Marie Skłodowska Curie Action – Postdoctoral Fellowship 2023
Expression of interest – Hosting offer
(MSCA-PF-2023)

Contact Person/Scientist in charge *(data of the principal investigator of the research group/lab or scientific supervisor)*	**Name**	MASSIN
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Laboratory /Department /Institute /Centre / *(data of the centre/department where the fellow would be located*	**Name**	CEREA (Centre d'Enseignement et de Recherche en Environnement Atmosphérique) – Research and Training Center in Atmospheric Environment
	Address	6-8 avenue Blaise Pascal, Cité Descartes Champs-sur-Marne, 77455 Marne la Vallée
Research Area *(Please select the research area: corresponding to the eight MSCA evaluation panels. You can select between one and up to three scientific areas per EOI)*		Environment and Geoscience (ENV)
Brief description of the Centre/Research Group *(max. 1,600 characters including spaces: information about the research centre or research group, scientific staff. Please include URL if possible)*		CEREA was created in 2003 as a research center at Ecole Nationale des Ponts et Chaussées. In January 2004, CEREA became a joint laboratory Ecole des Ponts ParisTech-EDF R&D, with two locations: Ecole des Ponts ParisTech/Champs sur Marne and EDF R&D Chatou. CEREA comprises around 50 persons (https://www.cerea-lab.fr/). Its research activities are focussed on air pollution. These activities range from academic research (aerosol modeling, data assimilation and inverse modeling, atmospheric boundary layer) to impact assessment studies (assessment of environmental impact of transport and thermal or nuclear energy production), using modeling/prediction of reactive pollutant transport at different scales (from regional, to urban air pollution and indoor air quality). It relies on different numerical tools. Polyphemus platform can model atmospheric dispersión with its Polair3D component at a continental or regional scale. It may be associated to SSH aerosol to take into accound the chemistry of emissions interacting with the atmosphere. It is also posible to couple it with a model of urban network of intersecting canyons and highways (MUNICH) to analyse urban air pollution at the street level. At last, 3D CFD simulations may be realised for local details ranging from a few meters to a few kilometers. It may also be used to assess models used at a larger scale to provide reduced models.

Project description *(max. 1,800 characters including spaces: short description of the research project / research line where the fellow would be hosted and develop his /her project)*	3D CFD simulations are up to now rarely used in air quality, although they may allow to characterize the heterogeneities of pollutant concentrations in cities at a district or neighborhood scale. We propose a research program of 18 months for a post-doctoral trainee. The trainee will participate to an international benchmark on air-quality modelling to compare 3D CFD LES simulations to measurements performed in the city of Paris. He will also realise the LES simulations with our 3D CFD platform code_saturne (https://www.code-saturne.org) associated with SSH-aerosol (https://sshaerosol.wordpress.com/) to treat the physico chemical transformation of gas and aerosols during atmospheric transport. At last, he will be able to compare the results of his simulations with respect to in-situ atmospheric measures giving access to the local chemical composition in the streets of Paris with experimental setups, and to the results of other 3D models. This comparison may allow to characterize how the heterogeneities differ depending on pollutants and open up the way to modelling improvements of urban air quality. The trainee will be part of the air quality modelling team, led by Research Director Karine Sartelet, of ENPC, team in which the development and validation of SSH-aerosol is conducted. He will also be associated to the team led by Dr Martin Ferrand of EDF R&D, on 3D modelling of the atmospheric layer with code_saturne. Both competences will allow him to develop fully coupled simulations using both tools.
Applications: documents to be submitted and deadlines *(Please indicate the documents that the candidate fellow should submit to establish contact: CV, letter of motivation, letter of references, etc., please indicate deadline. Recommended deadline: April 2023)*	CV, letter of motivation, references, Master's degree, PhD degree and PhD defence report.