

## Dr. Michael Stephen Town

Current position: Postdoc - Laboratoire de Glaciologie et  
Géophysique de l'Environnement  
CNRS/Université Joseph Fourier

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Personal Birth: 24 February 1977  
London, England  
Citizenship: USA and UK

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### Education

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2007 Ph.D. University of Washington, Seattle, WA USA  
Department: Atmospheric Sciences

Thesis title:  
**Investigations into the climate of the South Pole**

Advisors: Dr. Stephen G. Warren  
Dr. Von P. Walden (University of Idaho)

Committee: C. Bretherton, Q. Fu, J. Riley

2004 M.Sc. University of Washington, Seattle, WA USA  
Department: Atmospheric Sciences

Thesis title:  
**Spectral and broadband longwave downwelling radiative fluxes, cloud radiative forcing, and fractional cloud cover over the South Pole**

Advisors: Dr. Stephen G. Warren  
Dr. Von P. Walden (University of Idaho)

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- Town, M.S., V.P. Walden, S.G. Warren, 2007: Cloud cover climatology over the South Pole from visual observations, satellite retrievals, and surface based infrared measurements. *J. Climate*, **20**, pp. 544-559.
- Town, M.S., V.P. Walden, S.G. Warren, 2005: Spectral and broadband longwave downwelling radiative fluxes, cloud radiative forcing and fractional cloud cover over the South Pole. *J. Climate*, **18**, pp. 4235-4252.
- Walden, V.P., M.S. Town, B. Halter, and J.W.V. Storey, 2005: First Measurements of the Infrared Sky Brightness at Dome C, Antarctica. *Publications of the Astronomical Society of the Pacific*, **117** (829), pp. 300-308.
- Hudson, S.R., M.S. Town, V.P. Walden, S.G. Warren, 2004: Temperature, humidity, and pressure response of radiosondes at low temperatures. *J. Atmos. and Oce. Technol.*, **21** (5), pp. 825-836.
- Cooper, O.R., J.L. Moody, T.D. Thornberry, M.S. Town, M.A. Carroll, 2001: PROPHET 1998 meteorological overview and air-mass classification. *J. Geophys. Res.-Atmos.*, **106** (D20), pp. 24289-24299.
- Pippin, M., S. Bertman, T. Thornberry, M. Town, M.A. Carroll, S. Sillman, 2001: Seasonal variations of PAN, PPN, and O-3 at the upper Midwest PROPHET site. *J. Geophys. Res.-Atmos.*, **106** (D20), pp. 24451-24463.
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### **Selected Presentations and Conference Proceedings**

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- Town, M.S., I. Gorodetskaya, H. Gallée, S.G. Warren, V.P. Walden: The surface energy budget over the South Pole from observations and a regional model. *University of New South Wales, Sydney, Australia*, 25 May, 2009. (Invited talk).
- Town, M.S., S.G. Warren, V.P. Walden, E.D. Waddington. Effect of atmospheric water vapor on water stable isotopes in near-surface snow on ice sheets. *University of Michigan, Ann Arbor, USA*, 16 February 2009. (Invited talk).
- Town, M.S., S.G. Warren, V.P. Walden, E.D. Waddington. Effect of atmospheric water vapor on water stable isotopes in near-surface snow on ice sheets. *Niels Bohr Institute, Copenhagen, Denmark*, 21 February 2008. (Invited talk).
- Town, M.S., V.P. Walden, S.G. Warren. Model evaluation using a South Pole data set: An observational perspective. *Laboratoire de Glaciologie et Géophysique de l'Environnement, Grenoble, France*, 12 February 2008. (Invited talk).
- Town, M.S., V.P. Walden, S.G. Warren. Energy transfer processes affecting isotopic fractionation in the near-surface snow on the Antarctic Plateau. *International Union of Geodesy and Geophysics*,
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Perugia, Italy, 2-13 July 2007. (Talk).

Town, M.S., V.P. Walden, S.G. Warren. Energy transfer processes over the Antarctic Plateau. *American Geophysical Union Fall Assembly*, San Francisco CA, 11-15 December 2006. (Talk).

Town, M.S. A summary of: Adaptation and mitigation: Responses to climate change. The NCCR Climate summer school Swiss Climate Research. *Program on Climate Change Summer Institute*, Leavenworth WA, 22 September 2006. (Talk).

Town, M.S., V.P. Walden, S.G. Warren. Cloud cover climatology for the South Pole from surface-based infrared radiation measurements. *Graduate Climate Conference*, Pack Forest, April 2006. (Poster).

Town, M.S., V.P. Walden, S.G. Warren. Cloud cover from ground-based infrared measurements at the South Pole. *Cloud Climatology Workshop 2005*, Madison WI, 5-6 April 2005. (Talk).

Town, M.S., V.P. Walden, S.G. Warren. Cloud cover climatology for the South Pole from surface-based infrared radiation measurements. *8<sup>th</sup> Conference on Polar Meteorology*, American Meteorological Society, San Diego CA, 9-13 January 2005. (Extended Abstract and Poster).

Town, M.S., V.P. Walden. Uncertainty analysis of data from the Polar Atmospheric Emitted Radiance Interferometer (PAERI) during the South Pole Atmospheric Radiation and Cloud Lidar Experiment (SPARCLE). *International Radiation Symposium*, International Radiation Commission, Busan, Korea, 23-28 August, 2004. (Extended Abstract and Poster).

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### Summary of Research Efforts

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Current	(1) Evaluating polar mesoscale models over the East Antarctic interior. (2) Investigating the effect of meteorology on stable isotopes in near-surface snow. (3) Investigating energy transfer in stable boundary layers.
Past	* Investigated the spectral infrared radiative effects of greenhouse gases and clouds over the South Pole. Evaluated satellite retrievals of cloud fraction over snow and ice from historical satellite products. * Tested radiosonde response times at low temperatures to evaluate current radiosonde soundings over the Antarctic. * Investigated radiometric instrument calibration issues in the Polar Atmospheric Emitted Radiance Interferometer (PAERI). Developed a new

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radiometric calibration procedure and uncertainty calculation for the PAERI.

\* Investigated ozone (O<sub>3</sub>) and carbon (CO) monoxide sources and transport over a site in rural Michigan. Maintained routine measurements of O<sub>3</sub> and CO. Made improvements to the calibration of CO measurements.

\* Investigated thermal conductivity of novel polymers. Performed spectroscopic, rheologic, and pyranomic analysis on polymers in order to fully understand the polymerization mechanisms and final structures of the new substances.

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### **Research and field experience**

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Lausanne,  
Switzerland  
2008

\* Visiting researcher at Ecole Polytechnique Fédérale de Lausanne (Jan-Feb 2008). Helped install an energy balance measurement suite, and established a stable isotope sampling program on an alpine glacier. PI – M. Parlange.

Summit Camp,  
Greenland  
2006

\* Maintained nitrogen dioxide radical and nitric acid measurements at Summit, Greenland for 1 month. Redeployed field equipment to USA. PIs – Drs. E. Steig and M. Hastings.

Moscow, Idaho USA  
2006

\* Assisted in field maintenance of eddy flux tower. PIs – Drs. R. Qualls and W. Zhao.

SPARCLE  
South Pole,  
Antarctica  
2001

\* Winterover field technician for the South Pole Atmospheric Research and Cloud Lidar Experiment (SPARCLE). Performed pre- and post-campaign instrument calibrations. Deployed instrumentation to and from Antarctica. Maintained the PAERI, NASA's micropulse lidar, and other meteorological instrumentation. Flew radiosondes and a cloud particle sampler on tethered kites and balloons to validate radiometric retrievals of atmospheric properties from the PAERI. PIs – Drs. S.G. Warren and V.P. Walden.

Pellston, Michigan  
USA  
1998-1999

\* Maintained routine CO and O<sub>3</sub> measurements at a rural site in Northern Michigan. Developed automated calibration software and hardware for remote calibration of field instrumentation. PI – Dr. M. A. Carroll.

Ann Arbor, Michigan  
USA

\* Assisted in setting up the University of Michigan Global Change Laboratory (GCL). The GCL

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1998-1999	instrumentation included measurements of CO, O <sub>3</sub> , and NO <sub>x</sub> . PI – Dr. M. A. Carroll.
PROPHET Pellston, Michigan USA 1998	* Participated in the Program for Research on Oxidants: PHotochemistry, Emissions and Transport (PROPHET). Responsibilities included installing and maintaining routine CO and O <sub>3</sub> measurements during the 6 week field intensive. Other miscellaneous field maintenance was also required. PI – Dr. M. A. Carroll.
CWRU Macromolecular Sciences, Cleveland, Ohio USA 1997	* Investigated thermal conductivity of novel polymers. Performed spectroscopic, rheologic, and pyranomic analysis on polymers to understand polymerization mechanisms and final structures of new substances. PI – Dr. H. Ishida

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### Positions Held

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2007 - Present	* Postdoc at Department of Atmospheric Sciences, University of Washington and Department of Geography, University of Idaho.
2000 - 2007	* Graduate research assistant at Department of Atmospheric Sciences, University of Washington.
Nov 1999 - Mar 2000	* Image technician, Environmental Research Institute of Michigan (ERIM; now Veridian), Ann Arbor, Michigan USA.
1998-1999	* Research assistant, Department of Atmospheric, Oceanic, and Space Sciences, University of Michigan, Ann Arbor, Michigan USA.
Summer 1997	* Research assistant, Department of Macromolecular Science, Case Western Reserve University, Cleveland, Ohio USA.
Winter 1997	* Research assistant, Department of Physics, University of Michigan, Ann Arbor, Michigan USA

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### Relevant Skills

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Modeling	* Line-By-Line Radiative Transfer Model (LBLRTM) for clear sky infrared fluxes. * Discrete Ordinance Radiative Transfer (DISORT) model for simulation of light scattering in clouds and snow.
Computational	* Matlab, C++, C-shell * Unix/Linux, Windows, Macintosh, OS/2
Technical	* Measurements of O <sub>3</sub> , CO, and NO <sub>2</sub>

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- \* Measurements of spectral infrared radiation with the Polar Atmospheric Emitted Radiance Interferometer
- \* Measurements of DHO and H<sub>2</sub>O<sup>18</sup> with the Los Gatos DLT-100 (laser spectrometer).
- \* Measurements of temperature and frostpoint temperature in extreme cold.

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### Research funding

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OPP-0540090                      Made major contributions to “Collaborative Research: Longwave radiation processes and surface energy budget on the Antarctic Plateau” that was funded by NSF (Mar 2006 – Feb 2009), and currently provides my research support. PIs - S.G. Warren and V.P. Walden.

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### Miscellaneous

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TA experience                      \* Objective Analysis – Graduate level geophysical statistics and analysis methods class (2006). Instructor – Dr. D. Hartmann

   \* Weather 101 – Basic meteorology with an emphasis on the fundamental physics and chemistry of the atmosphere (2003). Instructor – Dr. D. Durran.

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Honors                                      \* Antarctic Service Medal (2001).

   \* Member of Sigma Pi Sigma (National Physics Honors Society, 1999)

   \* Research Undergraduate Experience Fellowship (1998).

   \* Member of Golden Key National Honor Society (1998).

   \* Dean’s List (1995-1998).

   \* Michigan Alumni Scholarship (1995-1996).

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Professional Societies, Services, and Experiences                      \* Co-chair of “Observations of high latitude climate change” at the MOCA-09, Montréal, Canada, 19-29 July 2009.

   \* Program on Climate Change Summer Institute, 20-23 September 2006. *Anthropogenic CO<sub>2</sub> Emissions: Projections, Mitigating Technologies and Policies.*

   \* NCCR Swiss Climate Summer School 27 August – 1 September 2006. *Adaptation and Mitigation:*

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*Responses to Climate Change.*

\* Graduate Climate Conference 2006, Pack Forest, Washington USA (Organization/Volunteer)

\* International Commission on Polar Meteorology. 2005-present.

\* American Meteorological Society. 2000-present.

\* American Geophysical Union. 2002-present.

\* International Glaciological Society. 2008-present.

Other Interests

\* Alternative energy (biodiesel, wind power, solar power)

\* Martial Arts - Tae Kwon Do (4th degree black belt), Hapkido, Judo

\* Guitar

\* Hiking, Backpacking, Downhill, and Cross-country skiing.

\* Spanish (conversant), French (in training)

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**Professional References**

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Christophe Genthon  
(Current supervisor)  
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