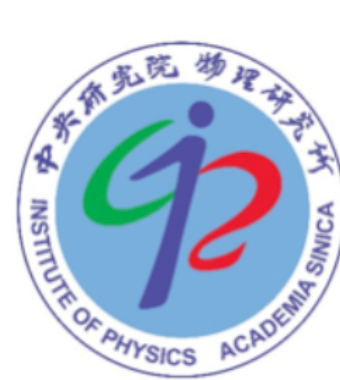




NSTC 國家科學及技術委員會
National Science and Technology Council



NSTCCore Introduction

嚴漢偉 Eric Yen

中央研究院網格中心

Academia Sinica Grid Computing Centre (ASGC)
Taiwan

NSTCCore Training
22 Oct. 2026

2:00 PM → 2:20 PM

- 一、NSTCCore 高效能運算服務介紹 暨 NVIDIA 受邀技術演講引言 | Introduction to NSTCCore Computing Services and Transition to the NVIDIA Invited Technical Talk
- 計算服務架構 Introduction of Computing Service
 - 運算資源、服務內容和計價模式 Resource, Service & Pricing
 - 帳號申請與 2FA Account Application & 2FA

Convener: Prof. Eric YEN (ASGC)

2:20 PM → 3:05 PM

- 二、NVIDIA 技術專題：量子-GPU 超級運算：探索量子運算與 AI / HPC 的整合 | Invited Technical Talk: Building Quantum-GPU Supercomputing (Presented by NVIDIA)
- The next generation of quantum systems will be quantum-GPU supercomputers that tightly integrate quantum processors with AI supercomputing infrastructure to achieve fault tolerance and run useful applications. Building these systems at scale will require advancements across algorithms, software, and hardware. AI and accelerated computing are also essential to this journey, from discovering efficient quantum applications and calibrating processors to enabling real-time control and quantum error correction. This talk will present NVIDIA’s vision for this convergence and highlight recent developments in CUDA-Q, NVQLink, and open models to create a unified platform where academia, labs, startups, and industry can collaborate to shape the future of supercomputing.
- Convener: Mr Yun-Yuan WANG (NVIDIA)

3:05 PM → 3:20 PM

休息 Break 15m

3:20 PM → 3:40 PM

- 三、虛擬化SaaS雲端計算服務 - DiCOSApp | Virtualized SaaS Cloud Computing Service – DiCOSApp
- 計算資源 Computing Resources
 - 服務架構 Service Overview
 - 軟體部署 Software Deployment
- Convener: Ms Ming-Jyuan YANG (ASGC)
- DiCOSApps.pdf

3:40 PM → 4:00 PM

- 四、SLURM 計算服務 | SLURM Computing Service
- SLURM執行工作操作 Running Jobs with SLURM
 - SLURM參數介紹 Introduction to SLURM Parameters
 - 多核心程式編程及操作 Multi-Core Job Programming and Execution
- Convener: Mr Felix LEE (ASGC)

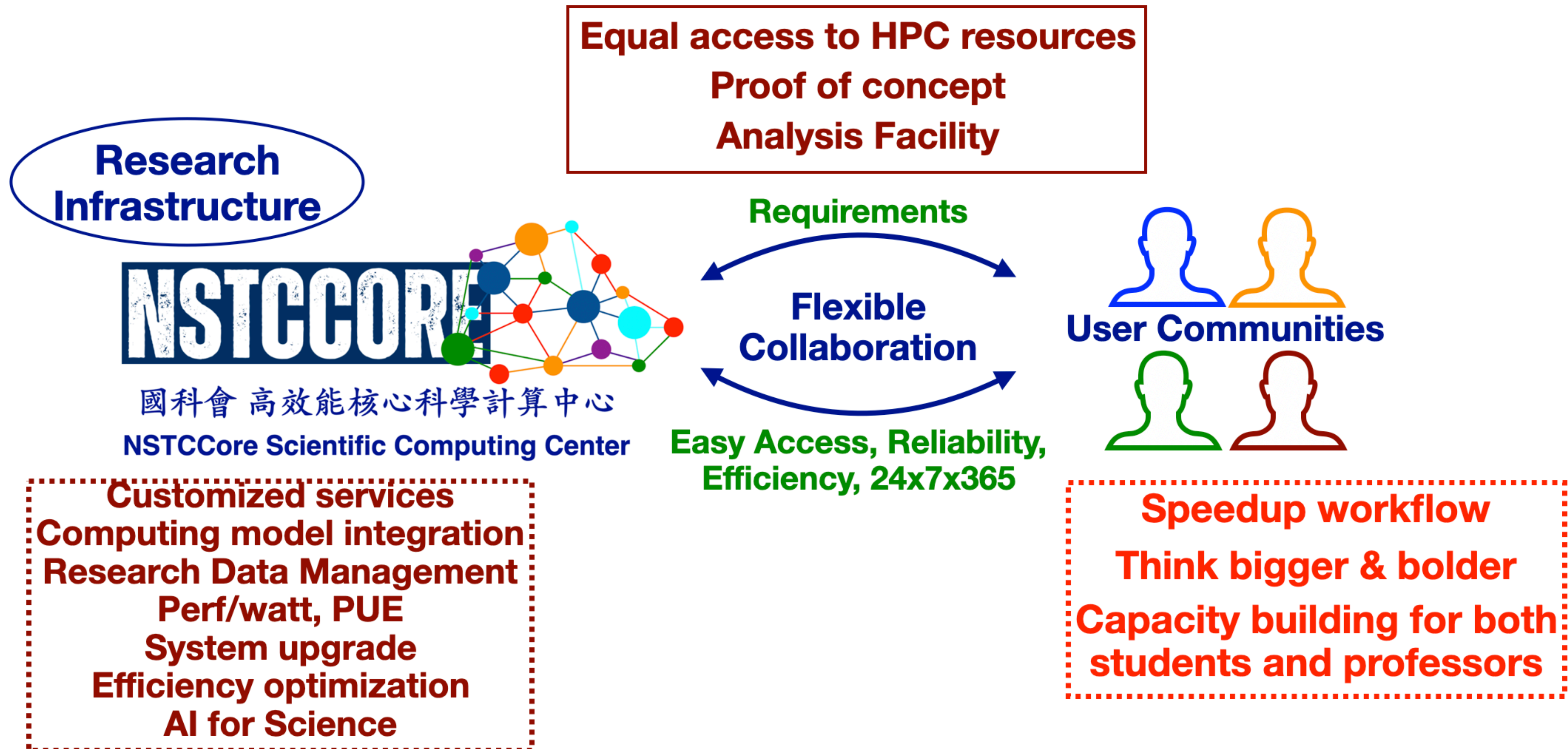
4:00 PM → 4:20 PM

- 五、資料服務 | Data Service
- 資料傳輸 Data Transfer
 - 資料操作 Data Management
- Convener: Mr Siang-Yu YANG (ASGC)
- Storage & Data Tran...

4:20 PM → 4:35 PM

- 六、綜合討論與交流（問卷填寫） | Discussion & Exchange (Feedback Questionnaire)
- Convener: Prof. Eric YEN (ASGC)

NSTCCore Is Your Research Computing Partner



NSTCCore: Medium-Scale Scientific Computing Facility

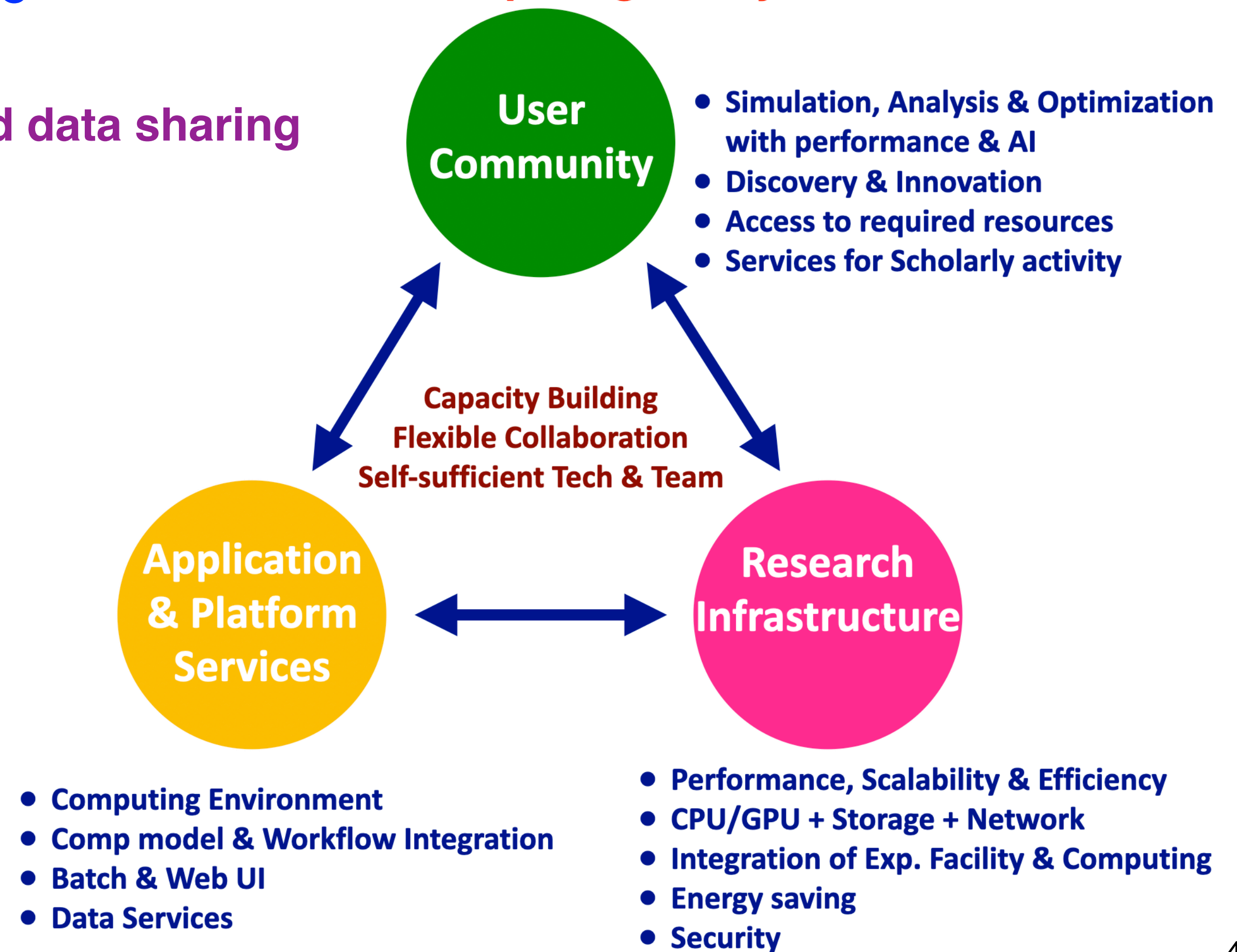
Accelerating Discovery & Innovation

Empowering Scientific Computing Ecosystem

- Resource Plan: 10K CPU Cores, 200+ GPU, 18PB Disk by end 2027
- Enhance the service, resource and infrastructure
 - Reliability, efficiency, scalability and extensibility
 - Streamlining scientific simulation, data analysis, and data sharing
 - User-oriented, service-based approach
 - Flexible collaboration models and customized services
- Supporting AI for Sciences
- Freeing researchers to focus on science

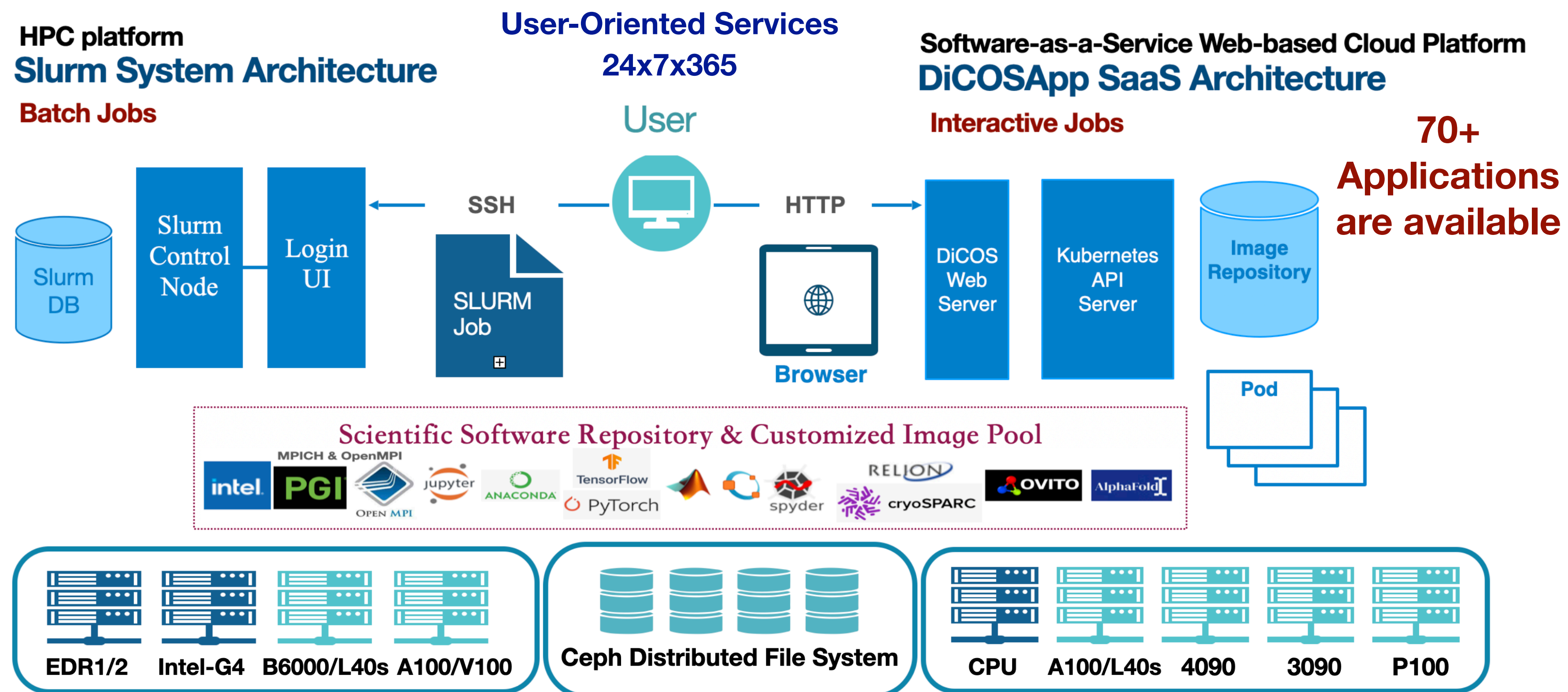
These are combined outcomes by NSTCCore and SCALE (中研院大數據分析與科學計算核心設施) projects.

Scientific Computing Ecosystem



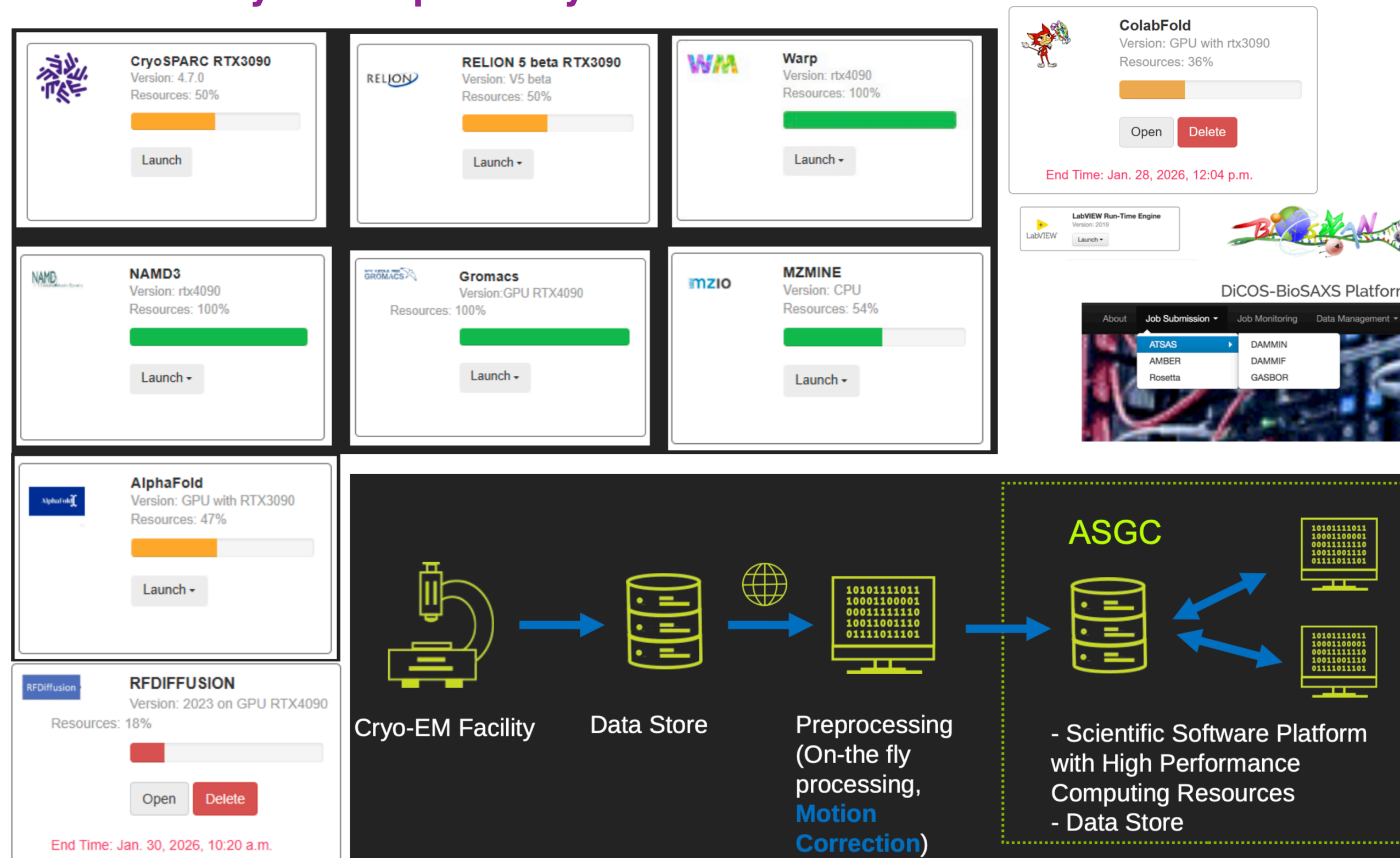
Integrating Computing Services Into Research Process

- **Objectives - reliability, efficiency, scalability and extensibility**
 - Streamlining scientific simulation, data analysis, and data sharing
 - Strengthening scientific computing ecosystem
 - Freeing researchers to focus on discovery
- **Customized Services**
 - Infrastructure for open science
 - Integrating data, algorithm and computing into a cohesive, AI-ready platform for science and innovation



Freeing Researchers To Focus on Science

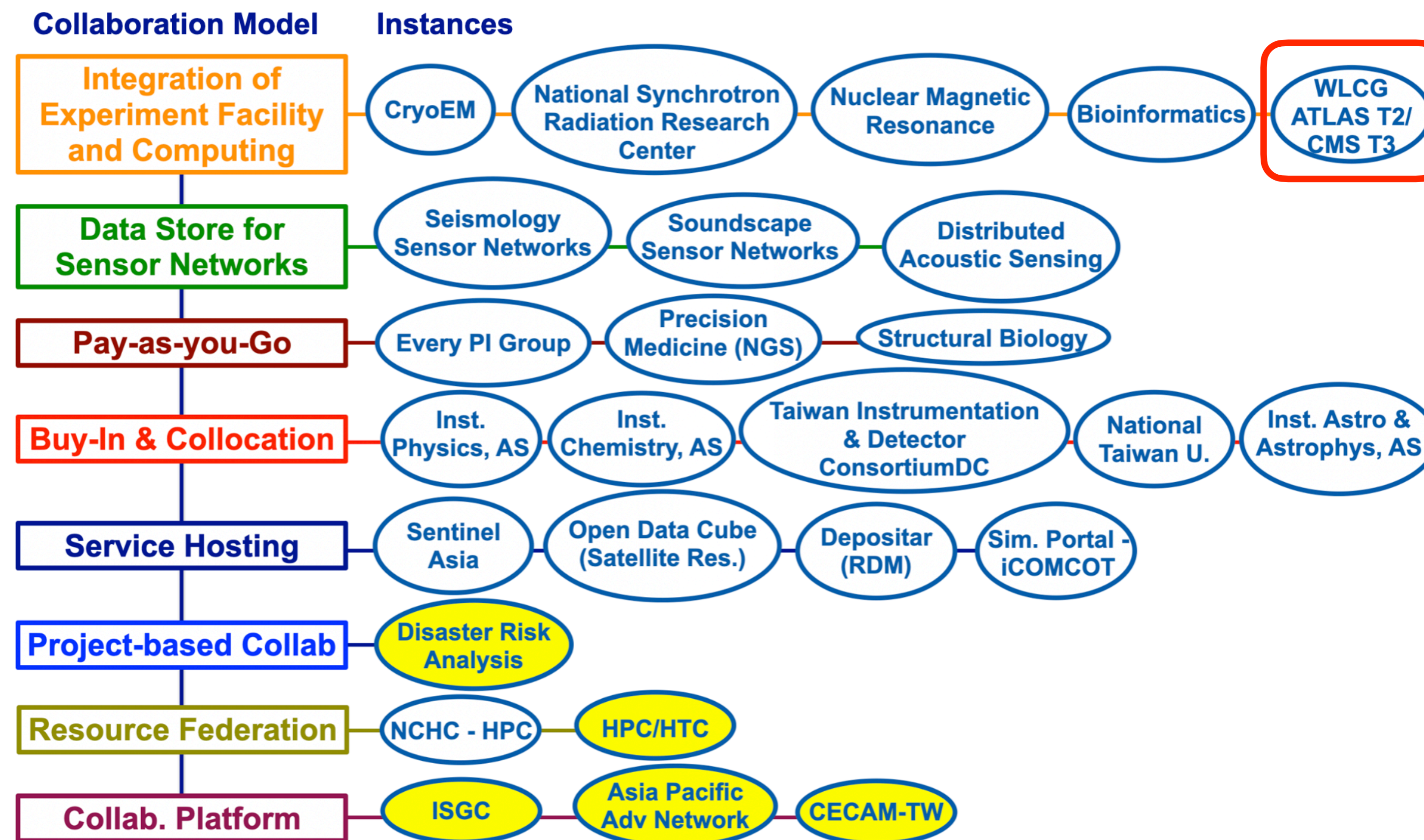
- Streamlined analysis pipeline cross ASCEM and ASGC facility
 - Saving the user cost of data download/upload and resource search, etc.
 - Browser only at user side: no need to setup and maintain software locally. ASGC will upgrade the software and associate GPU resource to it.
 - Local resource at PI lab is not a limit. User could access to scalable GPU @ASGC Cloud when they are required by multiple projects
- Customized software environment and workflow
- Application efficiency optimization
 - On-the-fly data transmission development: data efficiency improvement and reduced bandwidth requirement



AI-enabled Protein-related Tools

Flexible Collaboration Model

- Capacity building: for the ecosystem - user, application and resource
- Practices for open data & open Science - Hazard risk case studies
- AI for Science:
 - infrastructure/ platform/ software services,
 - domain-specific intelligent agent development & inferencing



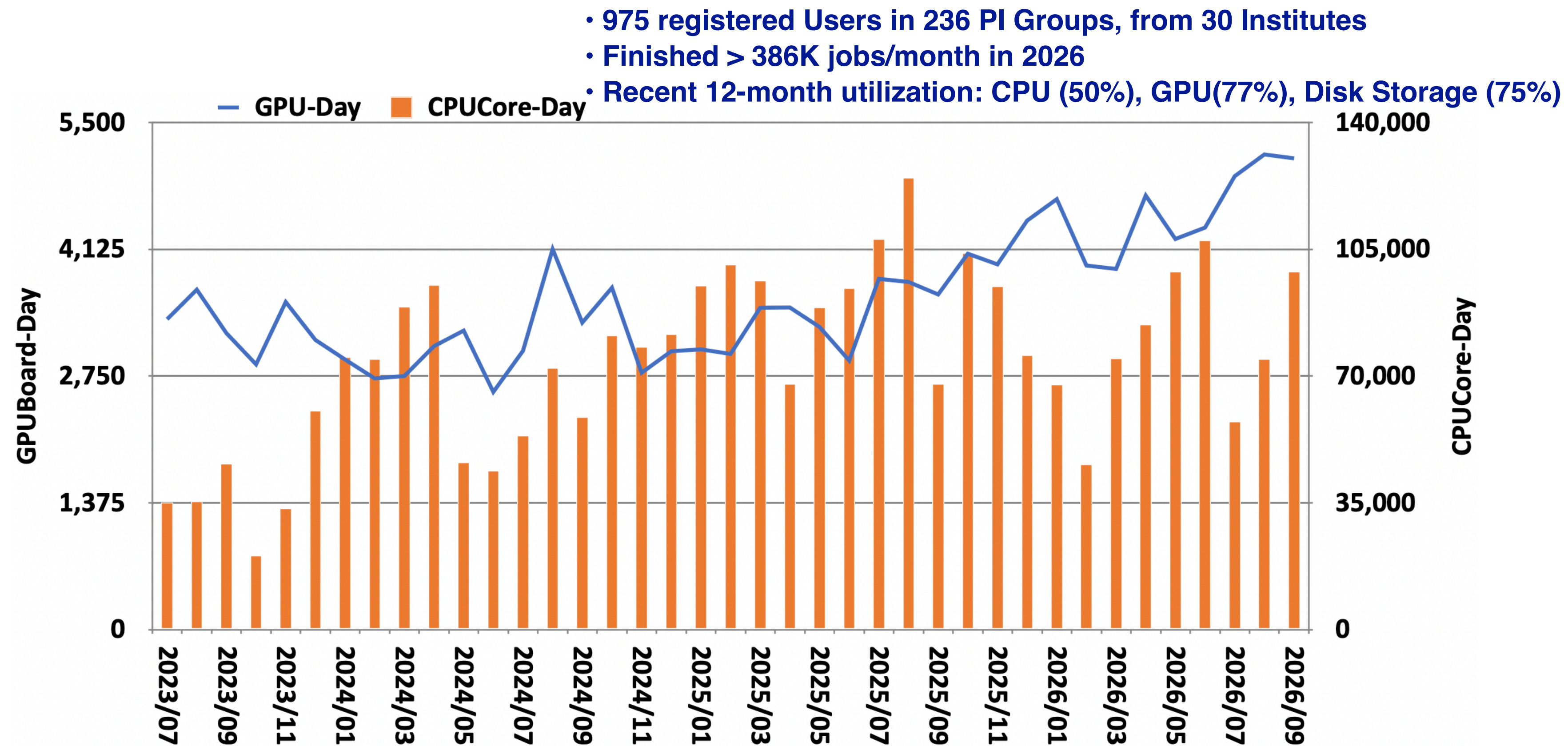
AS - Academia Sinica

NCHC - National Center for High-performance Computing

CECAM - Centre Européen de Calcul Atomique et Moléculaire

Sustaining our Mission - Scaling the Ecosystem

- Easier access to customized services without maintenance responsibilities
- Reliability and efficiency in 24x7x365
- Tackling complex computing challenges with federated capacity



Computing & Storage Resources

7,232 CPU Cores
188 GPU, 15PB Disk

CPU Cluster	Spec	CPU Cores	RAM(GB)/Core	Nodes	Performance (TFLOP/Core)	Network	Onboard Date	\$ /Core-Day
EDR2	AMD Genoa 9645	1,920	8	10		100Gb/HDR	Mar 2026	1.2
EDR1	AMD Genoa 9654	3,840 +960	8	20 +5	1.1	100Gb	Mar 2024, Dec 2024	1.2
Intel-G4	Intel Xeon 6448H	512	8	4	1	100Gb	Sep 2024	1.4

GPU Cluster	Spec	GPU	Architecture	Nodes	CPU Cores	Server RAM (GB)	CPU	Network	Onboard Date	\$/ GPU-Day
B6000	RTX 6000 96GB	8 +8	Blackwell	1 +1	32	1,536	Intel 6517Px2	200Gb	Mar 2026	127
B6000	RTX 6000 96GB	8 +8	Blackwell	1 +1	32	1,536	Intel 6517Px2	200Gb	Mar 2026	127
L40S	L40S 48GB	4	Ada Lovelace	1	32	768	AMD 9374x1	10Gb	Dec 2024	70
4090	RTX 4090 24GB	16	Ada Lovelace	2	40	1536	Intel 4416x2	10Gb	Jul 2024	60
3090	RTX 3090 24GB	56	Ampere	7	32	1024	AMD 7302x2	100Gb	Dec 2020	40
A100	A100 NVL 80GB	24	Ampere	3	64	512	AMD 7542x2	100Gb, NVL	Jun 2020	120
V100	Tesla V100 32GB	48	Volta	6	24	768	Intel 6126x2	10Gb, NVL	Dec 2018	35
P100	Tesla P100 16GB	16	Pascal	4	24	128	Intel 2650x2	10Gb, IB-FDR	Dec 2017	8

Storage	Capacity (TB)	System	Price	Remarks
Ceph File System	15,000	Online storage managed by Ceph distributed file system, with (8, 3) erasure coding	1,000 per TB-year	8PB funded by NSTC
Tape Lib System	10,000	LTO9 (18TB/Tape)	300 per TB-year	Service from 2025

+N Resource to be added after Nov. 2026

Resource in Yellow area is funded by NSTC

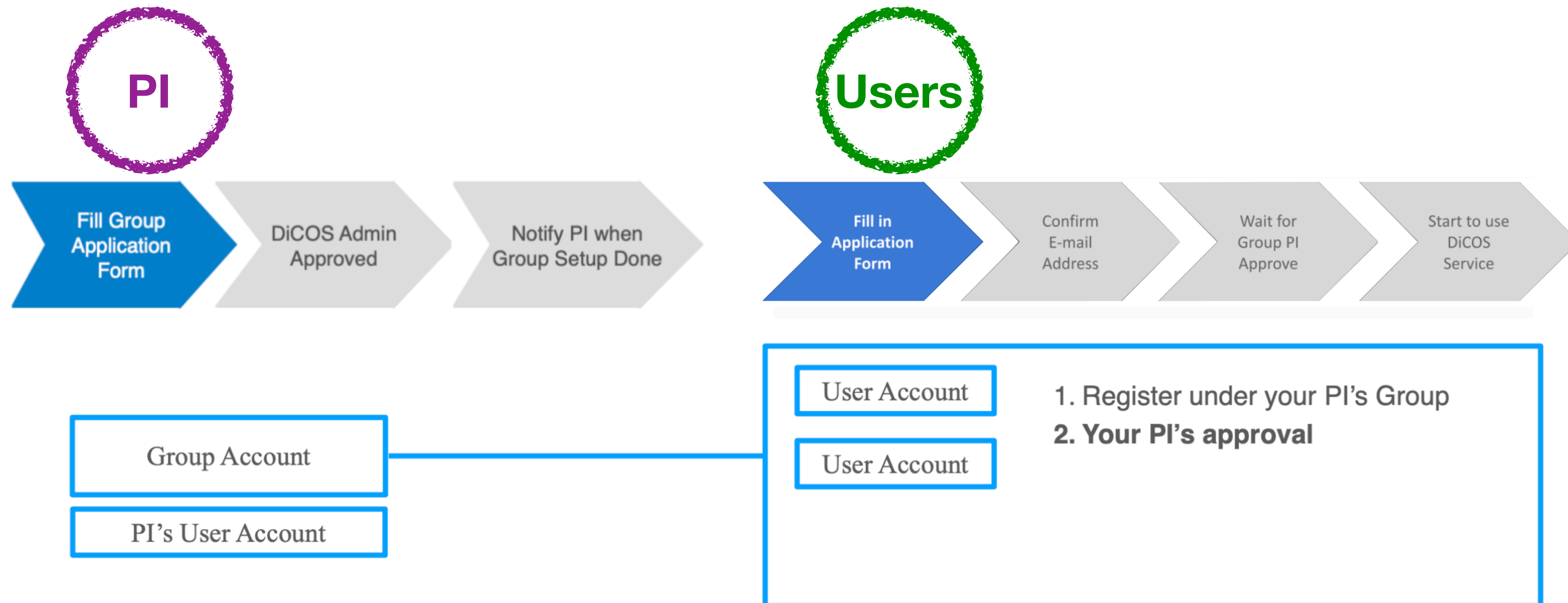
Scientist Could Focus on Scientific Questions

- Utilizing high-performance computing service by affordable cost 筆電價格即可使用整年高規格計算資源
 - 100CPUCore-Yr < NTD\$51,100
 - 1TB-Yr Disk = NTD\$1,000
 - 1xA100 (80GB RAM) GPU-Yr = NTD\$ 43,800
- Free quota for new every new user: NT\$ 200
 - 新使用者可有 NT\$ 200 免付費測試使用額度
- 若有特殊或急迫需求，請逕洽本團隊
- Storage System :
 - Free: 3TB shared space/group, 100GB/ user
 - Tape Storage: NT\$300/TB-Year
- Welcomed to share your requirements and questions

Access to NSTCCore Services

- Two-Factor Authentication enabled from January 2025
- Free \$200 Credits for 1-month Trial
- Free 3TB shared disk storage per group, and 100GB per user

- Group Resource Usage and Payment Management
- Member accounts management support
 - Members list
 - Abnormal member usage report
 - Member's usage review



• Group Accounts

- <https://canew.twgrid.org/ApplyAccount/groupcreate.php>

• User Accounts

- <https://canew.twgrid.org/ApplyAccount/ApplyAccount.php>

Group Management

- Members management
 - Members list
 - Abnormal member usage report
 - Member’s usage review

使用統計摘要(TOTAL SUMMARY TABLE)

使用明細(DETAILED USAGE ACCOUNTING)

使用明細(DETAILED USAGE ACCOUNTING)

使用者(username): chiong (CHAN-HIN IONG)

用量異常回報(submit issue)

Alert		#Instance	A100		FDR5		P100		RTX3090		V100	
			CPU (SRU)	GPU (SRU)	CPU (SRU)	GPU (SRU)	CPU (SRU)	GPU (SRU)	CPU (SRU)	GPU (SRU)	CPU (SRU)	GPU (SRU)
☐	relion311rtx3090	3							151	6,320		
☐	jupyterlabtf24gpu3090	2							11	474		
☐	matlab	2									0	6
☐	jupyterlabgpu26a100	1	1	519								
☐	openaccp100	1					11	282				
☐	FDR5 slurm	2			0	0						
☐	STORAGE USAGE (0.0 TB)											

使用者 (username)	姓名(name)	Email	Expired Date	Active	Joined Date	Last Login	Storage Usage (UI Home)
chiong	CHAN-HIN IONG	chiong@me.com	Jun. 13, 2024, 00:00 AM	True	Aug. 22, 2018, 00:00 AM	Jul. 31, 2023, 03:41 AM	33.4G/100G Latest Update: 2023-07-31 00:50:03
dickie	Dickie Chang	dickie.chang@twgrid.org	Oct. 12, 2023, 00:00 AM	True	Dec. 15, 2022, 07:16 AM		
eric	嚴漢偉 嚴漢偉	Eric.Yen@twgrid.org	Oct. 18, 2023, 00:00 AM	True	Mar. 11, 2019, 09:13 AM	Jul. 06, 2023, 04:37 AM	0.0G/100G Latest Update: 2023-07-31 00:50:03
ericyen	Eric YEN	Eric.Yen@twgrid.org	Dec. 08, 2023, 00:00 AM	True	Apr. 23, 2013, 00:00 AM	Jul. 24, 2023, 03:22 AM	0.0G/100G Latest Update: 2023-07-31 00:50:03
etomo	etomo etomo	etomo@twgrid.org	Aug. 09, 2025, 00:00 AM	True	Dec. 23, 2020, 09:19 AM	Jan. 22, 2021, 10:16 AM	0.0G/100G Latest Update: 2023-07-31 00:50:03
felixlee	Felix Lee	felix@twgrid.org	Oct. 24, 2023, 00:00 AM	True	Mar. 05, 2013, 00:00 AM	Jul. 27, 2023, 07:29 AM	436.3G/100G Latest Update: 2023-07-31 00:50:03

使用統計摘要(TOTAL SUMMARY TABLE)

使用明細(DETAILED USAGE ACCOUNTING)

計算資源使用統計(COMPUTING USAGE OF GROUP) – 預估使用費(INITIAL COST): NT \$15,878

使用者(username)	姓名(name)	CPU (SRU)	GPU (SRU)	預估費用 (Initial Cost Estimation)
chiong	CHAN-HIN IONG	175	7,601	15,552
jyou	Jingya You	1	54	110
rudy	陳侑廷	3	0	6
thwu	Tsung-Hsun Wu	4	101	210
總計	單價SRU=NT\$2	183	7,756	(183+7,756)*2=15,878

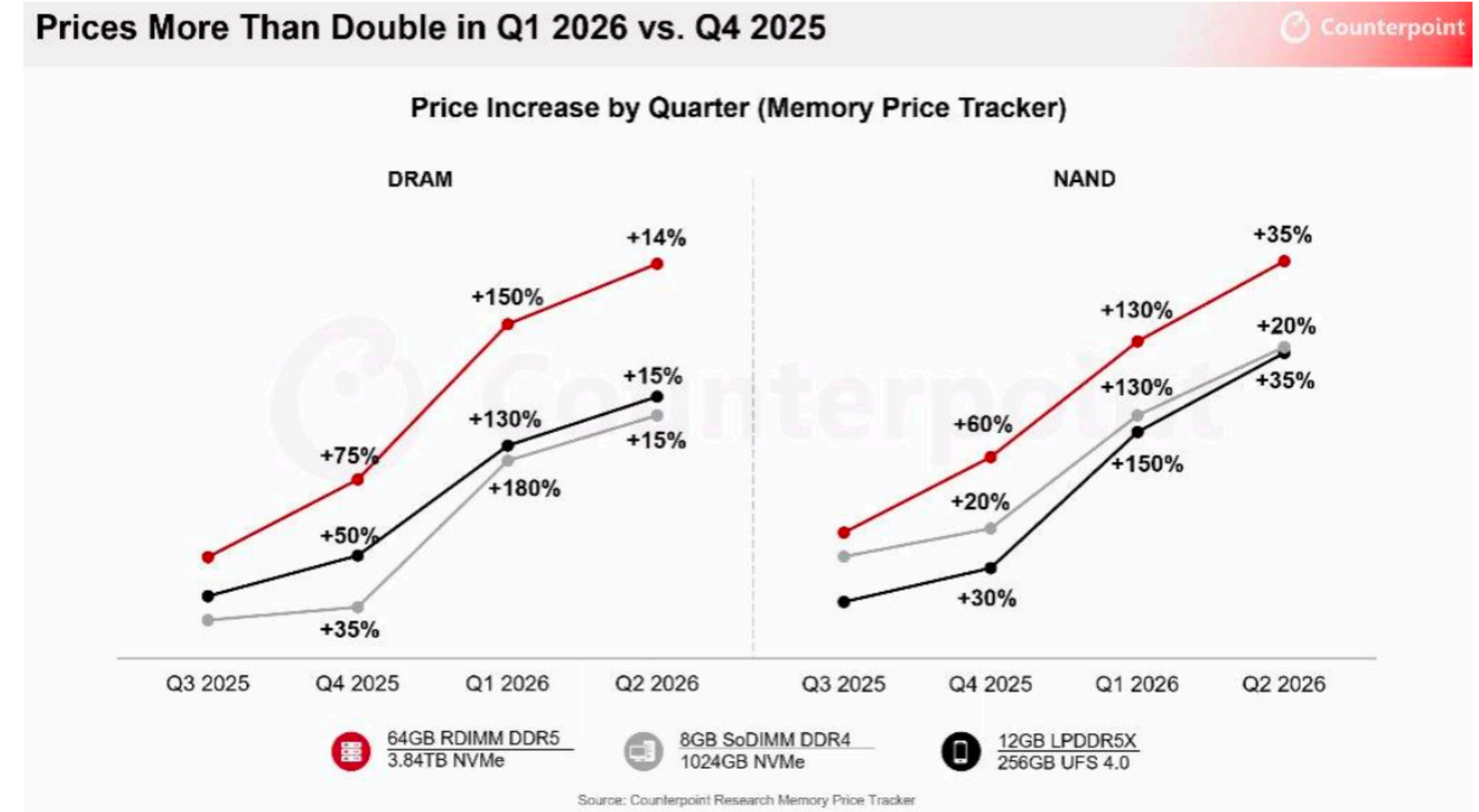
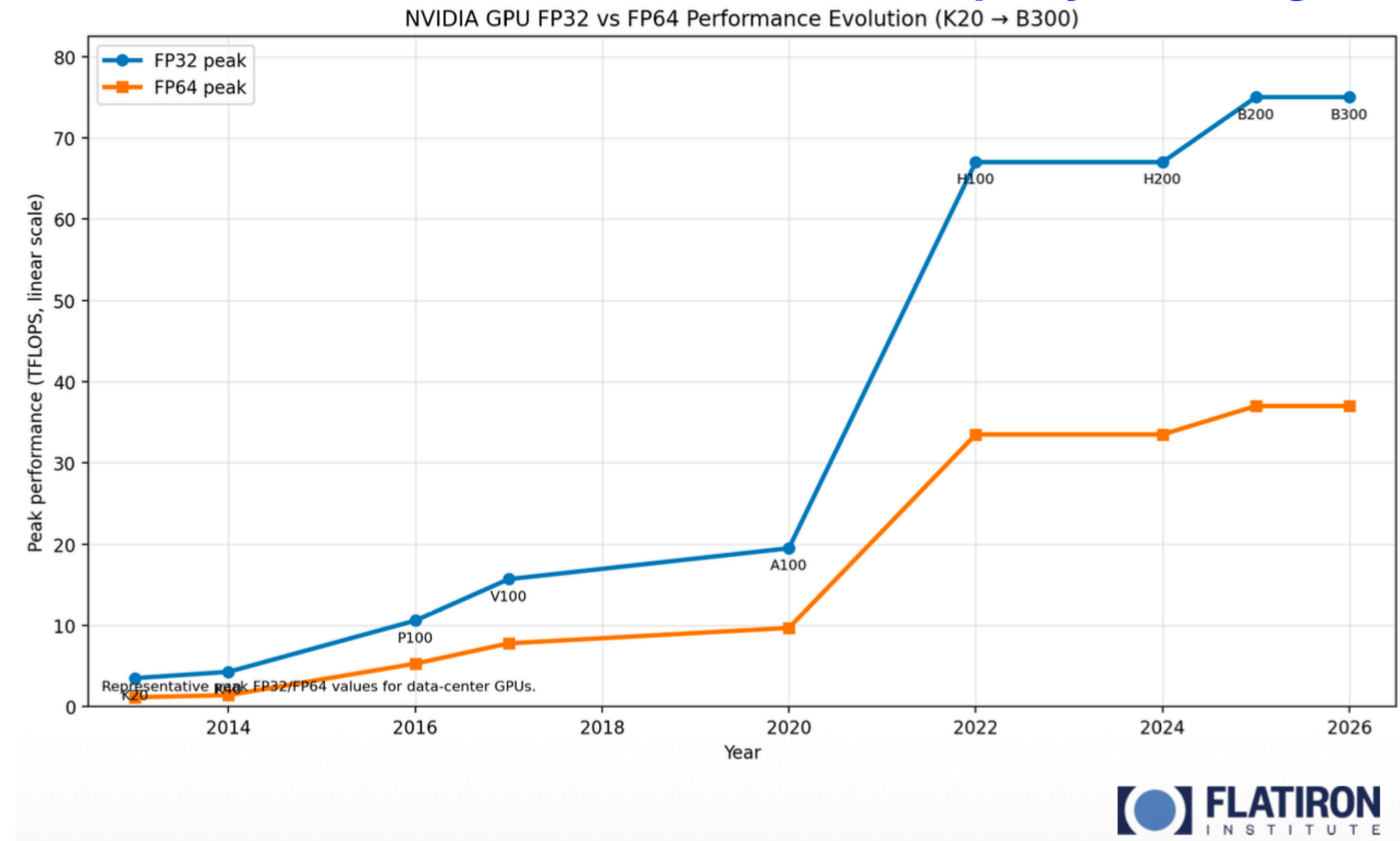
儲存資源使用統計(STORAGE USAGE OF GROUP) – 預估使用費(INITIAL COST): NT \$417

帳號(ID)	名稱(name)	儲存空間用量(storage(TB))	預估費用(Initial Cost Estimation)	說明(note)
ASGC	Group	0.0	0.0	Group使用空間
chiong	CHAN-HIN IONG	0.0	0.0	User使用空間
jyou	Jingya You	0.0	0.0	User使用空間
rudy	陳侑廷	0.0	0.0	User使用空間
thwu	Tsung-Hsun Wu	4.9	408.3	User使用空間

Tackle Common Challenges for Shared Resilience

- Better alignment with industry investment. We need to access to more efficient and more rapidly evolving GPUs

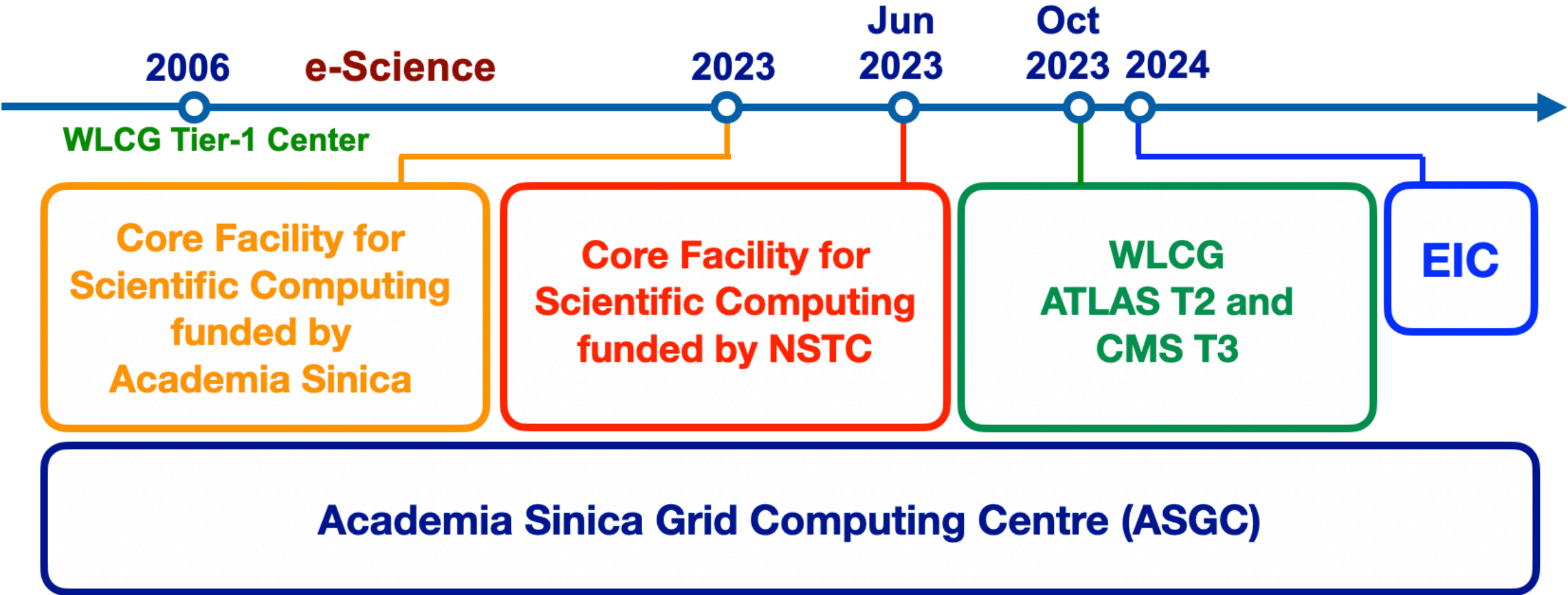
- Rising hardware cost - HW procurement & replacement models need to be revised



- AI for Science: Need to cope with the boom of agentic AI research applications
 - New services
 - Enhancement of both system efficiency and research applications
 - New paradigm of infrastructure and support - dynamic, low-latency and autonomous orchestration
- Security: Security Workshop @ISGC

ASGC Open Science Cloud - Accelerating Discovery & Innovation

- ASGC was founded for the deployment and development of WLCG system in 2005.
 - Operating ATLAS T1 (2005 - 2023), T2 (since 2005) and CMS T3 (since 2023)
- Vision: accelerating scientific discovery and empowering scientific computing ecosystem



Nuclear & Particle Physics	Astrophysics & Astronomy	Structural Biology
Quantum Material Physics	Earth Science	Drug Discovery
Active & Living Matters	Bioimaging	Computational Chemistry
Theoretical Physics	Mathematics	Biodiversity & Ecology

NSTCCore Contact Information

- **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**
- **Weekly User Meeting: 2:30pm, Wed, @IOP, AS**
- **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.

