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Education

- 2015 **Ph.D. in Geological Sciences** – School of Earth and Space Exploration, Arizona State University, Tempe, AZ, USA
- 2005 **M.Sc. in Volcanology** – Laboratoire Magmas et Volcans, Université Blaise Pascal, Clermont-Ferrand, France
- 2004 **License in Geological Sciences** – Département de Géologie, Université de Liège, Belgium

Employment History

- 2015-2017 **CNES Postdoctoral Researcher** - Laboratoire Magmas et Volcans, Université Clermont Auvergne, Clermont-Ferrand, France
- 2008-2014 **Graduate Teaching/Research Assistant** – Arizona State University, Tempe, AZ, USA

Teaching Experience

- 2008-2014 **Graduate Teaching Assistant** – Arizona State University
 - GLG 420 “Volcanology” – 2 semesters
 - GLG 103 “Introduction to Geology” lab section – 2 semesters
 - GLG 110/111 – “Dangerous World” - Coordinator and creator of lab content, online and in-person – 8 semesters

Research Interests

- **Spectroscopy (VNIR, TIR, UV) and Imaging techniques:** Tools for the characterization of natural surfaces and the observation of active geological processes, particularly volcanic products and phenomena
- **Volcanic emissions:** Study of the composition, magnitude and transport of volcanic gases, ashes and aerosols, and the hazards they pose
- **Physical volcanology:** Understanding conduit dynamics of persistent volcanic activity using monitoring methods and numerical modeling
- **Volcano monitoring:** long-term observation of volcanic activity using remote sensing methods

Academic Achievements

List of Publications

Manuscripts in review

- [6] **Smekens, J-F.**, and Gouhier, M.: Observation of SO₂ Degassing at Stromboli Volcano using a Hyperspectral Thermal Infrared Imager. Submitted to *JVGR*.
- [5] **Smekens, J-F.**, Clarke, A.B., and de'Michieli Vitturi, M.: Eruption cycles in a basaltic andesite system: insights from numerical modeling and field observations. Submitted to *EPSL*.

Published in peer-reviewed journals

- [4] **Smekens, J-F.**, Clarke, A.B., Burton, M.R., Harijoko, A., and Wibowo, H. (2015): SO₂ emissions at Semeru volcano, Indonesia: characterization and quantification of persistent periodic explosive activity. *J. Volcanol. Geotherm. Res.*, 300: 121-128, <http://dx.doi.org/10.1016/j.jvolgeores.2015.01.006>.
- [3] **Smekens, J-F.**, Burton, M.R., and Clarke, A.B. (2015): Validation of the SO₂ camera for high temporal and spatial resolution monitoring of SO₂ emissions. *J. Volcanol. Geotherm. Res.*, 300: 37-47, <http://dx.doi.org/10.1016/j.jvolgeores.2014.10.014>.
- [2] Kern, C., Lübcke, P., Bobrowski, N., Campion, R., Mori, T., **Smekens, J-F.**, Stebel, K., Tamburello, G., Burton, M., Platt, U., and Prata, F. (2015): Inter-comparison of SO₂ camera systems for imaging volcanic gas plumes. *J. Volcanol. Geotherm. Res.*, 300: 22-36, <http://dx.doi.org/10.1016/j.jvolgeores.2014.08.026>.
- [1] Vanderkluysen, L., Burton, M.R., Clarke, A.B., Hartnett, H.E., and **Smekens, J-F.** (2014): Composition and flux of explosive gas release at LUSI mud volcano (East Java, Indonesia). *G³*, <http://dx.doi.org/10.1002/2014gc005275>.

Selected Conference Abstracts

- Smekens, J-F.**, Gouhier, M. (2015): Observation of Passive and Explosive Emissions at Stromboli with a Ground-based Hyperspectral TIR Camera. AGU Fall Meeting.
- Smekens, J-F.**, Clarke, A.B., and de'Michieli Vitturi, M. (2015): Eruption cycles in a basaltic andesite system: insights from numerical modeling. AGU Fall Meeting.
- Smekens, J-F.**, Burton, M.R., Clarke, A.B., Sawyer, G.M, Harijoko, A., and Wibowo, H. (2014): SO₂ Emissions at Semeru Volcano, Indonesia: Characterization and Quantification of Persistent and Periodic Explosive Activity. AGU Fall Meeting.
- Smekens, J-F.**, and Christensen, P.R. (2011): The effect of weathering and outcrop variability on Thermal Infrared multispectral remote sensing data: a comparative study in Gila Bend, AZ. 42nd LPSC, 2011.

Oral presentations

Invited talks

- 2017 'Observation of volcanic degassing using ground-based imaging methods' – **University of Oslo** – April 6th, 2017
- 2016 'Quantifying passive and explosive degassing using ground-based imaging methods' – **University of Bristol** – May 6th, 2016
- 2013 'New developments in UV imaging techniques and application to volcanological problems' – **USGS Cascades Volcano Observatory** – July 31st, 2013
- 2013 'New developments in UV imaging for the monitoring of volcanic SO₂' - **Vrije Universiteit van Brussels** – January 15th, 2013

Conference and Workshop talks

- 2013 New developments in UV imaging for the monitoring of volcanic SO₂ - **Plume Imaging Workshop** - Stromboli, Italy - June 24th, 2013.
- 2010 SO₂ emissions from persistently active explosive volcanoes: can we estimate their contribution using satellite instruments? - **AGU Fall Meeting** - December 13th, 2010.
- 2009 Cyclic patterns of SO₂ emissions at Santiaguito volcano, Guatemala, revealed by UV camera measurements - **Workshop: "Advances in studies of volcanic plumes and pyroclastic density currents"** - Clermont-Ferrand, France - October 26th, 2009

Awards and Honors

- 2015 School of Earth and Space Exploration Pitching Competition: \$500 cash prize
- 2014 University Graduate Fellowship, School of Earth and Space Exploration, ASU
- 2013 Summer PhD Student Research Award, School of Earth and Space Exploration, ASU
- 2013 Doctoral Research Grant Program, Arizona Board Of Regents
- 2011 Graduate Research Achievement Award, School of Earth and Space Exploration, ASU
- 2009-2013 Travel Grant, Graduate and Professional Student Association, ASU (x5)
- 2009 Travel Grant, National Science Foundation. Workshop in Pasto, Colombia

Service and Outreach

- 2016 - International Association for the Volcanology and Chemistry of the Earth's Interior (IAVCEI), Member
- 2010 - American Geophysical Union (AGU), Member
- 2012 Convener, AGU Fall meeting session V13: "Erupt, Rest, Repeat: The Nature of Cyclic Behavior in Volcanic Systems"

2011-2013 Moderator for the VOLCANO listserv
2011-2013 President, Graduate Student Council, School of Earth and Space Exploration,
Arizona State University

Technical Skills

Experience with Laboratory and Field Instruments

- Benchtop **TIR Michelson Interferometer** for the characterization of natural materials
- Compact **UV diffraction spectrometers** and narrow FOV telescopes for the detection and quantification of volcanic and anthropogenic gas emissions (DOAS technique)
- **Open-Path Fourier Transform Infrared (OP-FTIR)** spectrometer for the determination of the composition of volcanic plumes
- Field-ready **Hyperspectral TIR imager** (TELOPS Hyper-Cam LW)
- **SO₂ camera**: a synchronized dual UV imager with bandpass filters and co-located UV spectrometer for the measurement of volcanic and anthropogenic gas emissions

Experience with Remote Sensing Data

- **MSG-SEVIRI**: multi-spectral TIR imager, MeteoFrance, Geostationary orbit
- **MODIS**: multi-spectral TIR imager, NASA, polar orbit
- **ASTER**: multi-spectral TIR imager, NASA, polar orbit
- **OMI**: hyper-spectral UV imager, NASA, polar orbit
- **TIMS**: multi-spectral TIR imager, airborne, deployment by request
- **MASTER**: airborne ASTER and MODIS simulator, deployment by request

Instrument Development

- Leader, SO₂ camera project (ASU)
- Research, purchase and assembly of commercially available components
- Adaptation for use in challenging field conditions (frame stabilization, protective enclosure)
- Design and development of a custom acquisition software (UVICAM - Labview)
- Development of custom data analysis routines (IDL and Matlab)

Scientific Programming

- **Labview**: Development of acquisition software for UV imaging instrument (GUI, instrument parameterization, synchronization of data acquisition with multiple instruments, organization of the data flow)
- **IDL**: Image processing, spectral analysis, forward modeling
- **Matlab**: Image processing, spectral analysis, forward modeling
- **Fortran 95**: Numerical modeling
- **Python**: Image processing

Petrology and Geochemistry

- **Sample preparation**: dissolution, dilution
- **Microscopy**: Optical microscope, Scanning Electron Microscope
- **Geochemistry**: Electron microprobe, ICP-MS, XRF spectrometer

Field Experience

- 2015 Remote measurements of volcanic degassing, Stromboli, Italy - 1 week
- 2013 Remote measurements of volcanic degassing and sample collection, Semeru and Merapi volcanoes, Java, Indonesia – 4 weeks
- 2011 Remote measurements of degassing and sample collection, LUSI mud volcano, Java, Indonesia – 3 weeks
- 2010 Sample collection at LUSI mud volcano and Bromo-Tengger volcanic complex, Java, Indonesia – 3 weeks
- 2009 Sample collection and thermal imaging of natural outcrops, Warford Ranch volcanic shield, Gila Bend, AZ, USA – 1 week
- 2007 Remote measurements of volcanic degassing, Pacays, Santiaguito and Fuego volcanoes, Guatemala – 3 weeks
- 2004 Master field camp, Alps and Sicily – 2 weeks
- 2004 Undergraduate field camp, South of France – 2 weeks

Language Skills

- **French:** native tongue
- **English:** Excellent written and oral proficiency (fluent)
- **Dutch:** Moderate written proficiency, low oral proficiency (high school level as a second language)