IC2016_Autumn BCAM International Call

Postdoctoral Fellowship in CFD Computational Technology: Cloud HPC

Job Offer	
Topics:	Our research concerns state of the art adaptive stabilized FEM [1], the FEniCS open source software project for automated solution of PDE (fenicsproject.org), in an HPC setting with good scaling on supercomputers [2] and advanced applications in computational turbulence and FSI, including parameter-free prediction of the aerodynamics of a full aircraft and simulating the human voice apparatus in the EUNISON EU project (see http://youtube.com/ctlabtv for examples). Based on our computational mathematical methodology we have developed a New Theory of Flight [3], which enables understanding of the mechanics of flight. Our adaptive methodology applied to turbulent flow is described in the Encyclopedia of Computational Mechanics [4]. This contract will be funded by the European project MSO4SC (Mathematical Modelling, Simulation and Optimization for Societal Challenges with Scientific Computing), funded by the European Commission through the call H2020-EINFRA-22-2016. The consortium is formed by ten partners (among them, BCAM, KTH, Atos, Cesga, EU-MATHS-IN…) from seven different countries. The role of our team will be interfacing our FEniCS-HPC framework and supercomputer applications in turbulent flow to the HPC cloud infrastructure developed together in the project consortium. Other recent awards include the high-profile awards from PRACE for supercomputing, the Swedish Innovation Agency for industrial CFD, best poster award at the Bilbao Marine Energy Week for our work on modelling of floating offshore wind power. The research environment is international and integrated with the department of Computational Science and Technology at KTH. [1] Johan Hoffman, Johan Jansson, Niclas Jansson, Rodrigo Vilela De Abreu, Towards a parameter-free method for high Reynolds number turbulent flow simulation based on adaptive finite element approximation, Computer Methods in Applied Mechanics and Engineering, 2015

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	[2] Johan Hoffman, Johan Jansson, Niclas Jansson, FEniCS-HPC: Automated predictive high-performance finite element computing with applications in aerodynamics, Proceedings of the 11th International Conference on Parallel Processing and Applied Mathematics, PPAM 2015. Lecture Notes in Computer Science, 2015 [3] Johan Hoffman, Johan Jansson, Claes Johnson, New Theory of Flight, Journal of Mathematical Fluid Mechanics, 2015 [4] Johan Hoffman, Johan Jansson, Niclas Jansson, Rodrigo Vilela de Abreu, and Claes Johnson, Computability and Adaptivity in CFD, Encyclopedia of Computational Mechanics. 2016
PI in charge:	Johan Jansson
Salary and conditions:	**The gross annual salary of the Fellowship will be 28.000 - 32.000€.** 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 1.000 to EUR 2.000 gross. *Free access to the Public Health System in Spain is provided to all employees.*
No Positions offered:	**#1**
Contract and offer:	**2-year contract**
Deadline:	**November 4th, 2016 14:00 CET (UTC+1)**
How to apply:	Applications must be submitted on-line at: http://www.bcamath.org/en/research/job

Scientific Profile Requested	
Requirements:	• Ability to demonstrate exceptional research accomplishments (or promise) • PhD degree (preferable in Mathematics or Computer Science) must have their PhD completed before the contract starts. • Solid knowledge and experience of computational mathematics and FEM is a requirement, as well as software development for distributed memory architectures.
Skills and track-record:	• Good communication and interpersonal skills. • Ability to effectively communicate and present research ideas to researchers with different background (e.g., mathematicians

	and engineers). • Ability to clearly present and publish research outcomes in spoken (talks) and written (papers) form. • Good command of spoken and written English. • Demonstrated ability to develop or extend computational methods and software, especially with a focus on usability. • Programming competence in C++ and Python. • Experience of cloud infrastructure such as Jupyter is a merit.
Scientific Profile:	The preferred candidate will have: • research experience and interest in FEM in a high-performance scientific computing setting,

Application and Selection Process	
Formal Requirements:	The selected candidate must have applied before the application deadline online at the webpage http://www.bcamath.org/en/research/job The candidates that do not fulfil the mandatory requirements will not be evaluated with respect to their scientific profile.
Application:	Required documents: ▪ CV ▪ Letter of interest ▪ 2 recommendation letters ▪ statement of past and proposed future research (2-3 pages)
Evaluation:	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.

Incorporation:	**Beginning of 2017 or as soon as possible thereafter.** *The BCAM postdoctoral contract will start when the selected candidate has finished the PhD, i.e. after dissertation defence.*

EUSKO JAURLARITZA
GOBIERNO VASCO
HEZKUNTZA, HIZKUNTZA POLITIKA ETA KULTURA SAILA
DEPARTAMENTO DE EDUCACIÓN, POLÍTICA LINGÜÍSTICA Y CULTURA

EXCELENCIA SEVERO OCHOA