2955 Glenwood Drive, Boulder, Colorado

Email: bernie.mason@noaa.gov

U.S. Phone: 303-517-6548

##### Education and Research Experience

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

Chemical Sciences Division, Boulder, Colorado

* + Developing and operating a combined cavity ring-down spectrometer/photo acoustic spectrometer for extinction and absorption measurements of ambient aerosol particles. 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.

|  |  |
| --- | --- |
| **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.

|  |  |
| --- | --- |
| **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

Cavity ring-down spectroscopy

* + Design and construction cavity ring down experiment for measuring the extinction properties of aerosol ensembles
  + Laser alignment and manipulation.

Photo acoustic spectrometry

* + Operation, operating theory and data analysis.
  + Ozone calibration in combination with CRDS.

Plumbing and gas flows

* + Design and use of humidification and purge flow systems.
  + Operation and modification of ozone generation for CRDS/PAS calibration.
  + Design of aerosol flow systems being mindful of losses and condensation.

Other Techniques

* Differential mobility analyser (DMA) theory, operation and maintenance, 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 (programming languages I’m proficient in are in bold):

* LabView, Igor, Python, 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, 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.
2. 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.
3. 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.
4. 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.
5. 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.
6. 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

|  |  |  |
| --- | --- | --- |
| £350 | Travel grant from the Aerosol society for attending the European Aerosol Conference in Granada | 2012 |