EuroCC Introductory Session

CaSToRC, Cyprus

THE CYPRUS INSTITUTE

RESEARCH · TECHNOLOGY · INNOVATION

EURO

Computation-based Sciece and Techonology Research Center - CaSToRC

CaSToRC is one of four research centers of The Cyprus Institute designated by the Government as the National HPC Competence Center for Cyprus with the mission to:

Cultivate the use of HPC, Simulation and Data Science and to serve the needs for compute- and data-intensive applications for academia, government and industry
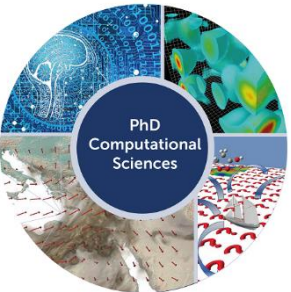
Objectives:

- To carry out research in computational sciences and engineering of international caliber

- To deliver graduate education programs in Simulation and Data Science, and Computational Sciences

- To provide advanced user support to academia and industry and access to a computational resources

CaSToRC – Educational Programmes

- Master of Science (MsC) degree in Simulation and Data Sciences (SDS)
  - Provide a unique interdisciplinary approach to solve critically important problems, using applied mathematics, physics, chemistry, biology, statistics and computing. Through modelling, simulation, data mining, and study of specific phenomena via computer analysis, students will learn to apply computation and data analytics to gain new insights.

- Doctor of Philosophy in Computational Sciences
  - Educate students and carry out significant research in Computational Science with specialization in important fields that require High Performance Computing such as Climate Modelling, Computational Physics, Machine Learning, Scientific Computing, Computational Chemistry, 3D Visualization and Computational Biology.
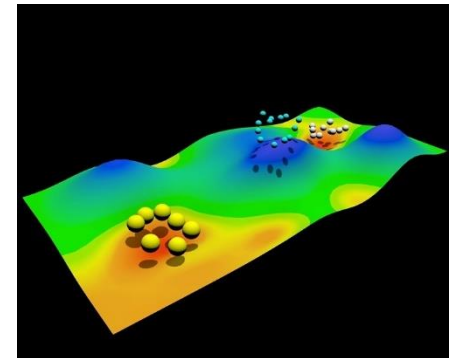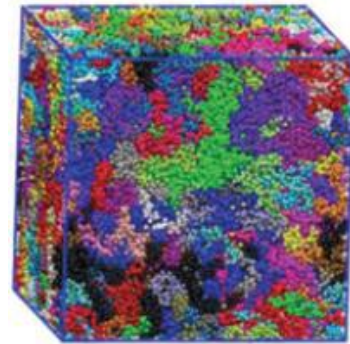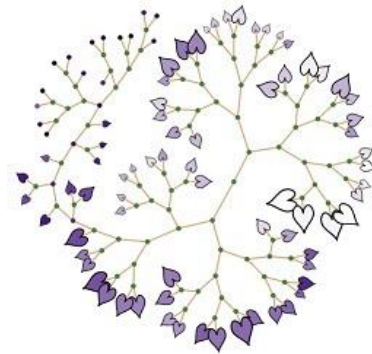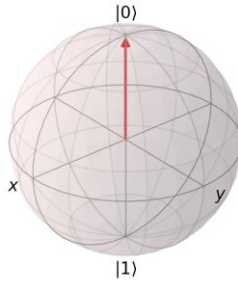
- European Joint Doctorates: SimulaTIon in MUltiscaLe physicAl and biological sysTEms (STIMULATE)
  - Delivers an interdisciplinary European Joint Doctorate (EJD) program in computational science, which educates students to best address the challenges posed by exascale computing and data-intensive science
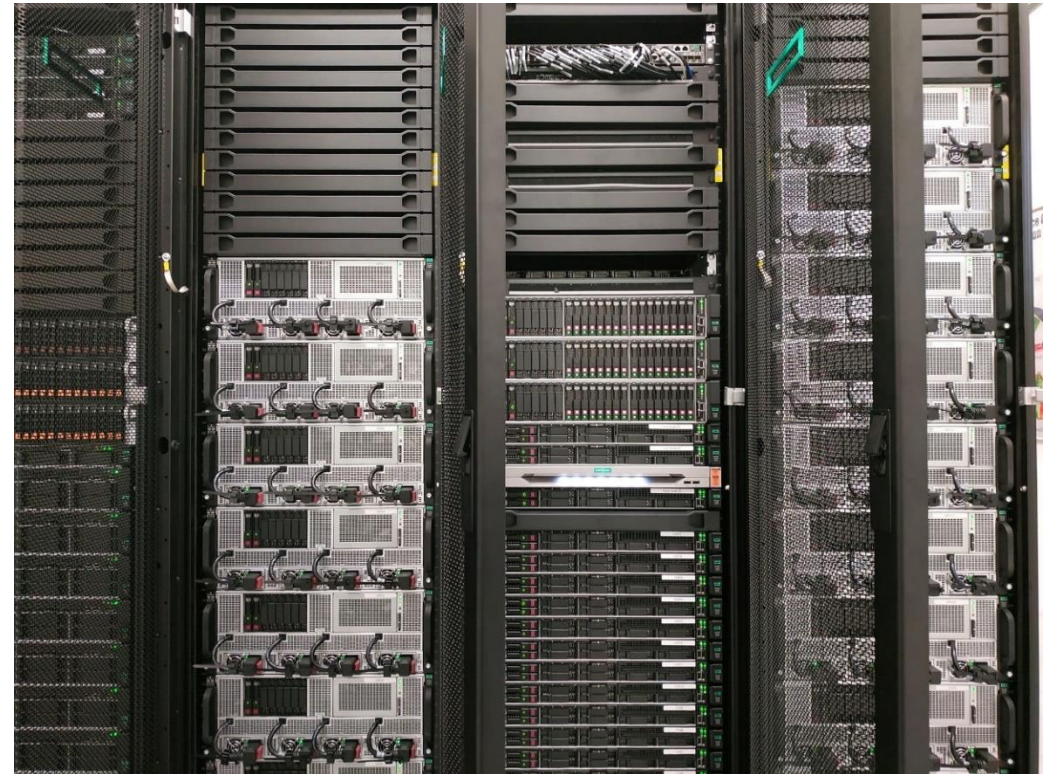
CaSToRC - Research

- Research in Computational Sciences is carried out in the following fields:
    - Modelling and algorithms
    - Data Science
    - Climate Modelling
    - Computational Physics
    - Computational Engineering
    - Computational Biology
    - Quantum Computing

CaSToRC - Infrastructure

- The main HPC System available via CaSToRC is Cyclone
    - Hybrid System
    - Peak/Sustained Performance
        - ~600 TFlop/s
    - Number of Nodes
        - 17 forty-core compute nodes
        - 16 forty-core compute nodes each with 4 NVidia V100 GPUs
- Other prototype systems
- Cyclone is the production platform for academia
- A dedicated machine will be procured for industrial applications

CaSToRC - Projects

- CaSToRC is participating in the following ongoing EU projects

Coordination of the European Joint Doctorate programme STIMULATE

WP2 and WP3 Co-Leader Leader of WP8 LyNcs project

"Linear Algebra, Krylov-subspace methods, and multigrain solvers for the discovery of New Physics"

Build up a science community, especially R&D and technology needs of the SESAME Members and beyond

ERA-Chair: Computation-Based Engineering for "computer design of materials and processes" via novel algorithmic approaches and computational tools.

Support the development and inclusion of the national Open Science Cloud initiatives in 15 Member States and Associated Countries in the EOSC governance

CaSToRC – NCC People

- Principal Investigator
  - Professor Constantia Alexandrou, Director of CaSToRC and Institute Professor

- EuroCC Champions
  - Competence Mapping
    - Stelios Erotokritou, Nikos Bakas
  - Training, Twinning, Mentoring
    - Jacob Finkenrath, Kyriacos Hadjiyiannakou, Simone Bacchio
  - Industrial Interaction
    - Christos Christodoulou, Nikos Savva
  - Dissemination/Awareness
    - Stelios Erotokritou, Andreas Gavrielides

CaSToRC – NCC Tasks

- Task 6.1: National Competence Centre Management
- Task 6.2: Training and Skills Development
- Task 6.3: Technology Transfer/Business Development
- Task 6.4: Collaboration with Industry
- Task 6.5: Mapping of HPC/Big Data/AI Technical Competences
- Task 6.6: Facilitation of access to scientific and technical expertise and knowledge pools
- Task 6.7: Awareness Creation and Collaboration

CaSToRC – NCC Tasks

- Task 6.1: National Competence Centre Management
  - Management of the HPC competence centre in close coordination with WP1
  - Definition of the roadmap for the NCC
  - Monitoring and quality control of the NCC deliverables
  - Risk matrix and monitoring to prevent issues
  - Hiring of NCC personnel
- Task 6.2: Training and Skills Development
  - Continuously updated map of the emerging needs in view of the future roadmap
  - Training and Skills Development for both
    - Personnel of the NCC
    - User communities - including users of the EM region

CaSToRC – NCC Tasks

- Task 6.3: Technology Transfer/Business Development
  - Establish the appropriate mechanisms for technology transfer and consultancy
    - NCC will maintain state-of-the-art HPC know-how, tools and services
  - Setup consultancy services
  - Advising local stakeholders for best practices, industry partnerships for R&D projects and facilitate bringing new technologies to the market
- Task 6.4: Collaboration with Industry
  - Supporting start-ups and spin-offs. Industrial scouting for outreach and networking to attract industrial users and develop common projects through partnerships
  - Annual industry week
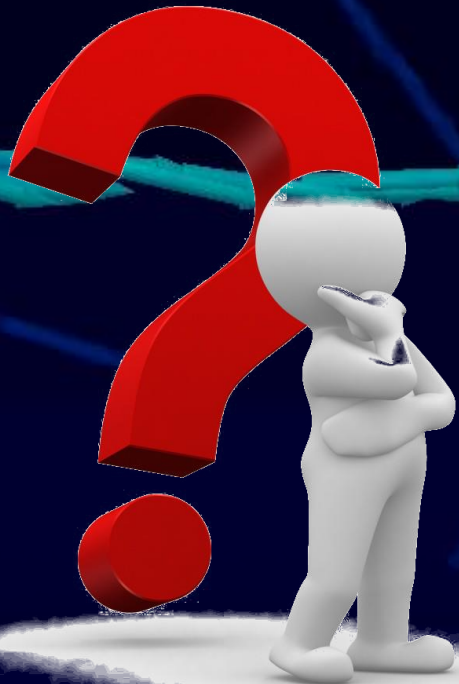   - Bringing academia and industry together to promote co-development.

CaSToRC – NCC Tasks

- Task 6.5: Mapping of HPC/Big Data/AI Technical Competences
  - NCC will continuously assess these competences among academia/industry/government
  - Assess future needs and map to the technical competencies required to respond to these needs
- Task 6.6: Facilitation of access to scientific and technical expertise and knowledge pools
  - High Level Support team will promote the intake of HPC
    - Provide support for accessing HPC infrastructure
    - Assess training needs
    - Provide tools for code development

CaSToRC – NCC Tasks

- Task 6.7: Awareness Creation and Collaboration
  - Dissemination material for each target group (academia, industry, government)
  - Maintain the www.castroc.cyi.ac.cy website for it to act as a single online presence for users from Cyprus and the Eastern Mediterranean region to access and benefit from the services available to them by EuroCC and EuroHPC

- Competence Mapping
  - This has already been carried out in the past
  - This will be reviewed and updated for the envisioned competences for the Cyprus (and regional) user community

Thank You!

Questions?

The Cyprus Institute
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