

**RESOLUTION TO CALL FOR A BEATRIZ GALINDO SENIOR RESEARCH
POSITION IN THE DEPARTMENT OF CHEMISTRY AT UNIVERSIDAD AUTÓNOMA
DE MADRID (BEAGAL18/00092)**

Universidad Autónoma de Madrid offers a position for a senior researcher within the **Beatriz Galindo Programme (Orden ECD/365/2018, of Secretaría General de Universidades at the Ministerio de Ciencia, Innovación y Universidades)**. The main goal of this Programme is to attract and retain research talent from abroad in an attempt to reinforce the excellence and competitiveness of faculty members in Spanish Public Universities.

All details of the Beatriz Galindo Call can be found at:

<http://www.culturaydeporte.gob.es/servicios-al-ciudadano-mecd/en/catalogo/general/educacion/277089/ficha.html>

BASIC INFORMATION

1. **Title:** BEATRIZ GALINDO SENIOR RESEARCH POSITION AT THE DEPARTMENT OF CHEMISTRY- UNIVERSIDAD AUTÓNOMA DE MADRID

2. **Candidate profile:** Senior

Required Education Level: PhD

Years of experience at a foreign institution: At least 7 years of postdoctoral experience*

*The date of reference to determine the duration of the stay at a foreign institution will be
May 24th 2019.

PROFILE

Teaching and Research Profile

Internationally recognized physicist or chemist with long experience in ultrafast science, either theoretician or experimentalist, who will be in conditions of using the large European computational or experimental facilities described in Annex 1.

All details about the teaching project, research project and knowledge transfer project requested by the University can be found in Annex 1.

3. **Research field**

Chemical Physics

4. Type of Contract

- Full time contract for 4 years
- Contract to be signed within 2 months from the date of resolution of the selection process.
- Salary: 90.000€/year including social costs.

Stabilization of the 'Beatriz Galindo' distinguished researcher within the academic staff of the University, at the end of the contract:

Within the fourth year and upon positive evaluation, UAM will open a call for a permanent position with the academic profile of the distinguished Beatriz Galindo researcher.

More details about the procedure of evaluation and stabilization can be found in Annex 2.

5. Submission of candidatures

Candidates must use the form available at:

<http://www.educacionyfp.gob.es/mecd/servicios-al-ciudadano-mecd/catalogo/general/educacion/277089/ficha/277089-2018-fase2.HTML>

Applications must include, at least, the following information:

- a) Teaching project proposed by the candidate that must take into account the requirements of the University (Annex 1).
- b) Research project and knowledge transfer project proposed by the candidate that must take into account the requirements of the University (Annex 1).
- c) Curriculum vitae of the candidate, including all predoctoral and postdoctoral positions and current or recent relations with foreign universities or research institutions.
- d) Report of the expected impact and return to the University of the teaching, research and knowledge transfer project proposed by the candidate.

Candidatures must be submitted in English.

Application Deadline: From April 24th, 2019 at 8 a.m. to May 24rd, 2019 at 17 p.m. (Spanish time).

6. Provisional list of admitted and excluded candidatures from the selection process

At the end of the application submission period, applicants whose applications are incomplete or contain correctable errors will be asked to remedy the deficiencies or to submit the necessary documents within a maximum of ten business days.

If the applicant fails to do so, it will be understood that the application has been withdrawn, pursuant to Article 68 of Law 39/2015 of 1 October 2015 on Common Administrative Procedures for Public Administrations.

7. Evaluation of candidatures

Candidatures will be evaluated by the international panel of experts appointed by the Secretaría General de Universidades of the Ministerio de Ciencia, Innovación y Universidades with a score between 0 and 10 points according to the following criteria:

- a) Teaching project, up to 2.5 points.
 - 1º Quality of the teaching project, up to 1.25 points
 - 2º Programming of the teaching project, up to 1.25 points.
- b) Research Project, up to 2.5 points.
 - 1º Quality of the research project, up to 1.25 points.
 - 2º Programming of the research project, up to 1.25 points.
- c) Knowledge transfer project, up to 2.5 points.
 - 1º Quality of the knowledge transfer project, up to 1.25 points.
 - 2º Programming of the knowledge transfer project, up to 1.25 points.
- d) Impact and return for the University of the teaching, research, and knowledge transfer project, up to 2.5 points.
 - 1º Return of the teaching project, up to 1.25 points.
 - 2º Return of the research project, up to 0.75 points.
 - 3º Return of the knowledge transfer project, up to 0.5 points.

Important: To evaluate all these criteria the curriculum vitae of the candidate will be considered.

8. Hiring University & Offer Posting Contact Details

University: Universidad Autónoma de Madrid

Department: Department of Chemistry at the Faculty of Sciences

Address: C/ Francisco Tomás y Valiente, 7
Campus de Cantoblanco, UAM
28049 Madrid

9. Incompatibilities

The regime of incompatibilities of the contract is established in the articles 19 and 21 of the Orden ECD/365/2018, of Secretaría General de Universidades at the Ministerio de Ciencia, Innovación y Universidades.

10. Publication of provisional resolution

The provisional selected candidate and alternates will be published on the University official website and on the electronic services of the Secretaría General de Universidades at the Ministerio de Ciencia, Innovación y Universidades.

Beginning the day after the list is published, candidates will have ten business days to present arguments for reconsideration of the evaluation.

11. Publication of the resolution

The decision containing the successful candidate and a reserve list will be published on the University official website and on the electronic services of the Secretaría General de Universidades at the Ministerio de Ciencia, Innovación y Universidades.

Against this decision, interested parties may appeal for reconsideration within a period of one month before the University, or appeal to the Contentious-Administrative Chamber of the Supreme Court of Justice of Madrid within a period of two months. These time limits shall commence on the day following the publication of the decision. All these procedures are in accordance with Spanish Laws on the Common Administrative Procedure of the Public Administration and Contentious-Administrative Jurisdiction.

Madrid, 23 de abril de 2019

Fdo: Rafael Garesse Alarcón

Rector

Annex 1: Teaching project and research and knowledge transfer project presented by the University and selected in this call

1. Teaching Project

The recruited scientist will actively participate at the undergraduate, master and PhD levels, and will play a key role in increasing the international dimension of UAM teaching activities. Indeed, at the master level, he/she will actively participate in the upgrade of the European Master in Theoretical Chemistry and Computational Modeling (TCCM). This master, coordinated by UAM, includes 7 European institutions and received in 2010 the Erasmus Mundus label. It has therefore a very high international reputation that allows UAM to attract and support with important grants the best students all over the world. Very recently, the coordinators of this master have applied for the renewal of the Erasmus Mundus label. In this upgrade, contents related to ultrafast dynamics processes have been strongly reinforced. Consequently, institutions containing some of the key computational and experimental infrastructures mentioned below (e.g., LCLS in Stanford, FERMI in Trieste, and PRACE nodes in Barcelona, Trieste and Paris) are partners in the new master structure. Also, some of the future master teaching activities will be developed in the Centre Européen de Calcul Atomique et Moléculaire (CECAM) at Lausanne (the central European institution for education in molecular modelling), thus increasing the impact of the proposed teaching activities. The new researcher will incorporate the latest developments in ultrafast methodologies and supercomputers to the subjects imparted in the master and will reinforce the links between the different nodes. He/she will also contribute to attract the best international students and to increase their number. Other UAM masters making use of ultrafast laser sources and supercomputers, as e.g., the master in Condensed Matter Physics and Biological Systems, or the master in Photonics, can also benefit from recruiting a candidate in this area.

At the PhD level, the researcher will bring the latest developments in ultrafast science to the Marie Skłodowska Curie (MSC) European Joint Doctorate (EJD) network in Theoretical Chemistry and Computational Modeling (TCCM), where many of the activities and ongoing PhD projects are directly related to ultrafast phenomena. This EJD is coordinated by UAM and, therefore, the benefits of reinforcing this area of research and teaching are similar to those described above for the TCCM master. To keep the leading position of UAM at the European level in this discipline, it is of utmost importance to renew the current EJD network by further extending the contents in ultrafast science. For this, it will be extremely important the active participation of the recruited scientist.

All the above will have an impact in the teaching activities at the undergraduate level. For example, inclusion of time-resolved spectroscopic techniques in the programs of some of the subjects imparted in current Physics and Chemistry degrees, such as Physical Chemistry III (PCIII), Physical Chemistry IV (PCIV), Atomic and Molecular Physics, or Photonics, is nowadays mandatory. The study of photoinduced phenomena,

in particular those occurring in the atmosphere, is also important in other UAM degrees, such as Environmental Sciences or Chemical Engineering. Subjects such as PCIII and PCIV are part of the UAM bilingual degrees program, which will thus benefit from the arrival of the new scientist. Introducing techniques that operate in the femto- and attosecond time scales, will bring to the undergraduate level the very latest technological developments in this emerging area. This will allow UAM graduate students to compete in the international arena by giving them the possibility to access the most prestigious European programs and companies demanding education in advanced technologies. In general, inclusion of these contents in the aforementioned degrees and masters should result in an improvement of the UAM academic standards and employability indicators.

More specifically, the new researcher will:

- Organize and teach the subject “Lasers” of the TCCM master from the very beginning of the contract.
- Contribute to the preparation of the new MCS-EJD application and take the responsibility of one of the training topics of this doctoral program related to ultrafast science.
- Teach PCIII or PCIV in the UAM bilingual program from the second year of the contract.

The proposed activities will decisively contribute to achieve key objectives of the UAM-CSIC Campus of International Excellence (CEI UAM-CSIC for short), as declared in the Future Provisions report. In particular, these activities will contribute to incorporate the emerging field of attosecond science in one of its strategic areas, namely "Nanoscience, Nanotechnology and Advanced Materials", by attracting talented students and researchers who could successfully participate in different CEI and EU calls. The involvement of the recruited researcher in the undergraduate bilingual teaching program, the Erasmus Mundus TCCM master will contribute to increase the number of international students, another declared priority of the CEI UAM-CSIC. Finally, the network of collaborations previously established by the recruited scientist will also facilitate the establishment of new international alliances in the emerging field of ultrafast science.

2. Research Project

Chemical reactions induced by the absorption of UV or X-ray light are at the basis of fundamental processes occurring in nature, such as photosynthesis, fluorescence, photo-oxidation, DNA damage, mutagenic miscoding, etc. Upon irradiation by UV or X-ray light, molecules are electronically excited or ionized and undergo profound structural changes that determine their chemical behavior. These changes occur because the coupled electron and nuclear dynamics that follows irradiation of a molecule can lead to the formation and breakage of chemical bonds, which is the essence of chemical

reactivity. The dynamical processes responsible for these phenomena occur on a time scale ranging from picoseconds ($1\text{ps} = 10^{-12}\text{ s}$) to femtoseconds ($1\text{fs} = 10^{-15}\text{ s}$), when considering structural changes due to nuclear motion, down to attoseconds ($1\text{as} = 10^{-18}\text{ s}$), when dealing with the motion of electrons. Thus, by acting on the system on the attosecond time scale one could modify the way electrons move and induce bond breaking at different molecular sites. Consequently, time-resolved studies of UV- and X-ray-induced excitation and ionization of molecules offer the possibility to control the dynamics of the system, and hence to understand and control chemically and biologically relevant processes that occur on a longer time scale.

New ultrashort light sources operating in the XUV and soft X-ray energy range have flourished all over Europe in the last few years: large scale Free Electron Lasers (FEL) are already in place (FELIX, FERMI, FLASH, EuXFEL, SWissFEL) or close to be operative (see <http://www.wayforlight.eu/eng/home.aspx>), the most advanced tabletop ultrashort lasers are accessible through the Laserlab-Europe network (<https://www.laserlab-europe.eu/>), and three new Extreme Light Infrastructures (ELI), namely ELI-Beamlines, ELI-Attosecond and ELI-Nuclear Physics, are currently under construction in Eastern European countries (<https://eli-laser.eu/>). Moreover, European researchers are playing a key role in successfully exploiting LCLS (Stanford) and SACLA (Japan) FELs for ultrafast science. These light sources have already shown their enormous potential for novel scientific applications in other contexts. In particular, the rapid progress in attosecond technology has already permitted to control electron dynamics in atoms and small molecules, and recent experimental efforts are already focusing on more complex molecules, including biomolecules. This area of research is receiving continuous support from the EU through ERC grants, European Training Networks, and various European Infrastructure programs. Many papers published in the area appear in journals such as Science and Nature.

Due to the sophistication of the above facilities, computer simulations are mandatory to guide and interpret experiments performed on large molecular systems, as well as to outline new experimental approaches. The fully ab initio theoretical description of the correlated motion of electrons and nuclei that follows excitation or ionization by attosecond pulses is still very challenging and requires the development of new computational tools and the use of large scale computational facilities. Europe is heavily investing in the development of new supercomputer facilities through the “Partnership for Advanced Computing in Europe” (PRACE, <http://www.prace-ri.eu/>), which gathers the most powerful supercomputer facilities located in 5 European countries, including Spain through the Red Española de Supercomputación (RES), and whose aim is to enable high impact scientific discovery to enhance European competitiveness for the benefit of society. In addition, the recently approved HPC-Europa3 project (<http://www.hpc-europa.org/>) aims at maintaining a high-quality service of transnational access to the most advanced HPC infrastructures available in Europe for the European research science community.

UAM has recently began to gain national and international visibility in ultrafast science through different European projects and research prizes, and is singular in applying this technology to problems of chemical interest in the national context. Therefore, UAM is in an optimum position to play a leading role in this field by widening its range of applicability to other disciplines, in particular chemistry, and by establishing new synergies at the international level. This can only be achieved by recruiting a top scientist who covers topics of ultrafast science not yet developed at UAM and aiming at chemical applications. Collaborations with companies already involved in recent COST and Marie Skłodowska Curie ETN applications submitted by UAM in this area, namely GlaxoSmithKline Research and development LTD, Fujitsu Spain, Scientific Computing and Modelling, Biolitec Research GmbH, Simune Atomistics SL, and AlyaTech, will facilitate the transfer of knowledge to the private sector. UAM will provide additional support through the “Cátedra de Patrocinio UAM-Fujitsu” managed by the UAM Foundation.

In case the recruited scientist is an experimentalist, the research project will focus on subjects that require utilizing the large experimental infrastructures mentioned above (FELIX, FERMI, FLASH, EuXFEL, SWissFEL, Laserlab-Europe, ELI-Beamlines, ELI-Attosecond or ELI-Nuclear Physics), to which UAM staff has not yet access due to the lack of scientists specialized in these techniques. The project will consist in irradiating molecules of chemical and biological interest by XUV and X-ray light pulses generated in such facilities to induce specific electron and nuclear dynamics that can be imaged by probing the system with a second light pulse. In a second step, these light sources will be used to manipulate and eventually control de chemical behavior of the molecules under investigation.

In case the recruited scientist is a theoretician, the research project will consist in extending the existing computational methods, which are designed to accurately describe molecules in their ground and lowest excited states, to treat the non-stationary ionization dynamics that results from the interaction with such light pulses. This is essential to understand and to design experiments in this field, so that it will allow UAM to participate in the development of these new technologies. This will require intensive use of PRACE infrastructures, which will be thus at the disposal of UAM.

Annex 2: Procedure for stabilization of the ‘Beatriz Galindo’ distinguished researcher within the academic staff of the University

Universidad Autónoma de Madrid (UAM) has the firm determination to incorporate the selected researcher into the Academic Staff of the University once the Beatriz Galindo contract is over. Within the fourth year and upon positive evaluation and accreditation by ANECA, UAM will open a call for a permanent full professor position with the academic profile of the distinguished Beatriz Galindo researcher.

As far as the aforementioned evaluation process is concerned, article 13 of the Beatriz Galindo Call (BOE-A-2018-4779) establishes a follow-up of the researchers’ activity by an international panel of experts who will evaluate it taking into account the Annual Reports that the Universities must submit, and that will aim at certifying the achieved objectives. Each of the individual proposals will constitute an obligatory reference to evaluate the performance of the corresponding distinguished researcher, especially at the end of the third year of the contract. However, we understand it is necessary to identify also some broad criteria and indicators that the UAM will use in the preparation of these ‘Annual Reports’, increasingly demanding throughout the contract period; namely:

- Leadership and relevance of the research activity - reflected by abundant top-quality scientific contributions produced by its own research group or, otherwise, by a recognizable subgroup within a broader research group.
- Capacity to attract external resources - obtaining funds in the international arena or, at least, drawing up competitive proposals in those programmes.
- Outstanding role in the scientific community in its field of knowledge - visible activity development as editor or reviewer of scientific journals, as national and international expert, as invited lecturer, as member of scientific societies, as recipient of scientific awards or honours, etc.
- Active role at different university degrees - participation in projects of teaching innovation, design of teaching activities, supervision of doctoral theses, etc.
- Communication and transmission of knowledge to external actors - design and participation of ‘open day’ activities, knowledge dissemination...
- The researcher shall demonstrate a proven record of various tasks in the academic community (organizing conferences, editing publications, undertaking high-level academic evaluation tasks and holding significant positions in scientific organizations).