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Three-year fully funded PhD at ETH Zurich in Atmospheric Physics on aerosol-cloud interactions: Experimental position

The Atmospheric Physics group at the Institute for Atmospheric and Climate Sciences at ETH Zurich (IAC-ETH) invites applications for a 3-year PhD position integrated into a Binational Swiss-French project "AerOsol cloud interactions: the Role of orgAnic compounds in CLoud droplEt activation (ORACLE), funded by the Swiss National Science Foundation (SNSF) and French Research National Agency (ANR).

Project background: Cloud droplets in the Earth's atmosphere form on ubiquitous aerosol particles. Presently, predictions of cloud droplet size and number concentration derived from aerosol properties are still poor, leading to large uncertainties in the radiation budget and climate projections. Cloud droplet activation is conventionally described by Köhler theory. Yet, classical Köhler curves do not include dynamically evolving surface tension and co-condensation of semi-volatile organic compounds during cloud condensation nuclei (CCN) activation. ORACLE aims to fundamentally improve the understanding of the role organics play in CCN activation through combined experimental and modelling work. For this project, the Atmospheric Physics group seeks two PhD students that will collaborate with each other and with the French partners. Two CCN counters with different working principles will be used to test cloud formation on aerosol sampled from a large tank with special emphasis on the role of the organic components and the dynamic equilibrium between gas phase and condensed phase during humidity variations. In addition, instrumentation to analyse the gas phase (CHARON-PTR-MS) and the condensed phase (high-resolution time-of-flight aerosol mass spectrometer (HR-ToF-AMS), filter sampling) will be jointly operated with the French partners.

Job description of the experimental PhD position:

- Constructing, building and validating a continuous-flow thermal-gradient diffusion chamber based on the design of ice nucleation chambers deployed in the Atmospheric Physics group.
- Operation of the tank experiment and equipment involved in it (differential mobility analyzer (DMA), hygroscopic growth differential mobility analyser (HTDMA), and CCN counters).
- Close collaboration with the French partners and organization of joint measurement campaigns.
- Analysing the experimental results in close interaction with the modelling PhD at ETH.

The successful candidate should hold an MSc (or equivalent) in chemistry, physics, engineering, atmospheric/environmental sciences, or a related field. Knowledge of oral and written English is required. Knowledge of aerosol measurement techniques and data analysis in Igor, MATLAB, Python or similar software is highly desired, and some knowledge of LabVIEW would be an asset, but not necessary. We are looking for a highly motivated, committed, and creative person.

We look forward to receiving your online application that includes a CV, academic transcripts, work certificates (if any) and a 1-page motivation letter stating research experiences and interests. Please provide the contact information of at least two referees. Note that we exclusively accept applications submitted through our online application portal. Applications via email or postal services will not be considered. **The project started in February 2021**, as such we are looking for a candidate to start as soon as possible. Applications will be considered immediately until position is filled.

For more information about the project and the working group please contact zamin.kanji@env.ethz.ch and visit our website.