Welcome & Appreciation

- On behalf of PI Prof. Yuan-Hann Chang and ASGC
- Great thanks to Prof. Jack KF Chen and colleagues of NTU Dept. Physics
- Today is the first thematic training event working together with & supported by user community
- Comment and suggestion are always welcomed - in order to be helpful for your research/education/ application

09:30 → 09:45 **一: 高效能計算服務教育訓練工作坊介紹 Introduction**

- 運算資源、服務內容和計價模式 (Resource, Service & Pricing)

Convener: Eric Yen (eric.yen@twgrid.org) (ASGC)

09:45 → 10:15 **二: 高效能科學運算服務介紹 HPC & Scientific Computing & Storage Service**

- 科學運算服務平台(Computing Service Platform)：SLURM & DiCOSApp
- 資料服務(Data Service)：資料備份及傳輸(Data Backup & Transfer)
- 軟體服務需求、環境部署

Convener: Jingya You

10:15 → 10:45 **休息 Break**

10:45 → 11:25 **四: 實作訓練：SLURM (Hands-on: SLURM)**

- 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: Rudy Chen (rudy.chen@twgrid.org)

11:25 → 11:45 **五、實作訓練: 資料操作和儲存服務 (Hands-on: Data Access & Storage Service)**

- 資料操作及工作儲存空間 (Job working space)
- 資料傳輸 (Data transfer)
- 資料備份 (Data backup)

Convener: Jingya You

11:45 → 13:00 **午餐 Lunch**

13:00 → 13:30 **六、: Hands-on: Computing Service for HEP & TIDC - Condor (Local Submission)**

Convener: Mr Felix Lee

13:30 → 14:00 **七、: Hands-on: Storage and Data Transfer for HEP & TIDC**

Convener: Mr Felix Lee

14:00 → 14:30 **休息 Break**

14:30 → 15:00 **八、: 高能物理及台灣聯合偵測器實驗室計算介紹 Computing Service for HEP & TIDC**

Conveners: Cheng-Han Wu (NCU) , Mr Kai-Feng Chen, You-Ying Li (NTU) , Yu-Hsuan Chou (NCU)

15:00 → 16:00 **九、: Hands-on: Analysis framework for HEP & TIDC**

Conveners: Cheng-Han Wu (NCU) , You-Ying Li, Yu-Hsuan Chou (NCU)

ASGC Is Enabling Innovations by Integrated Research Infrastructure - Connecting Instruments, Data, Minds, and Computing

- **ASGC is the primary computing arms in AS - by cloud-based research infrastructure**
  - **Integrating experiment/instruments and analysis facility**
  - **Batch and interactive job submission**
  - **Optimization of Data analysis pipeline and system efficiency**
  - **Collaborations: ATLAS, CMS, AMS, KAGRA, ICECube, Proton Therapy, CryoEM/Synchrotron Source, Astronomy, Condense Matter, Lattice QCD, NGS, Bioinformatics, Earth Science, Environmental Changes, etc.**
- **Resources: 20,090 CPU Cores; 236 GPU Cards; 30 PB Disk Storage**
- **Leverage the WLCG core technology and develop capacity to support broader scientific applications**

- **24/7/365 services since 2006**
  - **Data Center availability: 99%+**
  - **Scientific Computing Service reliability: 97%+**
  - **Daily average power consumption:10,326 KWH (2023), >20% reduction than 2022**
  - **Power saving efficiency: ~ 20% (cluster-based)**
  - **International Data Transmission (Inbound + Outbound, WLCG): > 21PB (2022)**
  - **Inside Data Center Traffic (Inbound + Outbound) > 1PB daily**
- **Reliability and Performance are the key objectives**
  - **User Scale：(#Groups, #Users) = (90, 350) (17 PI Groups of 12 Inst. are non-AS)**
  - **Finished #Jobs (2023 estimated): > 5,000,000 (40% for WLCG)**
  - **Supported research publications: >15 (15 in 2022, not including ATLAS & CMS)**
  - **Training and workshop: 5 events a year (4x training events + ISGC)**

Collaboration Aims To Carry Out our Jobs Efficiently

- **Reliability and Efficiency are the key focus**
- **New procured resource by end 2023**
  - **AMD Genoa: 1,792 Cores**
  - **CephFS: +3PB**
  - **LTO9 Tape Library: +4PB**
- **Continuous improvement according to user requirements and evolution of ICT**

Computing Activities

- AMD CPU Performance Tuning
- GPU Computing and Experience Sharing
- ML/AI-enabled data analytics
- ISGC 2024: 25-29 March 2024, Academia Sinica
  - Keynote speeches: ML/AI, Scientific Computing Advancement, etc.
  - Thematic Workshop: Security, Environmental Computing & Earth Science, Life Science, etc.
  - Sessions: HEP, Life Science, Earth Science, Cloud Computing, ML/AI, etc.

ASGC Services

- Weekly User Meeting: 1:20pm, Wed
- ASGC Web Site: https://www.twgrid.org
- Access to ASGC Resources
  - https://dicos.grid.sinica.edu.tw/
- Contact point: DiCOS-Support@twgrid.org