Allegato B

SILVIA CELLI
Curriculum Vitae ai fini della pubblicazione

Rome, Italy
01/10/2023

Part I – General Information

Full Name	Silvia Celli
Citizenship	Italian
Spoken Languages	Italian, English, French, Spanish

Part II – Education

Type	Year	Institution	Notes (Degree, Experience,…)
PhD (defended on Jan. 31st, 2019)	2015 - 2018	Gran Sasso Science Institute (GSSI), School for Advanced Studies, L'Aquila, Italy	PhD in Astroparticle Physics, with scholarship, final mark Excellent cum laude
University Master graduation	2013 - 2015	Sapienza University of Rome, Italy	Master Degree in Astronomy and Astrophysics, final mark 110/110 cum laude
University Bachelor graduation	2010 - 2013	Sapienza University of Rome, Italy	Bachelor Degree in Physics, final mark 110/110 cum laude

Part III – Appointments

IIIA – Academic Appointments

Start	End	Institution	Position
14/09/2020	present	Sapienza University of Rome, Rome, Italy	Assistant professor (RTDA FIS02/A1)
01/06/2020	31/08/2020	Associazione Romana per le Astroparticelle (ARAP)	Post-doctoral research fellow

01/08/2019	31/05/2020	Sapienza University of Rome, Rome, Italy	Post-doctoral research fellow as “Women in Science” by L’Oreal and UNESCO
01/03/2019	31/07/2019	Max Planck Institute for Nuclear Physics (MPIK), Heidelberg, Germany	Post-doctoral research fellow
01/11/2018	31/12/2018	MPIK, Heidelberg, Germany	Research fellow as junior scientist

IIIB – Other Appointments

Start	End	Role	Sector
11/2020	11/2031	Italian National scientific qualification (ASN) as Associate Professor	FIS02/A1
11/2020	11/2031	Italian National scientific qualification (ASN) as Associate Professor	FIS02/C1
09/2020	present	Member of several Bachelor and Masters degree committees at Sapienza University of Rome	Physics, Astronomy and Astrophysics
01/2022	present	Member of the ANTARES Publication Committee and analysis referee	ANTARES Collaboration
01/2022	03/2022	Run Coordinator of KM3NeT data acquisition and analysis referee	KM3NeT Collaboration
2019	present	Referee for high impact scientific journals	PRD, ApJ, MNRAS, Nature
2018	present	Referee for international conference proceedings	RICAP16, RICAP18, RICAP22, Gamma22
2018	present	Member of Organizing Committee of International Conferences	RICAP16, RICAP18, RICAP22, TeVPa2019
2018	2023	Chair of plenary and parallel sessions at international conferences	TMEX2023, RICAP22, 2nd KM3NeT Town Hall Meeting 2022, TeVPA2019, RICAP18
2022	present	Co-administrator of the webpage for the particle physics division at Sapienza University of Rome, https://web.infn.it/area-particelle-roma/	FIS02/A1

Part IV – Teaching experience

Year	Institution	Courses/Lectures
2022-2023	Sapienza University of Rome, Pharmacy Degree	Lecturer for the course in General Physics with Elements of Statistics (72 hours/8 CFU)
2021-2022 2020-2021	Sapienza University of Rome, Chemical and Pharmaceutical Technologies Degree (Latina)	Lecturer of the course in General Physics (72 hours/8CFU)

2022-2023 2021-2022 2020-2021 2019-2020	Sapienza University of Rome, Physics and Astronomy and Astrophysics Master and PhD Degrees	Co-lecturer for the course of Particle and Astroparticle Physics (4 to 8 hours per year of frontal lectures given within the course of Prof. Capone/Di Palma)
2017-2023	Sapienza University of Rome, Physics and Astronomy and Astrophysics Degree	- Thesis Advisor of 3 Master (R. Di Troia, F. Carenini, T. Pernice) and 1 bachelor (G. Auri) students; - Thesis co-advisor of 1 bachelor (E. Loiacono), 3 Master (A. Zegarelli, S. Gagliardini, M. Fasano) and 1 PhD students (A. Zegarelli).
2021-2022	Sapienza University of Rome, Astronomy and Astrophysics Master Degree	Tutor for excellence program of 1 Master student (L. Paiella).

Part V - Awards and Honors

Year	Title
2021	Lorenzoni Prize, awarded by the Astronomical Italian Society (SAIT);
2020	Amaldi Research Center (ARC) Prize awarded by ARC-Department of Physics, Sapienza University;
2019	Global Neutrino Network (GNN) Dissertation Prize awarded by GNN;
2019	Bruno Rossi Prize awarded by the National Institute for Nuclear Physics (INFN);
2019	Springer Prize as Outstanding PhD Thesis, leading to publication of PhD thesis with title “Gamma-ray and neutrino signatures of Galactic cosmic-ray accelerators”;
2019	Bignami Prize, awarded jointly by the Italian Society of Physics (SIF) and SAIT;
2019	L’Oreal-UNESCO For Women in Science grant (20 keuro), Italian edition;
2017	Best Talk Prize as Young Researcher at IFAE 2017 conference;
2016	Associazione Romana per le AstroParticelle Master Thesis prize;
2015	Excellence Track in Astronomy and Astrophysics Master Degree at Sapienza University of Rome, Italy.

Part VIa - Scientific Society memberships

Year	Title
2022 - present	Associate member of the National Institute of Astrophysics (INAF)
2021 - present	Associate member of Associazione Romana per le AstroParticelle (ARAP)
2021 - present	Associate member of Columbia-Dias-Yale (CDY) initiative
2015 - present	Associate member of the National Institute of Nuclear Physics (INFN)
2019	Junior member of SAIT and SIF

Part VIb - Scientific Collaboration memberships

2023 - present	Associate member of the ASTRI Collaboration
2021 - present	Associate member of H.E.S.S. Collaboration
2016 - present	Associate member of CTA Consortium
2015 - present	INFN full member of the ANTARES and KM3NeT Collaborations (100%)

present	Support member of the THESUS and HepX space missions (ESA and NASA)

Part VII - Funding Information [grants as PI (principal investigator) or I (co-investigator)]

Year	Title	Program	Grant value
2022 - 2024	"Real-time approach for multi-messenger astronomy" (PI)	Medium research project grant from Sapienza University of Rome, Italy	
2022	"On the origin of Galactic cosmic rays" (PI)	Visiting Professor Program from Bavarian State Ministry of Sciences and the Arts, Germany	
2021 - 2024	"Gamma rays and neutrinos at energies beyond 100 TeV: multi-messenger investigation of extreme astrophysical sources in the Universe" (I)	Large research project grant from Sapienza University of Rome, Italy, lead by Prof. Di Palma	+ postdoctoral fellow
2020 - 2022	"Core-Collapse Supernovae: Multi-messenger Data Analysis Search" (I)	Medium research project grant from Sapienza University, Italy, lead by Prof. Di Palma	+ postdoctoral fellow
2019 - 2020	"The search for PeVatrons in a multi-messenger framework" (PI)	L'Oreal and UNESCO - For Women in Science Program	euro

Part VIII – Invited visiting at international institutes

October 2022	Short term (1 month) visiting at the Erlangen Center for Astroparticle Physics (ECAP), Germany
December 2019	Short term (1 month) visiting at the Australian National University (ANU), Canberra, Australia
November 2018	Short term (1 month) visiting at the Adelaide University, Adelaide, Australia
March - July 2017	Long term (5 months) visiting at the Astroparticule et Cosmologie Laboratories (APC), Paris-7 Denis Diderot University, Paris, France

Part IX – Research Activities

My research interests concern the exploration of high-energy non-thermal particles populating the Universe, with particular regards to astrophysical neutrinos and their connections with cosmic rays, photons and gravitational waves (GWs).

Most of my scientific commitment and achievements have been framed in the context of the international collaborations running deep-sea neutrino telescopes: ANTARES and KM3NeT. A brief summary of these activities can be found below. While in my first period of research I was active inside the ANTARES experiment, my work is currently mainly devoted to exploiting the full potential of the KM3NeT detectors. Within this Collaboration, in fact, I have been charged to design, develop and put into operation the hardware and software platforms for the real-time processing of KM3NeT/ARCA events. This task is crucial, as an example, for the prompt identification of extreme explosions in the Universe, like those

induce by massive star collapses. The online platform is nearly complete and smoothly running since more than a year, allowing for the directional and energy reconstruction of events, their classification as either muons/neutrinos and tracks/showers, crucial features to evidence possible signatures for discoveries. Thanks to the real-time system, KM3NeT is now promptly following-up external alerts from the astrophysical community (both electromagnetic and GWs), and we are currently in the definition stage of the properties of interesting neutrino candidates (high-energy events, multiplets), to be provided to the community.

The role of multi-messenger connections is of paramount importance for understanding the physical processes occurring in astrophysical accelerators. The most extreme of such sources can produce particles with energies well beyond what is in the reach of our laboratory accelerators, particles that we observe since more than a century as a steady rain impacting Earth atmosphere and whose origin is to-date still a mystery. High energy neutrinos are key to unveil hadronic accelerators, responsible for these cosmic rays. To this extent, I have also dedicated part of my activities, mainly during my PhD, to investigate the nature of cosmic-ray and gamma-ray sources, both of Galactic and extra-Galactic nature.

On the Galactic scale, I have studied the transport and the interactions of charged particles in remnants of supernovae explosions (SNRs), as these are believed to be the main sources of cosmic rays. These activities have involved dealing with both analytical and numerical methods (for solving partial differential equations), and were performed during my PhD under the supervision of Prof. Felix Aharonian, leading to several publications. I have furthermore run Magneto-Hydrodynamical simulations of these sources, to investigate the coupling among plasma and accelerated particles. As such, I have joined as associate scientist the High Energy Stereoscopic System (H.E.S.S.) Collaboration, that is running the presently major array of imaging air Cherenkov detectors. I am also part of the Cherenkov Telescope Array (CTA) Consortium, and recently I have joined the ASTRI Collaboration, where I participate to the Galactic working group activities. Among other Galactic source classes, I have been studying the Galactic Center region and open star clusters.

On the extra-Galactic scale, I have been studying the physics of relativistic jets, particularly Gamma-Ray Bursts (GRBs), simulating the gamma-ray and (possible) neutrino emissions through full Monte Carlo techniques, following hadron acceleration and interactions. These activities started in the early post-doc period spent in Sapienza in the group of Prof. Antonio Capone, and have lead to several publications, few of which are indicated below. As such, I have gained significant phenomenological expertise in the fields, also within the neutrino community. Moreover, since my Masters thesis, I have been in charge to search for spatial and temporal coincidences among observed GRBs and neutrino-induced events in ANTARES, from both individual bright sources as well as from the entire sample of bursts occurred during ANTARES data taking period. The latter analysis has allowed to set upper limits about the contribution of GRBs to the diffuse astrophysical neutrino flux.

The recent detection of GRBs also in the multi-TeV gamma-ray domain by the Large High Altitude Air Shower Observatory (LHAASO) has renewed and reinforced the interest for hadron acceleration in GRB jets, a hypothesis put forward more than 30 years ago that would connect this class of sources to Ultra-High-Energy cosmic rays. I am personally in contact with members of the LHAASO Collaboration, including the experiment PI Prof. Zhen Cao, aiming at joint gamma-neutrino realtime strategies and data analyses. LHAASO data are furthermore opening new perspectives about understanding the cosmic-ray origin, after the detection of more than 90 sources emitting radiation at energies above 100 TeV in the Plane of our Galaxy. Data analyses of possible coincident neutrino signals are ongoing in both ANTARES and KM3NeT, that I am personally involved into.

Brief Description of my activities for the two experiments that I am full member of: ANTARES & KM3NeT

Collaboration	Description
KM3NeT (2019 - present)	• I have been designing the software architecture performing the online event processing of KM3NeT/ARCA, furthermore implementing the software for their reconstruction and classification, currently adopted for handling realtime alerts from and towards the multi-messenger community. This allows us to search for time and space correlation among KM3NeT data and external triggers, as well as to report analysis results with a latency of just few seconds; moreover it can look for extremely energetic neutrino-induced events and auto-correlation in KM3NeT data. This work has provided me with experience in environment virtualization and docker, as well as with handling of raw data. I reported for the first time an accurate description of the ongoing activities in the realtime platform at the International Cosmic Ray Conference 2023, whose proceedings (PoS 1125 ICRC2023) can be found at https://pos.sissa.it/444/1125/pdf; • Responsible for the full MonteCarlo background event (atmospheric muons) production of the detector in six string configuration, so-called ARCA6; • Run coordinator of data acquisition of both KM3NeT detectors (ARCA and ORCA) from January to March 2022, responsible for their operation, calibration and monitoring; • Member of the onshore team for the connection and commissioning of parts of the detector during the sea campaigns in September 2021, June 2022, and September 2023; • Internal referee of astrophysics analyses; • Author of the KM3NeT shift manual for the online event processing and monitoring.
ANTARES (2015 - present)	• Search for high-energy neutrinos from GRBs: I have been performing the data analysis searching space and time coincidence of emissions among neutrinos occurring in ANTARES data and the bright sources GRB080916C, GRB110918A, GRB130427A and GRB130505A. This analysis resulted into an ANTARES collaboration paper of which I am main author (https://doi.org/10.1093/mnras/stx902) and into international conference proceedings. • Later, I have been responsible for the stacking analysis searching for neutrinos in space and time coincidence with the population of GRBs occurred during 2007-2017; as a result, I am author of the relative collaboration paper (https://doi.org/10.1093/mnras/staa3503) and of several international conference proceedings. • Member for several periods of the data acquisition crew, responsible for the operation, calibration and monitoring of the detector; • Internal referee of astrophysics analyses; • Member of the ANTARES Collaboration publication committee since January 2022.

Part X – Summary of Scientific Achievements

Product type	Number	Type	Start	End
International papers	88	15 as main author, 73 within collaborations	2015	present
Books [scientific]	1	PhD Thesis published in Springer Outstanding PhD Theses Series, ISBN 978-3-030-33123-8	2019	2019
International Conference proceedings	20 60+	as main author (presenter/speaker) as collaboration member	2015	present
Invited seminars at international institutes	11	- Institute of High Energy Physics, Beijing, China (2023), “The search for hadronic PeVatrons”; - MPIK, Heidelberg, Germany (2018 and 2022), “Particle escape from supernova remnant shocks: gamma-ray and cosmic-ray signatures”; - Erlangen Center for AstroParticles (ECAP), Erlangen, Germany (2022), “On the radiation signatures of Galactic PeVatrons: the gamma-ray and neutrino perspective”; - Technical University of Munich (TUM), Munich, Germany (2021), “Neutrinos from GRBs: can they account for the IceCube diffuse flux?”; - Università di Padova, Padova, Italy (2021), “The search for Galactic PeVatrons: gamma-ray and neutrino signatures”; - Osservatorio Astronomico di Arcetri, Firenze, Italy (2022), “Status and perspectives of neutrino astronomy”; - Osservatorio di Roma, Italy (2021), “Particle escape from supernova remnants and their radiative signatures”; - Niels Bohr Institute, Copenhagen, Denmark (2021), “Supernova remnants and escaping cosmic rays”; - AstroParticule et Cosmologie laboratories, Paris, France (2017), “Gamma rays and neutrinos from the Galactic Center region”; - University of Adelaide, Australia (2018), “Propagation and radiation of accelerated particles in supernova remnants with clumpy structures”.	2018	present

Invited talks at international conferences/workshops	16	- Exploring Galactic Cosmic Ray Accelerators with Ultra-High-Energy Gamma Rays, Yerevan, Armenia (2023); - Pulsar Wind Nebulae and PeVatron workshop, Columbia University, New York, USA (2023); - Theory Meets EXperiments at 19th Rencontre du Vietnam, Quy Nhon, Vietnam (2023); - SIF2020 and SIF2021, Italy; - 1st LHAASO symposium, Chengdu, China (2023); - 1st MAGIC-LST-LHAASO workshop (2022); - Vulcano workshop 2022 - Frontier Objects in Astrophysics, Elba Island, Italy (2022); - Particle Acceleration in aSTrophysical Objects 2022, Osservatorio Astronomico di Roma, Rome, Italy (2022); - Multi-messenger high-energy astrophysics in the era of LHAASO, Rome, Italy (2020); - Gordon Godfrey Workshop on Astroparticle Physics 2020, Canberra, Australia (2020); - CTA linkages 2018 and 2019, University of Adelaide, Australia; - 1st KM3NeT Town Hall 2019, Marseille, France (2019); - International Workshop on Very High Energy Phenomena, Yerevan, Armenia (2019); - International Conference of Young Astronomers and Astrophysicists, Padova, Italy (2018).	2018	present
Invited lectures at international schools	2	- Obertrubach Astroparticle School (2022), Erlangen, Germany; - DIAS Summer School (2018), Dublin, Ireland.	2018	2022
Contributed talks/posters at international conferences/workshops	20	e.g. ICRC2023, Gamma2022, TAUP2021, ICRC2021, TeVPa2019, CRA2019, RICAP2018, Marcel Grossmann2018, MIAPP2018, PAHEN2017, IFAE2017, Neutrino2016, RICAP2016, YRM2015.	2015	present
Talks internal to collaboration meetings	30+	ANTARES, KM3NeT, CTA.	2015	present

Numerical indicators (source: Scopus, date: September 2023)

Total Impact factor	504.8
Total Citations	5178
Average Citations per Product	57.5
Hirsch (H) index	27
Normalized H index*	27/8=3.4

*H index divided by the academic seniority (counted from Master graduation year).

Part XI– Selected Publications

1) A. Albert et al. [ANTARES Collaboration], “Search for high-energy neutrinos from bright GRBs with ANTARES” edito da Monthly Notices of the Royal Astronomical Society riprodotto per estratto dal Vol. 469 N. 1 (2017);

2) A. Albert et al. [ANTARES Collaboration], “Constraining the contribution of Gamma-Ray Bursts to the high-energy diffuse neutrino flux with 10 yr of ANTARES data” edito da Monthly Notices of the Royal Astronomical Society riprodotto per estratto dal Vol. 500 N. 4 (2021);

3) A. Albert et al. [ANTARES Collaboration], “Review of the online analyses of multi-messenger alerts and electromagnetic transient events with the ANTARES neutrino telescope” edito da Journal of Cosmology and Astroparticle Physics riprodotto per estratto dal Vol. 08 N. 072 (2023);

4) L. Ambrogi, S. Celli and F. Aharonian, “On the potential of Cherenkov Telescope Arrays and KM3 Neutrino Telescopes for the detection of extended sources” edito da Astroparticle Physics riprodotto per estratto dal Vol. 100 (2018) pag. 69-79;

5) S. Celli, A. Palladino and F. Vissani, “Neutrinos and gamma rays from the Galactic Center Region After H.E.S.S. Multi-TeV Measurements” edito da European Physics Journal C riprodotto per estratto dal Vol. 77 N. 77 (2017);

6) M. Fasano, S. Celli, D. Guetta, A. Capone, A. Zegarelli and I. Di Palma, “Estimating the Neutrino Flux from Choked Gamma-Ray Bursts” edito da Journal of Cosmology and Astroparticle Physics riprodotto per estratto dal Vol. 9 N. 44 (2021);

7) A. Albert et al. [ANTARES Collaboration], “Hint for a TeV neutrino emission from the Galactic Ridge with ANTARES” edito da Physics Letters B riprodotto per estratto dal Vol. 841 N. 137951 (2023);

8) A. Albert et al. [ANTARES Collaboration], “ANTARES upper limits on the multi-TeV neutrino emission from the GRBs detected by IACTs” edito da Journal of Cosmology and Astroparticle Physics riprodotto per estratto dal Vol. 03 N. 92 (2021);

9) A. Albert et al. [ANTARES Collaboration], “ANTARES and IceCube Combined Search for Neutrino Point-like and Extended Sources in the Southern Sky” edito da The Astrophysical Journal riprodotto per estratto dal Vol. 892 N. 92 (2020);

10) A. Albert et al. [ANTARES Collaboration], “Search for neutrino counterparts to the gravitational wave sources from LIGO/Virgo O3 run with the ANTARES detector” edito da Journal of Cosmology and Astroparticle Physics riprodotto per estratto dal Vol. 04 N. 04 (2023);

11) S. Aiello et al. [KM3NeT Collaboration], “Sensitivity of the KM3NeT/ARCA neutrino telescope to point-like neutrino sources” edito da Astroparticle Physics riprodotto per estratto dal Vol. 111 (2019) pag. 100-110;

12) S. Aiello et al. [KM3NeT Collaboration], “The KM3NeT potential for the next core-collapse supernova neutrinos” edito da European Physics Journal C riprodotto per estratto dal Vol. 81 (2021) N. 445.

The full list of publications is available at http://www.roma1.infn.it/~cellisil/.

Part XII– Third mission

April 2022	Member of the organizing committee of Pint of Science - Rome
February 2022	Contributions to the Italian scientific magazine “Giornale di Astronomia”
September 2021	Interview released for the Italian scientific magazine “Le Scienze”
2019 - 2020	Interviews for several Italian journals and radio stations
May 2015	Scientific guide for Open Labs at the INFN Frascati laboratories