



CALL FOR THE AWARD OF N. 1 RESEARCH GRANTS
IN THE SCIENTIFIC AREA 02 / B2 - THEORETICAL PHYSICS OF MATTER

Art. 1 – OBJECT

Notice of a competition by qualifications and possible interviews announced for the assignment of n. 1 junior grant for collaboration in research activities lasting for **1 year** and for a gross amount of **€ 19.367,00**

Grant title: Thermal forces from a microscopic perspective
Research Project:

The project aims at investigating the properties of the steady state reached by a classical fluid in a nano-channel in the presence of a thermal gradient. When a uniform bulk fluid is placed in a thermal gradient, mechanical equilibrium quickly sets in via the force balance condition, implying constant pressure throughout the system. In the absence of external forces, the steady-state is characterized by a space dependent density profile and a constant heat flux not associated to mass current. The action of a thermal gradient on a fluid then resembles the effect of a fictitious "thermal force" which has been known to play also a dynamical role since the first studies in gases by Maxwell. The onset of a stationary fluid flow induced by temperature gradients (in the absence of symmetry breaking forces like gravity, when convection dominates) is named thermo-osmosis and only occurs due to the presence of a confining surface parallel to the thermal gradient. Thermo-osmosis is believed to be the driving mechanism for thermophoresis, i.e. the motion of a colloidal particle in a solvent due to a temperature gradient, where the slip of the fluid in the boundary layer close to the particle's surface gives rise to momentum transfer and eventually to particle motion. Thermo-osmosis is therefore one of the most fundamental manifestations of thermal forces and its physical origin is deeply rooted in non equilibrium statistical mechanics. At the same time is of great interest for applications as a mechanism for governing particle's motion at the nanoscale. A unified, first principle description of thermo-osmosis both in gases and in liquids is still lacking. In this project we will develop a microscopic approach to thermal forces based on Linear Response Theory, generalized to inhomogeneous and anisotropic environments. The results will be then compared to the recently available numerical simulations in simple models of fluids.

Responsible Scientist: Prof. Alberto Parola

The research will be performed at the Department of Science and High Technology located in Via Valleggio, 11 – Como (Italy)

Art. 2 – GENERAL REQUIREMENTS

All those who have received a **degree in PHYSICS** and who have an appropriate scientific-professional curriculum to carry out research activities established by this competition notice can participate in this public selection. **PhD in PHYSICS** or equivalent qualification earned abroad **is required** for admission according to this competition notice.

Candidates must have no criminal record.





Applicants having obtained the above titles/degrees abroad, not having the declaration of equivalence, will have to enclose in the application form a translation into Italian or into English of the foreign degree, completed by a self-certification related to the correspondence to the original of the translation itself. The degree earned abroad can be declared admissible, by the Judging Commission, only for purposes related to the selection.

Applicants must not have criminal convictions or pending prosecutions.

Qualifications must be possessed on the date of closure established for the presentation of the application form.

Candidates will be admitted to the competition conditionally.

Candidates having already been awarded fellowships according to law n. 240 30th December 2010 for more than 6 years (with the exception of periods corresponding to a PhD without scholarship) are not admitted. Maternity or sick leave are not relevant, according to laws in force.

Art. 3 – INCOMPATIBILY

As indicated in Art. 22 of Law 240/2010, employees of the Italian public administration and Universities permanent staff will not be admitted, nor the holders of any other research grants or scholarships, unless they resign if selected for the present competition.

The grant holder can not be enrolled, in Italy or abroad, in a Degree Course or Specialization course in the field of medicine or University Master.

Relatives and in-laws within the fourth degree included, or spouse, of a professor member of the Department or the Structure requiring the institution of the Research Grant, or of the Rector, the General Manager or a member of the Boards of Directors cannot participate in the competition for the assignment of the Research Grant.

The Research Grant cannot be combined with other grants or scholarships, except for scholarships awarded by either an Italian or a foreign institution, useful to integrate, while abroad, the holder's research activity. Throughout the duration of the grant it is prohibited to perform temporary or permanent employment relationships.

The total duration of the relationship established with grant holders as per the present article and of the contracts as specified in art. 24 of the Law no. 240 of 30th December, 2010, with one or more public, private, or telematic Universities, and with all the institutions listed in art. 22, paragraph 1, of the Law no. 240/2010, cannot exceed the total duration of 12 years, even non-continuous, with the same subject. As per the regulations in force, maternity and sick leave periods do not count in the duration of the above mentioned relationships.

Art. 4 - APPLICATION AND DEADLINES

The application for participation in the selection, as well as qualifications held, the documents and publications voted helpful for the competition must be submitted, under penalty of exclusion, via computer, using the computer application dedicated to page:
<https://pica.cineca.it/uninsubria/>

The computer application will necessarily require the possession of an e-mail address in order to perform the self-registration system.

The candidate will have to enter all data required for the production of the application and attach the documents in PDF format.



You can attach a maximum of n. 30 documents for publications and n. 30 documents for other qualifications to evaluate, and maximum 30 Mb size.

The application form must be completed in all its parts, as indicated in the electronic procedure, and must include:

- Curriculum of the scientific and professional activities
- Copy of an identity document valid

No other forms of submission of applications or useful documentation for participation in the procedure are allowed.

Within the application deadline, the system can be saved in draft mode.

The date of electronic submission of the request for participation in the selection is certified by the computer system that will be received by automatically sent via e-mail.

At the end of the period for submission, the system will no longer allow access and sending the electronic form.

To every application will be assigned an identification number which, together with the competition code in your application information must be specified for any subsequent communication.

The process of compiling and sending electronic application must be complete no later than 12.00 of 3rd June 2019

The presentation of the application form must be completed and concluded as follows:

- **Sign your document with ConFirma**
In order to sign digitally the application it is necessary to have a hardware (e.g. smart card or USB with digital signature certificate issued by an approved certification body) compatible with ConFirma service. After signing, applicants can download the signed pdf application.
- **Sign the application digitally on your pc**
In order to sign digitally the application it is necessary to have a hardware (e.g. smart card or USB with digital signature certificate issued by an approved certification body) and a software for digital signatures in order to create a pdf.p7m file from the pdf file downloaded from this site.
The pdf.p7m file must be uploaded in the website again.
- **Sign the application (no digital signature)**
If you can't sign the document digitally as specified in the other sections you need to download the pdf file of the application, print it, sign it in original, scan it in a pdf file and upload it again on the website.

ATTENTION: the copy of a valid identity document must be included as the last page of the scanned pdf, after the application form pages (this step can be dispensed with if a copy of the document was uploaded as an attachment of the application form).

They will be declared inadmissible the applications without the signature of the candidate.



Foreign nationals residing in Italy can take advantage of self above, limited to cases where it is necessary to proof conditions, facts and personal qualities certifiable by Italian public or private entities (art. 3 of Presidential Decree no. 445 / 2000).

Foreign nationals not resident in Italy cannot rely in any way the institute of self (art. 3 of Presidential Decree no. 445/2000).

Bonds, certificates and publications produced in a manner different than indicated above will not be taken into account. In application of the rules of self-certification matter, the University will undertake verification of the veracity of substitutive declarations and self-certifications under Presidential Decree n. 445/2000.

It is not allowed to make reference to documents and publications previously submitted for participation in other contests by this or other Administrations.

Each candidate is allowed to present one single application.

All the informations regarding the selection will be notified in the University Official Notice Board and on the University website: www.uninsubria.it.

Art. 5 - SELECTION PROCEDURE

The selection procedure is based on qualifications and possible interview aimed at verifying the candidate's aptitude for fellowship research.

Notification of the interview will be given to individual candidates using the e-mail address provided in the application or by registered post at least 7 days before the interview or the interview will be supported with a remote mode via computer media for audio and video, with the recognition of the identity of the candidate.

The interview will focus on the drawing of professional experience oriented candidate to assess the suitability of the check object in the pursuit of research.

Failure to attend the interview is considered to be explicit and definitive manifestation of the will of the candidate to give up the selection.

To take part in the interview, candidates must show a valid identification document.

The interview will be public.

Disabled candidates, according to Law n. 104/1992, should make a specific request for any assistance needed in order to take part in the interview.

To evaluate the candidate the Commission can use up to 70 points to be divided up in following way:

- Scientific and professional curriculum: up to 50 points
- Scientific publications: up to 20 points.

CURRICULUM (UP TO 50 POINTS)

- | | | |
|---------------------------|-----------|---|
| 1) the degree | | maximum 15/70 points and in particular: |
| - score 110/110 cum laude | 15 points | |
| - score from 105 to 110 | 12 points | |
| - score 99 to 104 | 9 points | |
| - score 80 to 98 | 6 points | |
| 2) PhD | | maximum 15/70 points |



- 3) previous scientific research activities
(contracts, scholarships, commissions, certificates...) maximum 10/70 points
- 4) other additional qualifications maximum 10/70 points

PUBLICATIONS (UP TO 20 POINTS)

- 5) maximum scientific publications maximum 20/70 points

For inclusion in the final ranking, if you make the interview, the candidates must have obtained a minimum score of 42/70.

At the end of the evaluation procedure the ranking will be published in the University Official Notice Board and on the University website: www.uninsubria.it.

The ranking will be used in case of resignation provided that the period proposed for the contract is not less than one year.

Art. 6 - EXCLUSION

The admission to the procedure is provisional and the following might lead to the exclusion:

1. the application is submitted after the deadline;
2. the form or unsigned;
3. not all requirements are fulfilled;
4. incompatibility.

The exclusion shall be duly motivated by the Scientific Director and shall be notified to the candidate by registered mail.

Art. 7 - WITHDRAWAL

Candidates willing to withdrawal shall notified it to the Director of the Department by email at: segreteria.dipsat@uninsubria.it.

Art. 8 - CONTRACT

The assignment of the Research Grant implies to sign a collaboration contract within a defined deadline that will be communicated to the awarded candidate.

The contract involves that the holder performs the research activity under the guidance of a Scientific Supervisor who will oversees what accomplished, according to Regulations on Research activities grant awards, Art. 34.

The grant is awarded for **1 year** and can be renewed for not less than 12 months.

The maximum duration of this kind of contracts even with different Authorities and Universities and eventually excluding the duration of an entire PhD cycle, if attended without a scholarship shall not be longer than 6 years.

Please refer to Articles 24, D.L. 240/2010 and 22-paragraph 1, D.L. 240/2010.

According to current regulations, maternity/sick leaves are not taken into account.

Renewals are in any case subject to the Scientific Committee positive evaluation of the performed research activities, as well as to the actual availability of budget funds.



The collaboration contract does not turn into either employment relationships or into acquiring positions inside the University. The University guarantees equal gender opportunities.

For non-EC subjects the contract will enter into effect after after obtaining the entrance visa for scientific research and when the research activity actually begins.

Art. 9 - PAYMENT CONDITIONS

The grant gross amount is **€ 19.367,00**, including social security costs charged to the grant holder. The Administration provides extra-cover for accident and public-liability insurance and for travel cost. The grant is exempt from IRPEF taxes. Please refer to Article 4, Law 476/August 4th 1984 and Art. 2, subsection 26 and forward, Law 335/August 8th 1995. The grant is paid on a monthly basis.

Art. 10 - MATERNITY AND SICK LEAVE

The research activity is suspended upon maternity leave. For further details, please refer to Ministry of Labour and social welfare, Decrees, Notice board no. 247/23rd October 2007. During the mandatory suspension, the grant holder is entitled to receive a subsidy by INPS integrated by University in order to cover the full amount of the research grant. The mandatory suspension period will be catch up at the end of the contract regular expiration. For further details, please refer to Article 1, subsection 788 and forward, Law 296/27th December 2006. The suspension are disposed by the Director.

Art. 11 - RESEARCH GRANT RESIGNATION

The holder has the right to resign from the contract by giving a 30 days notice to the Scientific Supervisor, to the Director of Department by email at: segreteria.dipsat@uninsubria.it. Failure to give notice will result in payment withhold, corresponding to the period of default.

Art. 12 - CONTRACT TERMINATION

If the grant holder with no reasonable justification does not perform the foreseen research activities or is responsible for serious and repeated misconduct, a contract termination could be ruled by the Council of the Department, on the basis of a detailed report written by the Scientific Supervisor.

Art. 13 - PRIVACY POLICY

According to the Italian Legislative Decree no. 196/2003 the personal data provided by candidates will be handled by University of Insubria only for the purposes connected to the selection procedure. Please refer to the privacy disclosure available on the web site www.uninsubria.it.

Art. 14 - INFORMATION ON THE APPLICATION OF REGULATIONS REGARDING THE PREVENTION OF CORRUPTION

The University adopted its three-year plan for the prevention of corruption and appointed the Head of the Prevention of Corruption.



The three-year plan is published in the web sites of the University of Insubria at <http://www4.uninsubria.it/on-line/home/naviga-per-tema/amministrazione-trasparente/articolo4719.html>.

Possible advisory can be sent to the address anticorruzione@uninsubria.it.

Art. 15 – PERSON IN CHARGE OF THE PROCEEDINGS

According to Law n. 241 dated 7/08/1990 Dott. Santo Zema Phone: +39 (0) 31.2386110 e-mail: santo.zema@uninsubria.it is in charge of the competition notice.

Art. 16 - FINAL RULES AND INFORMATION

As foreseen by the University rules and regulations on research grants, this call will be published in the Official University notice board, in the web sites of the University of Insubria, of the Ministry for University Education and Research and of the European Union.

Como, 16th May 2019

The Director of the Department
F.to (Prof. Umberto Piarulli)

DATE OF PUBLICATION IN THE OFFICIAL REGISTER: **17th MAY 2019**

DATE OF EXPIRATION OF TERMS: **3rd JUNE 2019**