

ISS contributions for LUXE

Veta Ghenescu

Institute of Space Science, Bucharest, ROMANIA



INSTITUTE OF SPACE SCIENCE legal subsidiary of the National Institute for Laser, Plasma and Radiation Physics (INFLPR) (https://www2.spacescience.ro)

Structure:

- High Energy Astrophysics and Advanced Technologies;
- Cosmology and Astroparticle Physics;
- Theoretical Physics;
- Space Plasma and Magnetometry;
- Space Applications for Health and Safety;
- Gravity, Microgravity and Nanosatellites;



Mission and goals:

- To involve in ground-based experiments of national and international interest;
- To involve in satellite and space missions of international interest;
- To develop space science technology facilities;
- To develop and improve a strong computational and theoretical infrastructure to support the R&D in space science and HEP;



International Ground Experiments:

- *ALICE* – "A Large Ion Collider Experiment" – LHC – CERN, Geneva;

- ANTARES – "Astronomy with a Neutrino Telescope and Abyss

environmental RESearch" - Mediterranean See;

- AUGER – Pierre Auger Observatory, Malargue, Argentina;

- *BECQUEREL* - Heavy ion experiments in nuclear emulsions – JINR – Dubna, Russia;

- CLICdp CERN, Geneva;
- FAIR GSI, Darmstadt;
- FCAL DESY, Germany;
- NUSTAR R3B "Reactions with Relativistic Radioactive Beams".



Space Missions and ESA programmes:

- *CLUSTER* – ESA mission

- *KEEV* - "Kinetic and Experimental Investigation of Earth's and Venus plasma layers" – ESA Project

- *ECSTRA* "Energy conversion and transfer in the solar wind magnetosphere ionosphere system" ESA/PECS project
- **EUCLID** ESA mission
- *Planck* ESA mission
- RoSpaceGRID "Romanian GRID middleware repository for Space

Science Applications" - ESA/PECS project

MC simulations:

- based on previous experience on the FCAL Collaboration,
- cross-checked by other specialists involved ongoing (e.g. TAU)

□ Hardware:

- Data acquisition system software development under EUDAQ framework
- SiPM detectors for Cherenkov detector based on previous ISS team experience (e.g. ESA SUVDET project)

Computing resources

 based on previous ISS experiences (e.g ALICE Collaboration, Planck and Euclid ESA Missions, etc.)

□ Test-beam campaigns

data taken and data analysis from different LUXE ECAL prototypes.

Computing resources – ISS capability



- →Designed for high density computing (Hot Aisle, InRow cooling);
- →Scalable solution for future investments;
- →UPS Power : 48 kVA (with N+1 redundancy power units);
- →Cooling capacity : 80 kW installed (2N capacity redundancy)

Cluster	Cores*/storage
ISS-ALICE	1424 / 2.41 PB
RO-13-ISS	128 / 100 TB
Euclid- OpenStack	1536 / 30 TB
Total	3088 / 2.54 PB
*HT is act	ivated

- ISS-ALICE use AliEn Grid Framework, dedicated to CERN ALICE Collaboration;
- RO-13-ISS use Unified Middleware Distribution (UMD) and the resources are used by Alice Collaboration and Auger Collaboration;
- Euclid-OpenStack is used by ESA Euclid and Planck missions.



 ISS manpower for LUXE experiment are involved in other collaborations and projects.

	Estimate FTE (for a 3-year period)	
	Senior researcher	
MC simulation	0.6	
Hardware	0.6	
Computing	0.25	
TB campaign	1 or 2 researcher for the upcoming test beam campaigns	



THANK YOU FOR YOUR ATTENTION