

Silvia Celli | Curriculum Vitae

La Sapienza University of Rome, Piazzale Aldo Moro 2, 00185, Rome, Italy

Education

Ph.D. in Astroparticle Physics (scholarship winner) <i>Gran Sasso Science Institute (GSSI), L'Aquila, Italy</i> in partnership with Scuola Superiore di Studi Avanzati (SISSA), Trieste, Italy Final grade: Excellent <i>cum laude</i>	Nov. 2015 – Oct. 2018
Master Degree in Astronomy and Astrophysics <i>La Sapienza University, Rome, Italy</i> Final grade: 110 <i>cum laude</i> (out of 110)	Nov. 2013 – Oct. 2015
Bachelor Degree in Physics <i>La Sapienza University, Rome, Italy</i> Final grade: 110 <i>cum laude</i> (out of 110)	Nov. 2010 – Oct. 2013
High School <i>Liceo Scientifico Statale G.B.Morgagni, Rome, Italy</i> Final grade: 100 <i>cum laude</i> (out of 100)	Sept. 2010 – Jul. 2005

Doctoral Thesis

Defended on: January 31st, 2019
Title: *Gamma-ray and neutrino signatures of Galactic cosmic-ray accelerators*
Advisor: Prof. Felix Aharonian

Master Thesis

Defended on: October 23th, 2015
Title: *Search for high energy neutrinos from GRB130427A with the ANTARES telescope*
Advisor: Prof. Antonio Capone

Bachelor Thesis

Defended on: October 24th, 2013
Title: *The primordial nucleosynthesis*
Advisor: Prof. Paolo De Bernardis

Research experience

Position: Italian National scientific qualification (ASN) for Associate Professor - sector FIS 02/A1 (Experimental Physics of Fundamental Interactions)
Date: Nov. 2020 – present

Position: Italian National scientific qualification (ASN) for Associate Professor - sector FIS 02/C1 (Astronomy, Astrophysics, Earth and Planet Science)

Date: Nov. 2020 – present

Position: Assistant Professor (RTDA)

Institution: La Sapienza University of Rome

Date: Sept. 2020 – present

Position: Post-doctoral researcher as ARAP (Associazione Romana per le AstroParticelle) fellow

Institution: La Sapienza University of Rome

Date: Jun. 2020 – Aug. 2020

Position: Post-doctoral researcher as L'Oreal-UNESCO "For Women in Science" fellow

Institution: La Sapienza University, Rome, Italy

Date: Aug. 2019 – May. 2020

Position: Post-doctoral researcher

Institution: Max Planck Institute for Nuclear Physics, Heidelberg, Germany

Date: Mar. 2019 – Jul. 2019

Position: Junior research scientist

Institution: Max Planck Institute for Nuclear Physics, Heidelberg, Germany

Date: Nov. 2018 – Dec. 2018

Invited visiting

Short term visitor Oct. 2022

Erlangen Center for Astroparticle Physics, Erlangen, Germany

Short term visitor Dec. 2019

Australian National University, Canberra, Australia

Short term visitor Nov. 2018

University of Adelaide, Adelaide, Australia

Long term visitor Mar. 2017 – Jul. 2017

APC, Paris-7 Denis-Diderot University, Paris, France

Awards

Lorenzoni Prize 2021 Jun. 2021

Awarded by SAlt (Italian Astronomical Society)

to the best paper of the year

Amaldi Research Center Prize 2020 Feb. 2021

Awarded by ARC (Amaldi Research Center)

to the best PhD thesis of the year

Bruno Rossi Prize 2019 <i>Awarded by INFN (National Institute for Nuclear Physics)</i> to the best PhD thesis of the year	Apr. 2020
GNN PhD Thesis Prize 2019 <i>Awarded by The Global Neutrino Network</i> to the best PhD thesis of the year	Feb. 2020
Springer Prize as Outstanding PhD thesis <i>Awarded by Springer Nature</i>	Dec. 2019
Bignami Prize <i>Awarded by SIF (Italian Society of Physics) and SAI (Italian Society of Astronomy)</i> to the best PhD thesis in the field of astroparticle physics, <i>for the contribution to the physics of cosmic rays, concerning both the data analysis and the original theoretical developments</i>	Sept. 2019
"For Women in Science" Prize (Italian edition) <i>Awarded by the L'Oreal-Italy Foundation and UNESCO</i> to six outstanding Italian female researchers in the field of science	2018-2019
IFAE 2017 Prize as Best Talk delivered by a "Young Researcher" <i>Awarded by INFN (National Institute for Nuclear Physics)</i> to the best young researcher talk	Apr. 2017
ARAP Prize for thesis work in the field of astroparticle physics <i>Awarded by ARAP (Roman Association for Astro-Particles)</i> to outstanding Master thesis, <i>for the data analysis of GRB130427A in the context of the ANTARES Collaboration</i>	Jun. 2016
Excellence Program in the Masters Degree of Astronomy and Astrophysics <i>Awarded by the Physics Department of La Sapienza University of Rome</i> to four best students within the Astronomy and Astrophysics Masters Degree	2013-2015

Scientific fundings

PI of the research project, for a medium term research project (11 keuro) funded in 2022 by Sapienza University of Rome titled *Real-time approach for multi-messenger astronomy* (grant ID RM1221816813FFA3).

Visiting professor Programme 2022, at Erlangen Center for Astroparticle Physics, 3.5 keuro funded by the Bavarian State Ministry of Science and the Arts, Germany.

Component of the research project lead by Prof. I. Di Palma, for a long term research project (46 keuro + postdoctoral position) funded in 2021 by Sapienza University of Rome titled *Gamma rays and neutrinos at energies beyond 100 TeV: multimessenger investigation of extreme astrophysical sources in the Universe* (grant ID RG12117A87956C66).

Component of the research project lead by Prof. I. Di Palma, for a medium term research project (14 keuro + postdoctoral position) funded in 2020 by Sapienza University of Rome titled *Core-Collapse Supernovae: Multi-messenger Data Analysis Search* (grant ID RM120172AEF49A82).

L'Oreal and UNESCO Fellow "For Women in Science", 10 month fellowship (20 keuro)

funded in 2019 for activities in Sapienza University of Rome titled *The search for PeVatrons in a multi-messenger framework*.

Membership of International Scientific Collaborations

Associate member of the ASTRI Collaboration (2023 – present): member of the "Galactic Science" working group.

Associate member of the HESS Collaboration (2021 – present): member of the working groups "SNRs, PWNe", "Stellar Sources" e "Diffusion, Outflows" for the phenomenological description of the particle escape from supernova remnants (SNRs), interaction with nearby clouds and related gamma-ray signatures.

Associate member of the CTA Consortium (2016 – present): member of the working groups "Galactic CRs" and "SNRs", involved in the morphological and spectral description of the γ -ray spectrum of the galactic SNR RXJ1713-7.3946 in terms of a hadronic scenario, including the presence of molecular clouds in the source environment.

Full member of the KM3NeT Collaboration (2015 – present): member of the KM3NeT shift crew, responsible for the operation, calibration and monitoring of the KM3NeT/ARCA detector. Responsible for the full Monte Carlo production of background events (atmospheric muons) of the detector configuration with six detection units, ARCA6. Responsible for the design, development and implementation of the software for the online processing (dispatching, reconstruction and classification) of KM3NeT/ARCA events, currently operating e.g. in realtime as response to external triggers. Member of the onshore team for the connection and commissioning of parts of the detector during the sea campaigns in Sept. 2021, Jun. 2022, and Sept. 2023. Run coordinator of data acquisition in 2022.

Full member of the ANTARES Collaboration (2015 – present): member of the ANTARES shift crew, responsible for the operation, calibration and monitoring of the ANTARES detector. Responsible for the analysis searching for neutrinos in space and time coincidence with the bright sources GRB080916C, GRB110918A, GRB130427A and GRB130505A. Responsible for the stacking analysis searching for neutrinos in space and time coincidence with the population of GRBs occurred during 2007-2017. Since Jan. 2022, member of the collaboration publication committee.

Member of the THESEUS Consortium (2019 – present): candidate medium-size space mission of European Space Agency.

Member of the HeP-X Collaboration (2023 – present): candidate NASA space mission.

Membership of other Scientific Societies

Associate member of the National Institute for Astrophysics (INAF) (2022 – present)

Associate member of the AstroParticle Roman Association (ARAP) (2021 – present)

Associate member of the Columbia-DIAS-Yale (CDY) initiative (2021 – present)

Associate member of the National Institute for Nuclear Physics (INFN) (2015 – present)

Junior member of the Italian Society of Astronomy (SIt) (2019)

Junior member of the Italian Society of Physics (SIF) (2019)

Committees and roles of responsibilities

Member of Bachelor and Master Degree Committees at Sapienza University of Rome: Sept. 2020 - present;

Member of the ANTARES Publication Committee: 2022 - present;

Run coordinator for the KM3NeT data acquisition: Jan 2022 - March 2022;

Referee of astro analysis for the ANTARES and KM3NeT Collaborations: 2019 - present.

Didactic experience

Teaching Activities:.....

A.Y. 2022/2023: Lecturer for the course of General Physics with Elements of Statistics in Sapienza University of Rome: 72 hours of frontal activity given during the academic year 2022/2023, for first year bachelor students in Pharmaceutical Sciences at La Sapienza University of Rome, for an equivalent of 8 CFU.

A.Y. 2022/2023: Co-lecturer for the course of Particle and Astroparticle Physics in Sapienza University of Rome: 4 hours of frontal activity given during the academic year 2022/2023 within the class of Prof. D Palma, for second year Masters students in Astronomy and Astrophysics and Particle and Astroparticle Physics at La Sapienza University of Rome, and 4 hours given during the analog PhD course.

A.Y. 2022/2023: Lecturer for the course of Astrophysical Acceleration: 4 hours of frontal activity given during the academic year 2022/2023 to the Obertrubach School for Astroparticle Physics 2022, Erlangen, Germany.

A.Y. 2021/2022: Lecturer for the course of General Physics in Sapienza University of Rome: 76 hours of frontal activity given during the academic year 2021/2022, for first year bachelor students in Chemicals and Pharmaceutical Technologies at La Sapienza University of Rome (Latina), for an equivalent of 8 CFU.

A.Y. 2021/2022: Co-lecturer for the course of Particle and Astroparticle Physics in Sapienza University of Rome: 6 hours of frontal activity given during the academic year 2021/2022 within the class of Prof. Antonio Capone, for second year Masters students in Astronomy and Astrophysics and Particle and Astroparticle Physics at La Sapienza University of Rome.

A.Y. 2020/2021: Co-lecturer for the course of Particle and Astroparticle Physics in Sapienza University of Rome: 4 hours of frontal activity given during the academic year 2020/2021 within the class of Prof. Antonio Capone, for second year Masters students in Astronomy and Astrophysics and Particle and Astroparticle Physics at La Sapienza University of Rome.

A.Y. 2020/2021: Lecturer for the course of General Physics in Sapienza University of Rome: 60 hours of frontal activity given during the academic year 2020/2021, for first year bachelor students in Chemicals and Pharmaceutical Technologies at La Sapienza University of Rome (Latina),

for an equivalent of 6 CFU.

A.Y. 2019/2020: Co-lecturer for the class of Particle and Astroparticle Physics in Sapienza University of Rome: 8 hours of frontal activity given during the academic year 2019/2020 within the class of Prof. Antonio Capone, for second year Masters students in Astronomy and Astrophysics and Particle and Astroparticle Physics at La Sapienza University of Rome.

A.Y. 2018/2019: Lecturer for the course of Neutrino Astronomy in the era of CTA: 2 hours of frontal activity given during the academic year 2018/2019 to the DIAS Summer School in High-Energy Astrophysics, Dublin, Ireland.

Student Supervisor Activities:.....

A.Y. 2022/2023: Advisor for Bachelor thesis in Physics at Sapienza University of Rome: Advisor for the candidate Giorgia Auri, with a thesis titled *Stato e prospettive dell'astronomia di neutrini*, to be discussed in December 2023.

A.Y. 2022/2023: Advisor for Masters thesis in Astronomy and Astrophysics at Sapienza University of Rome: Advisor for the candidate Raffaele De Troia, with a thesis titled *Neutrino Emissions from Choked Gamma-Ray Burst*, to be discussed in 2023.

A.Y. 2019/2022: Co-advisor for PhD thesis in Astronomy & Astrophysics at Sapienza University of Rome: Co-advisor for the candidate Angela Zegarelli with a thesis titled *Exploring neutrino emissions from Gamma-Ray Bursts: predictions and simulations with KM3NeT*, discussed in April 2023.

A.Y. 2021/2022: Advisor for Masters thesis in Particle and Astroparticle Physics at Sapienza University of Rome: Advisor for the candidate Teresa Pernice, with a thesis titled *High-energy neutrino emissions from Galactic molecular clouds and KM3NeT detection prospects*, discussed in December 2022.

A.Y. 2021/2022: Advisor for Masters thesis in Particle and Astroparticle Physics at Sapienza University of Rome: Advisor for the candidate Francesco Carenini, with a thesis titled *On the sensitivity of KM3NeT/ARCA towards high-energy neutrinos from Gamma-Ray Bursts*, discussed in October 2022.

A.Y. 2021/2022: Tutor of Excellence Program in Astronomy and Astrophysics Master Degree at Sapienza University of Rome: Tutor for the candidate Lavinia Paiella, with a project titled *GRB180817A: theory and observations*.

A.Y. 2020/2021: Co-advisor for Masters thesis in Particle and Astroparticle Physics at Sapienza University of Rome: Co-advisor for the candidate Silvia Gagliardini, with a thesis titled *Study of Photon and Neutrino Emissions from GRB190114C: simulations and comparison with experimental data*, discussed in October 2022.

A.Y. 2018/2019: Co-dvisor for Masters thesis in Particle and Astroparticle Physics at Sapienza University of Rome: Co-advisor for the candidate Michela Fasano, with a thesis titled *Estimate of the Neutrino Flux from Choked Gamma Ray Bursts*, discussed in January 2020.

A.Y. 2017/2018: Co-advisor for Masters thesis in Astronomy & Astrophysics at Sapienza University of Rome: Co-advisor for the candidate Angela Zegarelli, with a thesis titled *Temporal studies of GRB light curves and neutrino flux prediction for multi-collision zone model*, discussed in October 2018.

A.Y. 2017/2018: Co-advisor for Bachelor thesis in Physics at Sapienza University of Rome: Co-advisor for the candidate Eleonora Loiacono, with a thesis titled *Flussi di neutrini da sorgenti di Gamma-Ray Burst*, discussed in April 2018.

Refereeing for scientific journals

Referee for high-impact peer review journals: Nature (main journal), PRD (main journal), ApJ (main journal), MNRAS (main journal).

Referee for international conference proceedings: Gamma 2022 (in Proceedings of Science - POS);

Referee for international conference proceedings: RICAP 2022, RICAP 2018, RICAP 2016 (in EPJ Web of Conferences - epjconf).

Organization of conferences

Chair of the 'Gamma-Ray Astronomy' Plenary Session for TMEX 2023 conference: 5 - 11 January 2023, Quy Nhon, Vietnam.

Chair of the 'Multimessenger and Transients' Plenary Session for 2nd KM3NeT Town Hall meeting: 20 - 22 September 2022, Catania, Italy.

Member of the Local Organizing Committee, Chair of the 'Galactic Sources' Session and Chair of the 'Cosmic Ray' Plenary Session for RICAP 2022 conference: 6 - 9 September 2022, Rome, Italy.

Convener and Chair of the 'Galactic' Parallel Session for TeV Particle Astrophysics 2019 conference: 2 - 6 December 2019, Sydney, Australia.

Member of the Local Organizing Committee and Chair of the 'Ultra High Energy Cosmic Ray' Parallel Session for RICAP 2018 conference: 4 - 7 September 2018, Rome, Italy.

Talks

Summary.....

- 18 invited seminars at international institutes;
- 18 invited talks at international conferences, workshops and schools;
- 21 talks/posters to international conferences, workshops and schools;
- 20+ talks internal to collaboration meetings.

Third mission

April 2022: Member of the organizer committee of Pint of Science 2023 - Rome;

February 2022: Contribution to the Italian scientific magazine 'Giornale di Astronomia', published on June 2022;

September 2021: Interview for the Italian scientific magazine 'Le Scienze' to Matteo Serra, published on March 2022;

November 2020: Interview for the Italian newspaper 'Grazia' to Enrica Brocardo;

July 2019: Interview for the Italian radio channel 'Radio Rai 1' during the program 'Zapping';
June 2019: Interview for the Italian newspaper 'Corriere della Sera' to Elisabetta Andreis;
May 2015: Open Labs at the INFN National Laboratories in Frascati, Italy.

Technical and Personal skills

Programming Languages: C (advanced), C++ (advanced), bash (advanced), Fortran90 (intermediate), Python (basic) and IDL (basic).

Operative Systems: Mac Os (advanced), Unix/Linux (advanced) and Windows (advanced).

Markup Languages: LaTeX (advanced) and HTML (basic).

Websites: Since Jan. 2022, administrator and maintainer of the particle physics division website at Sapienza University of Rome, see <https://web.infn.it/area-particelle-roma/>.

Softwares: ROOT (advanced), Mathematica (advanced), Origin (advanced), PSpice (advanced), Gnuplot (advanced), Open Office (advanced) and Microsoft Office (advanced).

Simulations: Magnetohydrodynamic numerical astrophysics (PLUTO); Numerical methods for integration of partial differential equation; Numerical methods for astrophysics: modelling the non-thermal high-energy emission of astrophysical sources.

Specifics: Parallel programming in MPI and OpenMP; Experience in operating computer clusters, environment virtualization and docker.