41 Chandlers House, Bristol

Email: bernie.mason@noaa.gov

U.K. Phone: 07498203544

##### Education and Research Experience

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| **National Oceanic and Atmospheric Association - Postdoctoral Researcher** | **08/2014 – 08/2016** |

Chemical Sciences Division, Boulder, Colorado

* + Developing and operating combined cavity ring-down/photo-acoustic spectrometers for extinction and absorption measurements of ambient aerosol optical properties. Characterizing instrument performance in the laboratory and under ground level deployment conditions.
  + Analysis of historic flight data to assess the instrument performance against other commonly used aerosol absorption measurements.

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| **Ph.D. – Aerosol Optical Properties** | **01/2011 – 06/2014** |

University of Bristol, Aerosol Dynamics Group, Professor Jonathan Reid Laboratory

* + Cavity ring down spectroscopy for determining light-scattering properties of single particles and aerosol ensembles. Assessing fundamental optical properties of common atmospheric analogues for use in atmospheric radiative forcing models.

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| **M.Sci. – Chemistry** | **09/2007 – 07/2010** |

University of Bristol, Bristol, United Kingdom

* Final year research project: synthesized heterogeneous palladium and platinum catalyst analogues for synthesis of methyl methacrylate, a monomer used in the creation of the plastic, polymethyl methacrylate.

##### Research Skills, Expertise, and Techniques

Research Interests

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 thermos-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. The health impacts of human made aerosols in densely populated areas are also of interest to me. In addition, as an asthmatic I am keen to develop my understanding of the properties that govern aerosol growth and deposition in the lung.

Instrument design and development

* + Optical Techniques. Laser alignment and manipulation. Cavity ring down (CRDS) design, construction and use for measuring the extinction properties of aerosol ensembles and single particles Photo-acoustic spectrometry (PAS) development and use for measuring the absorption of ambient aerosols. Development of calibration with ozone. Nephelometry and filter based absorption measurements (CLAP, PSAP)
  + Particle sizing and selection. Differential mobility analyser (DMA), operation and maintenance, condensation particle counters (CPC) operation and nephelometer theory and operation

Software and Programming Languages

I have extensive computer experience. Programs with which I am familiar include, but not limited to;

* LabVIEW, Igor, Python, C#, HTML, javascript, Matlab, Scilab, Scifinder Scholar, EndNote, Corel Draw 10, ChemOffice, Microsoft Office

##### Publications

1. B.J. Mason, M.I. Cotterell, T.C. Preston J.P. Reid and A.J. Orr-Ewing  ‘Direct measurements of the optical cross sections and refractive indices of individual volatile and hygroscopic aerosol particles’ *The Journal of Physical Chemistry A,* 2015, 5701-5713.
2. M.I. Cotterell, B.J. Mason, T.C. Preston J.P. Reid and A.J. Orr-Ewing  ‘Optical extinction efficiency measurements on fine and accumulation mode aerosol using single particle cavity ring-down spectroscopy’ *Physical Chemistry Chemical Physics,* 2015, 15843-15856.
3. B.J. Mason, J.S. Walker, J.P. Reid and A.J. Orr-Ewing  ‘Deviations from plane-wave Mie scatteri0ng and precise retrieval of refractive index for a single spherical particle in an optical cavity’ *The Journal of Physical Chemistry A,* 2014, 2083-2088.
4. T.C. Preston, B.J. Mason, J.P. Reid, D. Luckhaus and R. Signorell 'Size-dependent position of a single aerosol droplet in a Bessel beam trap' *Journal of Optics,* 2014, 1-11.
5. M.I. Cotterell, B.J. Mason, A.E. Carruthers, J.S. Walker, A.J. Orr-Ewing and J.P. Reid 'Measurements of the evaporation and hygroscopic response of single fine-mode aerosol particles using a Bessel beam optical trap' *Physical Chemistry Chemical Physics* 16(5), 2014, 2118-2128.
6. B.J. Mason, S.-J. King, R.E.H. Miles, K.M. Manfred, A.M.J. Rickards, J. Kim, J.P. Reid and A.J. Orr-Ewing 'Comparison of the Accuracy of Aerosol Refractive Index Measurements from Single Particle and Ensemble Techniques' *The Journal of Physical Chemistry A* 116, 2012, 8547–8556.

##### Oral Presentations and Posters

Presenting author is underlined. OP = oral presentations for which I was the presenting author.

1. B.J Mason, Nicolas Wagner, Mathew Richardson, Gabriella Adler, Charles Brock, Daniel Murphy. An intercomparison of absorption data taken during SEAC4RS in 2013. May 1st, *CIRES Rendevous* 2016.
2. B.J Mason, Gabriella Adler, Nicolas Wagner, Mathew Richardson, Charles Brock, Daniel Murphy. Absorption and extinction analysis of the SEAC4Rs missions data. December 17th, *Annual Geophysical Union*, 2015.
3. B.J Mason, Nicolas Wagner, Mathew Richardson, Charles Brock, Daniel Murphy. Calibration of a multi-wavelength photoacoustic aerosol absorption spectrometer. May 1st, *CIRES Rendevous* 2015.
4. OP B.J Mason, J. Walker, T. Carruthers, M. Cotterell, T. Preston, Andrew Orr-Ewing and Jonathan P. Reid. Cavity ring-down for optical measurements of single aerosol particles. July 24th, *Annual Aerosol Society Conference*, 2013.
5. B.J Mason, J. Walker, T. Carruthers, M. Cotterell, T. Preston, Andrew Orr-Ewing and Jonathan P. Reid. Single aerosol optical properties measurements using cavity ring down spectroscopy. July 21-23, *Faraday Discussion 165,* 2013.
6. OP B.J Mason, R.E.H. Miles, S.-J. King, K. Manfred, J.S. Walker, A.E. Carruthers, A.J. Orr-Ewing and J.P. Reid, S. Measuring the optical properties of single particles and aerosol ensembles using cavity ring down spectroscopy, *European Aerosol Conference*, September 3-7, 2012.
7. A. E. Carruthers, B. J. Mason, J. S. Walker, Jonathan P. Reid and Andrew J. Orr-Ewing, Measuring the optical properties of aerosols using a counter-propagating Bessel beam optical trap April 3-4, *Annual Aerosol Society Conference*, 2012.

##### Teaching Activities

Laboratory Demonstrator, University of Bristol 09/2011-01/2013

* Taught weekly physical chemistry laboratory sessions to groups of sixteen first and second year undergraduate students.
* Marked student’s reports and provided written and verbal feedback each week.

##### Honours and Awards

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| Travel grant from the Aerosol society for attending the European Aerosol Conference in Granada | 2012 |