

## PhD position in local algebra

### Job Offer

Topics:

The PhD candidate will work under the supervision of Ilya Smirnov

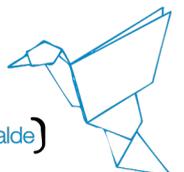
(<http://www.bcamath.org/en/people/ismirnov>) as a part of the STAG group (<http://www.bcamath.org/en/research/lines/STAG>).

The research area of the Fellowship will be local algebra, a branch of commutative algebra that originates from the study of singularities of the system of polynomial equations. More generally, it studies local rings from the viewpoint shaped by singularity theory and algebraic geometry as the results can be applied to local rings formed by the germs of functions at a point.

The specific project is to be determined in discussions with the Fellow, the potential areas are multiplicity theory and positive characteristic methods in commutative algebra.

Multiplicity theory is one of the oldest parts of local algebra, but it recently had an influx of new ideas largely focused on Lech's inequality. The inequality can be improved in various ways and this work is yet to be fully completed.

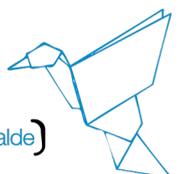
"Positive characteristic methods" refer to the algebraic study of singularities over a field of positive characteristic based on the use of the Frobenius endomorphism: there are various classes of so-called F-singularities and an even greater number of numerical invariants. This field is closely connected to algebraic geometry, but it has also purely algebraic open problems.



PI in charge:	Ilya Smirnov (Ikerbasque Research Fellow)
Salary and conditions:	<p><b>The gross annual salary of the Fellowship will be 18.450 the first year, and the following years must be reviewed yearly based on Spanish EPIF legislation.</b></p> <p>Additionally, we offer a moving allowance up to 1.000€.</p> <p>Should the researcher have a family at the time of recruitment:</p> <ol style="list-style-type: none"> <li>1. 1.000€ gross in a single payment will be offered (you must be married-official register or with children and the certificate to prove it must be sent).</li> <li>2. 600€ gross per year/per child (up to 2 children) will be offered (the certificate to prove it must be sent).</li> </ol> <p><i>Free access to the Public Health System in Spain is provided to all employees.</i></p>
No Positions offered:	<b>1</b>
Contract and offer:	<b>4 years contract</b>
Deadline:	<b>October 14<sup>th</sup>, 2022 16:00 CET</b>
How to apply:	Applications must be submitted on-line at: <a href="http://www.bcamath.org/en/research/job">http://www.bcamath.org/en/research/job</a>

### Scientific Profile Requested

Requirements:	<ul style="list-style-type: none"> <li>• Master's degree in Mathematics at the time the fellowship starts.</li> </ul>
Skills and track-record:	<ul style="list-style-type: none"> <li>• Applicants must have an excellent academic record.</li> <li>• Good command of spoken and written English.</li> <li>• Ability to clearly present in spoken and written form.</li> <li>• A solid knowledge of algebra proven by taken classes and a master thesis in related areas.</li> <li>• Mathematical maturity.</li> </ul>



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Scientific Profile:	<p>The preferred candidate will have:</p> <ul style="list-style-type: none"> <li>- Background in commutative algebra or algebraic geometry.</li> <li>- Basic experience in programming, such as computer algebra systems (Matlab, Maple, Mathematica, etc) may be useful.</li> </ul>
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<b>Application and Selection Process</b>	
Formal Requirements:	<p>The selected candidate must have applied before the application deadline online at the webpage <a href="http://www.bcamath.org/en/research/job">http://www.bcamath.org/en/research/job</a></p> <p>The candidates that do not fulfil the mandatory requirements will not be evaluated with respect to their scientific profile.</p>
Application:	<p>Required documents:</p> <ul style="list-style-type: none"> <li>▪ CV</li> <li>▪ Letter of interest</li> <li>▪ In scientific results achieved and research statement section please upload in the same pdf:               <ul style="list-style-type: none"> <li>○ A sample of writing (written research articles, bachelor thesis, or master thesis, whatever is available)</li> <li>○ transcripts of master and bachelor degrees.</li> </ul> </li> <li>▪ 2 recommendation letters</li> </ul>
Evaluation:	<p>Based on the provided application documents of each candidate, the evaluation committee will evaluate qualitatively: the adaption of the previous training and career to the profile offered, the recommendation letters, and other merits; taking in account the alignment of these items to the topic offered.</p>

**Incorporation:**

**December 2022 - October 2023.**

