

POST DOC POSITION IN

Heat transfer simulation in urban environment

- Recruitment grade: young researcher (i.e. with PhD)
- Location: Anglet, France
- Duration: 24 months, starting late 1st November 2021
- Deadline: 3 September 2021
- Gross Salary Range: 2960 euros / month

CONTEXT AND AIMS

The Urban Physics Joint Laboratory develops numerical tools and means of measurement to better understand energy interactions (sound, light and heat) in urban environments, in order to propose efficient solutions for architectural and urban projects.

The project proposed here consists in developing a finite element environment from existing free codes, which allows simulating thermal transfers at the scale of a district or an entire city.

TASKS AND PROPOSED METHODOLOGY

The first task will be to choose a coherent combination of programs (an open source finite element code, a mesh generator, a ray-tracing library, a graphical user interface) that will serve as the basis for the code to be developed. The first step will be to introduce the extended view factors into the finite element code for the calculation of thermal radiation (see: *Improving the daylighting performance of residential light wells by reflecting and redirecting approaches*, A. Bugeat, B. Beckers and E. Fernández, Solar Energy. Volume 207, 1 September 2020, Pages 1434-1444).

By the end of 2022, the team should have a working prototype, in order to collaborate fully on the following tasks:

- Measurement campaigns
- Geometric modeling
- Comparison of measurements/simulations to verify the hypotheses of the proposed physical model
- Simulation of rehabilitation or modification scenarios of a neighborhood

By the end of 2023, the tool will have to be complete and well documented, so that it can be validated by external users. The tool will be free and open source, in order to ensure the best diffusion.

FUNDING

This post doc position is funded by the project E2S-UPPA (Energy Environment Solutions) whose core scientific domain focuses on Environment and Energy to meet challenges related to the energy transition, geo-resources, aquatic habitats and the environmental effects of natural and anthropogenic changes (<https://e2s-uppa.eu/en/index.html>).

SUPERVISION AND CONTACT

Supervisory team: Urban Physics Joint Lab (IPRA, E2S UPPA)

For additional information and proposal, please contact: benoit.beckers@univ-pau.fr

YOUNG RESEARCHER SKILLS REQUIRED

Graduate Civil Engineer (or equivalent), having developed a doctoral thesis in the field of finite elements, with good knowledge in heat transfer and an interest in architecture and urban planning. The candidate must have a good level in French, English and Spanish. In particular, he/she should be able to give tutorials in French (Computer Aided Geometry, Introduction to Finite Elements for Thermal Engineering), and to participate in the setting up of a cross-border master's degree between France and Spain in the field of urban physics.

SALARY

The salary of the successful candidate will be based on level chart for teaching and research personnel in the salary system of French universities. The salary will be 2960 euros/month (gross salary), including allowance for 64 hours teaching per year.

APPLICATIONS AND DEADLINE

Please submit your application by email to benoit.beckers@univ-pau.fr. Please attach the following documents as a single pdf file:

- Detailed CV;
- Summary of the PhD (1 page);
- A motivation letter describing the applicant's previous research experience and how it is related to the present position (one, or maximum two pages);
- If the thesis is not yet defended, a letter from the Principal Director confirming that the defense will take place in 2021.

The deadline for submitting the application is 03/09/2021.