

## ACOM Seminar

# RADICAL: Developing an Electronic Sensor for Detecting Atmospheric Radicals and Other Gases

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Date: Monday, October 17<sup>th</sup> 2022, 9:30am – 10:30am

Links: <https://operations.ucar.edu/live-acom>

### ABSTRACT

This presentation will be split into two parts: first a discussion on the development of sensors to electrically detect atmospheric radicals and other gases and secondly, some preliminary results and lessons from the work to date will be presented.

**Towards the electrical detection of atmospheric radicals.** Atmospheric radicals, particularly hydroxyl and nitrate, are the drivers of chemical processes that determine atmospheric composition and thus influence local and global air quality and climate. However, the detection of these short-lived atmospheric radicals is far from routine, and only a few labs worldwide can accurately measure their concentrations in air. Current techniques for measuring radicals are based on spectroscopic and mass spectrometric methods, which although sensitive and robust, are technically complex, cumbersome, and expensive. The first part of the talk will provide an overview of the EU-funded project 'RADICAL', which aims to create a small, low-cost sensor to electrically detect short-lived atmospheric radicals in real-time. Although challenging, RADICAL sensors not only have the potential to be rolled out on a global scale but can also be adapted to detect other important atmospheric gases, particularly over short timescales.

**How do nanowires respond to the presence of atmospheric radicals?** Will interaction with atmospheric species influence electrically measured parameters, and if so, does that depend on which gas-phase species is present? How is it influenced by the surface functionality of the nanowires? How can we make the response both sensitive and selective? Some early indications that these questions can be answered will be presented and left open for discussion.