

## Call for postdoctoral and technological research grants

### Art. 1

1. The Gran Sasso Science Institute (GSSI) is opening fellowships for research activity in the following fields: Physics, Mathematics, Computer Science and Social Sciences.
2. The research grants referred to this call may be renewed on the basis of what is foreseen by current legislation and the University Regulation, subject to financial coverage.
3. Applicants willing to apply for the **postdoctoral research grants** must hold a PhD degree or an equivalent qualification. The PhD title should be earned before starting the appointment.
4. Applicants willing to apply for the **technological research grants** must hold a Master's degree diploma and any additional qualification required by the profile.

### Art. 2 - Physics

- 1.1 One postdoctoral position financed through the “Astrophysics Center for Multimessenger studies in Europe – ACME” G.A. n. 101131928, resp. scientifico Prof.ssa Marica Branchesi (CUP: D13C24001520006, cod. id Ugov: HE\_ACME) project funds, for the following profile: **ACME** “Expertise on Gravitational-wave and multi-messenger astrophysics: data analysis and modelling”.

The scientific coordinator of the activities is professor Marica Branchesi

Yearly gross salary: € 45.000,00 (gross amount before taxes, including taxes owed by the Institution).

The duration of the appointment is 24 months.

- 1.2 One postdoctoral position financed through the “Space It Up!”, bando di finanziamento ASI decreto n. 687/2022 - deliberazione n. 71/2022 - tematica 15 attività spaziali, di cui all'Avviso MUR n. 341/2022 per partenariati estesi (Cod. Id. Ugov: SPACE\_IT\_UP, CUP: D53C24000580005) project funds, for the following profile: **SPACE IT UP\_Aloisio** “High energy radiation detection with orbital and suborbital experiments: simulations and data reconstruction”. The ideal candidate should have a solid background in experimental particle and astroparticle physics with a PhD in the field. Previous experience in the experimental study of cosmic radiation with space based experiments and in the related activities (R&D, data analysis, and detector response simulations) would be an asset. The selected candidate will work in setting up innovative approaches for space based radiation measurements, including simulations and tests."

The scientific coordinator of the activities is professor Roberto Aloisio.

Yearly gross salary: € 45.000,00 (gross amount before taxes, including taxes owed by the Institution).

The duration of the appointment is 24 months.

- 1.3 One postdoctoral position funded through the GSSI funds for the 50% and through the PRIN2022\_BARBATO "WINK: a pathfinder mission for the future Crystal Eye X and gamma rays all sky monitor", bando D.D. MUR n. 104/2022, PNRR - M4C2 - investimento 1.1, Fondo per il

Programma Nazionale di Ricerca e Progetti di Rilevante Interesse Nazionale (PRIN) del Piano Nazionale di Ripresa e Resilienza – finanziato dall'Unione europea - NextGenerationEU, (cod. id. Ugov: PRIN2022\_BARBATO, cod. id. Cineca: 20229PR843\_001, CUP:D53D23002550006) project funds for the other 50%, for the following profile: **WINK** “The ideal candidate should have a solid background in experimental particle or astroparticle physics with a PhD in the field. The candidate is expected to work within the high energy experimental group on spaceborne experiments, in particular her/his activity will be focused on payload design, optimization and test. Therefore, previous experience in the experimental study of cosmic radiation is welcome. The experience with space-based experiments and their related laboratory and/or simulations activities would be an asset.”

The scientific coordinator is Dr. Felicia Carla Tiziana Barbato.

Yearly gross salary: € 45.000,00 (gross amount before taxes, including taxes owed by the Institution).

The duration of the appointment is 12 months, with possibility of extension.

- 1.4 One postdoctoral position financed through the GSSI Physics area funds for the 50% and through the DAREDEVIL: DARK-mattEr-DEVICES-for-Low-energy-detection”, bando D.D. MUR n. 104/2022 a valere sul PNRR - M4C2 - investimento 1.1, Fondo per il Programma Nazionale di Ricerca e Progetti di Rilevante Interesse Nazionale (PRIN) del Piano Nazionale di Ripresa e Resilienza – finanziato dall'Unione europea - NextGenerationEU, resp. scientifico prof.ssa Natalia di Marco (cod. id. Ugov: PRIN2022\_DIMARCO, cod. id. Cineca: 2022Z4RARB\_001, CUP:D53D23002960001) project funds for the other 50%, for the following profile: **DAREDEVIL** “Candidates are expected to have a background in particle or astroparticle physics, with a PhD in the field. Expertise in R&D, data analysis, Monte Carlo (MC) simulation, or experience with cryogenic detectors is considered an additional asset. The research activities will focus on characterizing new target materials for light dark matter particles with masses below 1 GeV/c<sup>2</sup>. The selected candidate will also have the opportunity to participate in other rare event search projects at the Laboratori Nazionali del Gran Sasso”. For this position the starting date is set for February 1st, 2025 save for any exceptions granted by the GSSI, under penalty of forfeiture of the position accrued in the ranking.

The scientific coordinator is professor Natalia Di Marco.

Yearly gross salary: € 40.000,00 (gross amount before taxes, including taxes owed by the Institution).

The duration of the appointment is 12 months, with possibility of extension.

- 1.5 One postdoctoral position for the following profile: **AUGER** “The ideal candidate should have a solid background in experimental particle and astroparticle physics with a PhD in the field. Previous experience in the experimental study of cosmic radiation with ground based experiments and in the related activities (R&D, data analysis, and detector response simulations) would be an asset. The selected candidate will work in the framework of Pierre Auger collaboration focusing on the tests of the new hardware for the water Cherenkov detectors, including calibration and validation with cosmic ray data”.

The scientific coordinator is dr. Felicia Carla Tiziana Barbato.

Yearly gross salary: € 45.000,00 (gross amount before taxes, including taxes owed by the Institution).

The duration of the appointment is 24 months.

### Art. 3 - Mathematics

- 1.1 One postdoctoral position financed through the “Holes in the heart: a fluid dynamics approach to atrial septal defects” bando D.D. n. 104/2022, responsabile scientifico Prof. Francesco Viola (CUP: D53C24004090001, cod. id. Cineca: 2022J5ZNHS\_001, cod. id. Ugov: PRIN2022\_VIOLA) project funds, for the following profile: **PRIN2022\_Viola** “The candidate will work within the PRIN project 'Holes in the heart: a fluid dynamics approach to atrial septal defects'. This project aims to investigate numerically the effects on the hemodynamics of atrial septal defect (ASD) and patent foramen ovale (PFO), which are congenital heart conditions impacting the inter-atrial septum—the tissue dividing the heart's upper chambers. The project is multidisciplinary, connecting engineering with medicine, and it aims at advancing the employment of computational methods in the clinical practice. The candidate should have strong expertise in numerical or experimental fluid dynamics.”

The scientific coordinator is Professor Francesco Viola.

Yearly gross salary: € 45.000,00 (gross amount before taxes, including taxes owed by the Institution).

The duration of the appointment is 12 months, with possibility of extension.

- 1.2 One postdoctoral position financed through the “Using CARDIac simulations to run in-silicO clinical TRIALS”, ERC-2021-STG, HORIZON-ERC, G.A. n. 101039657 (Cod. Id. Ugov: HE\_CARDIOTRIALS, CUP: D13C22000870006) project funds for the following profile: **CARDIOTRIALS** “The candidate will work within the ERC project ‘Using CARDIac simulations to run in–silicO clinical TRIALS’ (CARDIOTRIALS). The research activity aims at running in-silico trials to investigate cardiac pathologies and testing innovative medical devices. The candidate should have strong expertise in numerical or experimental fluid dynamics.

The scientific coordinator is Professor Francesco Viola.

Yearly gross salary: € 45.000,00 (gross amount before taxes, including taxes owed by the Institution).

The duration of the appointment is 24 months.

- 1.3 One postdoctoral position financed through the “MOLE: Manifold constrained Optimization and LEarning” – PRIN 2022 bando D.D. MUR n. 104/2022, ammesso a finanziamento con D.D. MUR n. 20428/2024 (Cod. id. Ugov: PRIN2022\_TUDISCO, CUP: D53C24003460006, cod. id. Cineca: 2022ZK5ME7\_003), resp. scientifico Prof. Francesco Tudisco project funds, for the following profile: **MOLE\_PRIN\_Tudisco** “The candidate will work within the PRIN project "MOLE: Manifold-constrained Optimization and LEarning". The project aims to develop new algorithms using low-rank and structured matrices for deep learning applications, including large language models, graph neural networks, and neural operators for the solution of (time-dependent) PDEs. The project is multidisciplinary, connecting numerical analysis and deep learning. The focus of the project can be on

theoretical and algorithmic aspects or software implementation, or a combination of them, depending on the candidate's interests and career goals.”

The scientific coordinator is Professor Francesco Tudisco.

Yearly gross salary: € 45.000,00 (gross amount before taxes, including taxes owed by the Institution).

The duration of the appointment is 18 months.

#### **Art. 4 - Computer Science**

- 1.1 One postdoctoral position financed through the GSSI funds for the following profile: **COMPUTER SCIENCE** “Design and engineering of distributed or autonomous systems, resorting on tools and methodologies deriving from software engineering, formal methods, algorithms and data structures or artificial intelligence”.

The scientific coordinator is Professor Patrizio Pelliccione.

Yearly gross salary: € 45.000,00 (gross amount before taxes, including taxes owed by the Institution).

The duration of the appointment is 24 months.

- 1.2 One postdoctoral position financed through the MATISSE “Model-based engineering of Digital Twins for early verification and validation of Industrial Systems - MATISSE” (CUP: D13C24001180006) project funds, for the following profile: **MATISSE** “The research activities will focus on digital twin and software engineering solutions for detection of faults and prediction in production environments. These techniques will be applicable to real-life systems in various domains, including the use of robots in the space domain. Previous experiences in the robotic and space domains are welcome but not required.”

The scientific coordinator is Professor Patrizio Pelliccione.

Yearly gross salary: € 45.000,00 (gross amount before taxes, including taxes owed by the Institution).

The duration of the appointment is 24 months.

#### **Art. 5 - Social Sciences**

- 1.1 One technological position funded through “CHANGES – Cultural Heritage Active Innovation for Sustainable Society” - Partenariato Esteso PE\_00000020 - Creazione di “Partenariati estesi alle università, ai centri di ricerca, alle aziende per il finanziamento di progetti di ricerca di base” D.D. MUR 341/2022 - Piano Nazionale di Ripresa e Resilienza, M4C2INV1.3, finanziato dall’Unione europea – NextGenerationEU (CUP: D53C22002560006, cod. id Ugov: CHANGES\_PNRR) project funds for the following position: This position is funded through **CHANGES** – Cultural Heritage Active Innovation for Sustainable Society - a PNRR-funded project. The CHANGES research consortium has been created as a "multi-technological transdisciplinary hub of international reference for training, research, technology transfer", falling within the broad theme area designated by MUR as "Humanistic Culture and Cultural Heritage as Laboratories for Innovation and Creativity". The post holder will contribute to the project with practice-oriented work dealing with

“Innovative techniques of sustainable management of cultural heritage facing human-caused and natural risk”. We are looking for a junior scholar with an attitude in both research and practice with an academic background in the field of cultural heritage studies from a perspective of social sciences attentive to place-specific conditions (human geography, environmental sociology, cultural anthropology, spatial planning, local history, cultural heritage management studies). Research will focus on the experimentation with socially innovative techniques of community preparedness to natural and human-caused risk, particularly involving participatory methods. Research will be conducted in the context of L'Aquila and its wider urban area. Candidates are expected to hold a Master's degree (laurea magistrale) in the above mentioned disciplinary fields. The candidate will have to apply his/her knowledge to the case study of the city of L'Aquila and the Abruzzo Region. Candidates should have an excellent knowledge of the English language, both written and spoken.

The scientific coordinators are: professor Speranza Falciano and professor Ugo Rossi.

Yearly gross salary: € 35.000,00 (gross amount before taxes, including taxes owed by the Institution).

The duration of the appointment is 12 months, renewable for another 12 months .

- 1.2 One postdoctoral position funded through the “Productivity & Resilience synergies and trade-offs: a post-Covid perspective” (CUP: D13C24002230005, cod. Id. Ugov: REDI\_1POSTDOC\_RESILICENCE) project funds for the following profile: **REDI** “The candidate will conduct a research aimed at assessing the trade offs and synergies between productivity and resilience in different territorial contexts. The ideal candidate will be a researcher with a background in applied economics and strong quantitative skills. The candidate should be able to master econometric modeling, including discrete choice and count models; excellent written and verbal communication abilities, demonstrated through publications, presentations, and stakeholder engagement; ability to work collaboratively in interdisciplinary teams, bridging gaps between economics, regional science and policy.”

The scientific coordinators are professor Alessandra Faggian and professor Marco Modica.

Yearly gross salary: € 30.000,00 (gross amount before taxes, including taxes owed by the Institution).

The duration of the appointment is 36 months.

- 1.3 One postdoctoral position funded through the “SpaceItUp!” bando di finanziamento ASI decreto n. 687/2022 - deliberazione n. 71/2022 - tematica 15 attività spaziali, di cui all’avviso MUR n. 341/2022 per partenariati estesi - approvato con decreto ASI n. 53/2024 - Contratto 2024-5-E.0, CUP Master: I53D24000060005, resp. scientifico Prof. Ivan De Mitri - Finanziamento dalla Presidenza del Consiglio dei Ministri ai sensi dell’Art. 1, comma 254, della legge 160/2019, Anno di riferimento 2024 (CUP: D53C24000580005; cod. id Ugov: SPACE\_IT\_UP\_CONTRATTO2024-5-E.0\_CUPI53D24000060005) project funds for the following profile: **SPACE IT UP\_Palma** “The candidate will be involved in the PNRR SpaceItUP project and will have a pivotal role in advancing socio-economic analysis within Spoke 7 - 'Space for the Sustainable Development of the Planet.' The ideal candidate has excellent ability to interact with interdisciplinary research teams, excellent written and verbal communication abilities, and stakeholder engagement. Proficiency in modern counterfactual econometric techniques, satellite data management, and coding are considered key assets.”

The scientific coordinator is professor Alessandro Palma.

Yearly gross salary: € 45.000,00 (gross amount before taxes, including taxes owed by the Institution).

The duration of the appointment is 24 months.

### Benefits

The GSSI provides to each postdoc a contribution for the purchase of IT equipment, upon request motivated by research needs, from the funds of the research project or on the GSSI funds. The contribution, up to a maximum of € 3.000,00, (gross amount before taxes, including taxes owed by the Institution), will be paid upon the presentation of a fiscal purchase receipt and the authorization of the Scientific coordinator or the Director of the Scientific Area.

### Requirements

1. Applicants willing to apply for the **postdoctoral research grants** must hold a PhD degree or an equivalent qualification. The PhD title should be earned before starting the appointment.
2. Candidates in possession of an academic qualification obtained abroad which has not already been declared equivalent pursuant to the current legislation, must attach to the application form the documents necessary to allow the selection committee to declare its equivalence for the sole purpose of participating in the selection procedure. If the above-mentioned documents are in a different language other than Italian or English, they must be translated and legalized by the competent diplomatic representatives abroad, according to the current legislation.
3. A **very good knowledge of English** is required.

### Application

The applications must be sent to GSSI only by filling in the online application form at the following link: <https://applications.gssi.it/postdoc/>.

The following documents are required for the **postdoctoral** research grants:

- a curriculum vitae, including the complete list of publications;
- a research statement (not required for the Mathematics Area)
- up to three selected publications which will be evaluated individually. The PhD thesis can be included, since it is considered as a publication;
- a valid ID document.

The following documents are required for the **technological** research grants:

- a curriculum vitae, including the complete list of publications;
- a valid ID document.

### **Deadline: January 20, 2025 - 3 p.m. (Italian time zone).**

The candidate can provide the names and contact information of up to two referees. The information provided by the applicants (name, institute and email address) in the online form will be used to send the referees an

email with a link to a page where they can upload the reference letter: referees should submit the reference letters in English or Italian through the online application system within **January 27, 2025**. Only for the position referred to in art. 2, c. 1, par. 1.4 (DAREDEVIL), the deadline for the upload of the reference letters is set on **January 22, 2025**. No reference letter uploaded by the candidates will be admitted. The reference letters are not mandatory.

Candidates willing to apply for more than one position should go through the application procedures for each position separately. It is necessary to register again and upload all the required documents separately and independently for each application.

All communications to candidates will be published on the GSSI Official Bulletin Board <https://www.gssi.it/albo-ufficiale-online-gssi> in the notice dedicated to this Call, with notification value to candidates.

### **Selection procedure**

1. The selection procedure is carried out in accordance with the "Regulations for the awarding of research grants", to which reference is made.
2. In the preliminary session, the Evaluation Committee has the right to provide for an interview, governed by the "Regulations for the awarding of research grants".

The call for applications is available at <https://applications.gssi.it/postdoc/>

For additional information please contact the following e-mail address: [applications@gssi.it](mailto:applications@gssi.it)

### **Disclaimer**

*Please be advised that this is a mere extract of the D.R. 252/2024. In case of doubt, the Italian version is the official document and shall prevail.*

L'Aquila, December 17, 2024