

**JOB DESCRIPTION**

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| **Job Title:** Senior Research Associate in Modelling Atmospheric Oxidation in the Tropics | **Grade:** 7 |
| **Department/College:** Lancaster Environment Centre | |
| **Directly responsible to:** Prof. Oliver Wild | |
| **Supervisory responsibility for:** Some supervision of postgraduate students | |
| **Other contacts** | |
| **Internal:**  Prof. Ryan Hossaini (LEC); Dr. Henry Moss (Maths); members of the atmospheric science research group; academic staff and PDRAs in LEC, the School of Mathematical Sciences, and the Data Science Institute | |
| **External:**  National project partners on the DeTOX project at Cambridge, Bristol, Reading, Exeter and Edinburgh; international partners in the US; national and international scientists working on tropospheric modelling, observations, satellite retrievals, machine learning and constraints on atmospheric composition. | |
| **Major Duties:**  This position will contribute to the NERC project DeTOX: Determination of Tropical Oxidising Capacity through model calibration. The goal of the position is to improve current understanding of the importance of different physical, chemical and meteorological processes in controlling tropospheric oxidation in the tropics, exploring how wildfires, lightning, convection, biogenic and marine emissions and other processes govern oxidants, ozone and OH in this important region. This will involve application of a state-of-the-art atmospheric chemistry transport model with a comprehensive suite of surface, airborne and satellite observations and a range of new statistical and machine learning approaches. Specific duties include:   1. Development and application of the FRSGC/UCI global Chemical Transport Model to characterize and quantify the impact of all major physical, chemical and meteorological processes on tropical oxidants, ozone and OH. 2. Collaboration with project partners to collate a comprehensive suite of surface, airborne and satellite observations of tropospheric constituents from across the tropics suitable for use in evaluating and constraining global models. 3. Performing perturbed parameter ensemble runs with the chemical transport model and working with applied statisticians on approaches to calibrate the model effectively and efficiently. 4. Application of the calibrated model to investigate how tropospheric composition in the tropics is likely to change under a range of future scenarios and how we might detect the first signals of this from observations. 5. Participation in DeTOX project meetings; preparation and presentation of talks, posters and reports to disseminate the results of these studies. 6. Participation in national and international conferences and workshops to present the results of the project to a wider audience and to learn about current advances in the field. 7. Preparation of research papers for publication of project findings in the scientific literature. 8. Involvement in development of new research proposals that build on the ground-breaking application of statistical approaches to model calibration developed in this project. | |