

## WILLIAM ROBERT SIMPSON

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### Education

*Ph.D.* Physical Chemistry, *Stanford University*, Stanford, CA June 1995  
*B.A. with High Honors*, Chemistry with Mathematics minor, *Swarthmore College*,  
Swarthmore, PA May 1988

### Awards

- NSF CAREER Grant Award 2001-2006
- Research Innovation Award for cavity ring-down spectroscopy, Research Corporation 1999
- NSF Graduate Research Fellowship for study at Stanford University 1989-1992
- American Chemical Society Annual Award for Scholastic Achievement,  
Swarthmore College 1988
- Stanley Adamson Prize in Chemistry, Given to the outstanding junior in the  
Chemistry Department, Swarthmore College 1987

### Honorary Professional societies

Phi Beta Kappa honorary society, Sigma Xi scientific honor society (Swarthmore Chapter), and Phi Lambda Upsilon Chemistry honor society, American Chemical Society, American Association for the Advancement of Science, American Physical Society, American Geophysical Union.

### Current Position

ASSOCIATE PROFESSOR OF PHYSICAL CHEMISTRY:, *University of Alaska Fairbanks Chemistry and Biochemistry Department and Geophysical Institute*, Fairbanks, AK July 2002 - present  
Investigating high latitude oxidation chemistry. Developing novel instrumentation for detection of reactive radicals. Investigating snowpack photochemistry at high latitudes.

ASSISTANT PROFESSOR OF PHYSICAL CHEMISTRY:, *University of Alaska Fairbanks Chemistry and Biochemistry Department and Geophysical Institute*, Fairbanks, AK Sept 1997 - July 02

### Current Active Grants

NOAA/CMDL, Operation of an automated Dobson spectrometer, PI William Simpson, \$36,000, per year August 2002-2007.

NSF Atmospheric Sciences, "REU Site: Summer Research Experience for Undergraduates in the Geosciences", PI Roger Smith, Co-PI Catherine Cahill, Co-PI William Simpson, \$227,741, 5 years, Sept 2001-2007.

NSF Office of Polar Programs, "Collaborative Research: Snow and Ice Processes in the Deposition and Fate of Mercury in the Arctic", PI William Simpson, 5 other PIs (collaborative grant), UAF portion \$271,803, 4 years, September 2004-2008.

NSF Office of Polar Programs, "Collaborative Research: The Collaborative O-Buoy Project: Deployment of a Network of Arctic Ocean Chemical Sensors for the IPY and Beyond", PI William Simpson, 4 other PIs (collaborative grant), UAF portion \$432,961, 3 years, May 2007-2010.

NSF Atmospheric Chemistry, "Chemical Transformations of Nitrogen Oxides in High Latitude Plumes: The Role of Dinitrogen Pentoxide ( $N_2O_5$ ) Heterogeneous Hydrolysis hydrolysis in  $NO_x$  removal, acid deposition, and fertilization of Arctic ecosystems", \$179,800, 2 years, October 2006-2008.

### **Classes Taught**

General Chemistry, Chem 105X, Freshman-level introductory chemistry for science majors  
Physical Chemistry I, Chem 331, Junior-level physical chemistry -- Thermodynamics  
Physical Chemistry II, Chem 332, Junior-level physical chemistry -- Quantum Mechanics  
Physical Chemistry Laboratory, Chem 434W, Senior-level physical chemistry laboratory  
Undergraduate Research Mentor, Chem 488, Mentor undergraduates in my research laboratory  
Atmospheric Chemistry, Chem 406/606, Atmospheric Chemistry  
Molecular Spectroscopy, Chem 632, Graduate-level molecular spectroscopy  
Research Presentation Techniques, Chem 691, Graduate-level instruction on presentations.

For these classes, my student evaluation of instruction (SOI) scores are typically higher than 4.9 out of 5.0, which corresponds to a ranking of >9 out of 10 among UAF instructors.

### **Community Service**

Group Leader for Atmospheric Sciences Research Group, Geophysical Institute 2005-present  
Member of Observational Facilities Advisor Panel (OFAP), NCAR. Term 2003-2006.  
Served as ad-hoc reviewer for Journal of Geophysical Research, Geophysical Research Letters, Journal of Physical Chemistry A, Atmospheric Environment, Atmospheric Chemistry and Physics.

Served as grant reviewer for NSF and DOE grant applications.

Mentor to High-school science project program, Lecture and provide demonstrations for local elementary, junior high, and high schools.

Served University on eight hiring committees, two as chair.

### **Past Research Experience**

POSTDOCTORAL ASSOCIATE: *Geophysical Institute*, Fairbanks, AK Sept 1996-Sept 1997

- Investigated nitrogen oxide chemistry in the group of Professor Daniel Jaffe. Constructed a chemiluminescence detector for NO and optimized performance of this detector. Assisted in balloon based ozone measurements.

POSTDOCTORAL ASSOCIATE: *Princeton University*, Princeton, NJ August 1995-May 1996

- Investigated protein dynamics in the group of Professor Thomas G. Spiro through resonance Raman spectroscopy. Developed instrumentation for time-resolved resonance Raman spectroscopy.

RESEARCH ASSISTANT: *Stanford University*, Stanford, CA September 1989-July 1995

- Performed Ph.D. research in physical chemistry in the group of Professor Richard N. Zare. Gained experience in gas-phase reaction dynamics and high-resolution nanosecond laser spectroscopy, including direct experience with LIF, REMPI, IR generation with an OPO, opto-acoustic, stimulated Raman and CARS spectroscopy. Designed and built fluorescence and ion collection systems including a TOF mass spectrometer.

RESEARCH ASSISTANT: *Swarthmore College*, Swarthmore, PA May 1987-May 1988

- Wrote an undergraduate thesis on original research in laser chemistry performed in the group of Professor Thomas Stephenson. Duties included writing data analysis programs, and building, maintaining, and repairing electronic and mechanical parts of the laser spectrometer.

RESEARCH ASSISTANT: *National Cancer Institute*, Bethesda, MD Summers 1982-1986

- Studied bacterial genetics in the group of Dr. Sankar Adhya. Duties included design of original techniques, molecular cloning, participation in laboratory group discussions, and scheduling of work times.

## Publications

1. T. A. Stephenson\*, et al., Laser induced fluorescence of jet cooled  $\text{IBr:B}^3\Pi_0^+ - \text{X } ^1\Sigma^+$  excitation spectra, *J. Phys. Chem.* **93**, 2310 (1989).
2. W. R. Simpson, T. A. Stephenson\*, Spectroscopy and A state dynamics of the  $\text{NeIBr vdW}$  complex, *J. Chem. Phys.* **90**, 3171 (1989).
3. M. J. Bronikowski, W. R. Simpson, B. Girard, R. N. Zare\*, Bond specific chemistry: OD:OH product ratios for the reactions  $\text{H} + \text{HOD}(100)$  and  $\text{H} + \text{HOD}(001)$ , *J. Chem. Phys.* **95**, 8647-8648 (1991).
4. M. J. Bronikowski, W. R. Simpson, R. N. Zare\*, Effect of reagent vibration on the  $\text{H} + \text{HOD}$  reaction: an example of bond-specific chemistry, *J. Phys. Chem.* **97**, 2194-2203 (1993).
5. M. J. Bronikowski, W. R. Simpson, R. N. Zare\*, Comparison of reagent stretch vs. bend excitation in the  $\text{H} + \text{D}_2\text{O}$  reaction: an example of mode-selective chemistry, *J. Phys. Chem.* **97**, 2204-2208 (1993).
6. W. R. Simpson, A. J. Orr-Ewing, R. N. Zare\*, State-to-state dynamics and doubly differential cross sections for the reaction of chlorine with  $\text{CH}_4(\nu_3=1, J)$ , Ed. C.-Y. Ng, Laser techniques for state-selected and state-to-state chemistry, Los Angeles, CA (SPIE: Bellingham, WA, 1993).
7. N. E. Shafer, A. J. Orr-Ewing, W. R. Simpson, H. Xu, R. N. Zare\*, State-to-state differential cross sections from photoinitiated bulb reactions, *Chem. Phys. Lett* **212**, 155-162 (1993).
8. W. R. Simpson, A. J. Orr-Ewing, R. N. Zare\*, State-to-state differential cross sections for the reaction  $\text{Cl}(^2P_{3/2}) + \text{CH}_4(\nu_3=1, J=1) \rightarrow \text{HCl}(\nu=1, J') + \text{CH}_3$ , *Chem. Phys. Lett.* **212**, 163-171 (1993).
9. A. J. Orr-Ewing, W. R. Simpson, T. P. Rakitzis, R. N. Zare\*, Preparing reagents: time dependence of  $\text{HCl}(\nu=1, J)$  alignment following pulsed infrared excitation, *Isr. J. Chem.* **34**, 95 (1994).

10. W. R. Simpson, A. J. Orr-Ewing, S. A. Kandel, T. P. Rakitzis, R. N. Zare<sup>\*</sup>, Core extraction for measuring state-to-state differential cross sections of bimolecular reactions, *J. Chem. Phys.* **103**, 7299-7312 (1995).
11. W. R. Simpson, T. P. Rakitzis, S. A. Kandel, A. J. Orr-Ewing, R. N. Zare<sup>\*</sup>, Reaction of Cl with vibrationally excited CH<sub>4</sub> and CHD<sub>3</sub>: State-to-state differential cross sections and steric effects for the HCl product, *J. Chem. Phys.* **103**, 7313-7335 (1995).
12. W. R. Simpson, T. P. Rakitzis, S. A. Kandel, T. Lev-On, R. N. Zare<sup>\*</sup>, Picturing the transition-state region and understanding vibrational enhancement in the Cl+CH<sub>4</sub> → HCl+CH<sub>3</sub> reaction, *J. Phys. Chem.*, **100**, 7938-7947 (1996).
13. A. J. Orr-Ewing, W. R. Simpson, T. P. Rakitzis, S. A. Kandel, R. N. Zare<sup>\*</sup>, Scattering-Angle Resolved Product Rotational Alignment for the Reaction of Cl with Vibrationally Excited Methane, *J. Chem. Phys.*, 5961-5971 (1997).
14. Schulz, K.J., and W.R. Simpson<sup>\*</sup>, Frequency-matched cavity ring-down spectroscopy, *Chem. Phys. Lett.*, 297, 523-529, (1998).
15. Jaffe, D.<sup>\*</sup>, T. Anderson, D. Covert, R. Kotchenruther, B. Trost, J. Danielson, W. Simpson, T. Berntsen, S. Karlsdottir, D. Blake, J. Harris, and G. Carmichael, Transport of Asian air pollution to North America, *Geophys. Res. Lett.*, 26 (6), 711-714, (1999).
16. Zhao, X., C. Tengroth, R. Chen, W. R. Simpson, T. G. Spiro, Time-resolved Raman spectroscopy with a tunable ultraviolet kilohertz nanosecond laser, *J. Raman Spectroscopy*, 30, 773-776, (1999).
17. Lloyd, S.<sup>\*</sup>, W.H. Swartz, T. Kusterer, D. Anderson, C.T. McElroy, C. Midwinter, R. Hall, K. Nassim, D. Jaffe, W. Simpson, J. Danielson, D. Griffin, B. Johnson, D. Quincy, S. Oltmans, P. Newman, R. McPeters, G. Labow, L. Moy, C. Seftor, and G. Toon, Total ozone observations and trend at Fairbanks during POLARIS, *J. Geophys. Res.*, 104 (D21), 26767-26778, (1999).
18. King, M.D., E.M. Dick, and W.R. Simpson<sup>\*</sup>, A new method for the atmospheric detection of the nitrate radical (NO<sub>3</sub>), *Atmos. Env.*, 34, 683-686, (2000).
19. Michelsen, H.A., and W.R. Simpson, Relating state-dependent cross sections to non-Arrhenius behavior for the Cl + CH<sub>4</sub> reaction, *J. Phys. Chem. A.*, 105, 1476-1488, (2000).
20. Jaffe, D., T. Anderson, D. Covert, B. Trost, J. Danielson, W. Simpson, D. Blake, J. Harris, and D. Streets, Observations of ozone and related species in the Northeast Pacific during the PHOBEA campaigns: 1. Ground based observations at Cheeka Peak, *J. Geophys. Res.*, 105 (D7), 7449-7461, (2001).
21. King, M.D., and W.R. Simpson<sup>\*</sup>, The extinction of UV radiation in Arctic snow at Alert, Canada (82°N), *J. Geophys. Res.*, 106 (D12), 12499-12508, (2001).
22. Simpson, W.R., M.D. King, H.J. Beine, R.E. Honrath, and M.C. Peterson, Atmospheric photolysis rates during the Polar Sunrise Experiment ALERT2000 Field Campaign, *Atmos. Env.*, 36 (15-16) 2471-2480 (2002).
23. Simpson, W.R., M.D. King, H.J. Beine, R.E. Honrath, and X. Zhou, Radiation-transfer modeling of snow pack photochemical processes during ALERT2000., *Atmos. Env.*, 36 (15-16), 2663-2670 (2002).

24. Zhou, X., H.J. Beine, R.E. Honrath, J.D. Fuentes, W.R. Simpson, P.B. Shepson, and J.W. Bottenheim, Snowpack Photochemical Production of HONO: a Major Source of OH in the Arctic Boundary Layer in Spring Time, *Geophys. Res. Lett.*, 28(21), 4087-4090, 2001.
25. Harald J. Beine, Richard E. Honrath, Florant Dominé, William R. Simpson, Martin D. King, Jose D. Fuentes, NO<sub>x</sub> during background and ozone depletion periods at Alert: Fluxes above the snow surface, *J. Geophys. Res.* 107 (D21), 4584-4596 (2002).
26. Amanda M. Grannas, Paul B. Shepson, Christofe Gimbaud, Ann Louise Sumner, Mary Albert, William Simpson, Florant Dominé, Hacine Boudries, Jan Bottenheim, Harald J. Beine, Richard E. Honrath, Zianliang Zhou, A study of carbonyl compounds and photochemistry in the Arctic atmospheric boundary layer, *Atmos. Env.* 36 (15-16), 2733-2742 (2002).
27. K. Seki, Y. Kasai, Y. Murayama, M. Kohei, T. Itable, F. J. Murcray, W. R. Simpson, and S. A. Lloyd, Trace gas observations with Poker Flat FTIR, *J. Communication Res. Lab.* 49 (2), 191-200 (2002).
28. W. R. Simpson, Continuous wave cavity ring-down spectroscopy applied to *in-situ* detection of dinitrogen pentoxide (N<sub>2</sub>O<sub>5</sub>), *Rev. Sci. Inst.*, 74:7, 3442-3452 (2003).
29. Simpson, W. R., L. Alvarez-Aviles, T. A. Douglas, M. Sturm, and F. Domine (2005), Halogens in the coastal snow pack near Barrow, Alaska: Evidence for active bromine air-snow chemistry during springtime, *Geophys. Res. Lett.*, 32, L04811.
30. Douglas, T. A., M. Sturm, W. R. Simpson, S. Brooks, S. Lindberg, and D. Perovich (2005), Elevated mercury measured in snow and frost flowers near Arctic sea ice leads, *Geophys. Res. Lett.*, 32, L04502.
31. Domine, F., A. S. Taillandier, W. R. Simpson, and K. Severin (2005), Specific surface area, density and microstructure of frost flowers, *Geophys. Res. Lett.*, 32, L13502.
32. Phillips, G. J., and W. R. Simpson (2005), Verification of snowpack radiation transfer models using actinometry, *J. Geophys. Res.*, 110, D08306.
33. Flowers, B. A., M. E. Angerhofer, W. R. Simpson, T. Nakayama, and Y. Matsumi (2005), Nitrate radical quantum yield from peroxyacetyl nitrate photolysis, *J. Phys. Chem. A*, 109, 2552-2558.
34. James D. Ayers, Randy L. Apodaca, William R. Simpson, and Douglas S. Baer (2005), Off-Axis Cavity Ring-Down Spectroscopy: Application to Atmospheric Nitrate Radical Detection, *Applied Optics*, 44, 7239-7242.
35. Ayers, J. D., and W. R. Simpson (2006), Measurements of N<sub>2</sub>O<sub>5</sub> near Fairbanks, Alaska, *J. Geophys. Res.*, 111, D14309.
36. Taillandier, A.-S., F. Domine, W. R. Simpson, M. Sturm, T. A. Douglas, and K. Severin (2007), Evolution of the Snow Area Index (SAI) of the subarctic snowpack in central Alaska over a whole season. Consequences for the air to snow transfer of pollutants., *Env. Sci. and Tech.*, in press.
37. Domine, F., A.-S. Taillandier, S. Houdier, F. Parrenin, W. R. Simpson, and T. A. Douglas (2007), Interactions between snow metamorphism and climate: physical and chemical aspects, in "Physics and Chemistry of Ice", W.F. Kuhs, ed., Royal Society of Chemistry, Cambridge, UK, pp. 27-46., in Physics and Chemistry of Ice, edited by W. F. Kuhs, Royal Society of Chemistry, Cambridge, UK.

38. Taillandier, A., F. Domine, W. R. Simpson, M. Sturm, and T. A. Douglas (2007), Rate of decrease of the specific surface area of dry snow: Isothermal and temperature gradient conditions, *J. Geophys. Res.*, 112, F03003, doi:03010.01029/02006JF000514.
39. Simpson, W. R., D. Carlson, G. Hoenninger, T. A. Douglas, M. Sturm, D. K. Perovich, and U. Platt (2007), The Dependence of Arctic Tropospheric Halogen Chemistry on Sea Ice Conditions, *Atmos. Chem. Phys.*, 7, 621 – 627.
40. W. R. Simpson, R. von Glasow, K. Riedel, P. Anderson, P. Ariya, J. Bottenheim, J. Burrows, L. Carpenter, U. Frieß, M. E. Goodsite, D. Heard, M. Hutterli, H.-W. Jacobi, L. Kaleschke, B. Neff, J. Plane, U. Platt, A. Richter, H. Roscoe, R. Sander, P. Shepson, J. Sodeau, A. Steffen, T. Wagner, E. Wolff (2007), Halogens and their role in polar boundary-layer ozone depletion, *Atmos. Chem. Phys.*, 7, 4375-4418, 2007
41. Grannas, A. M., Jones, A. E., Dibb, J., Ammann, M., Anastasio, C., Ariya, P., Beine, H. J., Bergin, M., Bottenheim, J., Boxe, C. S., Carver, G., Chen, G., Crawford, J. H., Domine, F., Frey, M. M., Guzman, M. I., Heard, D. E., Helmig, D., Hoffmann, M. R., Honrath, R. E., Huey, L. G., Hutterli, M., Jacobi, H., Klan, P., McConnell, J., Sander, R., Savarino, J., Shepson, P. B., Simpson, W. R., Sodeau, J. R., von Glasow, R., Weller, R., Wolff, E., and Zhu, T. (2007), An overview of snow photochemistry: Evidence, mechanisms and impacts, *Atmos. Chem. Phys. Discuss.*, 7, 329-4373, 2007.
42. F. Domine, M. Albert, T. Huthwelker, H.-W. Jacobi, A. A. Kokhanovsky, M. Lehning, G. Picard, and W. R. Simpson (2007), Snow physics as relevant to snow photochemistry, *Atmos. Chem. Phys. Discuss.*, 7, 5941–6036, 2007

### **Manuscripts in press and submitted**

43. Thomas A. Douglas, Matthew Sturm, William R. Simpson, Joel D. Blum, Laura Alvarez-Aviles, Gerald J. Keeler, Donald K. Perovich, Abir Biswas and Kelsey Johnson, The influence of snow and ice crystal formation and accumulation on mercury deposition to the Arctic, submitted to *Environmental Science and Technology*, 2007.
44. Bradley A. Flowers, John F. Stanton, William R. Simpson, Wavelength Dependence of Nitrate Radical Quantum Yield from Peroxyacetyl Nitrate Photolysis: Experimental and Theoretical Studies, accepted to the *Journal of Physical Chemistry, A*, 2007.

### **Conference Talks and Posters (Post July 1998, presenter underlined):**

- "High latitude oxidation chemistry", W. R. Simpson, a talk presented at Stanford University, 10 August 1998.
- "Cavity Ring-Down Spectroscopy: A New Tool for Trace Gas Detection and Atmospheric Transmission Studies", W.R. Simpson, K. J. Schulz, E. Dick, Poster Presented at 49th Arctic Science conference, 27 October 1998
- "Cavity ring-down spectroscopy: a new tool for arctic radical chemistry investigations" W. R. Simpson, K. J. Schulz, E. Dick, Poster at AGU Fall meeting, San Francisco, CA, 7 December 1998.
- "Atmospheric cavity ring-down spectroscopy: Application to measurement of reactive radicals", William R. Simpson, Martin King, Eric Dick, An informal talk presented during Sandia visitors to develop grant ideas (resulted in grant submission), 20 April 1999.

- "Production of O(<sup>1</sup>D) from ozone photolysis at high latitudes: Sensitivity to quantum yields in the 320 nm region", Martin King, Andrew Elsberg, Liz Hillard, Pam Sousanes, William R. Simpson, Talk presented at the 50th Arctic Science Conference, Denali Park and Preserve, Alaska, 20 September 1999
- "Cavity ring-down spectroscopy applied to nitrate radical detection", Eric Dick, Martin King, William R. Simpson, Poster presented at the 50th Arctic Science Conference, Denali Park and Preserve, Alaska, 21 September 1999
- "Developing cavity ring-down spectroscopy for trace gas detection", William R. Simpson, Martin King, Eric Dick, An invited talk at Sandia National Laboratory Combustion Research Facility, Livermore, CA, 27 September 1999
- "Production of O(<sup>1</sup>D) from photolysis of ozone at high latitudes: Sensitivity to quantum yields in the 320 nm region" A. E. Elsberg, E. A. Hilliard, M. D. King, P. Sousanes, and W. R. Simpson, a talk at the PRIMENet meeting, Sequoia National Park, California, USA, 1-4 November 1999.
- "High Latitude photochemistry in the atmosphere and in the snowpack", W. R. Simpson, a talk for the Atmospheric Sciences seminar series, UAF, 9 Feb 2000.
- "A new method for the atmospheric detection of the nitrate radical", M. D. King, E. M. Dick, and W. R. Simpson, 17th informal symposium on kinetics and photochemical processes in the atmosphere, University of California, Irvine, CA, 29 February 2000.
- "Relating state-dependent cross-sections to non-Arrhenius behavior for the Cl+CH<sub>4</sub> reaction," H. A. Michelsen and W. R. Simpson, a talk presented at the Spring 2000 ACS Meeting in San Francisco 26 - 30 March (2000).
- "Measurements of ultraviolet light fluxes in the snow pack at the ALERT2000 field campaign," William Simpson and Martin King, Poster presentation at EMSL 2000 meeting, Richland, WA, 19 - 24 June (2000).
- "Nitrous Oxide (N<sub>2</sub>O) production in sprites," D.R. Moudry, W.R. Simpson and H.C. Stenbaek-Nielsen, Poster presentation at the CEDAR 2000 conference, 25-30 June, (2000).
- "Relating state-dependent cross sections to non-Arrhenius behavior for the Cl+CH<sub>4</sub> reaction", H. A. Michelsen, C. A. Taatjes, and W. R. Simpson, a poster at the 16th International Symposium on Gas Kinetics, Cambridge, England, July 22-27, 2000.
- "Snow-pack photochemistry at the ALERT2000 field campaign, C.F.S. Alert (82°N), Canada," William R. Simpson and Martin D. King, a talk to the UAF Chemistry and Biochemistry department, 26 Sep 2000.
- "Ultraviolet radiation in and above the snow at ALERT2000", William Simpson and Martin King, ALERT2000 Data Workshop, Rome, Italy, 3 Oct 00
- "Observations of ultraviolet light fluxes in snow during the ALERT2000 field campaign", Martin King, William Simpson, Submitted as poster, American Geophysical Union Fall Meeting, San Francisco, December 15-19, 2000.
- "The oxidation of methane by atomic chlorine: Combining chemical and molecular dynamics measurements", H. A. Michelsen and W. R. Simpson, a talk at the American Geophysical Union Fall Meeting, San Francisco, December 15-19, 2000.

- "Radiation-transfer modeling of snowpack photochemistry during the ALERT2000 field campaign", William Simpson, Martin King, Jerry Harrington, Submitted as talk, American Geophysical Union Fall Meeting, San Francisco, December 15-19, 2000.
- "Application of cavity ring-down spectroscopy to determine nitrate radical (NO<sub>3</sub>) concentrations in the atmosphere", Eric M. Dick, Martin D. King, and William R. Simpson, a poster at the American Geophysical Union Fall Meeting, San Francisco, December 15-19, 2000.
- "Another look at Cl+CH<sub>4</sub>: Using state-resolved data to reduce the uncertainties of thermal rate constants", H. A. Michelsen and W. R. Simpson, a poster at the Workshop on Laboratory Studies of Upper Troposphere/Lower Stratosphere Processes in Breckenridge, CO, July 23-27, 2001.
- "Observations of atmospheric trace gases at Poker Flat, Alaska" Y. Murayama, S. Ochiai, K. Mizutani, Y. Kasai, F. Murcray, R. Collins, W. Simpson, H. Masuko, Spring meeting of Society of Geomagnetism and Earth, Planetary and Space Sciences, June 4-8, 2001, Japan
- "An analysis of the temperature-dependence of the Dobson dataset from TOMS<sup>3</sup>-F", William Simpson, Brandon Kerns, and TOMS<sup>3</sup>-F Science team, TOMS<sup>3</sup>-F Data Workshop, 24-25 Aug, 2001, Boulder, CO.
- "The total ozone measurements by satellites, sondes, and spectrometers at Fairbanks (TOMS-3F) field campaign: Preliminary results", P. K. Bhartia, R. D. McPeters, R. S. Stolarski, S. M. Hollandsworth-Frith and G. J. Labow, S. A. Lloyd, R. D. Evans, B. J. Johnson and S. J. Oltmans, W. R. Simpson, C. T. McElroy, J. B. Kerr and C. A. McLinden, Network for the Detection of Stratospheric Change (NDSC) 2001 Symposium, held in Arcachon, France, Sept. 24-27, 2001.
- "Observation of atmospheric trace species by Fourier-transform infrared spectrometer at Poker Flat, Alaska", Kouji Seki, Yasuko Kasai, Yasuhiro Murayama, Kohei Mizutani, Frank J. Murcray, William R. Simpson, Steven A. Lloyd, Fall AGU meeting, San Francisco, 2001.
- "Arctic atmospheric chemistry: Developing and deploying instruments to understand the chemistry of the Arctic atmosphere.", Bill Simpson, Eric Dick, Martin King, UAF Chemistry departmental seminar, 23 Oct 2001.
- "Arctic atmospheric chemistry: Developing and deploying instruments to understand the chemistry of the Arctic atmosphere.", Bill Simpson, Eric Dick, Martin King, University of Idaho Chemistry departmental seminar, Moscow ID, 27 Nov 2001.
- "Arctic atmospheric chemistry: Developing and deploying instruments to understand the chemistry of the Arctic atmosphere.", Bill Simpson, Eric Dick, Martin King, Oregon State University Chemistry departmental seminar, Corvallis, OR, 28 Nov 2001.
- "Arctic atmospheric chemistry: Developing and deploying instruments to understand the chemistry of the Arctic atmosphere.", Bill Simpson, Eric Dick, Martin King, Reed College Chemistry departmental seminar, Portland, OR, 29 Nov 2001.
- "Arctic atmospheric chemistry: Developing and deploying instruments to understand the chemistry of the Arctic atmosphere.", Bill Simpson, Eric Dick, Martin King, UAF Mechanical Engineering departmental seminar, Fairbanks, AK, 13 Dec 2001.
- "The Total Ozone Measurements by Satellites, Sondes and Spectrometers at Fairbanks (TOMS<sup>3</sup>-F) Field Campaign: Preliminary Results", S. A. Lloyd, P. K. Bhartia, R. D. McPeters, R. S. Stolarski, S. M. Hollandsworth-Frith, G. J. Labow, R. D. Evans, B. J. Johnson and S. J.

- Oltmans, W. R. Simpson, C. T. McElroy, J. B. Kerr and C. A. McLinden, Poster at Spring AGU, DC, 2002.
- "A new method to detect methane via ICOS", W. Simpson and D. Baer, Presentation at "Development of a Research Agenda to Determine the Current Circumpolar Carbon Budget", 29-30 July 2002, Fairbanks, AK
- "The Total Ozone Measurements by Satellites, Sondes and Spectrometers at Fairbanks (TOMS<sup>3</sup>-F) Field Campaign", W. R. Simpson, S. A. Lloyd, P. K. Bhartia, R. D. McPeters, R. S. Stolarski, S. M. Hollandsworth-Frith and G. J. Labow, R. D. Evans, B. J. Johnson and S. J. Oltmans, C. T. McElroy, J. B. Kerr and C. A. McLinden, a talk at the 53rd Arctic Science Conference, AAAS Arctic Division, 18-21 September, 2002, Fairbanks AK.
- "Cavity ring-down spectroscopic detection of NO<sub>3</sub>", William R. Simpson, A talk at the Air Force Research Laboratory, 23 Aug 2002, Hanscom, MA.
- "Using cavity-enhanced spectroscopy to investigate atmospheric chemistry", William R. Simpson, an invited poster presentation at the German-American Frontiers of Chemistry Conference, 23-25 August 2002, Durham, New Hampshire.
- "Detection of NO<sub>3</sub> and N<sub>2</sub>O<sub>5</sub> via cavity ring-down spectroscopy", William R. Simpson, a poster presentation at the Global Climate Change in the Arctic conference GCCA4, 4-8 November 2002, Fairbanks, AK.
- "Radiation transfer and photochemistry in snow", William R. Simpson, a talk at the Ocean-Air-Ice chemistry planning meeting, 10-12 November 2002, Purdue University, Indiana.
- "Nighttime nitrogen oxidation at high latitudes: winter observations of N<sub>2</sub>O<sub>5</sub> in Fairbanks, Alaska", William R. Simpson, Eric M. Dick, Gavin Phillips, Brad Flowers, An invited talk at the Climate Monitoring and Diagnostics Laboratory (NOAA/CMDL), 22 May 2003, Boulder CO.
- "Observations of N<sub>2</sub>O<sub>5</sub> and NO<sub>3</sub> in ambient air via continuous-wave cavity ring-down spectroscopy", William R. Simpson, Eric M. Dick, and Gavin Phillips, a talk at the 58th Molecular Spectroscopy Symposium, 16-20 June 2003, Columbus OH.
- "Photolysis of Peroxyacetyl Nitrate (PAN) Studied by Cavity Ring-down Spectroscopy", William R. Simpson, Mark Angerhofer, Gavin Phillips, Tomoki Nakayama, Yutaka Matsumi, Bradley Flowers, John Stanton, a talk at the 58th Molecular Spectroscopy Symposium, 16-20 June 2003, Columbus OH.
- "Using cavity ring-down spectroscopy to measure N<sub>2</sub>O<sub>5</sub> and NO<sub>3</sub> at high latitudes ", William R. Simpson, James Ayers, a poster at the Gordon Research Conference, Atmospheric Chemistry, 7-12 September, 2003, Big Sky Resort, MT.
- "Photochemistry of Peroxyacetyl nitrate (PAN)", William R. Simpson, Brad Flowers, and Mark Angerhofer a poster at the Gordon Research Conference, Atmospheric Chemistry, 7-12 September, 2003, Big Sky Resort, MT.
- "NO<sub>3</sub> and N<sub>2</sub>O<sub>5</sub> detection using cavity ring-down spectroscopy", Bill Simpson, James Ayers, and Randy Apodaca, UAF Atmospheric Science seminar, 1 Oct 2003.
- "Testing snow photochemical models using chemical actinometry and in-snow radiometry", William R. Simpson, Gavin J. Phillips, Anne-Sophie Taillandier, Florent Domine, Martin King, Matthew Sturm, Glenn Liston, Tom Douglas, Snow photochemistry workshop, Brno Czech Republic, 6 Nov 2004.

- “Arctic Atmospheric Chemistry: A spectroscopic approach”, William R. Simpson, Institute for Environmental Physics (IUP) seminar, University of Heidelberg, Heidelberg, Germany, 18 Nov 2004.
- “Transfer of halogens from the sea ice to the atmosphere: results from snow analyses near Alert, Ny-Ålesund, and Barrow”, Florent Domine, Roberto Sparapani, Antonietta Ianiello, Harald J Beine, William R Simpson, Laura Alvarez-Aviles, Thomas Douglas, Matthew Sturm, Anne-Sophie Taillandier, and Stephan Houdier, a poster presented at the International Global Atmospheric Chemistry (IGAC) conference, New Zealand, Nov 2004.
- “Physical and chemical changes in snowpacks subjected to different metamorphic conditions. A new feedback for climate change”, Florent Domine, William R Simpson, Anne-Sophie Taillandier, Laura Alvarez-Aviles, Stephan Houdier, Thomas Douglas, Matthew Sturm, Ken Severin, , a poster presented at the International Global Atmospheric Chemistry (IGAC) conference, New Zealand, Nov 2004.
- “Air-Snow interactions and Atmospheric Chemistry”, William R. Simpson, Institute for Environmental Physics (IUP) student seminar, University of Heidelberg, Heidelberg, Germany, 3 Dec 2004.
- “A coupled physical, optical, and photochemical model of snow: relating measurements of specific surface area to snow optical properties”, Gavin Phillips, William R. Simpson, Anne-Sophie Taillandier and Florent Domine, a poster presented at the Fall AGU meeting, San Francisco, CA, Dec 2004.
- “Measurements of NO<sub>3</sub> and N<sub>2</sub>O<sub>5</sub> in the Polluted Subarctic Atmosphere: A Seasonal Perspective from Multi-Year Observations in Fairbanks, AK”, James D. Ayers, and William Simpson, a poster presented at the Fall AGU meeting, San Francisco, CA, Dec 2004.
- “Observations of halogen concentrations in polar snow near Barrow, Alaska indicate that bromide is highly affected by atmospheric chemistry”, Laura Alvarez-Aviles, William R. Simpson, Thomas A. Douglas, Matthew Sturm, Florent Domine, a poster presented at the Fall AGU meeting, San Francisco, CA, Dec 2004.
- “Coupled Physical and Chemical Study of the Subarctic Snowpack: Feedback of Metamorphic Intensity on Climate Change”, Anne-Sophie Taillandier, Laura Alvarez-Aviles, Florent Domine, William R. Simpson, Stephan Houdier, Thomas Douglas, Matthew Sturm Richard Stolzberg , a poster presented at the Fall AGU meeting, San Francisco, CA, Dec 2004.
- “Halogen activation in the Arctic Springtime Boundary Layer: How chemical physics helps us to understand field observations”, William R. Simpson , Gerd Hönninger, Laura Alvarez-Aviles, Matthew Sturm, Tom Douglas, Florent Domine, Invited talk at the Joint Institute for Laboratory Astrophysics (JILA), CU Boulder, 22 Apr 2005.
- “Field studies of halogen activation and its relationship to tropospheric ozone depletion and mercury deposition”, William R. Simpson, Laura Alvarez-Aviles, Gerd Hoenninger, Ulrich Platt, Thomas A. Douglas, Matthew Sturm, Florent Domine, A poster presented at the Atmospheric Chemistry Gordon Research Conference, Big Sky Montana, 6-9 September, 2005.
- “A smoking gun at the smoking lead?: Halogen activation chemistry on the North Slope of Alaska”, William R. Simpson , Gerd Hönninger, Laura Alvarez-Aviles, Matthew Sturm, Tom Douglas, Florent Domine, An invited talk at the workshop entitled “The Interaction between the Atmosphere and Frozen Surfaces in Polar Regions”, Toronto, Canada, September 19-21, 2005.

- “Spatial Gradients in Halogen Oxides Across the North Slope of Alaska Indicate That Halogen Activated Airmasses are Spatially Large”, W.R. Simpson, Hoenninger, G S, Platt, U., A talk presented at the AGU Fall Meeting, San Francisco, 5–9 December 2005.
- “OOTI (Out On The Ice)”, Hoenninger, G, Staebler, R, Morin, S, Netcheva, S, Simpson, W, Savarino, J, Bottenheim, J, A talk presented at the AGU Fall Meeting, San Francisco, 5–9 December 2005.
- “Off-Axis Cavity Ring-Down Spectroscopy and Field Measurements of Dinitrogen Pentoxide at High-Latitudes”, Apodaca, R L, Huff, D M, Simpson, W R, Ayers, J D, Baer, D S, A poster presented at the AGU Fall Meeting, San Francisco, 5–9 December 2005.
- “Mercury deposition to snow and ice provides a link between the lower atmosphere and the cryosphere in northern Alaska”, Douglas, T A, Sturm, M, Simpson, W R, Alvarez-Aviles, L, Blum, J D, Perovich, D K, Keeler, G J, Lammers, A, Biswas, A, A talk presented at the AGU Fall Meeting, San Francisco, 5–9 December 2005.
- “LEADX-2005: A system study of near-surface winter tropospheric processes near Barrow, Alaska”, Sturm, M., Shepson, P B, Bottenheim, J W, Pinto, J, Blum, J, Simpson, W R, Perovich, D K, Douglas, T, Brooks, S, Rhew, R, Keeler, G, A poster presented at the AGU Fall Meeting, San Francisco, 5–9 December 2005.
- “Atmosphere Ice Chemical Interactions Workshop Arctic Ozone Depletion Overview”, William R. Simpson, An invited talk presented at the AICI Conference, Grenoble France 29-31 May 2006.
- "Physical and chemical evolution of dry snowpacks during metamorphism", Florent Dominé, A.-S. Taillandier, S. Houdier, F. Parrenin, W. R. Simpson, and T. A. Douglas, The Physics and Chemistry of Ice (PCI2006) conference, Bremerhaven, Germany 23-28 July, 2006.
- "Nocturnal atmospheric chemistry probed by off-axis cavity ring-down spectroscopy", William R. Simpson, Randy Apodaca, Deanna Huff, James Ayers, Doug Baer, An invited talk at the American Chemical Society Fall meeting, San Francisco, 11 Sep 2006.
- "Springtime Halogen Chemistry and Mercury Deposition in the Arctic", William R. Simpson, Dan Carlson, Gerd Hönninger, Laura Alvarez-Aviles, Matthew Sturm, Tom Douglas, Ulrich Platt, UAF Chemistry departmental seminar, Fairbanks, AK, 26 Sep 2006.
- "Off-Axis Cavity Ring-Down Spectroscopy: Technical Aspects and Studies of High-Latitude Heterogeneous Hydrolysis of N<sub>2</sub>O<sub>5</sub>", William R. Simpson, Randy Apodaca, Deanna Huff, James Ayers, Juelich, Germany, 20-21 Nov 2006
- "Observations of chemical composition in frost flower growth process and their implication in aerosol production and bromine activation chemistry", Laura Alvarez-Aviles, William R. Simpson, Thomas A. Douglas, Matthew Sturm, Donald Perovich, Fall AGU meeting, San Francisco, CA, 11-15 Dec, 2006.
- "OBuoys MAXDOAS design status", William R. Simpson, Dan Carlson, Laura Alvarez-Aviles, Paty Matrai, Paul Shepson, Don Perovich, Udo Frieß, Ulrich Platt, Hannover, New Hampshire, 15-17 March 2007.
- "O-buoys: self-contained, autonomous buoys for long-term observations of atmospheric chemical species in the polar marine boundary layer", Jan W. Bottenheim, Udo Friess, Patricia A. Matrai, Donald K. Perovich, Paul B. Shepson, and William R. Simpson, Spring European Geophysical Union (EGU) meeting, Vienna, Austria, 15–20 April 2007.

"Consideration of sea ice types and their role in springtime Arctic halogen chemistry", William R. Simpson, Dan Carlson, Laura Alvarez-Aviles, Matthew Sturm, Tom Douglas, Gerd Hönninger, Ulrich Platt, an invited talk, Institut für Umweltphysik, Universität Bremen, Bremen, Germany, 14 June 2007.

“University of Alaska Fairbanks Arctic Research Capabilities and Plans during ARCPAC – Spring 2008”, William R. Simpson, A talk presented at NOAA-Boulder in the Earth Systems Research Laboratory, Chemical Sciences Division, Boulder, Colorado, 11 July 2007.