

**AARHUS UNIVERSITY**  
**EXTERNAL SEMINAR**  
**DEPARTMENT OF ENVIRONMENTAL SCIENCE**

**Frederiksborgvej 399, 4000 Roskilde**

**3 May 2019, 13:00 – 14:00**

**Venue: Aarhus University, Risø Campus, the Pavilion**



**Title: *New particle formation within Volcanic Plumes***

**Speaker: Maher Sahyoun, PhD**

**Abstract:** Volcanic emissions can significantly affect the Earth's radiation budget by emitting aerosol particles and gas-phase species that can result in the new particle formation (NPF). These particles can scatter solar radiation or modify cloud properties, with consequences on health, weather, and climate. In Literature, the investigation of NPF process occurring within volcanic plumes and its impact on climate are scarce and poorly reported. Therefore, we present a comprehensive observational study investigating the NPF and their temporal and spatial evolution within the volcanic plume, which to best of our knowledge, is the first dedicated study detailing how gas-phase precursors emitted from volcanic plumes can influence the NPF. A series of airborne measurements were performed around the Etna and Stromboli volcanoes within the framework of the CLerVolc and STRAP projects. The ATR-42 aircraft was equipped with a range of instrumentation allowing the measurement of particle number concentration in diameter range above 2.5 nm, and gaseous species to investigate the aerosol dynamics and the processes governing the NPF and their growth. Using these measurements, we propose a new parameterization for NPF rate (J2.5) within the passive volcanic plume. This parameterization can be incorporated into mesoscale models to better assess the impact of the particle formed by natural processes, i.e. volcanic plumes, on climate. We also show examples of challenges that can be encountered when implementing observations into complex models associated with chemistry dispersion models.

**Host: Ulas Im, Scientist,** Section for Atmospheric Environment, Department of Environmental Science, Aarhus University

**External Guests** interested in attending the presentation should e-mail Department Secretary Christel Ege-Johansen, [cej@envs.au.dk](mailto:cej@envs.au.dk)

