Part B-2

4. CV of the Researcher

Dr. Jakub Skowronski | Curriculum Vitae

Postdoctoral Researcher · Experimental Nuclear Astrophysics · Polish Citizenship

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PROFILE

Postdoctoral researcher in experimental nuclear astrophysics with broad international experience in low-energy nuclear reaction measurements and in R-matrix analysis. I joined the LUNA deep-underground experiment at Gran Sasso National Laboratory (INFN-LNGS) as a Ph.D. student and have since led the measurement and analysis of several key astrophysical reactions, including the $^{12}C + p$ and $^{13}C + p$ radiative captures at LUNA and Felsenkeller and, as **Working Group Leader**, the $^{19}F + p$ reaction at the new MV accelerator facility. In parallel, I am **spokesperson** of a sub-femtosecond lifetime measurement performed with the AGATA γ-ray tracking array at INFN Legnaro National Laboratories (LNL), for which I led the full analysis pipeline; the data analysis is complete, and the manuscript has been submitted to *Nature*. Alongside this experimental programme, I serve as **DAQ Coordinator** of LUNA, the technical lead for the data acquisition and slow-control infrastructure of every measurement campaign and of the MV facility.

Since June 2025 I have been the **maintainer and lead developer of AZURE2**, the reference R-matrix code used worldwide by the nuclear astrophysics, IAEA nuclear-data evaluation, and materials-analysis communities for cross-section calculation and extrapolation. This role, together with my experimental work, has established me as one of the leading R-matrix experts internationally and has driven the creation of new worldwide collaborations, including invited membership in the **IAEA INDEN-LE committee** of six world experts and participation in three US-funded research projects (two NSF, one DOE). Since completing my Ph.D. in December 2023 I have received annual invitations to deliver seminars and lectures at major international schools and conferences.

EMPLOYMENT

May 2025 – Present — **Research Contract**, Università degli Studi di Padova

Oct 2023 – May 2025 — **Postdoctoral Researcher**, Università degli Studi di Padova

EDUCATION

Oct 2020 – Dec 2023 — **Ph.D. in Physics**, Università degli Studi di Padova — Advisor: Prof. Antonio Caciolli

Sep 2018 – Sep 2020 — **M.Sc. in Physics**, Università degli Studi di Padova — 110/110

Sep 2015 – Dec 2018 — **B.Sc. in Physics**, Università degli Studi di Padova — 94/110

RESEARCH EXPERIENCE

Feb 2020 – Present — **LUNA Experiment** · Laboratori Nazionali del Gran Sasso, INFN, Italy

- **Working Group Leader** for the $^{19}F + p$ measurement; analysis of the $^{12}C + p$ and $^{13}C + p$ experiments
- **DAQ Coordinator** — design, deployment and operation of the data acquisition and slow-control systems across all LUNA campaigns and the new Bellotti IBF facility

– Calibration of the 3.5 MV Pelletron accelerator of the Bellotti Ion Beam Facility (INFN-LNGS)
– Fine-tuning of the Geant4 simulation for BGO and HPGe setups
– R-matrix evaluation for ^{12}C + p, ^{13}C + p, ^{20}Ne + p and ^{22}Ne + p reactions

Jun 2025 – Present **AZURE2 R-matrix Code** · Maintainer and Lead Developer
– **Maintainer of the reference R-matrix code** used worldwide by the nuclear astrophysics, IAEA nuclear-data evaluation, and materials-analysis communities
– Design and implementation of new features, GUI, and documentation; support and training for the international user community across academia, national laboratories, and the IAEA

Jun 2024 – Present **CRYRING** · Gesellschaft für Schwerionenforschung, Darmstadt, Germany
– Study of the screening effect through the ^{15}N + p reaction in inverse kinematics

Nov 2023 – Present **AGATA Setup** · Laboratori Nazionali di Legnaro, INFN, Italy
– **Spokesperson** of the sub-femtosecond lifetime measurement of the 6.79 MeV state in ^{15}O with the AGATA γ-ray tracking array
– Led the complete data analysis pipeline (Doppler correction, kinematic reconstruction, Geant4 simulation, Bayesian extraction of the lifetime); manuscript **submitted to *Nature Physics* (under review)**

Feb 2024 – Mar 2024 **Dalton Cumbrian Facility** · Westlakes Science Park, Moor Row, UK
– Energy calibration of the 2.5 MV Pelletron accelerator

Oct 2020 – May 2023 **HEAT Experiment** · Laboratori Nazionali di Legnaro, INFN, Italy
– Studies of hydrogen desorption in carbon targets through Ion Beam Analysis

Feb 2019 – Feb 2020 **GALILEO Setup** · Laboratori Nazionali di Legnaro, INFN, Italy
– Characterization of the GALTRACE silicon detector with Neural Network techniques

PROJECTS

May 2026 – May 2031 **GENESIS** — Quantum-Enhanced Evaluation of Nuclear Reaction Cross Sections in R-Matrix Theory · Funded (NSF, USA) · Role: Participant

AWARDS

Feb 2026 **Villi Prize, INFN** · Italy — INFN prize for the best Ph.D. thesis

Feb 2025 – Present **Honorary Fellow, School of Physics and Astronomy, University of Edinburgh, UK** · in recognition of supervisory and research contribution

Oct 2024 – Present **IAEA INDEN-LE Committee** · International Atomic Energy Agency, Vienna — invited membership in the IAEA committee of world-leading R-matrix experts, working on the evaluation and extrapolation of light-element nuclear cross sections for research and industrial applications

TEACHING

2024, 2026 **Joint Lecturer**, Nuclear Astrophysics Ph.D. course, Università degli Studi di Padova

2020 – 2025 **Teaching Assistant**, Physics Laboratory, Università degli Studi di Padova (five academic years: 2020, 2021, 2022, 2024, 2025)

SUPERVISION

2022 – Present **Ph.D. Theses** — co-supervision of R. Biassisi (from 2024) and E. Pilotto (from 2022), Università degli Studi di Padova

2023 – 2025 **Master Theses** — co-supervision of T. Tasnim (2025), M. M. S. Nusir (2024), A. Vigolo (2023), Università degli Studi di Padova

2023 – 2025 **Bachelor Theses** — co-supervision of A. Lorenzetto, T. Prins (2025), M. Ponchio, E. D'Amore (2024), L. Cavezza (2023), Università degli Studi di Padova

PUBLICATIONS

I played a key role in the analysis of the ^{12}C + p and ^{13}C + p experiments at LUNA and Felsenkeller laboratories, contributing to data collection, refining analysis techniques and improving simulations, with a later focus on R-matrix analyses for the latest LUNA reactions. Since starting my Ph.D., I have published 31 peer-reviewed papers, including **four first-author papers and three reviews**, a notable accomplishment in the field of nuclear astrophysics, where the typical timeline from experiment to publication spans around three years.

Research Articles

1. E. Pilotto, **J. Skowronski** et al., *"The CNO Cycle in the Sun Constrained by a Novel Lifetime Measurement with AGATA"*, under review at *Nature Physics*
2. D. Robb et al., *"Experimental determination of the $^{23}Na(p,p)^{23}Na$ excitation function from 2.1 to 4.1 MeV"*, under review at *Phys. Rev. Lett.*
3. L. Barbieri et al., *"A new detection array for underground charged particle spectroscopy at LUNA-400"*, Nucl. Instrum. Methods Phys. Res. A 1092, 171767 (2026). doi: 10.1016/j.nima.2026.171767
4. J. Cruz, D. Neves, **J. Skowronski** et al., *"Experimental determination of the $^{23}Na(p,p)^{23}Na$ excitation function from 2.1 to 4.1 MeV"*, Eur. Phys. J. A 62, 75 (2026). doi: 10.1140/epja/s10050-026-01847-y
5. R. J. deBoer et al., *"Total cross section of ^{14}N + n from 0.1 to 12 MeV"*, Phys. Rev. C 112, 025805 (2025). doi: 10.1103/frgb-j5c3
6. R. S. Sidhu et al., *"Improved direct measurement of low-energy resonances in the $^{21}Ne(p,\gamma)^{22}Na$ reaction"*, Phys. Rev. C 112, L052801 (2025). doi: 10.1103/vqt1-jxpw
7. R. M. Gesuè et al., *"Detector characterization for a new $^{12}C+^{12}C$ reaction study at LUNA"*, J. Phys. G: Nucl. Part. Phys. 52, 105103 (2025). doi: 10.1088/1361-6471/ade0dc
8. K. Linkowski, R. S. Sidhu, **J. Skowronski** et al., "*Energy calibration of the 2.5 MV Pelletron at the Dalton Cumbrian Facility*", Eur. Phys. J. A 61, 155 (2025). doi: 10.1140/epja/s10050-025-01622-5
9. A. Compagnucci et al., *"Towards a comprehensive study of the $^{14}N(p,\gamma)^{15}O$ astrophysical key reaction: Description of the experimental technique including novel target preparation"*, Eur. Phys. J. A 61, 191 (2025). doi: 10.1140/epja/s10050-025-01658-7
10. E. Pilotto, F. J. Ferrer, **J. Skowronski** et al., *"Comparing He content in magnetron sputtered and implanted targets for nuclear studies"*, Eur. Phys. J. A 61, 117 (2025). doi: 10.1140/epja/s10050-025-01590-w
11. **J. Skowronski** et al., *"A Comparative Analysis of R-Matrix Fitting: $^{12}C(p,\gamma)^{13}N$ as Test Case"*, Phys. Rev. C 111, 035802 (2025). doi: 10.1103/PhysRevC.111.035802
12. E. Masha et al., *"A high-energy-resolution gas target setup to study selected NeNa cycle reactions"*, Eur. Phys. J. A 61, 45 (2025). doi: 10.1140/epja/s10050-025-01512-w
13. D. Rapagnani et al., *"Revision of the CNO cycle: Rate of ^{17}O destruction in stars"*, Phys. Rev. C 111, 025805 (2025). doi: 10.1103/PhysRevC.111.025805
14. K. Stöckel et al., *"Novel approach to infer the $^{2}H(p,\gamma)^{3}He$ angular distribution: Experimental results and comparison with theoretical calculations"*, Phys. Rev. C 110, L032801 (2024). doi: 10.1103/PhysRevC.110.L032801
15. L. Csedreki et al., *"Status and future directions for direct cross-section measurements of the $^{13}C(\alpha,n)^{16}O$ reaction for astrophysics"*, J. Phys. G: Nucl. Part. Phys. 51, 105201 (2024). doi: 10.1088/1361-6471/ad6a2a
16. R. M. Gesuè et al., *"First Direct Measurement of the 64.5 keV Resonance Strength in the $^{17}O(p,\gamma)^{18}F$ Reaction"*, Phys. Rev. Lett. 133, 052701 (2024). doi: 10.1103/PhysRevLett.133.052701
17. M. P. Takács et al., *"Direct capture cross section and resonances in the $^{22}Ne(p,\gamma)^{23}Na$ reaction at low energy"*, Phys. Rev. C 109, 064627 (2024). doi: 10.1103/PhysRevC.109.064627
18. C. Ananna et al., *"Detectors and Shieldings: Past and Future at LUNA"*, Universe 10(5), 228 (2024). doi: 10.3390/universe10050228
19. R. Buompane et al., *"Nuclear Physics Mid-Term Plan at LNGS"*, Eur. Phys. J. Plus 139, 224 (2024). doi: 10.1140/epjp/s13360-023-04840-2
20. C. Ananna et al., *"Recent results and future perspectives with solid targets at LUNA"*, Front. Astron. Space Sci. 10 (2023). doi: 10.3389/fspas.2023.1325053
21. M. Ballan et al., *"Nuclear physics midterm plan at Legnaro National Laboratories (LNL)"*, Eur. Phys. J. Plus 138, 8 (2023). doi: 10.1140/epjp/s13360-023-04249-x

22. **J. Skowronski** et al., *"Proton-capture rates on carbon isotopes and their impact on the astrophysical $^{12}C/^{13}C$ ratio"*, Phys. Rev. Lett. 131, 162701 (2023). doi: 10.1103/PhysRevLett.131.162701
23. **J. Skowronski** et al., *"Advances in radiative capture studies at LUNA with a segmented BGO detector"*, J. Phys. G: Nucl. Part. Phys. 50, 045201 (2023). doi: 10.1088/1361-6471/acb961
24. **J. Skowronski** et al., *"Improved S-factor of the $^{12}C(p,\gamma)^{13}N$ reaction at E = 320 – 620 keV and the 422 keV resonance"*, Phys. Rev. C 107, L062801 (2023). doi: 10.1103/PhysRevC.107.L062801
25. E. Masha, L. Barbieri, **J. Skowronski** et al., *"First measurement of the low-energy direct capture in $^{20}Ne(p,\gamma)^{21}Na$ and improved energy and strength of the E c.m. = 368 keV resonance"*, Phys. Rev. C 108, L052801 (2023). doi: 10.1103/PhysRevC.108.L052801
26. D. Piatti et al., *"First direct limit on the 334 keV resonance strength in $^{22}Ne(\alpha,\gamma)^{26}Mg$ reaction"*, Eur. Phys. J. A 58, 194 (2022). doi: 10.1140/epja/s10050-022-00827-2
27. C. Ananna et al., *"Underground Measurements of Nuclear Reaction Cross-Sections Relevant to AGB Stars"*, Universe 8, 4 (2021). doi: 10.3390/universe8010004
28. S. Capra et al., *"First in-beam test of the GALTRACE innovative silicon detector array"*, Il Nuovo Cimento C 34, 4 (2021). doi: 10.1393/ncc/i2021-21034-5

Conference Proceedings

1. **J. Skowronski** et al., *"Low-energy Cross Section Measurements of $^{12}C(p,\gamma)$ Deep Underground at LUNA"*, EPJ Web Conf. 279, 03002 (2023). doi: 10.1051/epjconf/202327903002
2. D. Rapagnani, **J. Skowronski** et al., *"Study of proton capture on carbon-13 isotope at LUNA"*, J. Phys. Conf. Ser. 2586, 012103 (2023). doi: 10.1088/1742-6596/2586/1/012103
3. **J. Skowronski** et al., *"Measurement and analysis techniques for a study of $^{12}C(p,\gamma)$ and $^{13}C(p,\gamma)$ deep underground"*, EPJ Web Conf. 260, 11008 (2022). doi: 10.1051/epjconf/202226011008
4. S. Capra et al., *"Validation and characterization of the GALTRACE silicon detector array demonstrator"*, IEEE Nucl. Sci. Med. Im. Conf. (2019). doi: 10.1109/NSS/MIC42101.2019.9059819

EVENTS

Organization and committee memberships

Jul 2026	**R-Matrix Workshop on Methods and Applications** · Oak Ridge National Laboratory, TN, USA — Member of International Committee
Jun 2026	**Carbon Burning: Theory, Astrophysics and Experiments Workshop** · Padova, Italy — **Chair**
Jul 2025	**HELIUM Workshop** · HZDR, Dresden, Germany — **Co-Chair**
2024 – 2025	**IReNA Online Seminar Organizing Committee** — Member
May 2023	**2nd Frontiers in Nuclear Astrophysics Summer School** · East Lansing, Michigan, USA — Member of Organizing Committee
Jun 2022	**ChETEC-INFRA 2nd General Assembly** · Padova, Italy — Talk: *$^{12}C(p,\gamma)^{13}N$ Cross Section Measurement at Felsenkeller*

Invited Contributions

Since completing my Ph.D. in December 2023 I have been receiving annual invitations to deliver seminars, lectures, and plenary talks at leading international schools and conferences on nuclear astrophysics and R-matrix analysis.

Sep 2026	**Nuclear Physics in Astrophysics XII (NPA XII)** — *Nuclear Physics at LUNA and with the AGATA array*
Oct 2025	**Seminar, University of Notre Dame** · South Bend, Indiana, USA — *A Young Eye on Ancient Stars: Contemporary experimental approaches to nuclear astrophysics measurements and extrapolations*
Mar 2025	**20th Russbach School on Nuclear Astrophysics** · Russbach, Austria — Lecture: *Probing the Stars Beneath Our Feet: Underground Proton Capture Reactions*
Jun 2024	**AZURE2 R-matrix Summer School** · Edinburgh, UK — Lecture: *Uncertainty Estimation for R-matrix Analysis*

Jun 2023 **R-matrix Workshop on Methods and Applications** · Athens, Ohio, USA — Talk: *Proton Capture on Carbon Isotopes*

Participation (selected)

May 2025 **29th International Nuclear Physics Conference** · Daejeon, South Korea — Talk: *Preliminary study of the $^{19}F + p$ at LUNA*

Aug 2024 **Zakopane Conference on Nuclear Physics** · Zakopane, Poland — Talk: *New Results on Proton Capture on Neon Isotopes*

Nov 2023 **ALPACA: Modern Algorithms in Machine Learning and Data Analysis** · Trento, Italy — Talk: *Neural Networks for Nuclear Astrophysics*

Jun 2023 **16th Varenna Conference on Nuclear Reaction Mechanism** · Varenna, Italy — Talk: *Proton Capture on Carbon Isotopes*

May 2022 **JINA-CEE Frontiers in Nuclear Astrophysics** · South Bend, Indiana, USA — Talk: *Study of Proton Capture on Carbon Isotopes at LUNA*

Sep 2021 **16th International Symposium on Nuclei in the Cosmos** · Online — Poster: *Measurement and Analysis for a Study of $^{12}C(p,\gamma)^{13}N$ and $^{13}C(p,\gamma)^{14}N$*

2020 – 2022 **Schools and national congresses** — 11th European Summer School on Experimental Nuclear Astrophysics (Catania, 2022); Euroschool on Exotic Beams (2021); 57th Karpacz Winter School of Theoretical Physics (2021); Frontiers in Nuclear and Hadronic Physics (2021); 106° and 107° Congresso Nazionale SIF (talks, 2020/2021)

OUTREACH

2024 **Stelle sulla Terra** — Nuclear Astrophysics for Impaired Children, UniPD

2023 **Project Asimov** — Scientific Essays for High School, INFN; **Project RadioLab** — Communication on Environmental Radioactivity, INFN; **Science4All** — Nuclear Astrophysics Stand, UniPD

2021 – 2022 **Astrofisica Nucleare** — High School Transversal Skills and Career Guidance, UniPD

SKILLS

Languages Native Polish, Fluent Italian, Advanced English

Coding C++, Python, PyTorch, ROOT, TCP/IP, Docker, Grafana, Graphite, Qt, XDAQ, Geant4, Verilog

Research R-matrix analysis, advanced statistical methods, data acquisition systems, radiation spectroscopy, detector characterization, target characterization, Monte Carlo techniques, uncertainty estimation

MISCELLANEOUS

May 2016 – May 2018 **Student Representative**, Physics Department Council, UniPD

Oct 2013 – Mar 2014 **NHSMUN Project**, New York, USA

5. Capacity of the Participating Organisation(s)

5.1 *Overview of Participating Organisations*

Organisation role	PIC	Legal Entity Short Name	Academic (Y/N)	Country	Name of Supervisor
Beneficiary	999974941	UEDIN	Y	United Kingdom	Prof. Thomas Davinson
Associated partner for secondment	999992789	INFN	Y	Italy	Dr. F. Ferraro

5.2 Capacity of the Participating Organisations

Choose one of:

☒ Beneficiary (compulsory)

☐ Associated partner linked to a beneficiary (if applicable)

☐ Associated partner for outgoing phase (compulsory for GF only)

☐ Associated partner for secondment (optional)

☐ Associated partner for non-academic placement (optional)

The University of Edinburgh, UEDIN, United Kingdom

General Description	The University of Edinburgh is the leading research university in Scotland and is amongst the top ten in the United Kingdom, ranking in the top three in terms of research power. Its School of Physics and Astronomy has an excellent worldwide reputation for its nuclear and particle physics research. The Nuclear Physics group hosts one of Europe's leading experimental nuclear-astrophysics programmes and uniquely combines the two capabilities this project requires: deep expertise in underground low-energy measurements, as a core member of the LUNA collaboration, and a world-class silicon-detection and instrumentation programme (AIDA, TUDA, and activities at TRIUMF, RIKEN and FAIR).
Role and Profile of Supervisor	**Prof. Thomas Davinson** (supervisor) is the architect of the AIDA and TUDA charged-particle detection systems, with four decades of experience in custom silicon spectroscopy for nuclear astrophysics and radioactive-beam experiments; detection systems built by his group have been deployed at every leading low-energy nuclear physics facility worldwide. Within the fellowship, he leads the technical training on detector physics, characterisation and chamber engineering. **Prof. Marialuisa Aliotta** (co-supervisor) is Professor of Experimental Nuclear Astrophysics, Fellow of the Royal Society of Edinburgh, and a senior member of the LUNA collaboration with a direct role in the planning of the MV programme. She took part in the direct measurements of the $^{12}C + ^{12}C$ reaction at low energies and is lead author of a recent Annual Review of Nuclear and Particle Science survey of low-energy nuclear astrophysics. She has supervised numerous postdoctoral researchers and Ph.D. students through to independent academic positions.
Key Research Facilities, Infrastructure and Equipment	The School of Physics and Astronomy provides the silicon-detector characterisation laboratory where the IGNIS detection system will be assembled and qualified, equipped with clean-room facilities, bonding stations, test electronics and vacuum systems, together with in-house mechanical and electronics workshops. The segmented silicon detector array at the core of the project is **already physically at Edinburgh**, so the work concerns characterisation and integration rather than procurement. High-performance computing for the GEANT4 simulations and the R-matrix evaluation is available through the institutional Eddie compute cluster, and the University Library provides access to the full journal portfolio. The Edinburgh Research Office and the Institute for Academic Development provide structured support for MSCA

	fellows, and the University holds the HR Excellence in Research Award and implements a Gender Equality Plan.
Previous and Current Involvement in EU-funded Research and Other Projects	The University of Edinburgh has traditionally been very successful in participating in European Framework Programmes. During the Sixth and Seventh Framework Programmes, the University was involved in over 600 projects, with a total award value of approximately €320M. As of October 2021, the University has been awarded 411 projects with a value of over €269M under Horizon 2020, hosting 90 ERC awards and 120 MSCA actions (1 COFUND, 4 RISE, 40 ITNs, 2 Researchers' Night and 73 IF). Under Horizon Europe, the University has successfully applied, as coordinator or beneficiary, to 26 ERC (including 2 Synergy) and 39 MSCA actions, 32 of which are MSCA PF. Within the Nuclear Physics group, several academic members hold or have held ERC grants, and the group has an established record of hosting MSCA Postdoctoral Fellows.

Choose one of:

☐ Beneficiary (compulsory)

☐ Associated partner linked to a beneficiary (if applicable)

☐ Associated partner for outgoing phase (compulsory for GF only)

☒ Associated partner for secondment (optional)

☐ Associated partner for non-academic placement (optional)

Laboratori Nazionali del Gran Sasso (LNGS), INFN, Italy

General Description	The Istituto Nazionale di Fisica Nucleare (INFN) is the Italian public research institute dedicated to nuclear, particle and astroparticle physics, operating four national laboratories and a network of divisions across Italy. Among them, the Laboratori Nazionali del Gran Sasso (LNGS) is the largest underground research laboratory in the world, where 1400 m of rock overburden suppress the cosmic-ray-induced background by six orders of magnitude. LNGS hosts the LUNA collaboration and the Bellotti Ion Beam Facility, a 3.5 MV accelerator delivering the most intense carbon beams available for deep-underground measurements, where the IGNIS experimental campaign will be carried out as a secondment.
Role and Profile of Supervisor	F. Ferraro is a senior member of the LUNA collaboration at INFN Laboratori Nazionali del Gran Sasso (LNGS), with extensive expertise in low-background nuclear astrophysics experiments conducted at the underground LUNA accelerator facility. As the on-site supervisor for the secondment, he will provide scientific and technical guidance based on the ongoing measurement of the $^{12}C + ^{12}C$ fusion reaction through gamma-ray detection, supporting the experimental activities, data acquisition, and analysis.
Key Research Facilities, Infrastructure and Equipment	For the deployment, commissioning and operation of the IGNIS detection system, LNGS provides the Bellotti Ion Beam Facility with its high-intensity carbon beams, the low-background underground experimental halls, target preparation and characterisation laboratories, chemistry and mechanical workshops, and the full LUNA infrastructure, including the WebDAQ data acquisition and slow-control system that I lead. All required institutional infrastructure, including safety training and underground access procedures, engineering and technical support, is readily available to members of the collaboration.
Previous and Current Involvement in EU-funded Research and Other Projects	INFN is among the most active Italian participants in the European Framework Programmes, hosting numerous ERC grants and MSCA actions under Horizon 2020 and Horizon Europe. LNGS and the LUNA collaboration are partners of the ChETEC-INFRA starting community for nuclear astrophysics (Horizon 2020) and of the EURO-LABS project (Horizon Europe), which provide transnational access to the underground facilities, and supporting early-career researchers and international exchange is at the core of the laboratory's mission.

6. Additional ethics information

No additional ethics information is needed. All relevant ethical aspects of the proposed project have been addressed in the ethics self-assessment section of Part A of this proposal.

7. Additional information on security screening

No additional security screening information is needed. The objectives and potential impact of the proposed research project are purely scientific and technological. The proposed project does not involve any activities raising security concerns; therefore, the project requires no specific security measures.

8. Environmental considerations in light of the MSCA Green Charter

The project will follow the general practices of sustainability, allowing it to comply with the goals of the MSCA Green Charter, and its very design minimises its environmental footprint. The segmented silicon detector array at the core of the project already exists at Edinburgh, so that the experimental programme requires characterisation and integration of existing hardware rather than the fabrication or procurement of new large-scale equipment, and the scattering chamber, accelerator and underground infrastructure at the Bellotti Ion Beam Facility are all in routine operation. If new project-related materials or consumables need to be purchased, green purchasing will be considered and promoted whenever possible, and recycling will be applied to plastics and other laboratory materials.

Travel between Edinburgh and LNGS is concentrated into a single consolidated secondment covering installation, commissioning and the measurement campaign, rather than repeated short visits, and the WebDAQ acquisition and slow-control system that I lead allows the experiment to be monitored, and shifts to be taken, remotely, further reducing the travel required of the wider collaboration. Collaboration and supervision meetings will be held by teleconference as a default, and low-emission transport, such as trains, will be preferred whenever practicable.

The energy-efficient institutional computing infrastructure required for the GEANT4 simulations and the R-matrix evaluation is already in place at Edinburgh, and sustainable coding and open-science practices, including the public release of the evaluation input files, will be followed throughout, so that the results can be reused rather than recomputed by the community. Digital documentation and reporting will be promoted to reduce paper usage. These measures are supported by the constant institutional commitment of both the University of Edinburgh and INFN to reducing greenhouse-gas emissions and fostering environmental awareness.

9. Required for Global Fellowships only: Letter(s) of commitment from associated partners (hosting the outgoing phase)

Not applicable. This proposal is submitted for a European Fellowship.