My background is in researching optical and physical properties of aerosol particles as well as studying aerosol processes in the atmosphere. During my PhD (2011-2014) I worked in the Bristol Aerosol Research Centre (BARC) where I built several instruments including a single particle Bessel beam optical trap. After finishing my PhD in Bristol I moved to Boulder, Colorado (United States) in 2014 where I recently finished working at the National Oceanic and Atmospheric Administration (NOAA) as a research scientist.

My primary research interest is the study of the optical and physical properties of ambient, man-made aerosol particles. The interactions and influences of such particles with clouds is also of great interest to me. Most of my research has, so far, involved field or laboratory measurements of aerosol optical, physical or thermo-physical properties. These measurements were geared towards better understanding the impact of aerosol particles on radiative forcing and in particular, the impact of light absorbing aerosols such as black carbon. Although most of my research has been measurement based I also have a great interest in aerosol modeling and analysis of large observational data sets. In particular I am interested in which properties of biomass burning particles, and in particular black carbon, climate models are sensitive too. As such I am very keen to expand my knowledge and to get a wider perspective of aerosol science by moving in aerosol modelling.

During my PhD I built and operated several aerosol instruments for measuring aerosol optical properties. I also wrote software to interface with these instruments and to do subsequent processing and data analysis. The main instrument I worked with, a single particle Bessel beam optical trap, allowed me to optically contain individual particles between 0.2 and 3 micrometers in diameter. I could then change the conditions around the particle to observe changes in the particle size and infer changes in composition. During this time I wrote, and had published, three first author scientific papers about my research. I also attended three conferences, including the European Aerosol Conference where I delivered an oral presentation, and a Faraday Discussions meeting where I presented a poster.

Whilst at NOAA I have attended several conferences in addition to presenting a poster at the American Geophysical Union in December 2015. My major role at NOAA has been in data analysis; developing procedures for analyzing large data sets taken during flight measurements of the SEAC4RS (Studies of Emission, Atmospheric Composition, Clouds and Climate Coupling by Regional Surveys) campaign in 2013. I used these procedures to process and apply calibrations to raw photoacoustic (measures aerosol absorption) and cavity ring-down (measures aerosol extinction) data from these flights. I then combined the data with those taken by other groups on the same flights to estimate the radiative impact of the aerosol that we sampled. In addition, with the aid of researchers at other institutes, I compared each of the different aerosol absorption measurements taken during the flight and am currently writing a scientific paper on their agreement and what it will mean for the aerosol community.

My second main role in NOAA was developing a combined 8 channel cavity ring-down spectrometer with a 5 channel photoacoustic spectrometer (CRDS-PAS) which is able to sample ambient aerosol particles on the ground or in an aircraft. The CRDS is able to measure aerosol extinction under dry, humidified and heated conditions and three separate wavelengths whilst the PAS measures aerosol absorption under dry and heated conditions. Most notably, this allows real time measurement of the single scattering albedo of an aerosol sample which indicates whether it will warm or cool the air around it. Whilst at NOAA, I developed this instrument in a variety of ways including redesigning the calibration and humidification systems. Last year I helped to plan a deployment of the instrument, taking some ambient ground measurements sampling the air in the city of Boulder. During that time I operated, maintained and improved the instrument design and data acquisition software.

All through my time working in Bristol and at NOAA, collaboration and communication have been a very important part of my work. No one person has the expertise and instrumentation to solve the issues of climate and health that we wish to understand and overcome. As such, I have always done my best to involve outsiders in my work and to talk to as many people about a given problem as possible. During my time at NOAA I helped to organise an inter-comparison between our photo-acoustic spectrometer and another absorption instrument that belonged to a different group. The collaboration is ongoing and will continue after I leave.

In addition to collaboration I believe that a sociable and friendly workplace is very important for my happiness and productivity. Whilst at NOAA and during my PhD I have organised numerous work social events ranging from hiking and skiing to organising a retirement party. At NOAA, I also strongly felt that many junior researchers need a forum to talk about their work in a judgment free environment. As such, I and several of my fellow researchers started a series of seminars where young scientists could come and discuss ideas and problems over lunch, without feeling judged by senior scientists.