Dejian Fu

dfu@acebox.uwaterloo.ca
213-350 Columbia Street West, Waterloo, Ontario, N2L 6P6
Tel: (519) 888-4737 (Work), (519) 746-0149 (Home)

EDUCATION:

- **Ph.D. in Atmospheric Chemistry, Chemistry Department, University of Waterloo, Waterloo, Canada, Sept. 2003 – Oct. 2007**

  Supervisor: Prof. Peter F. Bernath

  Research Topic: Spectroscopy of the Atmosphere

  Courses taken: Atmospheric Remote Sensing, Spectroscopy, Atmospheric Chemistry and Physics, *etc.*

- **M.Sc. in Geography, Institute of Estuarine and Coastal Research, East China Normal University, Shanghai, China, Sept. 2000 – July 2003**

  Supervisor: Prof. Jianrong Zhu

  Thesis title: Three-dimensional numerical experiments for the study of transportations of suspended sediments in estuaries

  Courses taken: Remote Sensing on Resources and Environment, Progress on Environmental Science, Fluid Mechanics, Instrument Analysis and Measurement Technology, *etc.*

- **B.Eng. in Optoelectronics, Physics Department, East China Normal University, Shanghai, China, Sept.1996 – July 2000**

RESEARCH EXPERIENCE:

Graduate research assistant and postdoctoral scholar, supervised by Prof. Peter Bernath, University of Waterloo, 2003-present

- Developed a methodology to use data from the Atmospheric Chemistry Experiment (ACE) mission to measure wind velocities
- Performed ground-based solar absorption studies for the proposed Carbon Cycle science by Fourier Transform Spectroscopy (CC-FTS) mission
- Investigated the global distributions of trace gases related to air pollution using the measurements ACE mission
- Extensive experience diagnosing instrumental problems and operating PARIS-IR (Portable Atmospheric Research Interferometric Spectrometer for the Infrared), which is a novel portable instrument (based on the ACE design) suitable for balloon-based and ground-based atmospheric remote sensing
- Retrieved vertical profiles of atmospheric trace gases related to the ozone chemistry such as O_3, HCl, HNO_3, NO_2, and NO *etc*, as well as in carbon cycle science such as CH_4, CO, CO_2, and O_2, from solar absorption spectra and familiar with the theory and practice of modern remote sensing using Optimal Estimation Method (OEM)
- Experience operating an ABB-Bomem DA8 Fourier transform spectrometer and a Bruker 120 HR IFS Fourier transform spectrometer and familiar with instruments in the Network for the Detection of Atmospheric Composition Change (NDACC) such as the National Solar Observatory at Kitt Peak, Toronto Atmospheric Observatory (TAO), and Polar Environment Atmospheric Research Laboratory (PEARL) *etc.*

- Other activities during my PhD program
  - Involved in several laboratory experiments on the high resolution Fourier transform infrared spectroscopy of transient metal-containing molecules in 2003
  - Graduate teaching assistant (demonstrator), Department of Chemistry, University of Waterloo, 2003-2007
  - Worked on the ACE outreach program, which is a science teaching program to present atmospheric research to teenagers living in Canadian high Arctic communities (Umimmak School in Grise Fiord, Nunavut and Qarmartalik School in Resolute Bay, Nunavut, Mar. 10 to 17, 2006)

Graduate research assistant for Professor Jianrong Zhu, East China Normal University, 2000-2003

- Developed a 3-D numerical model to study the transportation of suspended sediments in estuaries
- Participated in the East China Sea observation campaign from May to June 2002

OTHER SKILLS AND PROFESSIONAL TRAINING:

- Participated in a mechanic shop course and have machine shop experience
- Extensive experience in designing and building parts for experimental setups
- Extensive experience using MATLAB, FORTRAN, C, LabVIEW, Corel Draw
- Experience with computer hardware maintenance

PUBLICATIONS:

15. **D. Fu**, C. D. Boone, P. F. Bernath, D. K. Weisenstein, C. P. Rinsland, G. L. Manney and K. A. Walker, "First global observations of atmospheric COClF from the Atmospheric Chemistry Experiment mission", J. Quant. Spectrosc. Rad. Trans. (accepted February, 2009).

14. **D. Fu**, P. F. Bernath, K. Sung, K. A. Walker, K. Strong, R. Mittermeier and H. Fast, "Simultaneous Atmospheric remote sensing using Fourier transform infrared spectrometers at Polar Environment Atmospheric Research Laboratory (PEARL) during Spring 2006", Atmos. Chem. Phys. In Press, (online available since February 2008). http://www.atmos-chem-phys-discuss.net/8/5305/2008/acpd-8-5305-2008.pdf.

13. **D. Fu**, K. Sung, C. D. Boone, K. A. Walker, and P. F. Bernath, "Ground-based solar absorption studies for the Carbon Cycle science by Fourier Transform Spectroscopy (CC-FTS)", J. Quant. Spectrosc. Rad. Trans. (2008), doi:10.1016/j.jqsrt.2008.02.003.

12. **D. Fu**, C. D. Boone, P. F. Bernath, K. A. Walker, Ray Nassar, G. L. Manney and S. D. McLeod, "Global phosgene observations from the Atmospheric Chemistry Experiment (ACE) mission", Geophys. Res. Lett. 34 (2007), L17815, doi:10.1029/2007GL029942.

11. **D. Fu**, K. A. Walker, K. Sung, C. D. Boone, M.-A. Soucy and P. F. Bernath, "The Portable Atmospheric Research Interferometric Spectrometer for the Infrared, PARIS-IR", J. Quant. Spectrosc. Rad. Trans. 103 (2007) 362 – 370.

10. A. Fraser, P. F. Bernath, R. D. Blatherwick, J. R. Drummond, P. F. Fogal, **D. Fu**, F. Goutail, C. T. McElroy, C. Midwinter, J. R. Olson, K. Strong, K. A. Walker, D. Wunch, and I. Young, "Intercomparison of ground-based ozone and NO_2 measurements during the MANTRA 2004 campaign", submitted to Atmos. Chem. Phys. Discuss. (June, 2007).

9. K. Sung, R. Skelton, K. A. Walker, C. D. Boone**, D. Fu**, and P. F. Bernath, "N_2O and O_3 Arctic Column Amounts from PARIS-IR Observations: Retrievals, Characterization and Error Analysis", J. Quant. Spectrosc. Rad. Trans., DOI: 10.1016/j.jqsrt.2007.03.002.

8. D. Wunch, J. Taylor, **D. Fu**, P. F. Bernath, J. R. Drummond, C. Midwinter, K. Strong, K. A. Walker, "Simutaneous ground-based observations of O_3, HCl, N_2O and CH_4 over Toronto using three Fourier transform spectrometers with different resolutions", Atmos. Chem. Phys. Discuss. 6 (2006) 10883 – 10928.

7. T. Kerzenmacher, K. A. Walker, K. Strong, R. Berman, P. F. Bernath, C. Boone, J. R. Drummond, H. Fast, A. Fraser, **D. Fu**, F. Goutail, M. Harwood, P. Loewen, K. MacQuarrie, T. McElroy, C.e Midwinter, R. Mittermeier, R. Skelton, K. Strawbridge, K. Sung, J. Walker, and H. Wu, "Results from the Canadian Arctic Validation of ACE Campaigns from 2004 to 2006", European Space Agency Science Conference in Frascati, Italy (2006).

6. S. Yu, **D. Fu**, A. Shayesteh, I. E. Gordon, D. R. T. Appadoo and P. F. Bernath, "Infrared and near infrared emission spectra of SbH and SbD", J. Mol. Spectrosc. 229 (2005) 257 – 265.

5. S. Yu, A. Shayesteh, **D. Fu**, and P. F. Bernath, "The vibration-rotation emission spectrum of gaseous HZnCl", J.Phys. Chem. A, 109 (2005) 4092 – 4094.

4. S. Yu, A. Shayesteh, **D. Fu**, and P. F. Bernath, "Infrared and near infrared emission spectra of TeH and TeD", J. Mol. Spectrosc. 230 (2005) 105 – 116.

3. **D. Fu**, J. Zhu, H. Shen, "The effects from the shapes of river mouth on the formation of the turbidity maximum zone", Journal of East China Normal University (Nature Science), 4 (2004) 72 – 78.

2. J. Zhu, **D. Fu**, H.Wu and D. Qi, "Dynamical model and numerical experiments on the formation cause of the turbidity maximum zone", Ocean Engineering, 22 (2004) 83 – 90.

1. J. Zhu and **D. Fu,** "Open boundary condition considered residual current and tidal current simultaneously in ocean model", Journal of East China Normal University (Nature Science), 1 (2003) 81 – 85.

CONFERENCE PRESENTATIONS: (The name of the presenting author is underlined)

Oral

10. **D. Fu**, C. D. Boone, P. Bernath, S. D. McLeod, K. A. Walker, "Retrieval of atmospheric winds measured by the Atmospheric Chemistry Experiment Fourier Transform Spectrometer", 42th Canadian Meteorological and Oceanographic Society, Kelowna, British Columbia, Canada, May 25-May 29, 2008.

9. **D. Fu**, K. Sung, C. D. Boone, K. A. Walker, and P. F. Bernath, "Ground-based solar absorption studies for the Carbon Cycle science by Fourier Transform Spectroscopy (CC-FTS)", 62nd Ohio State University International Symposium on Molecular Spectroscopy, Columbus, Ohio, USA, June 18-22, 2007.

8. **D. Fu**, C. D. Boone, P. F. Bernath, K. A. Walker, Ray Nassar, G. L. Manney and S. D. Mcleod, "Global phosgene observations from the Atmospheric Chemistry Experiment (ACE) mission", 62nd Ohio State University International Symposium on Molecular Spectroscopy, Columbus, Ohio, USA, June 18-22, 2007.

7. K. Sung, K. A. Walker, J. R. Drummond, **D. Fu**, P. F. Bernath, R. L. Mittermeier, H. Fast, and K. Strong, "Partial and total column SFIT2 retrievals from DA9 and PARIS-IR Fourier transform Infrared spectra recorded over Canadian Arctic in the spring of 2004-5, including comparisons with ACE satellite measurements", 62nd Ohio State University International Symposium on Molecular Spectroscopy, Columbus, Ohio, USA, June 18-22, 2007.

6. **D. Fu** and P. F. Bernath, "Remote sensing of atmospheric trace gases using PARIS-IR", ABB 2006 Workshop on Infrared Remote Sensing Application (WIRSA), Quebec city, Quebec, Canada, Nov. 11-13, 2006.

5. J. Taylor, K. Strong, D. Wunch, J. R. Drummond, **D. Fu**, K.A. Walker and P. F. Bernath, "Mini-MANTRA: intercomparisons between three Fourier Transform spectrometers", 40th Canadian Meteorological and ceanographic Society, Toronto, Ontario, Canada, May 29-June 1, 2006.

4. **D. Fu**, K. A. Walker, K. Sung, C. D. Boone, P. F. Bernath, "Spectroscopic study of atmospheric trace gases using PARIS-IR from Waterloo Atmospheric Observatory in 2005 and 2006", 61st Ohio State University International Symposium on Molecular Spectroscopy, Columbus, Ohio, USA, June 18-23, 2006.

3. **D. Fu**, K. A. Walker, K. Sung, C. D. Boone, S. D. Mcleod, P. F. Bernath, "Comparisons of ACE-FTS and PARIS-IR and Measurements of several Trace Gases in the Northern Mid-latitude Atmosphere", 60th Ohio State University International Symposium on Molecular Spectroscopy, Columbus, Ohio, USA, June 20-24, 2005.

2. S. Yu, A. Shayesteh, **D. Fu**, and P. Bernath, "The vibration-rotation emission spectrum of gaseous HZnCl"60th Ohio State University International Symposium on Molecular Spectroscopy, Columbus, Ohio, USA, June 20-24, 2005.

1. S. Yu, **D. Fu**, A. Shayesteh, D. R. T. Appadoo and P. Bernath, "Infrared and near infrared emission spectra of SbH and SbD", 59th Ohio State University International Symposium on Molecular Spectroscopy, Columbus, Ohio, USA, June 21-25, 2004.

Poster

9. **D. Fu**, C. D. Boone, P. F. Bernath, D. K. Weisenstein, C. P. Rinsland, and K.A. Walker, "First Global Observations of Atmospheric COClF from the Atmospheric Chemistry Experiment (ACE) Mission", 23rd Annual Symposium on Chemical Physics, University of Waterloo, Waterloo, Ontario, Canada, Nov. 9-11, 2007.

8. **D. Fu**, K. Sung, K.A. Walker, C. D. Boone, and P. F. Bernath, "Ground-based Solar Absorption Studies for the Carbon Cycle Science by Fourier Transform Spectroscopy (CC-FTS) Mission", 2006 Fall AGU Meeting, San Francisco, California, Dec. 11-15, 2006.

7. K. A. Walker, E. Dupuy, T. Kerzenmacher, **D. Fu**, C. Boone, R. Skelton, S. McLeod, R. Hughes, P. F. Bernath, K. Strong, and C. T. McElroy, "Validation Results from the Atmospheric Chemistry Experiment (ACE)", 2006 Fall AGU Meeting, San Francisco, California, Dec. 11-15, 2006.

6. **D. Fu**, K. A. Walker, K. Sung, C. D. Boone and P. F. Bernath, "Remote sensing of Atmospheric gases using PARIS-IR", 22nd Annual Symposium on Chemical Physics, University of Waterloo, Waterloo, Ontario, Canada, Nov. 3-5, 2006.

5. **D. Fu**, K. A. Walker, K. Sung, C. Boone, P. Bernath, "Observations of O_3 during the Canadian Artic ACE validation campaign 2006", 40th Canadian Meteorological and Oceanographic Society, Toronto, Ontario, Canada, May 29-June 1, 2006.

4. **D. Fu**, K. A. Walker, K. Sung, C. Boone, R. Skelton, P. Bernath, J. R. Taylor, D. Wunch, K. Strong and J. R. Drummond, "PARIS-IR Ground-based Observation in Summer 2005", 21st Annual Symposium on Chemical Physics, University of Waterloo, Waterloo, Ontario, Canada, Oct. 28-30, 2005.

3. **D. Fu**, K. Walker, I. J. Young, Y. Bresler, and P.F. Bernath, "Preparation of the PARIS-IR Instrument for Balloon-Based Measurements", The Optical Society of America Poster night (Southwestern Ontario Section), Waterloo, Ontario, Canada, Mar. 22, 2005.

2. **D. Fu**, K. Walker, I. J. Young, Y. Bresler, and P.F. Bernath, "Preparation of the PARIS-IR Instrument for Balloon-Based Measurements", 20th Annual Symposium on Chemical Physics, University of Waterloo, Waterloo, Ontario, Oct. 29-31, 2004.

1. **D. Fu**, S. Yu, D. Appadoo, P. Bernath, "Study of the FT IR and near-IR Emission Spectra of SbH", 19th Annual Symposium on Chemical Physics, University of Waterloo, Waterloo, Ontario, Canada, Oct. 29-Nov. 2, 2003.

HONORS AND AWARDS:

- Bruker BioSpin Graduate Scholarship, Chemistry Department, University of Waterloo, Apr. 2007
- Award for student poster competition, the Optical Society of America poster night (Southwestern Ontario Section), Waterloo, Ontario, Canada, Mar. 2005
- International Doctoral Student Award, University of Waterloo, Sept. 2003-Aug. 2006
- Graduate Scholarship, University of Waterloo, Sept. 2003-present
- University of Waterloo Entrance Scholarship, University of Waterloo, Sept. 2003

REFERENCES:

Prof. Peter F. Bernath (PhD supervisor)
Department of Chemistry
University of Waterloo, Waterloo, Ontario, Canada N2L 3G1
Email address: bernath@uwaterloo.ca
Office Phone: (519) 888-4814

And, Department of Chemistry
University of York
Heslington
York YO10 5DD
United Kingdom
Phone: +44-(0)-1904-434526

Prof. Robert Le Roy (PhD. Advisory Committee Member)
Department of Chemistry
University of Waterloo, Waterloo, Ontario, Canada N2L 3G1
E-mail: leroy@uwaterloo.ca
Office Phone: (519) 888-4051

Prof. Chris Boone (co-worker)
Department of Chemistry
University of Waterloo, Waterloo, Ontario, Canada N2L 3G1
Email address: cboone@sciborg.uwaterloo.ca
Office Phone: (519) 888-4814