

Workshop Computing@CSN5



Report of Contributions

Contribution ID: 1

Type: **not specified**

Institutional Greetings

Monday, 14 October 2024 14:00 (30 minutes)

Contribution ID: 2

Type: **not specified**

ReCaS

Presenter: DI BARI, Domenico (Istituto Nazionale di Fisica Nucleare)

Contribution ID: 3

Type: **not specified**

Data Cloud for medical applications in the PNRR context and beyond

Monday, 14 October 2024 15:15 (30 minutes)

Presenter: MARTELLI, Barbara (Istituto Nazionale di Fisica Nucleare)

Contribution ID: 4

Type: **not specified**

PNRR FAIR (spoke 8): GPU demanding tasks in medical imaging applications

Monday, 14 October 2024 15:45 (15 minutes)

Presenter: LIZZI, Francesca (Istituto Nazionale di Fisica Nucleare)

Contribution ID: 5

Type: **not specified**

FAIR Project: Simulations of learning, consciousness, dreaming and deep sleep

Monday, 14 October 2024 16:30 (30 minutes)

Presenter: PAOLUCCI, Pier Stanislao (Istituto Nazionale di Fisica Nucleare)

Contribution ID: 6

Type: **not specified**

INFN DataCloud: an infrastructure that brings together hardware, software, services and know-how to support scientific applications

Monday, 14 October 2024 17:00 (30 minutes)

Presenter: DONVITO, Giacinto (Istituto Nazionale di Fisica Nucleare)

Contribution ID: 7

Type: **not specified**

Exploiting HPC resources in neuroscience: Cobrawap and the EBRAINS-Italy PNRR project

Monday, 14 October 2024 17:45 (15 minutes)

Presenter: LUPU, Cosimo (Istituto Nazionale di Fisica Nucleare)

Contribution ID: 8

Type: **not specified**

Supporting the development of Machine Learning for fundamental science in a federated Cloud with the AI_INFN platform

Tuesday, 15 October 2024 09:45 (30 minutes)

Presenter: BARBETTI, Matteo (INFN CNAF)

Contribution ID: 9

Type: **not specified**

next_AIM: DL techniques for medical applications: SW overview and infrastructure requirements

Tuesday, 15 October 2024 10:15 (15 minutes)

Presenter: POSTUMA, Ian (Istituto Nazionale di Fisica Nucleare)

Contribution ID: 11

Type: **not specified**

GPU for analytical and Montecarlo calculations in Treatment planning

Tuesday, 15 October 2024 12:00 (30 minutes)

Presenter: Prof. SCHIAVI, Angelo (La Sapienza - INFN Roma 1)

Contribution ID: 12

Type: **not specified**

Geant4 Monte Carlo simulations for medical physics applications and novel radiotherapy techniques

Tuesday, 15 October 2024 12:30 (15 minutes)

Presenter: MILLUZZO, Giuliana Giuseppina (Istituto Nazionale di Fisica Nucleare)

Contribution ID: 13

Type: **not specified**

PNRR-THE: multi-scale modelling for simulation of the intra-cell dynamics following FLASH irradiation

Tuesday, 15 October 2024 15:00 (20 minutes)

Presenter: TOZZINI, Valentina (Istituto Nazionale di Fisica Nucleare)

Contribution ID: 14

Type: **not specified**

AI driven and mechanistic Biophysical modeling

Tuesday, 15 October 2024 15:20 (25 minutes)

Presenter: CORDONI, Francesco Giuseppe (Istituto Nazionale di Fisica Nucleare)

Contribution ID: 15

Type: **not specified**

Conclusions

Contribution ID: 16

Type: **not specified**

Complex networks in computational neuroscience

Tuesday, 15 October 2024 17:00 (15 minutes)

Presenter: LA ROCCA, Marianna (BA)

Contribution ID: 17

Type: **not specified**

Large-scale neuronal network models of memory and learning mediated by synaptic plasticity

Tuesday, 15 October 2024 17:15 (15 minutes)

Presenter: Mr TIDDIA, Gianmarco (Istituto Nazionale di Fisica Nucleare, Sezione di Cagliari)

Contribution ID: **18**

Type: **not specified**

The BEAMIDE spin-off and the MRADSIM toolkit

Wednesday, 16 October 2024 09:45 (30 minutes)

Presenter: BARTOLINI, Giovanni (Istituto Nazionale di Fisica Nucleare)

Contribution ID: 19

Type: **not specified**

Dorian Technologies: Quantification in nuclear medicine

Wednesday, 16 October 2024 10:15 (30 minutes)

Presenter: BOSCO, Paolo (INFN - Pisa)

Contribution ID: 20

Type: **not specified**

Artificial Intelligence for Tomosynthesis

Wednesday, 16 October 2024 11:15 (30 minutes)

Presenter: METTIVIER, Giovanni (Istituto Nazionale di Fisica Nucleare)

Contribution ID: 21

Type: **not specified**

The COBIODE Project

Wednesday, 16 October 2024 11:45 (30 minutes)

Presenter: TRUCCO, Gabriella (Istituto Nazionale di Fisica Nucleare)

Contribution ID: 22

Type: **not specified**

Kubernetes technologies for ML-based solutions

Wednesday, 16 October 2024 12:15 (30 minutes)

Presenter: GATTARI, Mauro (Istituto Nazionale di Fisica Nucleare)

Contribution ID: 23

Type: **not specified**

GPU-accelerated dose engine for adaptive particle therapy

Tuesday, 15 October 2024 12:45 (15 minutes)

Presenter: GALEONE, Cosimo

Contribution ID: 24

Type: **not specified**

HPC Status and Perspectives in Europe

Monday, 14 October 2024 14:30 (45 minutes)

Presenter: VICINI, Piero (Istituto Nazionale di Fisica Nucleare)

Session Classification: keynote

Contribution ID: 25

Type: **not specified**

Quantum ML

Tuesday, 15 October 2024 09:00 (45 minutes)

Presenter: GIAGU, Stefano (Sapienza Università di Roma and Istituto Nazionale di Fisica Nucleare)

Session Classification: keynote

Contribution ID: 26

Type: **not specified**

Geant4INFN - link with CSN5 project and international collaboration

Tuesday, 15 October 2024 11:15 (45 minutes)

Presenter: PANDOLA, Luciano (Istituto Nazionale di Fisica Nucleare)

Session Classification: keynote

Contribution ID: 27

Type: **not specified**

next_AIM: overview and challenges in medical image analysis

Presenter: Prof. OLIVA, Piernicola

Session Classification: keynote

Contribution ID: 29

Type: **not specified**

Technological Transfer at INFN

Wednesday, 16 October 2024 09:00 (45 minutes)

Presenter: CESTELLI GUIDI, Mariangela (Istituto Nazionale di Fisica Nucleare)

Session Classification: keynote

Contribution ID: **30**

Type: **not specified**

Artificial Intelligence for BNCT: current applications and future prospects

Monday, 14 October 2024 17:30 (15 minutes)

Presenter: FATEMI, Setareh (Istituto Nazionale di Fisica Nucleare)

Contribution ID: 31

Type: **not specified**

EuroHPC JU Projects for High-Performance Networks for HPC

Tuesday, 15 October 2024 15:45 (30 minutes)

Presenter: BIAGIONI, Andrea (Istituto Nazionale di Fisica Nucleare)

Contribution ID: 32

Type: **not specified**

Large scale computing for designing plasma-based particle accelerators

Tuesday, 15 October 2024 16:45 (15 minutes)

Plasma accelerators can enable accelerator based applications at the university campus or large hospital level thanks to their reduced footprint and relatively low acquisition and operation costs. Their operation is described by the Vlasov-Maxwell equations coupled to the Lorentz force equation, so that their design requires solving of a system of highly non-linear partial differential equations; moreover, the physical problem is multi-scale (cm to 10s of μm). Baseline configurations can be obtained by reduced physics models running on desktops, but the complete study of jitters and instabilities need running fully 3D Particle In Cell (PIC) codes. These runs may require up to $10^5 - 10^6$ hours/core and produce terabyte of data; hence the need for large scale computational farms, efficient algorithms and dedicated storage. In this contribution, we showcase a selection of simulation codes and the result of their application to the EuPRAXIA and EuAPS projects.

Presenter: DEL DOTTO, Alessio (Istituto Nazionale di Fisica Nucleare)

Contribution ID: 33

Type: **not specified**

Imaging algorithms for online dosimetry in BNCT

Tuesday, 15 October 2024 10:30 (15 minutes)

Presenter: RAMOS LOPEZ, Dayron (Istituto Nazionale di Fisica Nucleare)