PERSONAL INFORMATION

Cristian De Santis

Affiliation
National Institute for Nuclear Physics (INFN)
Sezione di Roma Tor Vergata
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WORK EXPERIENCE

March 2010 - now

Technologist

National Institute for Nuclear Physics (INFN) - Sezione di Roma Tor Vergata (Rome, Italy)

May 2021 - now
Member of the Cluster Tecnologico Nazionale Aerospazio (CTNA) – GdL 3 “Advanced Data Acquisition, Transmission and Processing Systems”.

March 2021 - March 2024
INFN Principal Investigator for the Italian Space Agency (ASI) contract for Industrial Research projects and / or Experimental Development “Tecnologie Abilitanti Trasversali - Progetto “SpaN” (lead by Neat s.r.l.) devoted to the upscreening of a "custom" safety / mission critical computer for use in space (Low Earth Orbit, LEO).
Responsibility: study and characterization of the radiation environment in LEO missions according to ECSS standards and management of radiation hardness test at Italian (ASI-INFN ASIF Agreement) and international beam test facilities.

March 2019 - now
In the framework of the second Chinese satellite mission Chinese Seismo-Electromagnetic Satellite (CSES-02), Project Manager of the Limadou-2 Project, lead by ASI and INFN in collaboration with INAF, CNR, University of Trento, University of Rome Tor Vergata ans University of Turin. Responsible for organization, management and control of the project with particular regard to:

- design, manufacturing, integration, test and calibration and flight operations of two payloads: the High Energy Particle Detector (HEPD-02) and the Electric Field Detector (EFD-02)
- Support to the Product & Quality Assurance and Safety activities of the project with particular regard to development, Assembly, Integration & test activities (AIT), commissioning and in-flight operations of HEPD-02 and EFD-02
- Technical management of relations with the Chinese developers of the CSES-02 satellite with particular regard to the integration and test of HEPD-02 and EFD-02 detectors on board the satellite

September 2013 - now
In the framework of the Chinese satellite mission Chinese Seismo-Electromagnetic Satellite (CSES), Project Manager of the Limadou Project, lead by ASI and INFN in collaboration with INAF, INGV, University of Trento, University of Rome Tor Vergata ans UniNettuno University. Responsible for organization, management and control of the project with particular regard to:

- the development of the High Energy Particle Detector (HEPD) payload launched on board the CSES satellite in February 2018 (“Limadou fase B/C/D1” and “Limadou fase D2” projects):
  - design, manufacturing, integration, test and calibration of HEPD
  - integration and test of HEPD on board the CSES satellite
  - pre-launch test, in-orbit verification and commissioning activities of HEPD
- management of the in-flight operations of HEPD (“LIMADOU fase E/Operazioni” and LIMADOU Operazioni-FO” projects) in collaboration with the developers of the CSES satellite (DFH Satellite Co., Ltd, China)
- Product & Quality Assurance and Safety management of the project with particular regard to development, Assembly, Integration & test (AIT), commissioning activities and in-flight operations of HEPD
- development, construction, test of the Engineering Model of the Electric Field Detector (EFD)
- technical coordination of the contracts (Limadou Scienza and Limadou Scienza+) on:
  - scientific activities related to the exploitation of the data produced by HEPD and the other payloads of the CSES mission
  - management of the Italian Ground Segment at the Space Science Data Center (SSDC) of ASI.

April 2012-August 2013
In the framework of the JEM-EUSO (Extreme Universe Space Observatory) program for the realization of a space mission for scientific research on the highest energy cosmic rays, responsible for the development team of the CPU data-handling software of two pathfinder experiments of the

program:
- EUSO-Balloon, flight on a stratospheric balloon funded by the French space agency (CNES), which flew on August 25, 2014 from the Timmins base (Canada);
- EUSO-TA, in operation since February 2015 at the Telescope Array (TA) in the Utah desert (USA).

October 2011-December 2012
In the framework of the SuperB project, high luminosity electron-positron collider, responsible for the design and development of the back-end database of the experiment and of some modules of the distributed computing production system.

March 2010-December 2017
In the framework of the PAMELA satellite experiment (Payload for Antimatter Matter Exploration and Light-nuclei Astrophysiscs), responsible for:
- PAMELA data download operations at JSC-RSS (Moscow, Russia) for the PAMELA international collaboration and their transfer to INFN-CNAF
- planning and cost management of ASI-INFN contract activities "PAMELA: scientific activities of data analysis and instrument calibration"

Business or sector Scientific Research

May 2009 - February 2010

Research Fellow

National Institute for Nuclear Physics (INFN) - Sezione di Roma Tor Vergata (Rome, Italy)

In the framework of the PAMELA satellite experiment (Payload for Antimatter Matter Exploration and Light-nuclei Astrophysiscs), responsible for:
- development of algorithms and C / C ++ applications for data analysis
- data analysis of the light nuclei component in cosmic rays

Business or sector Scientific Research

April 2008 - April 2009

Research Fellow

University of Rome Tor Vergata, Department of Physics (Rome, Italy)

In the framework of the PAMELA satellite experiment (Payload for Antimatter Matter Exploration and Light-nuclei Astrophysiscs), responsible for:
- development of algorithms and C / C ++ applications for data analysis with particular regard to the optimization of the light nuclei tracking algorithm
- data analysis of the light nuclei component in cosmic rays
- design, implementation and administration of a distributed, scalable and highly available computing cluster optimized for the experiment analysis software at the INFN Division of Rome Tor Vergata

In the framework of the ALTEA (Anomalous Long Term Effects on Astronauts) experiment on board the International Space Station (ISS), responsible for:
- development of algorithms and applications by means of databases and C / C ++ applications for the experiment data analysis

Business or sector Scientific Research

July 2002 - March 2008

Research Fellow

National Institute for AstroPhysics (INAF) - Osservatorio Astronomico di Roma (Monteporzio, Italy)

Responsible for design, development and test of the pipeline for the data analysis of the Large Binocular Camera (LBC) of the Large Binocular Telescope (LBT) with particular regard to: camera calibration and telescope focusing; data management via database and pre-reduction; data reduction and analysis

Responsible for design, development and test of algorithms and applications for: data reduction of the Large Binocular Camera (LBC) of the Large Binocular Telescope (LBT); multi-band image analysis suitable for data produced by ground and space telescopes; analysis of deep multi-band images through the use of databases and the development of an integrated web interfaces.

Business or sector Scientific Research

December 2001 - June 2002

Junior Software Developer

Faraday s.r.l. (Rome, Italy)

Project engineer for design, development and test of simulation applications of the Large Binocular Camera (LBC) of the Large Binocular Telescope (LBT) for: creation of artificial astronomical images, simulation of images obtained in different observational conditions, simulation of images obtained by optical instruments of the LBC.

Business or sector Information Technology

September 2001 - December 2001

Research Fellow

Osservatorio Astronomico di Roma (Monteporzio, Italy)

Responsible for the development of applications for the automation of the pipeline for the analysis and image reduction of the Very Large Telescope (VLT)

Business or sector Scientific Research

EDUCATION AND TRAINING

2009-2014

PhD in Physics

University of Rome Tor Vergata (Rome, Italy)

Nuclear and sub-nuclear physics, cosmic ray physics, algorithm and software development, numerical computation, data analysis, statistical analysis.
PhD thesis: "PAMELA measurements of boron and carbon spectra and B / C ratio in the energy range 0.44 GeV/n - 129 GeV/n"

January 2007 - May 2007

Project Management Course Certificate

Project Management Lab (Milan, Italy)

Project Management introduction with particular regard to the ECSS (European Cooperation for Space Standardization) standard: project planning, project phasing, Work Breakdown Structure, risk assessment, information and documentation management, cost schedule.

1992-2001

Master Degree in Physics

University of Rome Tor Vergata (Rome, Italy)

Theoretical physics, statistical mechanics, disordered systems modelling, algorithm and software development, numerical methods and computation.
Thesis: “Universality classes in statistical models with disorder in 3 dimensions”.

WORK ACTIVITIES

Main projects

- Principal Investigator of the “LIMADOU Operazioni-FO” Project
- Project Manager of the “Limadou Scienza+” Project
- Project Manager of the "Limadou-2 fase B2/C/D/E1” Project
- Project Manager of the “LIMADOU fase E/Operazioni” Project
- Project Manager of the “Limadou Scienza” Project
- Project Manager of the “Limadou fase D2” Project
- Project Manager of the “Limadou fase B/C/D1” Project
- INFN Principal Investigator of the Industrial Research projects and / or Experimental Development “Tecnologie Abilitanti Trasversali - Progetto “SpaN”

Tutoring activities

- 2008-2013 - Teaching Assistant of the “Computer coding lab” course - 2nd year of “Material Sciences” course (SSD INF/01)

Awards

- ARAP (Associazione Romana AstroParticelle) Award 2014 for the doctoral thesis: "PAMELA measurements of boron and carbon spectra and B / C ratio in the energy range 0.44 GeV/n - 129 GeV/n"

Editorial activity

- COSPAR (COmmittee on SPAce Research) 2018 - Scientific Organizing Committee (SOC) memeber of the session “S.1: CSES Preliminary Results on Ionospheric Variability and Its Connection with Seismic Activity and Solar Forcing”
- Workshop “10 Years of PAMELA” 2016 - Local Organizing Committee (LOC) member

- 15th WRMISS (Workshop on Radiation Monitoring for the International Space Station) 2010 - Local Organizing Committee (LOC) member
- Guest Editor of Special Issue "Nuclear and Ray Technologies for Space Physics Applications" on *Applied Science*
- Editorial Board Member of *Applied Sciences*
- Section Board Member of *Applied Sciences*

Invited presentations

Grants

Patents

ADDITIONAL INFORMATION

Publications

Total number of publications in peer-review journals: 105
Total number of citations (Scopus): 6013
H index (Scopus): 34