**ARIES DLA COMPETITIVE PHD STUDENTSHIP**

# Pollution dynamics of streams and soils in rural-urban catchments: improving environmental health and climate resilience in Emmbrook Park and Woosehill Meadows

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## Scientific background

Rivers and streams in rural-urban areas face complex pollution and nutrient issues due to varying inputs and environmental changes. Urban park riparian zones offer a chance to improve water quality and aquatic life. Detailed knowledge of pollution and nutrient flows is needed to develop effective mitigation strategies. The study will focus on the Emmbrook River as it flows through the Emmbrook Park and Woosehill Meadows in East Berkshire. The goal is to assess how green spaces can improve water quality and climate resilience through infrastructure and natural interventions.

## Research methodology

Soils and vegetation will be collected and analysed at different times of year to assess the influence of weather and seasonality on heavy metal concentrations.  Water samples will be also collected for microplastic and nutrient (phosphate, nitrate and ammonia) analysis. The contaminants will be used to determine bioavailability by evaluating runoff, and bio-accessibility by analysing the vegetation. The spread of contaminants will be mapped, and mitigation plans defined, building a conceptual model to assess human health risk and impacts on receptors (fauna and flora).

In addition, you will deploy multi-sensor drone surveys, aquatic surveys using ROV's, water quality sampling (aquifer and river), hydrological tracer tests (using fluorescein dye) and analytical + numerical modelling to simulate the movement of pollutants in the natural environment.

## Training

You will receive training in drone and ROV piloting at the unique RHUL Omnidrome facility, in addition to survey planning, multi-sensor data acquisition and data analysis and near-surface geophysical and hydrological survey setup and execution. You will also be trained in laboratory analyses of soil, vegetation and water samples, and micro-plastic extraction and hydrogeological modelling (e.g. using Modflow).

## Person specification

We seek an enthusiastic individual who is committed to addressing issues of climate change and pollution mitigation at a local scale. Fieldwork experience, particularly involving liaising with different stakeholders, is beneficial but not essential. Similarly, prior experience with any form of remote sensing using UAV's, geophysical or hydrological surveying is desirable.

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