

**Name : Fidel Costa**

**Job Title : Assoc. Prof.**

**Researcher unique identifier: <https://orcid.org/0000-0002-1409-5325>**

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#### **a) Professional Preparation**

Undergraduate Institution	University of Barcelona (1995) BSc Geology
Graduate Institution	University of Geneva (2000) PhD Earth Sciences
Postdoctoral Institution	CNRS- Orleans, France, 2000-2002
Postdoctoral Institution	Ruhr-Universität Bochum, Germany, 2003-2006
Postdoctoral Institution	CSIC-Barcelona, Spain, 2007-2010

#### **b) Appointments**

07/2018-present.	Associate Chair (Faculty) of Asian School of the Environment. Nanyang Technological University, Singapore.
01/2017-06/2018.	Acting Chair of Asian School of the Environment. Nanyang Technological University, Singapore.
09/2015-12/2006.	Associate Chair (Faculty) of Asian School of the Environment. Nanyang Technological University, Singapore.
09/2015-present.	Associate professor and Principal Investigator at the Earth Observatory of Singapore. Nanyang Technological University, Singapore.
02/2010-08/2015.	Assistant professor and Principal Investigator at the Earth Observatory of Singapore. Nanyang Technological University, Singapore.

#### **c) Publications in the last 4 years**

##### **2018**

Andersen, N., Singer, **Costa, F.** et al. (2018) Petrochronologic perspective on rhyolite volcano unrest at Laguna del Maule, Chile. *Earth and Planetary Science Letters* 493, 57-70.

Fabbro, G., Druitt, T., and **Costa, F.** (2018). Storage and Eruption of Silicic Magma across the Transition from Dominantly Effusive to Caldera-forming States at an Arc Volcano (Santorini, Greece). *Journal of Petrology*; doi: 10.1093/petrology/egy013.

Flaherty, T., Druitt, T., Tuffen, H., Higgins, M.D., **Costa, F.**, Cadoux, A. (2018): Multiple timescale constraints on magma chamber assembly prior to the Minoan caldera-forming eruption of Santorini (Greece). *Contributions to Mineralogy and Petrology* 173, 75; doi.org/10.1007/s00410-018-1490-1.

Liqing, J., Tapponnier, P., **Costa, F.**, et al (2018). Necking and fracturing may explain stationary seismicity and full degassing in volcanic silicic spine extrusion. *Earth and Planetary Science Letters* 503, 47-57.

Lynn, Shea, T., K. Garcia, M., **Costa, F.**, Norman, M.D. (2018) Lithium diffusion in olivine records priming of explosive basaltic eruptions. *Earth and Planetary Science Letters* 500, 127-135.

Ruth, D., **Costa, F.**, Bouvet de Maisonneuve, C., Franco, L., Cortés J.A., Calder, E. S (2018) Crystal and melt inclusion timescales reveal the evolution of magma migration before eruption. *Nature Communications* 9 : 2657, doi.org/10.1038/s41467-018-05086-8.

Zeng, L., Cheng, L., **Costa, F.#**, Herrin, J. (2018) CEMin: A MATLAB-based software for computational phenocryst extraction and statistical petrology. *Geochemistry, Geophysics, Geosystems*.

##### **2017**

Cooper, K.M., Till, C.B., Kent, A.J.R., **Costa, F.**, Rubin, A.E., Bose, M., Gravley, D., Deering, C., Cole J. (2017) Response to comment on "Rapid cooling and cold storage in a silicic magma reservoir recorded in individual crystals". *Science* 358, 10.1126/science.aap9145.

Rubin, A.E., Cooper, K.M., Till, C.B., Kent, A.J.R., **Costa, F.**, Bose, M., Gravley, D., Deering, C., Cole J. (2017) Rapid cooling and cold storage in a silicic magma reservoir recorded in individual crystals. *Science* 356, 1154–1156.

- Lynn, K. Garcia, M., Shea, T., **Costa, F.**, Swanson D.A. (2017): Timescales of mixing and storage for Keanakāko'i Tephra magmas (1500-1823 C.E.), *Contributions to Mineralogy and Petrology* 172:76 DOI 10.1007/s00410-017-1395-4.
- Newhall C., **Costa F.**, Ratdomopurbo A, Venezky D.Y., Widiwijayanti C, Nang Thin Zar Win, Tan K, Fajiculay E. (2017): WOVOdat – an online, growing library of worldwide volcanic unrest. *Journal of Volcanology and Geothermal Research* 345: 184-199.
- Marchev, P., Arai, S., Orlando, V., **Costa F.**, Zanetti, A., Downes H. (2017) Metasomatic Reaction Phenomena from Entrainment to Surface Cooling: Evidence from Mantle Peridotite Xenoliths from Bulgaria. *Journal of Petrology* 58: 599–640.
- Cheng, L., **Costa, F.**, and Carniel, R. (2017). Unraveling the presence of multiple plagioclase populations and identification of representative two dimensional sections using a statistical and numerical approach. *American Mineralogist* 102:1894-1905.
- Krimer, D. and **Costa F.** (2017) Evaluation of the effects of 3d diffusion, crystal geometry, and initial conditions on retrieved time-scales from Fe-Mg zoning in natural oriented orthopyroxene crystals. *Geochimica et Cosmochimica Acta*, 196: 271–288.

## 2016

- Singer, B., **Costa, F.**, Herrin, J.S., Hildreth, W., Fierstein, J. (2016) The timing of compositionally-zoned magma reservoirs and mafic 'priming' weeks before the 1912 Novarupta-Katmai rhyolite eruption. *Earth and Planetary Science Letters*. 451, 125-137.
- Bouvet de Maisonneuve, C., **Costa, F.**, Huber, C., Vonlanthen, P, Bachmann, O., Dungan. M. (2016) How do olivines record magmatic events? Insights from major and trace element zoning. *Contributions to Mineralogy and Petrology*, 171, 10.1007/s00410-016-1264-6.
- Albert, H., **Costa F.**, Marti, J. (2016) Years to weeks of seismic unrest and magmatic intrusions precede monogenetic eruptions. *Geology* 44, 211-214.

## 2015

- Kahl, M., Chakraborty, S., Pompillio, M., **Costa, F.** (2015) Constraints on the nature and evolution of the magma plumbing system of Mt. Etna volcano (1991 – 2008) from a combined thermodynamic and kinetic modelling of the compositional record of minerals. *Journal of Petrology* 56: 2025-2068.
- Girona, T., **Costa, F.**, Schubert, G. (2015): Degassing during quiescence as a trigger of magma ascent and volcanic eruptions. *Scientific Reports* 5: 18212 | DOI: 10.1038/srep18212.
- Albert, H., **Costa F.**, Marti, J. (2015) Timing of magmatic processes and unrest associated with mafic historical monogenetic eruptions in Tenerife Island. *Journal of Petrology* 56: 1945-1966.
- Bouvet de Maisonneuve, C., **Costa, F.**, Patia, H., Huber, C. (2015): Unrest and eruption in a caldera setting: Insights from the 2006 eruption of Rabaul (Papua New Guinea). *Geological Society of London, Special publications*. 422, doi.org/10.1144/SP422.2
- Shea, T., **Costa F.**, Hammer, J., Krimer, D. (2015) Accuracy and precision of timescales retrieved from diffusion modeling in olivine: a 3D perspective. *American Mineralogist* 100, 2026-2042.
- Belousov, A., Belousova, M., Krimer, D., **Costa, F.**, Zaenuddin, A., Prambada, O. (2015): Volcaniclastic stratigraphy of Gede volcano, West Java, Indonesia: how it erupted and when. *Journal of Volcanology and Geothermal Research* 310, 238-252.
- Fontijn, K., **Costa, F.**, Sutawidjaja, I., Newhall, C., Herrin, J. (2015) A five thousand year record of multiple highly explosive mafic eruptions from Gunung Agung (Bali, Indonesia): Implications for eruption frequency and volcanic hazards. *Bulletin of Volcanology* 77.
- Girona, T., **Costa, F.**, Taisne, B., Aggangan, B., Ildefonso, S. (2015) Fractal degassing from Erebus and Mayon volcanoes revealed by a new method to monitor H<sub>2</sub>O emission cycles. *Journal of Geophysical Research*, doi:10.1002/2014JB011797.

### (d) Supervision of Graduate Students and Postdoctoral Fellows

\*Post-doctoral mentoring of H. Albert (NTU, EOS, 2016-currently). Main topic: Volcanic unrest and magmatic processes at Mt Fuji (Japan).

\*Post-doctoral mentoring of R.I. Made (NTU, NRF, 2017-currently). Main topic: Exsolution lamellae in pyroxenes as a record of thermal histories of magmas.

\*Post-doctoral mentoring of L. Cheng (NTU, EOS, 2015-currently). Main topic: Statistical Petrology.

\*Post-doctoral mentoring of D. Ruth (NTU, EOS, 2015-2017). Now researcher at United States Geological Survey (Menlo Park, US).

\*Post-doctoral mentoring of C. Bouvet de Maisonneuve (NTU, EOS,). Now Assist. Prof at ASE (NTU).

#### *Current PhD students*

\*PhD student co-advisee w/ Prof. Tim White (MSE): W. Li (NTU, DES, Start: 2014). PhD topic: ' Time scales and magmatic processes of Merapi volcano, Indonesia'. IGS NTU program.

\*PhD student advisee: Sri Budhi Utami (NTU, ASE, start: 2016). PhD topic: Understanding magma plumbing system and unrest of Kelut volcano, Indonesia.

\*PhD student advisee: Damia Bonet (NTU, ASE, start: 2018). PhD topic: Unravelling the sources of volcanic ash and their use in anticipating major eruptions.

#### *Graduated PhD students*

\*PhD student co-advisee (w/ P. Tapponnier): J. Liqing (NTU, ASE, 2011-2016). PhD topic: ' Discrete Element Modeling of Continental Deformation and Volcanic Spine Extrusion'. Now RF at EOS.

\*PhD student advisee: D. Krimer (NTU, ASE, 2010-2015). PhD topic: ' Geochemistry and Petrology of Gede volcano, Indonesia'. Springer *Best PhD award* in 2016.

\*PhD student advisee: A. Winson (NTU, ASE, 2010-2016). PhD topic: ' Alert level Analysis and eruption forecasts at open vent volcanoes'. Now Researcher at British Geological Survey (UK).

\*Ph.D. student advisee T. Girona (NTU, DES, 2010-2014). PhD topic 'Numerical modeling of permanent degassing volcanoes'. Now Post-doctoral fellow at JPL (US). American Geophysical Union Graduate *Research Award of Natural Hazards* section 2016.

#### **(e) Memberships of Scientific Societies and Commissions of Trust (if applicable)**

\*Associate Editor of Journal of Volcanology and Geothermal Research

\*Associate Editor of 'Geologica Acta'

\*Associate Editor of 'Geochemistry, Geophysics, Geosystems'

\*Associate Editor of 'American Mineralogist'

#### **(f) Awards and fellowships**

2000. Marie Curie Fellow (EU).

2009. Ramon y Cajal Fellow (Spain).

2013- Wager Medal, by the International Association of Volcanology and Chemistry of the Earth's Interior (awarded on 20th July 2013, Kagoshima, Japan). The medal is given every two years to a scientist up to 15 years after Ph.D acquisition, who has made outstanding contributions to volcanology, particularly in the eight-year period prior to the Award. [http://www.iaucei.org/IAUCEI\\_awards/wagner\\_IAUCEI.htm](http://www.iaucei.org/IAUCEI_awards/wagner_IAUCEI.htm)

2016- Fellow of the University Scholars Program (USP) of NTU.

2017- National Research Foundation Investigator (Singapore).