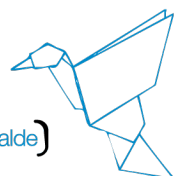


## PhD position in Mesoscopic Fluid Dynamics Modelling and Simulation of Virus Transport

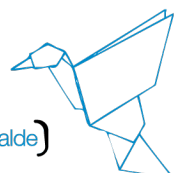
Job Offer	
Topics	<p>In the framework of the BCAM “Mathematical Modelling Applied to Health” strategy, a series of projects will be launched in different areas of Applied Mathematics. The “Computational Fluid Dynamics” research line (<a href="http://www.bcamath.org/en/research/lines/CFDMS">http://www.bcamath.org/en/research/lines/CFDMS</a>) at the BCAM looks for a PhD candidate to work in the project:</p> <p><b><i>“Mesoscopic fluid dynamics modelling and simulation of virus transport”</i></b></p> <p>The coronavirus SARS-CoV-2 (as well as other viruses), consist of a nanoscale spherical capsid decorated with protruding functional proteins. The alignment of the such proteins with specific receptors of the human cells determines the linkage and further insertion of the viral genetic material into the cells. At the nanoscale, the rotational diffusion of such decorated objects may exhibit characteristic deviations compared to a simple nanosphere. Moreover, the type and distribution of the surrounding proteins can provide rotational signatures that differentiate various types of virus, thus providing relevant biomarkers.</p> <p>The goal of this PhD project is to explore the potential of microrheological characterization of viral solutions as a tool for virus-identification and characterization. The effect of the decorating-proteins morphology and distribution over the dynamics of virus will be investigated using the smoothed dissipative particle dynamics method. The results of this project will provide relevant mesoscopic information to construct a multiscale framework to investigated viral pathologies.</p>



	The PhD candidate will work under the supervision of Ikerbasque Prof. Marco Ellero (CFD group, BCAM) on the developments and use of mesoscopic particle-simulation methods to better understand changes in the translational and rotational diffusivity of viruses. Experimental collaborations with the Dr. Padilla's Lab at Kings College ( <a href="https://www.kcl.ac.uk/research/padilla-parra-lab">https://www.kcl.ac.uk/research/padilla-parra-lab</a> ) as well as with groups at CICbiomagune and BioDonostia in San Sebastian are foreseen.
PI in charge:	Prof. Marco Ellero (Ikerbasque Research Professor)
Salary and conditions:	<b>The gross annual salary of the Fellowship will be 18.000</b> It will then be on your own responsibility to make your yearly income declaration at the Bizkaia Treasury Agency. There is a moving allowance for those researchers that come from a research institution outside the Basque Country from EUR 500 to EUR 1.000 gross. <i>Free access to the Public Health System in Spain is provided to all employees.</i>
No Positions offered:	<b>#1</b>
Contract and offer:	<b>3 years contract</b>
Deadline:	<b>April 19<sup>th</sup>, 2022 14:00 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>

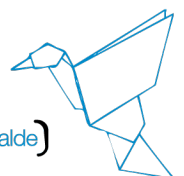
### Scientific Profile Requested

Requirements:	<ul style="list-style-type: none"> <li>• Bachelor's or Master's degree in Physics, Engineering or Applied Mathematics.</li> </ul>
Skills and track-record:	<ul style="list-style-type: none"> <li>• Applicants must have an excellent academic record.</li> <li>• Good communication and interpersonal skills.</li> <li>• Good command of spoken and written English.</li> <li>• Ability to clearly present and publish research outcomes in spoken (talks) and written (papers) form.</li> <li>• Knowledge of advanced particle-based methods.</li> <li>• Ability to analyse data, perform statistical analysis and interpret results.</li> <li>• Strong analytical and problem-solving skills.</li> <li>• Demonstrated ability to work independently and as part of a collaborative research team.</li> </ul>
Scientific Profile:	The preferred candidate will have:



	<ul style="list-style-type: none"> <li>- Background in fluid mechanics, rheology, soft matter, particulate systems or complex fluids.</li> <li>- Knowledge of C/C++ or Fortran programming languages is desired.</li> <li>- Experience in modelling and simulation using particle methods such as smoothed particle hydrodynamics (SPH), dissipative particle dynamics (DPD) or Stokesian Dynamics (SD) methods is desired.</li> <li>- Some experience in mesoscopic modelling and simulation of virus (or arbitrary shape-particles) Brownian dynamics is a plus.</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>○ Statement of previous research experience</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, the main results achieved (papers, proceedings, etc.), the statement of past and proposed future research and other merits; taking in account the alignment of these items to the topic offered.</p>



**Incorporation:**

**May/June or as soon as possible thereafter.**

