

Richard W. Sanderson

Curriculum Vitæ

CONTACT INFORMATION

Dept. of Earth & Environmental Sciences
New Mexico Institute of Mining and Technology
801 Leroy Place, Socorro, NM 87801 USA

E-mail: rsanderson 'at' ees.nmt.edu
Web site: <http://www.nmt.edu/~rsanders>

RESEARCH INTERESTS

Assessing and understanding explosive mechanisms and energy partitioning at volcanoes.
Integrated geophysical monitoring of eruptions.
Using seismometers as pseudo-tilt-meters.
Interpreting evolving self-similar volcanic seismo-acoustic signals.
Developing efficient monitoring techniques based upon limited seismo-acoustic datasets.

EDUCATION

New Mexico Institute of Mining and Technology, Socorro, NM, USA (2007 – 2010)

- MS Geophysics candidate (after transferring from UNH)
- Advisor: Jeffrey B. Johnson
- Committee: Jeffrey B. Johnson, Richard C. Aster, Jonathan M. Lees (UNC Chapel-Hill).
- Thesis: Inverting pseudo-tilt signals for source at Santiaguito volcano, Guatemala.

University of New Hampshire, Durham, NH, USA (2006 – 2007)

- MS Geology candidate (before transferring to NMT)
- Advisor: Jeffrey B. Johnson

University of East Anglia, Norwich, UK (2002 – 2005)

- BSc Geophysical Sciences, Upper Second Class classification [2(i)]
- Advisor: Paul W. Burton
- Dissertation: Determining bulk densities of topographic features using gravitational measurements, while assessing effects of surveying techniques and analytical methods.

Graduate classes: *Geophysical Inverse Methods, Tectonophysics, Observational Seismology, Theoretical Seismology, Controlled-Source Seismology, Digital Signal Processing and Analysis, Volcanology, Mechanics of Earthquakes and Faulting, Climate and Tectonics (inc. Paleomagnetism).*

Undergraduate classes: *Volcano Geophysics, Environmental Seismology and Faulting, Geodynamics, Applied Geophysics, Geographical Information Systems, Mathematics for Geophysical Sciences I-IV, Sedimentology: Depositional Environments, related field work in Greece, Wales and Scotland.*

PROFESSIONAL EXPERIENCE

Universidad de Colima, Colima, México (07/2005 – 03/2006) - Voluntary position in the Centre of Exchange and Research in Volcanology. Primary work involved robust classification and interpretation of seismic signals and leading/assisting with weekly field work. Secondary tasks included obtaining MODIS and ASTER images and servicing equipment. Work presented at conferences and also undertaken in collaboration with professors at other universities.

ACADEMIC EXPERIENCE

Research Assistant: June 2007, June – Dec 2009:

Conducting research into seismo-acoustic signal generation at Santiaguito volcano, Guatemala.

Infrasound Lab Assistant: 2006, 2008, 2009:

Constructing J.B. Johnson designed infrasound microphones and cables for use during field campaigns.

Teaching Assistant: Aug 2006 – May 2009:

NMT: EARTH 101 - Earth Processes; EARTH 203/206 – The Earth's Crust; EARTH 205 – Earth Science Practicum; EARTH 308 – The Geophysical Earth; EARTH 491 – Marine Geology.

UNH: ESCI 409 – Environmental Geology; ESCI 501 – Introduction to Oceanography.

FIELD EXPERIENCE

2010: **Villarrica and Chaitén, Chile** - Deployment of seismo-acoustic networks. PI – Jeff Johnson (NMT).

2009: **Santiaguito, Guatemala** - Deployment of seismo-acoustic network. PI – Jeff Johnson (NMT).

2008: **Bezmyanny and Karymsky, Kamchatka, Russia** – Expansion and servicing of existing seismic-acoustic network. PI – Mike West (UAF).

2007: **Tungurahua, Ecuador** - Deployment of seismo-acoustic network. PI – Mario Ruiz (IG-EPN).

2007: **Santiaguito, Guatemala** - Deployment of seismo-acoustic network. PI – Jeff Johnson (UNH).

2005/2006: **Volcán de Colima, México** – seismometer and microphone installation; collection of ash and pyroclastic material, video, infrared and COSPEC monitoring of eruptions; estimation of lahar and pyroclastic deposition and remobilization volumes; bomb crater mapping; spring sampling; temperature and gas sampling from lava flows and exploratory reconnaissance. PI – Nick Varley (CIIV).

Use of Güralp CMG-3T, 3ESP and 40T seismometers with REF TEK RT 130s and Quanterra Q330s.

Non-academic volcanic trips in Alaska, Guatemala, El Salvador, Ecuador, Washington, México and NZ.

PUBLISHED PAPERS

Johnson, J.B., **Sanderson, R.**, Lyons, J., Escobar-Wolf, R., Waite, G., Lees, J.M. (2009) Dissection of a composite volcanic earthquake at Santiaguito, Guatemala, *Geophysical Research Letters*, Vol. 36, L16308.

FORTHCOMING PAPERS

Sanderson, R.W., Johnson, J.B., Lees, J.M. (2010?) Ultra-long period seismic signals indicate cyclic deflation coincident with eruptions at Santiaguito volcano, Guatemala.

Another on Karymsky being headed by A. Belousov and one on Colima headed by N.Varley.

CONFERENCE PRESENTATIONS

Oral presentations:

Johnson, J.B., **Sanderson, R.**, Lyons, J.J., Escobar-Wolf, R.P., Waite, G.P., Lees, J.M. (2009) Dissection of a composite volcanic earthquake at Santiaguito, Guatemala, *EOS Trans. AGU*, 90(52), Fall Meet. Suppl., Abstract V12A-01.

Sanderson, R.W., West, M. (w. Shuler, A., Lopez, T.) (2009) Explosive seismic signals at Karymsky volcano 2008, *Abstract volume of the JKASP 2009 workshop, Fairbanks, Alaska*.

Johnson, J.B., **Sanderson, R.**, Lees, J.M., Ruiz, M., Gerst, A., Hort, M., Scharff, L., Varley, N., Sahagian, D. (2008) Lava dome soufflé: Long period earthquakes and co-eruptive volcano respirations captured with seismometers, video camera, and a Doppler radar, *Abstract volume of the IAVCEI 2008 General Assembly, Reykjavík, Iceland*.

Johnson, J.B., Lees, J.M., **Sanderson, R.** (2008) Co-Eruptive Earthquakes and Lava Dome Respiration Captured with Seismometers and a Video Camera. *Seismological Research Letters*, Volume 79, Number 2.

Johnson, J. B., Varley, N., **Sanderson, R.**, Gerst, A., Lees, J., Dalton, M., Marcillo, O., Every, S., Normand, J., Ruiz, M. (2007) Eruption dynamics at the active Santiaguito Dome inferred from a multidisciplinary geophysical experiment, *EOS Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract V41B-07.

Johnson, J.B., Lees, J.M., **Sanderson, R.**, Sahagian, D., Normand, J.A. (2007) Dome surges, long period earthquake generation, and pyroclastic eruptions at Santiaguito Dome, Guatemala, *EOS Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract V54B-07.

Johnson, J.B., **Sanderson, R.**, Every, S., Normand, J., Marcillo, O. (2007) Eruption dynamics at the active Santiaguito Dome inferred from a multidisciplinary geophysical experiment, *Geological Society of America Abstracts with Programs*, Vol. 39, No. 1, p. 79.

Varley, N., Stevenson, J., Johnson, J.B., Reyes, G., Weber, K., **Sanderson, R.** (2006) Vulcanian explosions at Volcán de Colima, México: modeling the conduit processes, *EOS Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract V43B-1787.

Varley, N., Stevenson, J., Johnson, J.B., Colvin, A., Weber, K., **Sanderson, R.**, Hébert, M-C., Reyes, G. (2006) Modeling conduit processes at Volcán de Colima, México: interpretation of monitoring data, *Abstract volume of the Reunión Anual Unión Geofísica Mexicana, Puerto Vallarta*.

Varley, N., Stevenson, J., Johnson, J.B., Reyes, G., Sword-Daniels, V., Colvin, A., Weber, K., **Sanderson, R.**, Harwood, R. (2006) Modeling conduit processes at Volcán de Colima, México, *Abstract volume of Physics of Fluid Oscillations in Volcanic Systems, Lancaster University, UK*.

Poster presentations:

Sanderson, R.W., Johnson, J.B., Waite, G.P., Lees, J.M. (2009) Ultra-long period seismic signals indicate cyclic deflation coincident with eruptions at Santiaguito volcano, Guatemala, *EOS Trans. AGU*, 90(52), Fall Meet. Suppl., Abstract V23D-2100.

Sanderson, R.W., Johnson, J.B., Lees, J.M. (2008) Seismic precursors to episodic eruptive events at Santiaguito Volcano, *Seismological Research Letters*, Volume 79, Number 2.

Sanderson, R.W., Johnson, J.B. (2007) Pre-eruptive seismicity associated with explosive events at Santiaguito volcano, Guatemala, *EOS Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract V51D-0780.

Sanderson, R., Varley, N., Johnson, J.B., Murphy, C., Reyes-Davila, G. (2006) The relationships between explosive plumes generated and the related seismic and acoustic waveforms received at Volcán de Colima, México, *Abstract volume of the X Reunión internacional "Volcán de Colima", Colima*.

Sanderson, R., Varley, N., Reyes-Davila, G., Johnson, J.B., Murphy, C. (2005) The relationships between explosive plumes generated and the corresponding seismic and acoustic waveforms received at Volcán de Colima, México, *Abstract volume of the Reunión Anual Unión Geofísica Mexicana Selper-México y AGM, Puerto Vallarta*.

PROFESSIONAL AFFILIATIONS

American Geophysical Union (2007 – present)
Seismological Society of America (2008)
The Geological Society (UK) (2001-2002)

COMPUTER SKILLS

Languages: MATLAB, L^AT_EX.
General: MS Office (Word, Excel, PowerPoint), Windows, Mac OS X, some Linux/Unix.
Seismological - PQL II, REF TEK RT130 and Quanterra Q330 DAS programming, some SAC.
Other: SAP, some Dreamweaver/HTML.

OTHER SKILLS

Basic – Intermediate Spanish.
Full UK and US driving licenses with minivan experience.
PADI Advanced Open Water SCUBA diver.

REFERENCES

Jeffrey B. Johnson	Richard C. Aster
Assistant Professor of Geophysics	Professor of Geophysics
Dept of Earth & Environmental Science	Dept of Earth & Environmental Science
New Mexico Tech	New Mexico Tech
801 Leroy Place	801 Leroy Place
Socorro, NM 87801	Socorro, NM 87801