



Cities on Volcanoes 9  
November 20-25, 2016  
Puerto Varas, Chile

*'Understanding volcanoes and society: the key for risk mitigation'*



## **A nested volcanic crater system in high-resolution: insights from integrated ground- and space borne techniques at Láscar Volcano, North Chilean Andes**

**Nicole Richter<sup>1</sup>, Elske de Zeeuw-van Dalfsen, Mehdi Nikkhoo & Thomas R. Walter**

<sup>1</sup>German Research Centre for Geosciences GFZ, Section 2.1 Physics of Earthquakes and Volcanoes, Potsdam, Germany

Keywords: InSAR, Terrestrial Laser Scanner, Láscar Volcano

We combine high-resolution TerraSAR-X SpotLight imagery with a precise digital elevation model (DEM) from terrestrial laser scanner (TLS) data in order to better understand the deformation and structural evolution of nested volcanic craters. Here we present new results achieved at the nested summit craters of Láscar Volcano in the Central Volcanic Zone of the Chilean Andes. The TLS data were collected over two days in December 2013 using a long-range RIEGL instrument. We generate a digital elevation model of the active eastern edifice of Láscar Volcano, featuring a spatial resolution of ~1 m from ~15 million data points. We use this DEM in combination with the TerraSAR-X satellite data to create high-resolution interferograms of the volcano's summit area over a period of ~2 years. We detect two separate regions of local subsidence occurring within the volcano's summit craters. We speculate that these movements are related to the general geomorphologic setting and structural architecture of the nested summit craters. Our results are valuable for the assessment of the current physical state of the volcano's active summit area and have implications for the dynamics of nested summit craters elsewhere in the world.