



English version

The legally binding version is the Italian one:

Determinazione n. 222 del 13/12/2023

SUBJECT: Open call for application for number one grant with title: ***“Intergalactic magnetic field measurement with joint MAGIC + LST1 observations of the blazar 1ES 0229+200”***

as stated and expressed above

DECREES

Art. 1 – Object of the Call

A selection is called, based on qualifications and possible interview, for n. 1 grant for the duration of 2 years for carrying out research activities on: ***“Intergalactic magnetic field measurement with joint MAGIC + LST1 observations of the blazar 1ES 0229+200”***.

This project is devoted to study one of the long-standing problems in cosmology, namely the origin of the magnetic fields in the large-scale universe. In order to confirm or disclaim the different scenarios with which they are explained it is crucial looking for signatures of magnetization in regions devoid of structures, cosmic voids. The Inter Galactic Magnetic Field (IGMF) has never been detected. Only upper limits with different techniques have been derived. In the last decade an innovative technique based on the observation of extragalactic gamma-ray sources allowed to derive lower bounds on the IGMF with strengths not reachable by the standard techniques used to measure the astrophysical magnetic fields. This technique can in principle provide a direct measure of the IGMF strength: multi TeV gamma rays coming from an extragalactic source are not able to propagate over large distances because they interact with the extragalactic background light (EBL) producing electron-positron pairs. The pair production reduces the VHE (Very High Energy, $E > 50$ GeV) flux of an extragalactic source. The pairs, in turn, upscatter the Cosmic Microwave Background (CMB) photons to high energies via Inverse Compton (IC) scattering. The high energy photons will then restart the whole process, creating a cascade of particles. As a result these cascade photons represent a new additional gamma ray component along the line of sight. In addition, if the pairs are deflected by a not negligible IGMF, the cascade emission is expected to be extended; the angular extension depends on the IGMF strength and this provides a direct method to measure it.

The goal of this project is to study the gamma ray emission of the blazar 1ES 0220+200, an ideal target for IGMF studies. This source has been recently scheduled to be observed with MAGIC+CTA/LST1 system. This system allows to perform the most sensitive extended emission search in the pre-CTA era. Once the data has been analyzed and the production of a flux/excess map is performed, data fitting with point like or extended source models will allow to test the presence of the halo emission and, in case of no detection, using simulation softwares, templates of halo emission for different IGMF strengths can be created. These templates will be used to fit the flux/excess map to exclude some IGMF strengths.

This selection procedure is contextually aimed:

to offer the opportunity of professional growth to young PhD holders, or to research fellows, or fix-term employees who are willing to get engaged in both national or international research environments in the perspective of turnover and mobility, which means to employ specific professional competences for fix-term projects and/or research activities;



to fill positions that stands outside programs of permanent staff recruitment, and consequently do not represent binding prerequisite for employment as permanent staff of the institute;

The grant holder will carry out the activity at the INAF - Osservatorio di Astrofisica e Scienza dello Spazio di Bologna, under the scientific supervision of Dr. Paolo Da Vela.

The responsible for the procedure of the present call is Dr.ssa Manuela Spiga.

Art. 2 - Requirements for participation

Participation to the selection is reserved to Italian and foreign citizens holding the following minimum requirements (besides what reported in the "Regolamento del Personale INAF" mentioned above in the premises):

- Degree in Physics or Astronomy obtained according to the regulations in force prior to the reform referred to in Ministerial Decree 509/09 (DL) or the classes of specialist degrees (LS) or the classes of master's degrees (LM) to which the aforementioned diplomas degree have been equated by the Ministerial Decree of 9 July 2009 for the purposes of participation in public competitions, or equivalent foreign qualification.

The applicants having obtained a degree in a foreign University, which was not already declared complaint to the Italian law, will be admitted to the current evaluation after a positive review by the selection committee (see Art. 8), on the basis of the documentation provided by the applicant.

If the applicant will be successful and the position offered, the Administration on the basis of the opinion of the selection committee will forward the submitted documentation, along with that described in Art. 3, co. 2, letter a) or b) of the Italian Republic President decree number 189 issued on July 30, 2009 and the candidate specific request, at the Minister of University and Research, for the purpose of acquiring the expected opinion according to Art. 4, comma 2 of the above mentioned decree.

A good knowledge of the English language is also required.

For the selection of the candidate, preferential requisites will be:

- i. experience in analyzing data by imaging atmospheric Cherenkov telescopes;
- ii. very good knowledge of data statistical treatments considered as a key point to implement routines that perform data fitting.
- iii. experience with softwares devoted to study extragalactic propagation of cosmic rays and gamma rays

Art. 3 - Ineligibility and incompatibility with other funding

The research grant of the present call cannot be awarded to Italian permanent staff of any University, public institutions and Italian research public institutes according to art. 8 of the DPCM 30 December 1993, n. 593 and subsequent amendments and additions.

The grant cannot be held contemporarily with other fellowships of whatever kind (University and other institutions or research institutions), except those awarded with the aim of integrating the training or research activity of the fellowship holder through a period spent abroad.

The fellow must issue an explicit declaration of the non-existence of the aforementioned inadmissible



accumulation situations, upon acceptance of the grant.

The public employee who may be the recipient of the check referred to in this announcement may be admitted after being placed on leave without pay, according to the current regulatory and/or contractual provisions of the sector, by their own administration.

Art. 4 - Duration of the Research fellowship

The Research Fellowship will last 24 months; the starting date will be established as soon as the financial resources are available in the "Observatory of Astrophysics and Space Science of Bologna budget." The exact initial date will be negotiated with the grant holder and is renewable -- with the action of the Director of INAF-OAS Bologna, after a specific request by the scientific supervisor responsible for the funds verified the necessary financial coverage.

Any renewals could burden financial funds associated with projects of INAF-OAS Bologna, in line with the scientific goals described in the art. 1.

Possible delays of the starting date of the research grant, or possible interruption of the research activity, will be allowed in accordance with current legislation.

The motivated interruption of the research activity, implies the suspension of the salary for the same period in which the research activity is interrupted, and consequently the final deadline for the expiry of the research grant is postponed by a period equal to the duration of the interruption.

The entire period of the relationship established with the grant holder, as per section 22, Law 240/2010, as modified by section 6, co. 2 bis of the Law Decree 192/2014, also known as "Mille proroghe", converted as Law n.11 on 27.02.2015 n. 11 (published in G.U.R.I. on 28.02.2015, n. 49); including also different public, private and online Universities, as well as research Institutes of section 22, part 1 Law 240/2010 cannot exceed a total of 6 years, even not continuous, excluding the period of Ph.D. courses within their maximum duration, also excluding the periods of maternity leave or for health reasons, according to the current legislation.

Art. 5 - Salary amount, and insurance policy

The grant is worth € 32.000,00 (euros thirty-two thousand/00) gross per year, inclusive of all charges payable by the grant holder, and will be paid in deferred monthly installments.

The amount does not include any cost related to missions that might be necessary to pursue the research activity linked to the research grant; in that case the INAF legislation for such missions will apply.

For what concerns tax, social security matters, compulsory maternity leave and sick leave, the resolutions according to art. 22, paragraph 6, of the Law 240 of 2010 and provisions of the INAF Regulations will be applied.

The grant holder is required to take out an insurance policy against the risk of accidents, which must be shown when the contract is formalised.

Art. 6 - Application, deadline



Applications must be submitted in English or Italian, strictly following the attached scheme (Annex A), dated, signed and accompanied by the required documentation, and must be sent by mean of the Certified Electronic Post (PEC) or by ordinary e-mail with return receipt by the deadline of 05/02/2024 before 11:59 pm at the PEC address inafoasbo@postecert.it indicating in the subject “**Domanda per Assegno di Ricerca IGMF with MAGIC + LST1**” must clearly and precisely declare in the application under his own responsibility:

- name and surname, date and place of birth, nationality, residence and address for sending correspondence,
- to possess all the requirements described in art. 2 of this announcement;
- not to be in some of the incompatibility conditions described in art. 3 of this announcement.

The lack of the aforementioned declarations will result in exclusion from the selective procedure for incomplete application.

For the purposes of selection, the candidate:

- can self-certify the possession of academic qualifications through Attachment A.

In addition

- Citizens of non-member states of the European Union residing outside Italy, if successful, must produce the original or a certified copy of the qualifications obtained outside Italy.

To participate in this selection, the **following documents** must be submitted:

1. **Annex A - application form**
2. **Annex B - substitutive declaration of certification** - substitutive declaration of deed of notoriety (art.19 - 46 - 47 of Presidential Decree 28 December 2000, n. 445);
3. “**Curriculum vitae**”, **signed and dated** by the candidate, which also indicates any scholarships and research grants previously or in progress;
4. **Copy of a valid identity document;**
5. **List of publications**
6. **Any other qualification**, work experience, research activity at public or private institutions and publications that the candidate deems appropriate to attach;
7. **List of all documents submitted.**

Candidates are admitted to the selection with reserve and may, at each stage, be notified of their exclusion from the selection for the following reasons:

the application was submitted after the deadline;

- lack of signature of the application;
- lack of signature of the curriculum vitae;
- lack of a copy of a valid identity document;
- lack of the requirements indicated in art. 2.

If the reasons for exclusion are ascertained after the conclusion of the selection procedure, the candidate will lose all rights deriving from participation in the selection; similarly, we will proceed if the production of false declarations is ascertained.

All the documents need to be in the original form or certified copy; in the latter case by means of self-certification according to art. 46 of the DPR 28/12/2000, n. 445, or by means of a copy with attached the aforementioned self-certification, according to art. 19 of the DPR 28.12.2000 n. 445 and through a self-declaration according to Artt. 46 and 47 of the DPR 28.11.2000 N. 445, following the scheme shown in the attachment B; (especially for the publications not present in the ADS database). Any declaration (and self-certification) must be accompanied with a copy of a valid identity document;



INAF - Osservatorio di Astrofisica e Scienza dello Spazio di Bologna assumes no responsibility for the dispersion of communications resulting from inaccurate indication of the address by the candidate or omitted or late communication of the change in the address indicated in the application, nor for any disservices related to the computer network.

Disabled applicants, according to Law n. 104 of 5 February 1992, must request specifically, in the application, related to their handicap, regarding the necessary aid, as well as the possible need for additional time for the completion of any interview, according to the aforementioned law.

The applications that are not signed, those received after the deadline and those that do not comply with what described in this article will not be taken into consideration;

Art. 7 - Exclusion from selection

Candidates are admitted to the selection with reserve, subject to successful checks on the candidate's qualifications according to art. 2 of this Call. The justified exclusion from the selection can be ordered at any time by the Director of the INAF-OAS Bologna.

The candidates excluded from the selection, with justified provision by the Director of INAF-OAS Bologna, will be notified by registered letter with acknowledgment of receipt or by certified email (PEC), if the candidate provided an address for the certified email (PEC).

Art. 8 - Selection Committee and selection procedure

The selection of the candidates will be performed by a Selection Committee appointed according to art. 9 of the INAF Disciplinary by the Director of INAF - OAS Bologna and is composed by three members, from either Italian or foreign research staff or from the University, with expertise in the research field of the position offered in this announcement (art. 1).

The Selection Committee will first define the selection criteria to be applied on the titles and the possible interview, according to art. 2, and before accessing all the documentation provided by the candidates.

For the evaluation of the CV and the interview, the search committee will follow the "preliminary Guidelines to assign a research contract" and in particular section 11.

At the end of the evaluation of the qualifications, a ranked list of the candidates is produced by the Committee, with a score associated to each candidate. The list, signed by the President and Secretary of the Committee, will be posted at the same day of examinations at INAF - OAS Bologna.

If necessary, the Committee can integrate the evaluation with an interview that will be performed either in person or online. Applicants selected for the interview will be informed at least 15 days before the date of the interview. Details of the connection for the online interview will be sent to the applicants in due time. Selected candidates are required to fill Annex C.

INAF does not provide for the reimbursement of any expenses incurred by candidates for participation in any interview.

At the end of the evaluation, the Committee will draw up a final ranked list according to the score assigned to each candidate and will indicate the grant holder corresponding to the candidate with the



highest score. In case of equal score, the youngest candidate is selected.

The Committee will send the ranked list to the Director of INAF-OAS Bologna per the final approval and subsequent post on INAF - OAS Bologna website.

Art. 9 - Awarding of the fellowship

After the publication of the final ranked list, the Director of INAF - OAS Bologna will notify the highest ranked candidate of the award of the grant.

Within 10 days from the date of receipt of the formal communication, the winner will issue a formal declaration of acceptance of the research grant, at the same time certifying that he is not in any of the impediments provided for by art. 4 of this announcement.

If the candidate does not provide a declaration of acceptance within a period of 10 days, the right to the research grant that can be assigned to the next ranked candidate forfeits the right to.

The stipulation of the contract does not in any case give rise to a subordinate employment relationship or to rights regarding access to the roles of INAF.

In the case that the fellow is an employee of a public administration, before starting the research activity, they must submit a copy of the placement on unpaid leave.

The successful candidate, before starting the research activity, must sign an insurance policy against accidents at work, otherwise the research contract will not be valid.

As regards the risks of civil liability towards third parties, the fellow will be covered by insurance stipulated by INAF. This insurance does not cover the civil liability of the holder of the check towards INAF.

The grant holder that will interrupt without justified reason the research activity, during the foreseen assigned period, or will be responsible for serious or repeated failures, or proves that he does not have sufficient aptitude for carrying out the research activity, will be declared discharge from the assigned grant after the justified provision of the Director of INAF - OAS Bologna, after request by the scientific Supervisor.

The grant holder may withdraw from the contract after giving written notice of at least 30 days in advance. In case the alert is not properly notified in advance, INAF - OAS Bologna has the right to withhold the amount corresponding to the notice period not given.

Under no circumstances the signing of the contract starts a subordinate employment relationship or ensures any rights to access to permanent INAF staff positions.

Art. 10 Processing of personal data

1. According to art. 13 of the "*Regolamento (UE) 2016/679 del Parlamento Europeo e del Consiglio del 27 aprile 2016 relativo alla protezione delle persone fisiche con riguardo al trattamento dei dati personali, nonché alla libera circolazione di tali dati e che abroga la direttiva 95/46/CE*" also known as "*Regolamento generale sulla protezione dei dati*", l' "*Istituto Nazionale di Astrofisica - Osservatorio di Astrofisica e Scienza dello Spazio*", as the owner of the procedure,



informs that the processing of the data made available by the candidates who submit an application to participate in this Call, or acquired by the "*Osservatorio*", is aimed solely at carrying out the activities, acts and provisions envisaged by the aforementioned procedure and will be carried out by the persons responsible for its execution, including the members of the Examining Commission.

2. The processing of personal data will be performed with suitable procedures, aimed to pursue the purposes specified in the previous paragraph, even in the event of any communication to third parties.

3. Personal data are necessary to verify the requisites needed for the participation in the selection procedure; any missing personal data may preclude such verification.

4. Candidates have the rights according to Art. 15 and subsequently, of the "*Regolamento generale sulla protezione dei dati*" and in particular, have the right to access their data, to request their rectification, cancellation, limitation to the processing, as well as to oppose the processing, which may be exercised by sending a proper request to the "*Istituto Nazionale di Astrofisica*", located in Rome, Viale del Parco Mellini n. 84, postal code 00136, following the procedures defined in the next paragraph.

5. The rights indicated in the previous paragraph may be exercised, without any formalities, by sending a request to the "*Responsabile della Protezione dei Dati*" dell'*Istituto Nazionale di Astrofisica*":

- a) by registered letter with acknowledgment of receipt to the address specified at the paragraph 4 of this article;
- b) by e-mail to the following address: rpd@inaf.it;
- c) by certified e-mail (PEC) to the following address rpd-inaf@legalmail.it;

6. Candidates who believe that the processing of their personal data is carried out in violation of the provisions contained in the "*Regolamento Generale sulla protezione dei Dati*" and those according to the present article can lodge a complaint to the Guarantor for the protection of Personal Data, according to Art. 77 of the aforementioned Regulation, or to appeal to the competent judicial authority, according to Art. 79 of the aforementioned Regulation.

Art. 11 - Advertising

The full advertising of this announcement is arranged through publication on the website of the National Institute of Astrophysics (<http://www.inaf.it/>) and on the website of the INAF - OAS di Bologna (<http://www.oas.inaf.it>).

Art. 12 - Final Provisions

For what is not explicitly mentioned in this announcement, the Observatory shall act in compliance with the regulations in force concerning public selection procedures, when applicable by analogy.

Il Direttore
Dr. Andrea Comastri