

Dr. Simon A. Carn

Curriculum Vitae

Geological and Mining Engineering and Sciences
Michigan Technological University (MTU)
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Education

St. Catharine's College, University of Cambridge, UK: Ph.D. (1999), Volcanology
Université Blaise Pascal, Clermont-Ferrand, France: D.E.A. (1994), Volcanology and Magmatic Processes
Exeter College, University of Oxford, UK: B.A. Hons (1993), Natural Science - Geology

Employment

Department of Geological and Mining Engineering and Sciences, Michigan Technological University
2008 - Assistant Professor

Joint Center for Earth Systems Technology, University of Maryland Baltimore County
2005 – 2008 Assistant Research Scientist
2001 – 2005 Research Associate

Montserrat Volcano Observatory, Montserrat, West Indies
2000 – 2001 Volcanologist (volcanic gas monitoring specialist)

Honors and Distinctions

William T. Pecora Award (NASA/US DOI) – TOMS Science Team (2006)
NASA Group Achievement Award – Aura Project (2005)
NASA Goddard Space Flight Center Group Achievement Award – Aura Science Team (2005)
Remote Sensing and Photogrammetry Society Len Curtis European Award (2001) – for best scientific paper published in the open remote sensing literature during the year 2000

Professional and Technical Societies

Geological Society of America (2009 – present)
Technical Advisory Committee, UN Project 'Volcano Risk Reduction in Goma, DRC' (2004 – present)
Total Ozone Mapping Spectrometer (TOMS) Science Team (2001 – present)
Ozone Monitoring Instrument (OMI) Science Team (2001 – present)
American Geophysical Union (1994 – present)
International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI) (1994 – present)
2010-11 Scientific Committee member, IAVCEI Field Workshop on Chemistry of Volcanic Gases, Kamchatka, Russia
2008 - Secretary, IAVCEI Remote Sensing Commission
2008 Scientific Committee member, IAVCEI Field Workshop on Chemistry of Volcanic Gases, Mexico

Academic Service

Editorships: Journal of Geophysical Research-Atmospheres (Associate Editor)
Journal reviews: Geology, Geophysical Research Letters, J. Geophysical Research, Bulletin of Volcanology, J. Volcanology & Geothermal Research, Atmospheric Chemistry and Physics, J. Applied Meteorology, Geological Society of London Special Publications, AGU Geophysical Monographs, Acta Vulcanologica, J. Photogrammetry and Remote Sensing, Atmospheric Science Letters, International Journal of Remote Sensing, Remote Sensing of Environment, Natural Hazards, Revista Geologica de Chile, J. African Earth Sciences

Proposal reviews: NASA Solid Earth and Natural Hazards program, NASA Atmospheric Composition, Modeling and Analysis (ACMAP) program, National Science Foundation Petrology and Geochemistry program, UK Natural Environment Research Council, Canadian Natural Sciences and Engineering Research Council (NSERC)

Panel reviews: NASA Earth Surface and Interior program (Geohazards Imaging, 2007), AAAS review of USGS Volcano Hazard Program (2007)

Research Grants

NASA

- 2011 A-Train Volcano Observatory (ATVO); NASA ROSES 2010, Aura Science Team, \$667k, 3 yrs (PI)
- 2011 Continuation of Long-Term Sulfur Dioxide EDR with the NPP Ozone Mapping and Profiler Suite Nadir Mapper, NASA ROSES 2010, NPP Science Team, \$830k, 3 yrs (co-I)
- 2010 A Combined EOS Data and GEOS-Chem Modeling Study of the Direct Radiative Forcing of Volcanic Sulfate Aerosols; NASA ROSES 2009, ACPMAP, \$400k, 3 yrs (co-PI)
- 2006 Validation of OMI L2 Sulfur Dioxide Retrievals Over Volcanic and Anthropogenic Sources; NASA Aura Validation NRA, \$550k, 3 yrs (PI)
- 2005 Near Real-time NASA Volcanic Cloud Data for NOAA, FAA and USGS Decision Support Systems; NASA DECISIONS CAN, \$1,272k, 3 yrs (co-PI)
- 2004 TOMS Science Team extension, NASA code YS, \$63k, 1 yr (co-PI)

National Science Foundation

- 2010 RAPID: Particle Trajectories in Volcanic Plumes: Tracking the 2010 Eyjafjallajökull Plume, NSF EAR, \$56k, 1 yr (co-I)
- 2010 PASI: Volcanic Hazards and Remote Sensing in Pacific Latin America; San Jose, Costa Rica; January/February, 2011; NSF OISE, \$100k, 1 yr (co-PI)
- 2009 An Integrated Analysis of Seismicity, Infrasound, and High-Resolution SO₂ Measurements to Determine the Source of Low-Frequency Seismicity at Villarrica Volcano, Chile; NSF EAR, \$222k, 3 yrs (co-PI)
- 2009 VHub: Cyberinfrastructure for Volcano Eruption and Hazards Modeling and Simulation; NSF CDI, 333k, 4 yrs (PI)
- 2005 Virunga Volcanic SO₂ Emissions Research (VISOR) project; NSF EAR, \$300k, 4 yrs (PI)
- 2002 Travel grant to attend Chapman Conference on Volcanism and the Earth's Atmosphere, \$600

National Geographic Society Committee for Research and Exploration

- 2004 Virunga Volcanic SO₂ Emissions Research (VISOR) project, \$15k, 1 yr travel grant (PI)

Royal Society

- 2000 Travel grant to attend IAVCEI General Assembly, Bali, Indonesia, \$1k

European Union

- 2005 Network for Observation of Volcanic and Atmospheric Change (NOVAC), EU Sixth Framework Program (PI: B. Galle, Chalmers University, Sweden), 3 yrs (co-I)

Michigan Technological University

- 2009 Infrared Spectroscopy of Tropospheric Volcanic Plumes; Michigan Space Grant Consortium, \$5k (PI)
- 2008 Century II Campaign Endowed Equipment Fund (C2E2); \$12.5k for equipment (PI)

Teaching

- 2009- Atmospheric Observations and Meteorology (Fall 2009, 2010)
- 2009- Fundamentals of Remote Sensing (Spring 2009, 2010)
- 2007 Invited guest scientist, International Volcanological Field School, Kamchatka, Russia

- 2006 - Co-advisor of volcanology Ph.D. student at Michigan Technological University, USA
- 2005 – 2006 Co-advisor of volcanology Ph.D. student at Cambridge University, UK
- 2004 – 2006 Co-advisor of volcanology M.S. student at Michigan Technological University, USA
- 2000 Tutor in Volcanology, Dept. of Geography, Cambridge University, UK
- 1999 Lecturer in volcano remote sensing techniques, UNESCO Geological Applications of Remote Sensing program, Philippines Institute of Volcanology and Seismology, Manila, Philippines
- 1994 – 1999 Teaching Assistant, Dept. of Earth Sciences, Cambridge University, UK
- 1994 Tour guide (in French), Volcan de Lemptégy, Clermont-Ferrand, France

Academic advising and committees

PhD

- Elisabet Head (GMES) – committee chair (Michigan Space Grant Consortium Graduate Fellowship 2010)
- Helen Thomas (GMES) – committee co-chair (Michigan Tech Finishing Fellowship award 2011)
- Patricia Nadeau (GMES) – committee co-chair
- Marika Dalton (GMES) – committee member
- John Lyons (GMES) – committee member
- Rüdiger Escobar-Wolf (GMES) – committee member
- Kateryna Lapina (CEE) – committee member

MS

- Petri Latva-Käyrä (Forestry, 2011) – committee member
- Anieri Morales-Rivera (Geology, 2011) – committee chair (NSF Graduate Fellowship Honorable Mention 2011)
- Dulcinea Avouris (Geology, 2011) – committee co-chair (Michigan Space Grant Consortium Graduate Fellowship 2011)
- Nicole McMahon (Geophysics, 2011) – committee member

Professional development

- 2010 Attended NSF ADVANCE training session ‘Making STRIDE: Faculty Recruitment for Diversity and Excellence’ led by Dr. J. Wayne Jones (U Michigan), April 1, 2010
- 2010 Attended 2-day workshop on ‘Teaching for Understanding in Science: Designing learner-centered instruction’ led by Diane Ebert-Mey (Michigan State), MTU, June 3-4, 2010

Outreach activities and media

- 2010 Conducted several interviews for national and international newspapers and radio during the eruption of Eyjafjallajökull volcano (Iceland)
- 2007 Assisted production of outreach poster (‘Sulfur in the Air’) for NASA Aura Project
- 2005 Research featured in NOVA popular science TV program on Public Broadcasting Service (PBS) in the USA (<http://www.pbs.org/wgbh/nova/volcanocity/>)
- 2002 – Contributor to NASA’s Earth Observatory educational website (<http://earthobservatory.nasa.gov>)
- 2002 – Moderator of Volcanic Clouds email list – a discussion forum for the volcanic cloud remote sensing community
- 2001 – Contributor to the Smithsonian Global Volcanism Program website (<http://www.volcano.si.edu/gvp/index.cfm>)
- 2001 – Developer of OMI/TOMS volcanic emissions website (<http://so2.umbc.edu>)

University service

- Chair, Atmospheric Sciences Faculty Search Committee, GMES, Michigan Tech. (2009-2010)
- Member, Geology Lecturer Search Committee, GMES, Michigan Tech. (2009)
- Member, Forestry Faculty Search Committee, Michigan Tech. (2008-2009)
- Member, Graduate Committee, GMES, Michigan Tech. (2008-)

Publications

Citation data (based on top 39 cited articles listed in Web of Science, as of January 2011)

Total citations: **459**; Average citations per item: **11.8**; h-index: **12**

Refereed Journals, Monographs and Books

* Denotes student author

Submitted

- *Head, E.M., A. Maclean, and **S.A. Carn**, Three decades of effusive eruptions from Nyamuragira volcano (DR Congo): a remote sensing perspective, *Remote Sens. Environ.* (under review).

Published

50. **Carn, S.A.**, K. Froyd, B.E. Anderson, P. Wennberg, J. Crouse, K. Spencer, J. Dibb, N.A. Krotkov, E.V. Browell, J.W. Hair, G. Diskin, G. Sachse, and S. Vay (2011), *In-situ* measurements of tropospheric volcanic plumes in Ecuador and Colombia during TC⁴, *J. Geophys. Res.*, doi:10.1029/2010JD014718 (in press).

49. Thomas, H.E., I.M. Watson, **S.A. Carn**, A.J. Prata, and V.J. Realmuto (2011). A comparison of AIRS, MODIS and OMI sulphur dioxide retrievals in volcanic clouds, *Geomatics, Natural Hazards and Risk, Special Issue: Passive satellite techniques and ground-based investigations for volcanic activity monitoring* (in press).

48. Krotkov, N.A., M.R. Schoeberl, G.A. Morris, **S.A. Carn**, and K. Yang (2010). Dispersion and lifetime of the SO₂ cloud from the August 2008 Kasatochi eruption, *J. Geophys. Res., Okmok-Kasatochi Special Issue*, 115, D00L20, doi:10.1029/2010JD013984.

47. **Carn, S.A.**, and A.J. Prata (2010). Satellite-based constraints on explosive SO₂ release from Soufrière Hills volcano, Montserrat, *Geophys. Res. Lett.*, 37, L00E22, doi:10.1029/2010GL044971.

46. Yang, K., X. Liu, P.K. Bhartia, N.A. Krotkov, **S.A. Carn**, E. Hughes, A.J. Krueger, R. Spurr and S. Trahan (2010). Direct Retrieval of Sulfur Dioxide Amount and Altitude from Spaceborne Hyper-spectral UV Measurements: Theory and Application, *J. Geophys. Res., Okmok-Kasatochi Special Issue*, 115, D00L09, doi:10.1029/2010JD013982.

45. *Spinei, E., **S.A. Carn**, N.A. Krotkov, G.H. Mount, K. Yang, and A.J. Krueger (2010). Validation of OMI SO₂ measurements in the Okmok volcanic plume over Pullman, WA in July 2008. *J. Geophys. Res., Okmok-Kasatochi Special Issue*, 115, D00L08, doi:10.1029/2009JD013492.

44. *Ferguson, D.J., T.D. Barnie, D.M. Pyle, C. Oppenheimer, G. Yirgu, E. Lewi, T. Kidane, **S.A. Carn**, and I. Hamling (2010). Recent rift-related volcanism in Afar, Ethiopia, *Earth Planet. Sci. Lett.*, 292(3-4), 409-418, doi:10.1016/j.epsl.2010.02.010.

43. Prata, A.J., G.J.S. Bluth, C. Werner, V.J. Realmuto, **S.A. Carn**, and I.M. Watson (2010). Gas Emissions from Volcanoes, in *Monitoring Volcanoes in the North Pacific: Observations from Space*, eds. K.G. Dean and J. Dehn, ISBN: 978-3-540-24125-6, Springer-Praxis Books (in press).

42. Krueger, A.J., N. Krotkov, K. Yang, **S. Carn**, G. Vicente, and W. Schroeder (2009). Applications of satellite-based sulfur dioxide monitoring. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 2(4), 293-298.

41. Bani, P., C. Oppenheimer, J.C. Varekamp, T. Quinou, M. Lardy, **S.A. Carn** (2009). Remarkable geochemical changes and degassing at Voui crater lake, Ambae volcano, Vanuatu, *J. Volcanol. Geotherm. Res.*, 188(4), 347-357, doi: 10.1016/j.jvolgeores.2009.09.018.

40. Bani, P., C. Oppenheimer, V.I. Tsanev, **S.A. Carn**, S.J. Cronin, R. Crimp, J.A. Calkins, D. Charley, M. Lardy, and T.R. Roberts (2009). Surge in sulfur and halogen degassing from Ambrym volcano, Vanuatu, *Bull. Volcanol.*, 71(10), 1159-1168, [doi:10.1007/s00445-009-0293-7](https://doi.org/10.1007/s00445-009-0293-7).
39. **Carn, S.A.**, A.J. Krueger, N.A. Krotkov, K. Yang, and K. Evans (2009). Tracking volcanic sulfur dioxide clouds for aviation hazard mitigation. *Natural Hazards*, 51(2), 325-343, [doi:10.1007/s11069-008-9228-4](https://doi.org/10.1007/s11069-008-9228-4).
38. Martinsson, B.G., C.A.M. Brenninkmeijer, **S.A. Carn**, M. Hermann, K.-P. Heue, P.F.J. van Velthoven, and A. Zahn (2009). Influence of the 2008 Kasatochi volcanic eruption on sulfurous and carbonaceous aerosol constituents in the lower stratosphere. *Geophys. Res. Lett.*, 36, L12813, doi:10.1029/2009GL038735.
37. **Carn, S.A.**, J.S. Pallister, L. Lara, J.W. Ewert, S. Watt, A.J. Prata, R.J. Thomas, and G. Villarosa (2009). The unexpected awakening of Chaitén volcano, Chile, *EOS Trans. AGU*, 90(24), 205-206. [NASA Earth Science Research highlight]
36. *Kearney, C., I.M. Watson, G.J.S. Bluth, **S.A. Carn**, and V. Realmuto (2009). A Comparison of Thermal Infrared and Ultraviolet Retrievals of SO₂ in the Cloud Produced by the 2003 Al-Mishraq State Sulfur Plant Fire. *Geophys. Res. Lett.*, 36, L10807, doi:10.1029/2009GL038215.
35. Yang, K., X. Liu, N.A. Krotkov, A.J. Krueger and **S.A. Carn** (2009). Estimating the altitude of volcanic sulfur dioxide plumes from space-borne hyper-spectral UV measurements, *Geophys. Res. Lett.*, 36, L10803, doi:10.1029/2009GL038025.
34. *Thomas, H.E., I.M. Watson, C. Kearney, **S.A. Carn**, and S.J. Murray (2009). A multi-sensor comparison of sulphur dioxide emissions from the 2005 eruption of Sierra Negra volcano, Galápagos Islands. *Remote Sens. Environ.*, 113(6), 1331-1342, doi:10.1016/j.rse.2009.02.019.
33. Yang, K., N.A. Krotkov, A.J. Krueger, **S.A. Carn**, P.K. Bhartia, and P.F. Levelt (2009). Improving retrieval of volcanic sulfur dioxide from backscattered UV satellite observations. *Geophys. Res. Lett.*, 36, L03102, doi:10.1029/2008GL036036.
32. Clerbaux, C., P.-F. Coheur, L. Clarisse, J. Hadji-Lazaro, D. Hurtmans, S. Turquety, K. Bowman, H. Worden, and **S. A. Carn** (2008). Measurements of SO₂ profiles in volcanic plumes from the NASA Tropospheric Emission Spectrometer (TES). *Geophys. Res. Lett.*, 35, L22807, doi:10.1029/2008GL035566.
31. Bluth, G.J.S., and **S.A. Carn** (2008). Exceptional sulphur degassing from Nyamuragira volcano, 1979-2005, *Int. J. Remote Sensing*, 29(22), 6667-6685, doi:10.1080/01431160802168434.
30. **Carn, S.A.**, A.J. Krueger, N.A. Krotkov, S. Arellano, and K. Yang (2008). Daily monitoring of Ecuadorian volcanic degassing from space, *J. Volcanol. Geotherm. Res.*, 176(1), 141-150, doi:10.1016/j.jvolgeores.2008.01.029.
29. Krueger, A.J., N.A. Krotkov, and **S.A. Carn** (2008). El Chichon: the genesis of volcanic sulfur dioxide monitoring from space, *J. Volcanol. Geotherm. Res.*, 175, 408-414, doi:10.1016/j.jvolgeores.2008.02.026.
28. **Carn, S.A.**, A.J. Prata, and S. Karlsdóttir (2008). Circumpolar transport of a volcanic cloud from Hekla (Iceland). *J. Geophys. Res.*, 113, D14311, doi:10.1029/2008JD009878. [[AGU Journal Highlight](#)]
27. Krotkov, N. A., B. McClure, R.R. Dickerson, **S.A. Carn**, C. Li, P.K. Bhartia, K. Yang, A.J. Krueger, Z. Li, P. Levelt, H. Chen, P. Wang, and D.R. Lu (2008), Validation of SO₂ retrievals from the Ozone Monitoring Instrument (OMI) over NE China, *J. Geophys. Res.*, 113, D16S40, doi:10.1029/2007JD008818.
26. *Sawyer, G.M., **S.A. Carn**, C. Oppenheimer, V.I. Tsanev, and M. Burton (2008). Investigation into magma degassing at Nyiragongo volcano, Democratic Republic of Congo. *Geochem. Geophys. Geosyst.*, 9, Q02017, doi:10.1029/2007GC001829.

25. Yang, K., N.A. Krotkov, A.J. Krueger, **S.A. Carn**, P.K. Bhartia, and P.F. Levelt (2007). Retrieval of large volcanic SO₂ columns from the Aura Ozone Monitoring Instrument (OMI): comparison and limitations. *J. Geophys. Res.*, 112, D24S43, doi:10.1029/2007JD008825.
24. Tedesco, D., O. Vaselli, P. Papale, **S.A. Carn**, M. Voltaggio, G.M. Sawyer, J. Durieux, M. Kasereka, and F. Tassi (2007). The January 2002 volcano-tectonic eruption of Nyiragongo volcano, Democratic Republic of Congo. *J. Geophys. Res.*, 112, B09202, doi:10.1029/2006JB004762.
23. Prata, A.J., **S.A. Carn**, A. Stohl, and J. Kerkmann (2007). Long range transport and fate of a stratospheric volcanic cloud from Soufriere Hills volcano, Montserrat, *Atmos. Chem. Phys.*, 7, 5093-5103. (<http://www.atmos-chem-phys.net/7/5093/2007/acp-7-5093-2007.html>)
22. **Carn, S.A.**, N.A. Krotkov, A.J. Krueger, K. Yang, and P.F. Levelt (2007). Sulfur dioxide emissions from Peruvian copper smelters detected by the Ozone Monitoring Instrument, *Geophys. Res. Lett.* 34, L09801, doi:10.1029/2006GL029020.
21. **Carn, S.A.**, N.A. Krotkov, K. Yang, R.M. Hoff, A.J. Prata, A.J. Krueger, S.C. Loughlin, and P.F. Levelt (2007). Extended observations of volcanic SO₂ and sulfate aerosol in the stratosphere, *Atmos. Chem. Phys. Discuss.*, 7, 2857-2871. (<http://www.atmos-chem-phys-discuss.net/7/2857/2007/acpd-7-2857-2007.html>)
20. Tupper, A., I. Itikarai, M. Richards, A.J. Prata, **S.A. Carn**, and D. Rosenfeld (2007). Facing the challenges of the International Airways Volcano Watch: the 2004/05 eruptions of Manam, Papua New Guinea, *Weather and Forecasting* 22(1), 175-191.
19. Krotkov, N.A., **Carn, S.A.**, Krueger, A.J., Bhartia, P.K., and Yang, K. (2006). Band Residual Difference algorithm for retrieval of SO₂ from the Aura Ozone Monitoring Instrument (OMI). *IEEE Trans. Geosci. Remote Sensing, AURA Special Issue*, 44(5), 1259-1266, doi:10.1109/TGRS.2005.861932.
18. Wright, R., **Carn, S.A.**, and Flynn, L. (2005). A satellite chronology of the May 2003 eruption of Anatahan volcano. *J. Volcanol. Geotherm. Res.* 146, 102-116.
17. **Carn, S.A.**, L.L. Strow, S. de Souza-Machado, Y. Edmonds, and S. Hannon (2005). Quantifying tropospheric volcanic emissions with AIRS: the 2002 eruption of Mt. Etna (Italy). *Geophys. Res. Lett.* 32(2), L02301, doi:10.1029/2004GL021034.
16. *Rodriguez, L.A., Watson, I.M., Rose, W.I., Branan, Y.K., Bluth, G.J.S., Chigna, G, Matias, O., Escobar, D., **Carn, S.A.**, and Fischer, T. (2004). SO₂ emissions to the atmosphere from active volcanoes in Guatemala and El Salvador, 1999-2002, *J. Volcanol. Geotherm. Res.* 138(3-4), 345-364.
15. **Carn, S.A.**, A. J. Krueger, N. A. Krotkov, and M.A. Gray (2004). Fire at Iraqi sulfur plant emits SO₂ clouds detected by Earth Probe TOMS. *Geophys. Res. Lett.* 31(19), L19105, doi:10.1029/2004GL020719. [GRL cover image 31(19)]
14. **Carn, S.A.** (2004). Eruptive and passive degassing of sulfur dioxide at Nyiragongo volcano (D.R. Congo): the 17 January 2002 eruption and its aftermath. *Acta Vulcanologica* 14-15, 75-86.
13. Tupper, A., **Carn, S.A.**, Davey, J., Kamada, Y., Potts, R., Prata, F., and Tokuno, M. (2004). An evaluation of volcanic cloud detection techniques during recent significant eruptions in the western 'Ring of Fire'. *Rem. Sens. Environ.* 91, 27-46, doi: 10.1016/j.rse.2004.02.004.
12. **Carn, S.A.**, Watts, R.B., Thompson, G. and Norton, G.E. (2004). Anatomy of a lava dome collapse: the March 20, 2000 event at Soufrière Hills volcano, Montserrat. *J. Volcanol. Geotherm. Res.* 131(3-4), 241-264.
11. **Carn, S.A.**, and Bluth, G.J.S. (2003). Prodigious sulfur dioxide emissions from Nyamuragira volcano, D.R. Congo. *Geophys. Res. Lett.* 30(23), 2211, doi:10.1029/2003GL018465.
10. Rose, W.I., Gu, Y., Watson, I.M., Yu, T., Bluth, G.J.S., Prata, A.J., Krueger, A.J., Krotkov, N., **Carn, S.**, Fromm, M.D., Hunton, D.E., Viggiano, A.A., Miller, T.M., Ballentin, J.O., Ernst, G.G.J., Reeves, J.M., Wilson, C.

- and Anderson, B.E. (2003). The February-March 2000 eruption of Hekla, Iceland from a satellite perspective. In: *Volcanism and the Earth's Atmosphere* (eds. A. Robock and C. Oppenheimer), AGU Geophysical Monograph 139, pp. 107-132.
9. Wallace, P., **Carn, S.A.**, Rose, W.I., Gerlach, T.M., and Bluth, G.J.S. (2003). Integrating petrologic and remote sensing perspectives on magmatic volatiles and volcanic degassing. *EOS Trans. AGU*, 84(42):441, 446-447.
8. **Carn, S.A.**, Krueger, A.J., Bluth, G.J.S., Schaefer, S.J., Krotkov, N.A., Watson, I.M. and Datta, S. (2003). Volcanic eruption detection by the Total Ozone Mapping Spectrometer (TOMS) instruments: a 22-year record of sulfur dioxide and ash emissions. In: *Volcanic Degassing* (eds. C. Oppenheimer, D.M. Pyle and J. Barclay), Geological Society, London, Special Publications, 213, pp.177-202.
7. Matthews, A.J., Barclay, J., **Carn, S.A.**, Thompson, G., Alexander, J., Herd, R.A. and Williams, C. (2002). Rainfall-induced volcanic activity on Montserrat. *Geophys. Res. Lett.* 29(13), 10.1029/2002GL014863. (Featured story in New Scientist magazine: <http://www.newscientist.com/news/news.jsp;jsessionId=ECAGKKHHGHDB?id=ns99992755>).
6. ***Carn, S. A.** and Pyle, D. M. (2001). Petrology and geochemistry of the Lamongan volcanic field, East Java, Indonesia: primitive Sunda arc magmas in an extensional tectonic setting? *J. Petrology* 42:1643-1683.
5. ***Carn, S. A.** and Oppenheimer, C. (2000). Remote monitoring of Indonesian volcanoes using satellite data from the Internet. *Int. J. Remote Sensing* 21(5):873-910.
4. ***Carn, S. A.** (2000). The Lamongan volcanic field, East Java, Indonesia: physical volcanology, historic activity and hazards. *J. Volcanol. Geotherm. Res.* 95(1-4):81-108
3. ***Carn, S. A.** (1999). Application of Synthetic Aperture Radar (SAR) imagery to volcano mapping in the humid tropics: a case study in East Java, Indonesia. *Bull. Volcanol.* 61:92-105.
2. Sigmarsson, O., ***Carn, S. A.** and Carracedo, J. C. (1998). Systematics of U-series nuclides in primitive lavas from the 1730-36 eruption of Lanzarote, Canary Islands, and implications for the role of garnet pyroxenites during oceanic basalt formations. *Earth Planet. Sci. Lett.* 162(1-4):137-151.
1. Sigmarsson, O., ***Carn, S. A.** and Carracedo, J. C. (1998). Systematics of ^{238}U - ^{230}Th - ^{226}Ra in primitive lavas from the 1730-36 eruption of Lanzarote, Canary Islands, and implications for oceanic basalt formations. *Min. Mag.* 62A:1402-3.

Web-based publications and news items

- NASA Earth Observatory (2010) Image of the Day: Eruption at Mount Merapi, Indonesia. <http://earthobservatory.nasa.gov/IOTD/view.php?id=46881>
- Research highlighted in Michigan Tech Engineering Research Magazine 2010 (including cover image)
- Volcanic cloud research featured in [Sensing Our Planet: NASA Earth Science Research Features 2009](#)
- NASA EOS Aura mission website (2008) Okmok eruption. <http://aura.gsfc.nasa.gov/science/feature-072308.html>
- National Geographic News (2008) Eruption of Chaitén (Chile). URL <http://news.nationalgeographic.com/news/2008/05/080509-animals-volcano.html>
- NASA Earth Observatory Newsroom (2008) Aerosols from Chaiten Volcano. URL http://earthobservatory.nasa.gov/Newsroom/NewImages/images.php3?img_id=18040
- NASA Earth Observatory Newsroom (2008) Sulfur dioxide and vog from Kilauea. URL http://earthobservatory.nasa.gov/Newsroom/NewImages/images.php3?img_id=18013
- NASA Earth Observatory Newsroom (2008) Sulfur dioxide plume from Kilauea. URL http://earthobservatory.nasa.gov/Newsroom/NewImages/images.php3?img_id=17981
- NASA Earth Observatory Newsroom (2008) Sulfur dioxide plume from Llaima volcano. URL http://earthobservatory.nasa.gov/Newsroom/NewImages/images.php3?img_id=17887
- NASA Earth Observatory Newsroom (2007) Activity at Manda Hararo. URL http://earthobservatory.nasa.gov/NaturalHazards/natural_hazards_v2.php3?img_id=14473
- NASA Earth Observatory Newsroom (2006) Eruption of Mount Nyamulagira (Nyamuragira). URL

- http://earthobservatory.nasa.gov/Newsroom/NewImages/images.php3?img_id=17483
- NASA Earth Observatory Newsroom (2006) Volcanic activity on Rabaul. URL: http://earthobservatory.nasa.gov/NaturalHazards/natural_hazards_v2.php3?img_id=13922
- NASA Earth Observatory Newsroom (2006) Sulfur dioxide from Soufriere Hills volcano. URL: http://earthobservatory.nasa.gov/Newsroom/NewImages/images.php3?img_id=17334
- NASA Earth Observatory Newsroom (2005) Sierra Negra erupts. URL: http://earthobservatory.nasa.gov/NaturalHazards/natural_hazards_v2.php3?img_id=13253
- NASA Earth Observatory Newsroom (2005) Sulfur dioxide leaks from Ambrym volcano. URL: http://earthobservatory.nasa.gov/NaturalHazards/natural_hazards_v2.php3?img_id=12795
- NASA Earth Observatory Newsroom (2005) Sulfur dioxide plume from Manam volcano. URL: http://earthobservatory.nasa.gov/Newsroom/NewImages/images.php3?img_id=16820
- NASA Earth Observatory Newsroom (2005) Eruption of Anatahan. URL: http://earthobservatory.nasa.gov/NaturalHazards/natural_hazards_v2.php3?img_id=12711
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- Nature Online (2004) Iraqi fire pollution rivaled volcano. URL: <http://www.nature.com/news/2004/041025/full/041025-5.html>, doi:10.1038/news041025-5
- BBC Online (2004) Iraq sulphur fire breaks records. URL: <http://news.bbc.co.uk/1/hi/sci/tech/3955005.stm>
- NASA Earth Observatory Newsroom (2003) Sulfur dioxide plume lingers over Iraq. URL: http://earthobservatory.nasa.gov/Newsroom/NewImages/images.php3?img_id=15349
- New Scientist (2002) Rainstorms could trigger killer eruptions. URL: <http://www.newscientist.com/news/news.jsp;jsessionid=ECAGKHHGHDB?id=ns99992755>

Invited talks and seminars

- 2010 AGU Fall Meeting, Session V34, San Francisco, CA, Dec 13-17 (invited talk)
- 2010 International Symposium on the A-Train Satellite Constellation, New Orleans, LA, Oct 25-28 (invited plenary talk)
- 2010 NWS Alaska Aviation and Volcanic Ash Workshop, Anchorage, AK, Sep 20-23 (invited panel member).
- 2010 15th OMI Science Team Meeting, De Bilt, The Netherlands, June 15-17 (invited talk)
- 2010 USGS Workshop on Remote Sensing and GIS Modeling at Volcanoes, Earth Observatory of Singapore (EOS), Nanyang Technological University, Singapore, March 3-10 (invited lecturer)
- 2009 IAVCEI Commission on Explosive Volcanism workshop, Advances in Studies of Volcanic Plumes and Pyroclastic Density Currents, Clermont-Ferrand, France, Oct 26-29 (invited keynote).
- 2009 Advanced Workshop on Evaluating, Monitoring and Communicating Volcanic and Seismic Hazards in East Africa, co-sponsored by IAVCEI-IASPEI-NSF-UNAVCO-USAID, Trieste, Italy, Aug 17-28 (invited keynote).
- 2008 Cascades Volcano Observatory, Vancouver, WA, 6 Feb (invited seminar).
- 2007 Cities on Volcanoes 5, Shimabara, Japan, Nov 19-23 (invited talk).
- 2007 Michigan Technological University, Dept. of Geological and Mining Engineering and Sciences, Remote Sensing Institute seminar, 5 Nov.
- 2007 Woods Hole Oceanographic Institution, Dept. of Geology and Geophysics seminar, 26 Oct.
- 2007 International Volcanological Field School, Mutnovsky-Gorely volcanoes, Kamchatka, Russia, Jul 22 – Aug 5 (invited guest lecturer)
- 2007 AGU Joint Assembly, Session V41, Acapulco, Mexico, May 22-25 (invited talk)
- 2007 International Conference on Evolution, Transfer and Release of Magmas and Volcanic Gases, Academia Sinica, Taipei, April 22-27 (keynote)
- 2007 4th International Workshop on Volcanic Ash, Rotorua, New Zealand, Mar 22-25
- 2006 AGU Fall Meeting, Session V43, San Francisco, CA, Dec 11-15
- 2006 NASA Graduate Student Summer Program (GSSP) seminar series, invited seminar, 26 July
- 2006 Cities on Volcanoes 4 meeting, Quito, Ecuador
- 2005 Michigan Technological University, Dept. of Geological and Mining Engineering and Sciences, Remote Sensing Institute seminar, 14 Nov
- 2005 Michigan Technological University, Dept. of Geological and Mining Engineering and Sciences, Remote Sensing Institute seminar, 21 Feb.
- 2003 University of Pittsburgh, Dept. Geology and Planetary Sciences Colloquium Series, 7 Nov.
- 2003 8th IAVCEI Field Workshop on Volcanic Gases, Nicaragua/Costa Rica, Mar 26 – Apr 1, Keynote speaker.

Abstracts and conference presentations

* Denotes student author

132. **Carn, S.A.**, A.J. Prata, A.J. Durant and W.I. Rose, 2010, Satellite remote sensing of the 2008 Chaitén eruption, *AGU Fall Meeting, San Francisco, CA, Dec 13-17 (invited talk)*.

131. **Carn, S.A.**, J. Wang, K. Yang, and N.A. Krotkov, 2010, Sulfur budget of the 2010 Eyjafjallajökull eruption derived from satellite observations, *AGU Fall Meeting, San Francisco, CA, Dec 13-17 (talk)*.

130. *Head, E.M., **S.A. Carn**, and G.J.S. Bluth, 2010, Galapagos Islands volcanic SO₂ emissions (1979-2009), *AGU Fall Meeting, San Francisco, CA, Dec 13-17 (poster)*.

129. *Nadeau, P.A., C.A. Werner, G.P. Waite, I.D. Brewer, **S.A. Carn**, T. Elias, M.P. Poland, A.J. Sutton, and D. Wilson, 2010, Ultraviolet imaging of volcanic SO₂: implementation as part of a multidisciplinary approach to studying summit activity at Kilauea volcano, Hawaii, *AGU Fall Meeting, San Francisco, CA, Dec 13-17 (invited poster)*.

128. *Thomas, H.E., A.J. Prata, **S.A. Carn**, L. Clarisse, and I.W. Watson, 2010, Separation of volcanic ash and sulfur dioxide from the Eyjafjallajökull eruption, April-May 2010, *AGU Fall Meeting, San Francisco, CA, Dec 13-17 (poster)*.

127. Schwandner, F.M., **S.A. Carn**, E.M. Head, and C.G. Newhall, 2010, Volcanic carbon dioxide emissions: observation strategies using GOSAT FTS SWIR data, *AGU Fall Meeting, San Francisco, CA, Dec 13-17 (poster)*.

126. Bursik, M.I., **S.A. Carn**, K.G. Dean, A.K. Patra, M.J. Pavolonis, E. Pitman, P. Singla, T. Singh, and P. Webley, 2010, Ensemble modeling of the Eyjafjallajökull plume of 15-20 April 2010, *AGU Fall Meeting, San Francisco, CA, Dec 13-17 (poster)*.

125. Yang, K., X. Liu, N.A. Krotkov, P.K. Bhartia, **S.A. Carn**, and A.J. Krueger, 2010, Eyjafjallajökull eruptions: direct SO₂ plume height estimation and enhanced ash detection with OMI, *AGU Fall Meeting, San Francisco, CA, Dec 13-17 (poster)*.

124. Hendratno, K., J.S. Pallister, W.A. McCausland, M. Kristianto, F.R. Bina, **S.A. Carn**, N. Haerani, J. Griswold, and R. Keeler, 2010, 2006-2008 eruptions and volcano hazards of Sopotan volcano, North Sulawesi, Indonesia, *AGU Fall Meeting, San Francisco, CA, Dec 13-17 (poster)*.

123. Perro, C.W., T.J. Duck, L. Bitar, G.J. Nott, G.B. Lesins, N.T. O'Neill, E. Eloranta, K. Strong, **S.A. Carn**, R. Lindenmaier, R. Batchelor, A. Saha, C. Pike-Thackray, and J.R. Drummond, 2010, Sarychev volcanic aerosol and chemical measurements over Eureka, Canada, *AGU Fall Meeting, San Francisco, CA, Dec 13-17 (poster)*.

122. **Carn, S.A.**, A.J. Prata, K. Yang, and N.A. Krotkov, 2010, New perspectives on volcanic clouds from the A-Train, *International A-Train Symposium, New Orleans, LA, Oct 25-28 (invited plenary talk)*.

121. **Carn, S.A.**, N.A. Krotkov, K. Yang, and A.J. Prata, 2010, A-Train observations of the 2010 eruption of Eyjafjallajökull volcano (Iceland), *Aura Science Team Meeting, Boulder, CO, Sep 27-29 (oral)*.

120. **Carn, S.A.**, 2010, Satellite remote sensing of volcanic SO₂ emissions, *NWS Alaska Aviation and Volcanic Ash Workshop, Anchorage, AK, Sep 20-23 (invited panel member)*.

119. Krotkov, N.A., A. Krueger, K. Yang, **S. Carn**, G. Vicente, E. Hughes, J. Joiner, R. Kahn, M. Pavolonis, N. Fujisaki, J. Tamminen, S. Hassinen, P. Levelt, J. Murray, and J. Haynes, 2010, Improving capabilities of satellite monitoring of volcanic clouds: lessons learned from Eyjafjallajökull eruption, *Atlantic Conference on Eyjafjallajökull and Aviation, Keflavik, Iceland, Sep 15-16 (oral)*.

118. **Carn, S.A.**, 2010, The 2010 Eyjafjallajökull eruption: overview and OMI observations, *15th OMI Science Team Meeting, De Bilt, The Netherlands, Jun 15-18 (invited talk)*.

117. Krotkov, N.A., K. Yang, **S. Carn**, A. Krueger, G. Vicente, E. Hughes, P. Colarco, G. Morris, C. Seftor, J. Joiner, R. Kahn, and M. Pavolonis, 2010. Current capabilities and limitations of satellite monitoring and forecasting of volcanic clouds: the example of the Eyjafjallajökull eruption, *15th OMI Science Team Meeting, De Bilt, The Netherlands, Jun 15-18* (oral).
116. Schwandner, F.M., **S.A. Carn** and C.G. Newhall, 2010. GOSAT/TANSO-FTS measurement of volcanic and geothermal CO₂ emissions. *EGU General Assembly, Vienna, Austria, Apr 3-8* (poster).
115. **Carn, S.A.**, A.J. Sutton, T. Elias, M.R. Patrick, R.C. Owen, and S. Wu, 2009. Satellite measurements of SO₂ emission and dispersion during the 2008-2009 eruption of Halema'uma'u, Kīlauea. *AGU Fall Meeting, San Francisco, CA, Dec 14-18* (oral).
114. Yang, K., X. Liu, N.A. Krotkov, A.J. Krueger, **S.A. Carn**, E.J. Hughes, S.G. De Souza-Machado, and L. Strow, 2009. Measuring volcanic emissions using hyper-spectral UV observations from satellite. *AGU Fall Meeting, San Francisco, CA, Dec 14-18* (poster).
113. Vicente, G.A., W. Schroeder, Krueger, A.J., K. Yang, **S.A. Carn**, N. Krotkov, M. Guffanti, and P. Levelt, 2009. The NOAA-NASA OMI/GOME-2 near-real-time monitoring system of volcanic SO₂ and aerosol clouds. *AGU Fall Meeting, San Francisco, CA, Dec 14-18* (poster).
112. *Hughes, E.J., L.C. Sparling, **S.A. Carn**, A.J. Krueger, K. Yang, and S.G. Trahan, 2009. Reconstructing the emission height of volcanic SO₂ from back trajectories: comparison of explosive and effusive eruptions. *AGU Fall Meeting, San Francisco, CA, Dec 14-18* (poster).
111. Krueger, A.J., **S.A. Carn**, and N.A. Krotkov, 2009. Satellite-based magmatic volcano eruption database. *AGU Fall Meeting, San Francisco, CA, Dec 14-18* (poster).
110. Valentine, G.A., M.D. Jones, M.I. Bursik, E.S. Calder, S.M. Gallo, C. Connor, **S. Carn**, W. Rose, D.A. Moore-Russo, C. Renschler, B. Pitman, M.F. Sheridan, W. Marzocchi, A. Costa, A. Neri, R.S.J. Sparks, S.J. Cronin, S. Takarada, J. Marti, J.-C. Komorowski, T.H. Druitt, T. Koyaguchi, J.L. Macias, and S. Dartevelle, 2009. VHub – Cyberinfrastructure for volcano eruption and hazards modeling and simulation. *AGU Fall Meeting, San Francisco, CA, Dec 14-18* (oral).
109. *Lopez, T.M., **S.A. Carn**, P. Webley, M.A. Pfeffer, M.P. Doukas, P.J. Kelly, C.A. Werner, F. Prata, C.F. Cahill, and D.J. Schneider, 2009. Evaluation of satellite derived sulfur dioxide measurements for volcano monitoring during the 2009 Redoubt eruption. *AGU Fall Meeting, San Francisco, CA, Dec 14-18* (oral).
108. *Henney, L.A., I.M. Watson, and **S.A. Carn**, 2009. Monitoring passively degassing volcanoes from space: a comparison between ASTER and OMI retrievals of lower tropospheric SO₂. *AGU Fall Meeting, San Francisco, CA, Dec 14-18* (poster).
107. *Head, E.M., **S.A. Carn**, K.W.W. Sims, A.M. Shaw, P. Wallace, and A. Maclean, 2009. Degassing from a mafic alkaline shield volcano: Nyamuragira volcano, DR Congo. *AGU Fall Meeting, San Francisco, CA, Dec 14-18* (poster).
106. *Thomas, H.E., I.M. Watson, and **S.A. Carn**, 2009. The use of satellite-based remote sensing to quantify the contribution of volcanoes to the global SO₂ budget. *AGU Fall Meeting, San Francisco, CA, Dec 14-18* (poster).
105. *Head, E.M., **S.A. Carn**, A. Shaw, K.W.W. Sims, and P. Wallace, 2009. Degassing of mafic alkaline magmas at Nyamuragira volcano, DR Congo. *GSA Annual Meeting, Portland, OR, Oct 18-21* (poster).
104. **Carn, S.A.**, A.J. Prata, N.A. Krotkov, K. Yang, and A.J. Krueger, 2009. Satellite measurements of volatile emissions from recent North Pacific arc eruptions. *GSA Annual Meeting, Portland, OR, Oct 18-21* (oral).

103. Krotkov, N., K. Yang, **S. Carn**, A. Krueger, K. Pickering, J. Witte, C. Li, R. Dickerson, C. Wei, C. Lee, R. Martin, G. Carmichael, D. Streets, and Q. Zhang, 2009. New discoveries enabled by OMI SO₂ measurements. *Aura Science Team Meeting, Leiden, The Netherlands, Sep 13-19* (oral).
102. **Carn, S.A.**, T. Lopez, M. Pfeffer, M. Doukas, P. Kelly, C. Werner, N.A. Krotkov, K. Yang, A.J. Prata, R. Kivi, T.P. Kurosu, and A.J. Krueger, 2009. The 2008-2009 cluster of North Pacific volcanic eruptions: A-Train observations and OMI validation. *Aura Science Team Meeting, Leiden, The Netherlands, Sep 13-19* (oral).
101. Vicente, G.A., G. Serafino, Krueger, A.J., **S.A. Carn**, K. Yang, N. Krotkov, W. Schroeder, J. Guo, M. Guffanti, and P. Levelt, 2009. The NOAA-NASA OMI volcanic SO₂ cloud and aerosol index online, near-real-time distribution system. *89th Annual AMS Meeting, Natural Hazards session, Phoenix, AZ, Jan 11-15* (poster).
100. *Nadeau, P., **S.A. Carn**, and W.I. Rose, 2008. Aged volcanic clouds – are they an aviation hazard and why? *AGU Fall Meeting, San Francisco, CA, Dec 15-19* (oral).
99. *Spinei, E., **S.A. Carn**, N.A. Krotkov, K. Yang, A. Krueger, P.K. Bhartia, and G.H. Mount, 2008. Validation of OMI measurements of SO₂ by ground-based MFDOAS spectroscopy during the Okmok volcanic eruption in July 2008. *AGU Fall Meeting, San Francisco, CA, Dec 15-19* (poster).
98. Prata, A.J., **S.A. Carn**, M. Fromm, and N.A. Krotkov, 2008. A-Train satellite observations of the Chaitén eruption clouds. *AGU Fall Meeting, San Francisco, CA, Dec 15-19* (poster).
97. **Carn, S.A.**, N.A. Krotkov, V. Fioletov, K. Yang, A.J. Krueger, and D. Tarasick, 2008. Emission, transport and validation of sulfur dioxide in the 2008 Okmok and Kasatochi eruption clouds. *AGU Fall Meeting, San Francisco, CA, Dec 15-19* (oral).
96. Vicente, G.A., G. Serafino, Krueger, A.J., **S.A. Carn**, K. Yang, N. Krotkov, W. Schroeder, J. Guo, M. Guffanti, and P. Levelt, 2008. Volcanic ash, aerosols and SO₂ cloud monitoring via satellite. *EUMETSAT Meteorological Satellite Conference, Darmstadt, Germany, Sep 8-12* (poster).
95. Krueger, A.J., **S.A. Carn**, N. Krotkov, G. Serafino, G. Vicente, 2008. Detection and monitoring of sulfur dioxide from satellite-based UV sensors. *EUMETSAT Meteorological Satellite Conference, Darmstadt, Germany, Sep 8-12* (oral).
94. *Hughes, E., L. Sparling, **S.A. Carn**, 2008. Using horizontal transport characteristics to infer an emission height time-series of volcanic SO₂. *IAVCEI General Assembly, Reykjavik, Iceland, Aug 18-22* (poster).
93. *Head, E.M., P.J. Wallace, **S.A. Carn**, G.J.S. Bluth, K.W.W. Sims, A. Shaw, 2008. Interpreting SO₂ degassing with melt inclusions: Nyamuragira volcano, D.R. Congo (1980-2006). *IAVCEI General Assembly, Reykjavik, Iceland, Aug 18-22* (poster).
92. *Sawyer, G.M., C. Oppenheimer, V. Tsanev, **Carn, S.A.**, G. Yirgu, 2008. Degassing from two persistent lava lakes. *IAVCEI General Assembly, Reykjavik, Iceland, Aug 18-22* (poster).
91. **Carn, S.A.**, A.J. Prata, S. Karlsdóttir, N.I. Kristiansen, S. Eckhardt, 2008. Incursion of volcanic emissions into the Arctic atmosphere. *IAVCEI General Assembly, Reykjavik, Iceland, Aug 18-22* (oral).
90. **Carn, S.A.**, A.J. Prata, W.G. Read, C. Clerbaux, N.A. Krotkov, K. Yang, A.J. Krueger, 2008. Probing volcanic clouds with the A-Train. *IAVCEI General Assembly, Reykjavik, Iceland, Aug 18-22* (poster).
89. **Carn, S.A.**, C.R. Holliday, J.E. Piatt, N.A. Krotkov, K. Yang, A.J. Krueger, 2008. Widespread air pollution in the western Pacific linked to volcanic emissions from Anatahan. *IAVCEI General Assembly, Reykjavik, Iceland, Aug 18-22* (oral).
88. **Carn, S.A.**, A.J. Krueger, N.A. Krotkov, K. Yang, 2008. Volcanic degassing flare-ups. *IAVCEI General Assembly, Reykjavik, Iceland, Aug 18-22* (oral).

87. Krotkov, N.A., K. Yang, P.K. Bhartia, **S.A. Carn**, A. Krueger, R. Dickerson, C. Li, 2008. What have we learned about global SO₂ pollution sources with Aura/OMI data? *AGU Joint Assembly, Fort Lauderdale, FL, May 27-30*.
86. Beita, V.H., H. Vömel, J. Valverde-Canossa, H. Selkirk, J. Herrera, K. Cerna, D. Gonzáles, **S.A. Carn**, 2008. Evidence for SO₂ in the plume of Volcan Turrialba from ozonesonde measurements. *AGU Joint Assembly, Fort Lauderdale, FL, May 27-30*.
85. McMillan, W.W., C. Barnet, **S. Carn**, K. Evans, J. Gleason, R. Hoff, F.W. Irion, N. Krotkov, A. Krueger, T.P. Kurosu, G. Osterman, B. Pierce, O. Torres, L. Yuganov, 2008. Air quality observations from the A-Train: a synergistic view. *AGU Joint Assembly, Fort Lauderdale, FL, May 27-30*.
84. **Carn, S.A.**, N.A. Krotkov, K. Yang, A.J. Krueger, M.R. Schoeberl, P. Wennberg, J.E. Dibb, B.E. Anderson, G. Diskin, G. Sachse, S.A. Vay, S. Arellano, 2008. *In-situ* measurements of tropospheric volcanic plumes in Ecuador and Colombia during TC⁴: comparisons with OMI SO₂ data. *TC⁴ Science Team Meeting, Virginia Beach, VA, Feb 26-29 (oral)*.
83. Vicente, G., G. Serafino, A. Krueger, **S. Carn**, K. Yang, N. Krotkov, M. Guffanti, P. Levelt, 2007. The NOAA near real-time OMI-SO₂ cloud visualization and product distribution system. *AGU Fall Meeting, San Francisco, CA, Dec 10-14 (poster)*.
82. Krueger, A.J., **S. Carn**, K. Evans, N. Krotkov, K. Yang, P. Levelt, G. Serafino, G. Vicente, M. Guffanti, D. Schneider, 2007. Sulfur dioxide and ash monitoring for volcanic aviation hazards. *Second Support to Aviation Control Service (SACS) Workshop, Toulouse VAAC, Toulouse, France, November 26-27*.
81. **Carn, S.A.**, A.J. Krueger, N.A. Krotkov, K. Yang, K. Evans, 2007. Measuring volcanic emissions with the Ozone Monitoring Instrument (OMI). *Cities on Volcanoes 5, Shimabara, Japan, November 19-23 (invited paper)*.
80. **Carn, S.A.**, F. Kervyn, P. Mitangala, G.M. Sawyer, A.-C. van Overbeke, 2007. The health impacts of persistent degassing at Nyiragongo volcano (DR Congo). *Cities on Volcanoes 5, Shimabara, Japan, November 19-23 (oral)*.
79. Bani, P., C. Oppenheimer, V. Tsanev, M. Lardy, **S.A. Carn**, 2007. High emissions of sulphur dioxide from Vanuatu volcanoes. *Cities on Volcanoes 5, Shimabara, Japan, November 19-23 (poster)*.
78. *Head, E.M., G.J.S. Bluth, **S.A. Carn**, 2007. Eruptions of Nyamuragira volcano, D.R. Congo (1980-2006). *26th ECGS Workshop, Active Volcanism and Continental Rifting with special focus on the Virunga (North Kivu, DRC), European Center for Geodynamics and Seismology, Luxembourg, November 19-21 (poster)*.
77. *Sawyer, G.M., **S.A. Carn**, V. Tsanev, C. Oppenheimer, M.R. Burton, 2007. Investigation into magma degassing at Nyiragongo volcano, Democratic Republic of Congo. *26th ECGS Workshop, Active Volcanism and Continental Rifting with special focus on the Virunga (North Kivu, DRC), European Center for Geodynamics and Seismology, Luxembourg, November 19-21 (poster)*.
76. **Carn, S.A.**, N.A. Krotkov, M.R. Schoeberl, P. Wennberg, J.E. Dibb, B.E. Anderson, G. Diskin, G. Sachse, S.A. Vay, K. Yang, A.J. Krueger, S. Arellano, 2007. Direct sampling of tropospheric volcanic plumes in Ecuador and Colombia during TC⁴. *Aura Science Team Meeting, Pasadena, CA, October 1-5 (oral)*.
75. Sparling, L., *E. Hughes, **S.A. Carn**, 2007. Using horizontal transport characteristics to infer the emission altitude of a volcanic SO₂ plume. *Aura Science Team Meeting, Pasadena, CA, October 1-5 (poster)*.
74. **Carn, S.A.**, and A.J. Prata, 2007. Comparisons of OMI and AIRS sulphur dioxide retrievals in volcanic eruption clouds. *IUGG General Assembly, Perugia, Italy, July 2-13, 2007 (oral)*.
73. Tupper, A., A.J. Prata, **S.A. Carn**, and D. Rosenfeld, 2007. Remote sensing of volcanic clouds in the moist tropics for aviation safety. *IUGG General Assembly, Perugia, Italy, July 2-13, 2007 (oral)*.

72. Hamill, P., J. Redemann, **S.A. Carn**, P.F. Levelt, and D. Winker, 2007. Comparison of Model Predictions with Data from the OMI SO₂ Measurements and the CALIPSO Backscatter Measurements. *IUGG General Assembly, Perugia, Italy, July 2-13, 2007* (oral).
71. Krotkov, N.A., A.J. Krueger, K. Yang, **S.A. Carn**, P.K. Bhartia, K. Evans, 2007. OMI SO₂ product status and outlook. *OMI Science Team Meeting #12, Baltimore, MD, June 5-8, 2007*.
70. **Carn, S.A.**, A.J. Krueger, S. Arellano, M. Segovia, N.A. Krotkov, K. Yang, 2007. Daily monitoring of Ecuadorian volcanic degassing from space. *AGU Joint Assembly, Acapulco, Mexico, May 22-25, 2007 (invited paper)*.
69. **Carn, S.A.**, N.A. Krotkov, A.J. Krueger, K. Yang, 2007. A survey of volcanic degassing in the Americas since 2004. *AGU Joint Assembly, Acapulco, Mexico, May 22-25, 2007* (oral).
68. Krueger, A.J., N.A. Krotkov, **S.A. Carn**, 2007. The 1982 El Chichon eruption: the birth of volcanic sulfur dioxide monitoring from space. *AGU Joint Assembly, Acapulco, Mexico, May 22-25, 2007* (oral).
67. Kearney, C., I.M. Watson, G.J.S. Bluth, **S.A. Carn**, V.J. Realmuto, 2007. A comparison of ultraviolet and thermal infrared SO₂ retrievals of a near-pure SO₂ plume. *AGU Joint Assembly, Acapulco, Mexico, May 22-25, 2007*.
66. Galle, B., U. Platt, M. Van Roozendaal, C. Oppenheimer, T. Hansteen, G. Boudon, M. Burton, H. Delgado, W. Strauch, E. Duarte, G. Garzon, C. Pullinger, M. Kasereka, M. Molina, **S. Carn**, P. Samaniego, E. Sanchez, S. Inguaggiato, 2007. NOVAC – Network for Observation of Volcanic and Atmospheric Change, First installations and results. *AGU Joint Assembly, Acapulco, Mexico, May 22-25, 2007*.
65. **Carn, S.A.**, N.A. Krotkov, A.J. Krueger, R.M. Hoff, K. Yang, and A.J. Prata, 2007. New Insights into Volcanic Degassing from OMI and the A-Train. *ENVISAT Symposium, Montreux, Switzerland, April 23-27, 2007* (talk given by A.J. Krueger).
64. Krotkov, N.A., A.J. Krueger, K. Yang, **S.A. Carn**, P.K. Bhartia, and P.F. Levelt, 2007. SO₂ data from the Ozone Monitoring Instrument. *ENVISAT Symposium, Montreux, Switzerland, April 23-27, 2007* (oral).
63. **Carn, S.A.**, N.A. Krotkov, K. Yang, and A.J. Krueger, 2007. The state of the art of measuring volcanic degassing from space. *International Conference on Evolution, Transfer and Release of Magmas and Volcanic Gases, Academia Sinica, Taipei, April 22-27, 2007* (keynote).
62. *Sawyer, G.M., **S.A. Carn**, C. Oppenheimer, and V. Tsanev, 2007. Gas emissions from Nyiragongo volcano, D.R. Congo. *International Conference on Evolution, Transfer and Release of Magmas and Volcanic Gases, Academia Sinica, Taipei, April 22-27, 2007* (poster).
61. **Carn, S.A.**, N.A. Krotkov, K. Yang, A.J. Krueger, A.J. Prata, and R.M. Hoff, 2007. Advances in the detection and tracking of volcanic clouds from space. *4th International Workshop on Volcanic Ash, Rotorua, New Zealand, Mar 22-25, 2007 (invited paper)*.
60. **Carn, S.A.**, N.A. Krotkov, A.J. Krueger, K. Yang, 2006. The first daily measurements of passive volcanic degassing from space. *AGU Fall Meeting, San Francisco, CA, Dec 11-15, 2006* (invited talk given by A.J. Krueger).
59. Yang, K., N.A. Krotkov, **S.A. Carn**, A.J. Krueger, P.F. Levelt, 2006. A fast algorithm for retrieval of volcanic sulfur dioxide with OMI. *AGU Fall Meeting, San Francisco, CA, Dec 11-15, 2006* (poster).
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