



AREA RICERCA E TRASFERIMENTO TECNOLOGICO
SETTORE DOTTORATI E CONTRATTI PER LA RICERCA
U.O. ASSEgni DI RICERCA

PUBLIC SELECTION FOR NR. 3 RESEARCH FELLOWSHIP GRANTS – TYPE B
TO COOPERATE WITH A RESEARCH PROGRAMME WITH SPECIFIC FUNDING
(LAW 30 DECEMBER 2010, N. 240, ART.22)

THE RECTOR

HAVING REGARD to the Law 9 May 1989, n. 168;

HAVING REGARD to the Law 30 December 2010, N. 240, Art.22 “Assegni di ricerca”;

HAVING REGARD to the Decree of the Minister of Education, University and Research of 9 March 2011, n. 102, setting the minimum amount of research fellowship grants;

HAVING REGARD to the article 15 of the Law n. 183 of 11 November 2011, defining the rules of certifications and replacement statements, and the prohibition of introducing in the implementation of European Union directives additional obligations compared to those provided for by the directives themselves;

HAVING REGARD to the law of 29 June 2022, n. 79 “Conversion into law, with amendments, of the decree-law of 30 April 2022, n. 36, containing further urgent measures for the implementation of the National Recovery and Resilience Plan (PNRR)”, which allows, in a transitional regime, the assignment of grants for collaboration in research activity pursuant to art. 22 of law 240/2010;

HAVING REGARD to the decree-law of 29 December 2022, n. 198 (“milleproroghe” decree), following which the possibility of launching procedures for the awarding of research grants pursuant to article 22 of the law of 30 December 2010, n. 240, in the text in force before the date of entry into force of the decree-law 36/22;

HAVING REGARD to the Rules for the awarding of research fellowship grants, issued with Rector’s Decree n. 2760 of 02/07/2021;

HAVING REGARD to the PRIN 2022 Notice, issued by the MUR with Directorial Decree no. 104 of 2/02/2023, for the financing of research projects of Significant National Interest (PRIN) to be financed within the framework of the PNRR, lasting two years, concerning the three macro-sectors determined by the ERC, aimed at promoting the national system of research, to strengthen interactions between universities and research bodies in line with the objectives outlined by the National Recovery and Resilience Plan (PNRR) and to encourage Italian participation in initiatives relating to the European Union's Framework Program for research and innovation - *Mission 4 “Education and Research” - Component C2 Investment 1.1 “Fund for the National Research Program and Projects of Significant National Interest (PRIN)”*;

CONSIDERING that, as part of the above call, the following projects were financed for professors and researchers belonging to the Department of Matematica e Informatica:

Cognome resp.	nome resp.	Codice	Titolo	Settore ERC	CUP	Numero decreto di finanziamento	Data decreto di finanziamento
FICI	Gabriele	20229BCXNW_002	Algorithmic Problems and Machine Learning	PE6	B53D23012920006	959	30/06/2023
LIVREA	Roberto	2022ZXZTN2_010	Nonlinear differential problems with applications to real phenomena	PE1	B53D23009580006	973	30/06/2023
LOMBARDO	Maria Carmela	2022M9BKBC_002	Evolution problems involving interacting scales	PE1	B53D23009350006	973	30/06/2023
ROCCHESSO	Davide	2022RB939W_001	Multiscale Analysis of Human and Artificial Trajectories: Models and Applications	PE6	B53D23013150006	959	30/06/2023
SCIORTINO	Marinella	2022YRB97K_003	PINC, Pangenome INformatiCs: from Theory to Applications	PE6	B53D23013300006	959	30/06/2023

HAVING REGARD to the Regulations for granting the benefits granted for the financed projects mentioned above, which provides, among other things, that the implementation of the project activities is consistent with the principles of gender equality in relation to articles 2, 3, paragraph 3, of the TEU, 8, 10, 19 and 157 of the TFEU, and 21 and 23 of the Charter of Fundamental Rights of the European Union, the protection and development of young people and the overcoming of territorial gaps;

GIVEN the requests of the Department of Matematica e Informatica aimed at activating a total of no. 3 type B research grants to be paid from PRIN 2022 funds;

DECREES

Art. 1 - Duration and amount of the research grant

A public selective procedure is announced, based on qualifications and interview, for the assignment of **n. 3 grants** for collaboration in research activities (Type B), to be carried out at the **Department of Matematica e Informatica**, using the PRIN 2022 funds, listed below.

Nr. Assegno	Area CUN	SSD	Cognome resp.	nome resp.	Codice	CUP
1	1	INF/01	FICI	Gabriele	20229BCXNW_02	B53D23012920006
2	1	MAT/07	LOMBARDO	Maria Carmela	2022M9BKBC_02	B53D23009350006
3	1	INF/01	SCIORTINO	Marinella	2022YRB97K_003	B53D23013300006

The identifying elements of the research grants are shown in the sheets attached to this announcement which constitute an integral part of the same.

The total gross amount including the charges borne by the Administration will be paid to the beneficiary in deferred monthly instalments.

Art. 2 - General admission requirements

The holders of an Italian Degree obtained under the previous system (before Ministerial Decree 509/99) of an Italian Master's Degree, of a single-cycle Degree or equivalent qualifications issued by foreign countries, who are in possession of a professional scientific curriculum suitable for carrying out research activities as for Art.1 may apply for the public selection for the assignment of the allowance in question.

Italian citizens who are excluded from the active political electorate cannot be admitted to the selection procedure.

Citizens of EU Member States and non-EU countries must also possess the following requisites:

- enjoy full civil and political rights in the states of belonging or provenance;
- be in possession, with the exception of the ownership of Italian citizenship, of all other requisites envisaged for Italian citizens;
- have a working knowledge of the English language

Applicants must possess the prescribed requirements on the date of expiry of the deadline for the submission of the application for admission.

The University administration may at any time, with a motivated provision, decide the exclusion from the selection procedure due to the lack of the prescribed requirements.

Art. 3 - Application and deadline

The application for admission to the selection procedure, drawn up in free paper according to the form attached to the notice (Annex 1, downloadable from the following link:

<http://www.unipa.it/amministrazione/direzionegenerale/serviziospecialericercadiateneo/u.o.assegnidiricerca/struttura/modulistica.html> - **ALLEGATI DOMANDA ASSEgni TIPOLOGIA B**), signed by the candidate, scanned and accompanied by the other attachments downloadable from the aforementioned link and by the documentation deemed useful for the purposes of the assessment (in PDF format), should be

addressed to the Area Ricerca e Trasferimento Tecnologico – Settore Dottorati e Contratti di Ricerca - U.O. Assegni di ricerca, University of Palermo, Piazza Marina n. 61 - 90133 Palermo and forwarded, no later than thirty days from the date of posting of this notice to the University notice board, by electronic means (by midnight of the thirtieth day), by personal PEC at the address: pec@cert.unipa.it.

The application form and the attached documents must be contained in a single PEC. For reasons related to the management of the certified e-mail box, the files to be sent attached to the PEC must have a maximum overall size of 30 MB. As regards the scientific works for which the evaluation is requested, the candidate is required to submit a specific substitutive declaration of certification in which, specifying whether he is the author or co-author, he must list them, number them and divide them by type. For each scientific work listed in the aforementioned list, the link through which the Commission can view it must be indicated.

The Administration is exempt from any responsibility for the non-receipt of the PEC sent by the candidates dependent on technical errors and / or causes not attributable to the same.

The obligation to sign by hand is considered fulfilled by attaching a copy of a valid identity document to the scan of the completed application and signed by the PEC holder.

For subjects belonging to the Member States of the European Union and non-EU countries, the application for admission to the selective procedure, signed with a digital signature and scanned, as well as the relative documentation requested (in PDF format) can be sent electronically from an address of ordinary e-mail by sending an e-mail to the following address: mail-protocollo@unipa.it. If it is not possible to sign with a digital signature, the obligation of handwritten signing, is considered fulfilled with validation of the application and declarations by handwritten signature before the interview.

In both of the cases described above, it is necessary to specify in the subject of the e-mail the following: "Public selective procedure for the allocation of n. 3 research grants PRIN 2022 – Department of Matematica e Informatica Prof. _____ (specifying the name of the Scientific Director)".

For the participation in the competition candidates are required, under penalty of exclusion, to pay within the deadline for submission of the application, a contribution for organizational costs in the amount of € 50.00. This contribution must be paid by bank transfer to c/c n. 000300004577 registered to the University of Palermo - Via Roma, 185 - 90133 Palermo - identification code of the treasury of the University of Palermo 9150300 - UniCredit S.p.A. - IBAN code IT09A0200804682000300004577 - SWIFT code: UNCRITMMPAE indicating in the reason for payment: " Contributo per la partecipazione alla *procedura selettiva pubblica per l'attribuzione di n. 3 assegni di ricerca PRIN 2022 – Dipartimento di Matematica e Informatica Prof. _____ (specificando il nome del Responsabile Scientifico)*".

Copy of the bank transfer must be attached to the application.

In the application the candidates must indicate the selection call for which they intend to apply, the area and the scientific disciplinary sector (SSD) of reference of the research, the Department, the title of the research and the scientific director of the project; they must also declare under their own responsibility what is specified below:

- surname and name;

- place and date of birth;
- mailing address;
- residence;
- telephone number, e-mail box, social security number (or tax code, if any);
- citizenship;
- municipality on whose electoral lists they are registered, or the reasons for non-registration or cancellation from the same lists;
- to have no criminal convictions or to have ongoing criminal proceedings. In the opposite case, they must indicate the penal convictions reported or the criminal proceedings in progress, specifying whether amnesty, judicial pardon, pardon, etc. have been granted.
- degree held with the indication of the final mark and the date and the University in which it was awarded (candidates with a qualification obtained abroad that has not been declared equivalent, must expressly request a declaration of correspondence, only for the participation in the selection and attach the documents required by current legislation to enable the aforementioned declaration in question by the selection Committee);
- PhD title (if they hold one) or, for specific sectors, Medical Graduate School degree, with indication of the date of achievement and of the issuing University. Candidates with a PhD qualification obtained abroad must send together with the application form the qualifications with certified Italian translation and legalization by the authorities of the Country issuing the title (except in the case of exemption under international agreements and conventions) Each qualification must also be accompanied by the "Declaration of value" ("Dichiarazione di valore") issued by the Italian diplomatic representation in the Country where the qualification was obtained. Where the title has been declared equivalent, the candidate must attach the relevant documentation);
- attendance, if any, of second-level masters courses, post-graduate specialization courses obtained both in Italy and abroad, attendance of high- specialization schools, organization of scientific meetings, periods spent at Italian and foreign scientific institutions;
- e-mail address, to which the communications relating to this selective procedure are to be transmitted;
- enjoyment of civil and political rights in the Country of origin or provenance, or reasons for exclusion from them (for EU citizens and non-EU citizens);
- knowledge of the foreign language indicated in the form of interest
- non-existence of incompatibility pursuant to art. 11 of this announcement (otherwise the type of incompatibility must be indicated);
- to have or not have benefited from previous research fellowship grants pursuant to art. 22 of the law 240/2010;
- to have or not to have already been the holder of fixed-term research contracts (if any) pursuant to art. 24 of Law 240/2010.

The qualifications submitted for evaluation must be sent in certified copy or accompanied by a replacement statement, pursuant to article 46 or of a declaration pursuant to article 47 of the aforementioned decree.

The data and documents held by the University of Palermo may be acquired *ex officio* if the candidate indicates the indispensable elements for obtaining the information or data requested.

Candidates who hold only the degree must, on pain of exclusion from the competition, submit the documentation necessary to demonstrate they possess a scientific professional curriculum suitable for carrying out the research activity of this announcement.

Disabled candidates, according to the law of 5 February 1992, n. 104, will have to make explicit request, in relation to their handicap, with regard to the aid necessary to be able to sustain the interview.

The University administration assumes no responsibility for the dispersal of communications due to incorrect indication of the contact by the candidate or failure or late communication of the change of address and contact indicated in the application, nor for any errors not attributable to the administration itself.

Applications missing both from the application form signed and drawn up according to annex 1 and from any other document required by the call under penalty of exclusion and applications sent after the deadline will be declared ineligible.

Art. 4 – Selection Committee

No later than 15 days from the deadline for submission of applications, the Board of the Department Council or the Board of the field office proposes the names of the members of the Selection Committee, (three full members and an alternate one), chosen among the professors or researchers (tenured or not tenured) of the University of Palermo belonging to the CUN area of research, including the Scientific Director of the project entitled to funding, with the role of President.

In the first meeting, the Commission of selection, appointed by decree of the Rector, preliminarily and explicitly establishes the criteria and methods for assessing qualifications and the conduct of the interview. Subsequently, after having received the documentation of the candidates from the office and having examined the list of the candidates, it inserts, during the second meeting, a declaration showing that the commissioners are not in a relationship of kinship or affinity up to the fourth degree included, among them and with the candidates and that therefore there are not the causes of abstention referred to in articles. 51 and 52 of the Civil Procedural Code.

Then it proceeds to the evaluation of the qualifications and the attribution of the relevant score, which is communicated to the candidates before the date of the interview.

The Committee must complete the work within a maximum period of 60 days from receipt of the candidates' applications; it performs a comparative evaluation of the candidates based on the examination of the qualifications submitted by the same and an interview and draws up appropriate minutes according to the current selection regulations.

The judgment of the Commission is unquestionable on the merits.

Art.5 - Selection

The selection is carried out through the evaluation of academic qualification and interview. Up to 70 points may be awarded to qualifications and up to 30 points to the interview. To be admitted to the interview, candidates must achieve at least 40 points

out of 70 points for the qualifications. The interview is considered passed by candidates who have achieved at least 10 out of 30 available points.

Art.6 - Evaluation

The Committee will attribute the evaluation, expressed out of 100, according to the following criteria:

Titles

- up to 60 points for documented scientific activity according to the Unipa procedures for determining the status of active University researcher; theses and doctoral theses are excluded;
- up to 10 points for other qualifications (second level University master courses, post-graduate specialization courses obtained both in Italy and abroad, attendance of higher education institutions, organization of scientific meetings, periods spent at Italian and foreign scientific institutions).

Interview

Up to 30 points might be awarded for the interview, based on the discussion of the candidate's scientific production and aiming at ascertaining the level of scientific knowledge with respect to the research program of the research fellowship grant as well as the knowledge of the foreign language (for candidates who do not hold the level B1 certificate).

Art.7 Interview and ranking

Candidates, at least 20 days in advance, unless at the time of submitting the application, attach a declaration certifying that they waive the legal notice periods, will be notified in the manner deemed most appropriate, of the place, day and date. time when the interview will take place. To take the interview, candidates must have a valid identification document.

At the end of each interview session, the Commission will display at the exam center the list of candidates examined with an indication of the marks obtained by each.

The interview will take place in a room open to the public.

The Commission forms the merit ranking in decreasing order, adding the score of the qualifications to that of the interview.

For the purposes of awarding grants, a research doctorate or, for the sectors concerned, a qualification in the medical area accompanied by adequate scientific production is a preferential qualification.

In the event of equal merit, preference will be given to the female candidate and, subordinately, to the one with a younger age.

A specific report will be drawn up of the selection operations and signed by all members of the Commission, which, once its work has been completed, will immediately transmit, via the Titulus IT protocol system, all the documents to the Research and Technology Transfer Area - Doctorates and Contracts Sector of Research - U.O. Research grants for further required obligations.

The competition documents and the related merit ranking are approved by decree of the Rector.

It will be posted, for a period of thirty days, on the official noticeboard of the University of Palermo.

Art.8 (Stipulation of the contract)

The research grant is established following the stipulation with the University of Palermo of an intellectual work contract pursuant to articles 2222 and following of the Civil Code.

The contract must be signed by the winner with a digital signature which must be affixed in PadES mode.

The contract may provide for possible penalties in case of non-compliance with contractual obligations.

The activity of the research fellow should not be considered, in any case, a subordinate employment activity. Grants do not give rise to rights regarding access to the staff roles of Italian universities.

The winner is required to present himself for the stipulation of the contract within fifteen days of the convocation.

Failure to comply with this term will result in the loss of the right to the research grant. In the case of particular, justified and documented motivations, the stipulation of the contract may be postponed beyond fifteen days but, in any case, for a period not exceeding sixty days from the convocation date; the only exception consists in the possible requests for extension for pregnancy and puerperium, or serious and documented infirmity.

The winner or the holder of the grant can also obtain the postponement or suspension of the the grant for a period not exceeding one continuous year in the following cases:
a) for the mandatory year of training for teaching at schools on a motivated request, with the consent of the Scientific Responsible of the project and of the Department to which the research project relates (following the Academic Senate deliberation in the session of 30 October 2001)

b) for the activation of scholarships granted by national or foreign institutions permitted by current legislation

The winner of the research fellowship grant is required to self-certify any changes made to the points referred to in art. 3 of this announcement, before signing the contract.

Art. 9 (Service)

The winner is required to start the research activity the first day after the signature of the contract.

The beginning of the activity is documented by the Director of the Department in which the person concerned must carry out his/her collaboration by sending a statement to the to the Area Ricerca e Trasferimento Tecnologico – Settore Dottorati e Contratti di Ricerca - U.O. Assegni di ricerca. For non-EU citizens the grant will start afterobtaining the entry visa for scientific research and from the very beginning of the research activity.

Art. 10 (Activities and evaluation of the research fellows)

The methods and characteristics related to the research, in accordance with the aims of the project, will be established in the contract.

The holder of the research grant:

- carries out the research activities foreseen by the contract, previously declared by the Department Board compatible with its own research programs;
- may participate in university research groups and projects, regardless of the funding body;
- can take part in all the activities planned by the Department or by the field office for the promotion of research and the dissemination of results;
- can be part of the examination Boards, being already expert in the subject for the teachings of the scientific-disciplinary field of reference, at the request of the scientific tutor of the research fellow and after the presentation of the proposal drawn up in accordance with art.2 of the regulations for the appointment of scholars;
- can perform university teaching assignments conferred through contracts;
- may perform a limited supplementary teaching activity (maximum 20 hours per year) with authorization from the Tutor, if assigned by the Board of a Degree Course;

The Department or field office must provide the research fellow with the necessary support for the realization of the research program, guaranteeing access to the equipment, the necessary resources and the needed technical - administrative services.

The research fellow must carry out his/her research activity within the University facilities, according to the research program. Any research activity outside the University, provided that it is consistent with the research programs and objectives assigned to the grant holder, must be proposed by the Tutor and approved by the Board of the Department or of the field office.

Any renewal of the research grant will be authorized, upon motivated request of Board of the Department or of the field office, by the University Board of Directors, after verification of the availability of funding for the same research activity and subject to the positive evaluation by the Scientific Director of the project of the research activity carried out by the research fellow, certifying the need for the continuation of the fellowship grant for the completion of the research.

At the end of the period covered by the research fellowship grant, and in any case at the end of the research activity before the pre-established deadline, the research fellow must send to the to the Area Ricerca e Trasferimento Tecnologico – Settore Dottorati e Contratti di Ricerca - U.O. Assegni di ricerca a report on the activity carried out, countersigned by the Tutor or the Scientific Director/Contact person, accompanied by the evaluation expressed by the Board of the Department or of the field office in relation to the objectives set and accompanied by the relevant scientific production.

Article 11 (prohibition of cumulation, incompatibility, interruptions)

The following categories cannot be holders of a research fellowship grant:

- a) the permanent employees of universities, institutions, public research and experimentation bodies, ENEA, ASI, as well as of institutions whose scientific advanced diploma has been recognized as equivalent to the Ph.D. qualification pursuant to article 74, fourth paragraph, of the Decree of the President of the Republic July 11, 1980, n. 382, unless termination of the relationship due to voluntary resignation in the case of attribution of the grant;

b) those who have a degree of kinship or affinity, up to and including the fourth degree, with a professor belonging to the Department to whom the grant has been assigned or to the structure publishing the call or with the Rector, the General Manager or a member of the University Board of Directors.

The grant is individual.

The grant cannot be cumulated with any scholarships, with the exception of those granted by national or foreign institutions useful for integrating, with stays abroad, the research activity of the research fellows.

The holder of the grant cannot participate in 1st and 2nd cycle degree courses, university master courses, PhD courses with scholarship or medical graduate schools, in Italy or abroad; employees of public administration must put themselves on leave, before accepting the research fellowship grant.

Private employees, even if part-time ones, cannot benefit from research fellowship grants.

The holders of research fellowship grants cannot participate to university master courses.

Self-employment and occasional collaboration activities are compatible with the research grant only if previously authorized by the Board of the Department or of the field office, upon acquisition of the motivated opinion of the Tutor and provided that the further activity does not prejudice the regular conduct of the research activity.

The total duration of the research fellowship, including any renewal, cannot in any case exceed six years (DL 31.12.2014 n.192, converted into Law n.11 of 27.02.2015), excluding the period in which the fellowship coincided with a PhD course, within the maximum limit of the legal duration of the relevant course.

The total duration of the research fellowship or of non tenured university researcher contracts, also intervening with other public, private or distance-education universities, as well as with public research and experimentation bodies, ENEA and ASI it cannot in any case exceed twelve years even if non-continuous.

The periods spent on maternity leave or on leave for health reasons according to current legislation are not taken into account for the purposes of the duration of the aforementioned contracts.

The research activity and the grant can be suspended, provided that the duration of the fellowship cannot be reduced due to the following suspensions, for:

- mandatory maternity leave and parental leave;
- severe illness;

Art.12 (termination of the grant and voluntary resignation)

In cases of serious non-compliance, reported by the Board of the Department, the contract can be immediately terminated by resolution of the Academic Senate, after hearing the interested party.

The revocation is automatic in the following cases:

- failure to start the activity within the established term;
- unjustified suspension of the activity for a period longer than fifteen days;
- serious violation of the incompatibility regime;

In case of withdrawal from the contract, the holder of the grant is required to give thirty days' notice.

In the event of failure to give notice, the Administration will withhold or recover from the holder of the grant an amount corresponding to the remuneration for thirty days.

The winners of public selections that give rise to the placement in the roles of university personnel are not subject to the obligation of thirty days' notice.

Article 13 (Taxes, social security and insurance)

As established by art. 22 paragraph 6 of Law 240/2010, the provisions of art. 4 of the Law of 13 August 1984, n.476 and subsequent amendments and additions, as well as, in matters of social security, those pursuant to art. 2, paragraphs 26 and following, of the law of 8 August 1995, n. 335 and subsequent modifications do apply to research fellowship grants.

With respect to mandatory maternity leave for checks, the provisions of the Ministry of Labour and Social Welfare Decree of 12 July 2007, and, with regard to sick leave, article 1, paragraph 788, of the law of 27 December 2006, n. 296 and subsequent modifications are applied.

During the period of mandatory maternity leave, the indemnity paid by the INPS pursuant to article 5 of the aforementioned decree of 12 July 2007 is integrated by the University up to the total amount of the research fellowship grant.

The University provides to the holders of the research fellowship grant the insurance coverage for accidents and civil liability towards third parties in carrying out the research activity.

The amount of the relative premium is deducted from the grant.

Health care insurance is the responsibility of the researcher without any intervention by the University.

Art.14 - Substitutions

In case of non-completion of the research fellowship period by the winner of the selection process, it will be possible to call the following in the ranking if the contract period still to be used is equal to or greater than 12 months, pursuant to the provisions of law 240/2010 which provides for a minimum duration of one year.

Art. 15 - Publicity of the selection procedure

The present announcement will be posted on the official board of the University of Palermo, (<http://www.unipa.it/albo.html>) and on the MIUR website (<http://bandi.miur.it>).

The announcement will also be accessible at the University of Palermo website at: <http://www.unipa.it/amministrazione/direzionegenerale/serviziospecialericercadiateneo/u.o.assegnidiricerca/bandi>

Art.16 Processing of personal data

In application of EU Regulations 2016/679 the University undertakes to respect the confidential nature of the information provided by the candidate: "all data provided will



AREA RICERCA E TRASFERIMENTO TECNOLOGICO
SETTORE DOTTORATI E CONTRATTI PER LA RICERCA
U.O. ASSEgni DI RICERCA

be processed only for purposes related to and instrumental to the competition and to the possible stipulation and management of the contract with the University".

Art. 17 – Official in charge for the administrative procedure

Pursuant to the provisions of art. 5 of the law of 7 August 1990 n. 241 the official in charge for the selection proceedings referred to in this announcement is appointed in the person of Dott.ssa Stefania Crifasi - Head of the to the Area Ricerca e Trasferimento Tecnologico – Settore Dottorati e Contratti di Ricerca - U.O. Assegni di ricerca - email: stefania.crifasi@unipa.it.

Art. 18 Final provisions

For anything not provided for in this announcement, please refer to the Regulations and laws in force.

Palermo

THE RECTOR
Prof. Massimo Midiri

Grant n. 1

SCIENTIFIC AREA	01
SCIENTIFIC-DISCIPLINARY SECTOR	INF/01
SCIENTIFIC DIRECTOR	Prof. Gabriele Fici
TITLE	Combinatorics on Words for Machine Learning
DESCRIPTION	The research focuses on the study of combinatorial problems on strings and other discrete structures coming from the area of Machine Learning. The development of new combinatorial techniques will allow the design of efficient algorithms for solving problems concerning automatic learning.
DURATION	12 months
FUNDS	PRIN 2022 project Algorithmic Problems and Machine Learning - U-GOV Code PRJ-1359
CUP	B53D23012920006
TOTAL GROSS AMOUNT	€ 26.000,00
KNOWLEDGE OF FOREIGN LANGUAGE	English

Grant n. 2

SCIENTIFIC AREA	01
SCIENTIFIC-DISCIPLINARY SECTOR	MAT/07
SCIENTIFIC DIRECTOR	Prof.ssa Maria Carmela Lombardo
TITLE	Coherent structures and asymptotic limits in hydrodynamical and parabolic models
DESCRIPTION	The formation of coherent structures is an important phenomenon observed in many models of continuum mechanics. Typically, such transitions are explained in terms of the destabilization of the homogeneous equilibrium caused by a bifurcation that leads to the appearance of new states. The simplest bifurcations leading to coherent states are the Turing bifurcation, the Hopf bifurcation and the wave-instability. The project aims to construct coherent structure-type solutions for parabolic and hydrodynamic systems in asymptotic limits of physical-mathematical interest, as well as to study their stability. The main focus will be on reaction-diffusion models such as FitzHugh-Nagumo, IntraGuild Predation systems, the Ginzburg-Landau equations or Kolmogorov-type hydrodynamic models. The mathematical methods employed in pursuit of the objectives will presumably be asymptotic analysis with multiple scales, spectral and finite difference numerical schemes
DURATION	12 months
FUNDS	PRIN 2022 project Evolution problems involving interacting scales - U-GOV Code PRJ-1416
CUP	B53D23009350006
TOTAL GROSS AMOUNT	€ 24.048,41
KNOWLEDGE OF FOREIGN LANGUAGE	English

Grant n. 3

SCIENTIFIC AREA	01
SCIENTIFIC-DISCIPLINARY SECTOR	INF/01
SCIENTIFIC DIRECTOR	Prof.ssa Marinella Sciortino
TITLE	Combinatorial methods for comparing and indexing highly repetitive string collections
DESCRIPTION	In many application domains, massive and highly repetitive data needs to be stored, analysed and queried. In the context of the biological sequences, huge and highly repetitive data limit the scalability of state-of-art methods for efficiently and effectively compressing and indexing collections of pangenomic sequencing reads or whole genomes. A promising research direction is to define efficient indexing structures whose size is proportional to an effective measure of input repetitiveness. We plan to use combinatorial methods to define new measures that can effectively evaluate the repetitiveness of large collections of sequences and to develop new methodologies for comparing and indexing pangenomes and huge sequence collections.
DURATION	12 months
FUNDS	PRIN 2022 project PINC, Pangenome INformatiCs: from Theory to Applications - U-GOV Code PRJ-1432
CUP	B53D23013300006
TOTAL GROSS AMOUNT	€ 26.000,00
KNOWLEDGE OF FOREIGN LANGUAGE	English