

## Curriculum Vitae

### **Fidel Costa Rodríguez**

Associate Professor  
Asian School of the Environment  
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### **Academic Qualifications**

03/1995-11/1999: Ph.D. in Earth Sciences, Department of Mineralogy, University of Geneva, Switzerland. “The petrology and geochemistry of diverse crustal xenoliths, Tatará-San Pedro Volcanic Complex, Chilean Andes”. Advisors: Prof. Michael Dungan (Department of Mineralogy, University of Geneva) and Prof. Bradley Singer (Department of Geology and Geophysics, University of Wisconsin, USA). Mention: “Tres bien”  
10/1989-12/1994: Bachelor degree in Earth Sciences. University of Barcelona (Spain)

### **Working Experience**

04/2019-present: Designate Interim Director, Earth Observatory of Singapore, Nanyang Technological University, Singapore  
04/2019-present: Provost’s Chair in Earth Sciences, Asian School of the Environment. Nanyang Technological University, Singapore  
08/2018-present: Associate Chair (Faculty) of Asian School of the Environment. Nanyang Technological University, Singapore  
04/2017-present: National Research Foundation Investigator (Singapore)  
01/2017-07/2018: 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  
10/2006-01/2010: Ramon y Cajal Research Fellowship at the CSIC, Institut de Ciències de la Terra 'Jaume Almera', Barcelona, Spain  
12/2002-09/2006: Post-doctoral position at the Institut für Geologie, Mineralogie und Geophysik, Ruhr-Universität, Bochum, Germany  
11/2000-11/2002: Marie-Curie Research Fellowship at the Institut des Sciences de la Terre d'Orléans-CNRS, France  
12/1999-10/2000: Post-doctoral position at the Department of Mineralogy of the University of Geneva, Switzerland

03/1995-11/1999: PhD thesis research funded by the Swiss National Science Foundation  
1994-1995: Employee of the Spanish Geological Survey (ITGE). Detailed mapping and characterization of mineral deposits. Metallogenetic map, sheet 25 (Figueres), 1:200,000

## Teaching Experience

Development of teaching materials

- I developed a new graduate “Foundations of Earth Science”. This was for graduate student without a Bachelor on Earth sciences to learn the basic knowledge about facts, processes, and theories about the earth.
- I developed a new undergraduate course within the University Scholars Program called ‘Planet Earth’. This course includes lectures followed by exercises. A key aspect is that each year the course concentrates in one topic of the Planet Earth (e.g. “Clean water resources’ was the topic in 2013) that the students have to develop and present orally and as a written report.
- I have developed a new graduate course called ‘Volcanology’ together with Asst. Profs B. Taisne and C. Bouvet de Maisonneuve. This involves lectures and exercises, plus a semester long project of the students.
- I have developed and taught a new undergraduate course called "Earth Materials". For second year undergraduates. This included a lot of hand specimens and thin sections of rocks. They students also did a semester long research project about a rock of their choice. They learned thin section preparation, using the SEM, and writing a professional-style paper about the rocks’ constituents and an interpretation.
- I have developed and taught (Sem1-2016-17-18) a new undergraduate course ES3003 “Introduction to Geochemistry”. This involved lectures and a laboratory semester long research project for each student that was focused on a particular analytical instrument.
- I have developed and taught (Sem2-2016-17) new undergraduate course called “Advanced Field Course in Geology” together with K. Sieh. This involved six weeks of field work where the students mapped 3 areas with different rock types and exposures in western USA.

Short courses

- Introduction to volcanic processes and Introduction to event tress in volcanic crises. For the Asian Consortium of Volcanology, Kagoshima (Japan), April 2017.
- Introduction to event tress in volcanic crises. For the Asian Consortium of Volcanology, Kyoto, September 2015.
- Time scales of volcanic processes. MemoVolc European Summer School, September-October 2015, Santorini, Greece.
- Time Scales of Igneous Processes From Diffusion Modeling of Crystal Zoning Patterns. 'Minerals, Inclusions and Volcanic Processes', Mineralogical Society of America Short Course, San Francisco, 13-14 December, 2008.
- Curso de introducción a la vulcanología: Termodinámica y procesos cinéticos. Universitat de Barcelona (Spain). 1-3 June, 2007.
- Geospeedometry and the time scales of geological processes. '2nd Short Course of Diffusion in Geological Materials', 19-22 April. Free Berlin University, Germany, 2006.

- Geospeedometry and the time scales of geological processes. '1st Short Course of Diffusion in Geological Materials'. 22-24 September. University of Basel, Switzerland, 2005.

#### Student supervision on and mentoring

##### Research Fellows

- Post-doctoral mentoring of J. Cabato (NTU, EOS, 2010-2012). Main topic: 'Unraveling the plumbing system of Mayon volcano and its relation to degassing and monitoring data'. Now post-doctoral fellow at University of New Hampshire.
- Post-doctoral mentoring of C. Bouvet de Maisonneuve (Swiss National Foundation project, and NTU, EOS, 2012-2013). Main topic: Understanding seismic and deformation unrest at Rabaul caldera. Now Assistant Professor at ASE (NTU) and EOS PI.
- Post-doctoral mentoring of D. Ruth (NTU, Tier 2 project, 2014-2017). Main topic: Understanding open vent volcanoes: the case of Mayon. Now Research Scientist at United States Geological Survey (at Menlo Park, California).
- Post-doctoral mentoring of H. Albert (NTU, EOS, 2016-2019). Main topic: Volcanic unrest and magmatic processes at Mt Fuji (Japan). Now Research Scientist at the Instituto Geografico Nacional (Spain).
- Post-doctoral mentoring of L. Cheng (NTU, NRF, 2017-present). Main topic: Analysis of crystal zoning patterns as insights into magmatic processes.
- Post-doctoral mentoring of R.I. Made (NTU, NRF, 2017-present). Main topic: Exsolution lamellae in pyroxenes as a record of thermal histories of magmas.

##### PhD Students

- PhD student main advisor (co-advisor: T. White): Weiran Li (NTU, IGS, Start: 2014). PhD topic: 'Time scales and magmatic processes of Merapi volcano, Indonesia'. PhD submitted 24 June 2019. Best paper award at the European Mineralogy and Petrology Meeting (June 2018).
- PhD student main advisor (co-advisor: S. Barbot, USA): Sagar Masuti (NTU, ASE, Start: 2015). PhD topic: 'Understanding mantle rheology through modeling experimental and natural observations. Expected Submission date in October 2019.
- PhD student sole advisor: Sri Budhi Utami (NTU, ASE, start: 2016). PhD topic: Understanding magma plumbing system and unrest of Kelut volcano, Indonesia.
- PhD student co-advisor with Heather Handley (Macquarie University, Australia). Rosa Didonna (Start 2016; PhD submitted 1 June 2019). PhD topic: Magmatic processes at subduction zone volcanoes.
- PhD student sole advisor: Damia Bonet (NTU, NRF, start: 2018). PhD topic: Unravelling the sources of volcanic ash and their use in anticipating major eruptions.
- PhD student main advisor (co-advisor B. Taisne): Charlotte Barrington (NTU, ASE, Start: 2018). PhD topic: Understanding volcanic degassing

##### Graduated PhD students

- PhD student advisor (co-advisor P. Tapponnier): J. Liqing (NTU, ASE, 2011-2016). PhD topic: 'Discrete Element Modeling of Continental Deformation and Volcanic Spine Extrusion'. Now Research Fellow at EOS.
- PhD student sole advisor: D. Krimer (NTU, ASE, 2010-2015). PhD topic: 'Geochemistry and Petrology of Gede volcano, Indonesia'. Springer Best PhD award in 2016. Now at European Commission Research grants agency in Hungary.

- PhD student sole advisor: A. Winson (NTU, ASE, 2010-2016). PhD topic: 'Alert level Analysis and eruption forecasts at open vent volcanoes'. Now researcher at the British Geological Survey (UK).
- PhD student official co-advisor with J. Marti (University of Barcelona, Spain): H. Albert (University of Barcelona 2013-2015) PhD topic: 'Magmatic processes, time scales, and seismic unrest of monogenetic eruptions'. Now Research Fellow at EOS.
- Ph.D. student sole advisor T. Girona (NTU, ASE, 2010-2014). PhD topic 'Numerical modeling of permanent degassing volcanoes'. First student graduated from ASE. American Geophysical Union Graduate Research Award of Natural Hazards section 2016. Now Post-doctoral fellow at NASA-JPL (US).
- Ph.D. student official co-advisor with T. Druitt (Clermont Ferrand, Universite Blaise Pascal, France), Gareth Fabbro (2010-2014). Now Assist. Prof at Fiji.
- Ph.D. student co-advisor: with S. Chakaraborty (Ruhr-Universitat Bochum, Germany), Maren Kahl (2006-2011). Now Assistant professor at University of Iceland.

#### Mentoring of international PhD students (Summer internships at NTU)

- East Asia and Pacific Summer Institutes, PhD student summer internships (funded by NSF, USA and NRF, Singapore): Casey Tierney (Northern Arizona University) June-August 2017.
- East Asia and Pacific Summer Institutes, PhD student summer internships (funded by NSF, USA and NRF, Singapore): Taya Flaherty (Michigan Tech) June-August 2016. *Published one paper as a result of the visit.*
- East Asia and Pacific Summer Institutes, PhD student summer internships (funded by NSF, USA and NRF, Singapore): Kendra Lynn (University of Hawaii) June-August 2015. *Published two papers as a result of the visit.*
- East Asia and Pacific Summer Institutes, PhD student Nathan Andersen (University of Wisconsin, Madison, USA), June-August 2014. *Published one paper as a result of the visit.*
- East Asia and Pacific Summer Institutes, PhD student summer internships (funded by NSF, USA and NRF, Singapore): Allison Rubin (University of California, Davis; USA), June-August 2014. *Published two papers as a result of the visit.*
- East Asia and Pacific Summer Institutes, PhD student summer internship (funded by NSF, USA and NRF, Singapore): Dawn Ruth (University of Buffalo, USA), June-August 2013. *Published one paper as a result of the visit.*

## Research

### Awards

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 PhD acquisition, who has made outstanding contributions to volcanology, particularly in the eight-year period prior to the Award.

[http://www.iavcei.org/IAVCEI\\_awards/wagner\\_IAVCEI.htm](http://www.iavcei.org/IAVCEI_awards/wagner_IAVCEI.htm)

### Citations

Scopus: Total of about 2200 citations, h-index: 26; 68 journal papers and 4 book chapters.

Achievements earning significant publicities for the University

- My research topic and I were featured in a Science article (November 2016). [http://www.sciencemagazinedigital.org/sciencemagazine/18\\_november\\_2016?folio=822&pg=22#pg22](http://www.sciencemagazinedigital.org/sciencemagazine/18_november_2016?folio=822&pg=22#pg22)
- The findings from the paper in Nature (February 2012) were widely reported in news media worldwide including BBC, The Daily Mail, MSNBC, USAtoday, New Scientist, Science News, Le Monde, Le Temps.
- The findings from the paper in Geology (march 2016) were widely reported in the Spanish news media including in 'El Periodico" and TVE.
- The work that I'm doing together with Benoit Taisne and Caroline Bouvet de Maisonneuve (both at EOS, NTU) about the likely impact of volcanic ash in Singapore was highlighted in a Press conference that we did with the Meteorological Service of Singapore. I was quoted in an article of the Straits Times ('Singapore to get a volcanic sensor system') dated May 15th 2014.

#### Appointment as external assessor; membership on visiting committees

- Evaluation of dossier for tenure appointments of Associate Professor for the Universidad Nacional Autonoma de Mexico (Mexico).

#### Service as editor and associate editor for international journals

- 2018-present: Associate Editor of Frontiers in Earth Sciences,
- 2018-present: Associate Editor of Journal of Volcanology and Geothermal Research
- 2016-present: Associate Editor of 'Boletín de la Sociedad Geológica Mexicana'
- 2009-2017: Associate Editor of 'Geologica Acta'
- 2012-2014: Associate Editor of 'Geochemistry, Geophysics, Geosystems' (AGU journal)
- 2013-2017: Associate Editor of 'American Mineralogist' (MSA journal)

#### Service as external examiner for PhD thesis

- PhD examiner of L. Guanxing, NTU, March 2018
- PhD examiner of Jose Fonseca, University of Pavia (Italy). January 2018
- PhD committee chair of Louisa Tsang ', NTU, January 2016
- PhD examiner of Patricia Larrea 'The magmatic evolution of Graciosa and Corvo oceanic Island, Azores archipelago', University of Zaragoza, 14th February 2014
- PhD examiner of Juan Andujar 'Application of experimental petrology to the characterization of phonolitic magma from Tenerife, Canary Island', University of Barcelona, 27th June 2007

#### Invited presentations at scientific meetings or other Universities

- Invited speaker at Institute Physique du Globe de Paris (CNRS, Universite de Paris, France), on May 27th, 2019
- Invited speaker at European Geophysical Union (Vienna, Austria) on April 10th, 2019
- Invited speaker at Institute Sciences de la Terre d'Orleans-CNRS (France) on April 5th, 2019.
- Invited speaker at Yamagata University (Japan) on March 4th, 2019
- Invited speaker at Academia Sinica (Taiwan) on November 2th, 2018
- Invited speaker at Tohoku University (Japan) on May 29th, 2018
- Invited speaker at Merging Geophysical, Petrochronologic, and Modeling Perspectives of Large Silicic Magma Systems. Chapman conference, American Geophysical Union, Chile in January 2018

- Invited speaker at Cambridge University (UK), 1st December 2107
- Invited speaker at University of Wisconsin, February 2017
- AGU Fall meeting, December 2014 (San Francisco, USA), Session: Accelerated and Punctuated: Using Geochronology, Diffusion Modeling, and Numerical Models to Understand Magmatic Processes II'
- Cities on Volcanoes 8, September 2014 (Jogjakarta, Indonesia), Plenary talk: What can geology and volcanology do to help anticipate and mitigate volcanic eruption" KEYNOTE.
- Goldschmidt Conference June 2014 (Sacramento, USA), session "'12a. Crystallization histories vs. eruption histories: what do geospeedometry and geochronology tell us?"
- AGU Fall meeting 2013 (San Francisco, USA), session 'V44B. Innovations and Challenges in Microanalysis and Isotope Mass Spectrometry'.
- AGU Fall meeting 2012 (San Francisco, USA), session 'V041: Space, Time, and Transport in Petrology and Geochemistry'
- AGU Fall meeting 2012 (San Francisco, USA), session 'V007: Combining petrological studies of volcanic systems with geophysical, gas, and other information sources'
- Asia-Oceania Geophysical Society, August 2012 (Singapore), session 'SE85 Time Scales of Magmatic Evolution and Eruption in Intermediate to Silicic Magmatic Systems'
- Goldschmidt Conference June 2012 (Montreal, Canada), session 'SS25-Geochemical evolution of silicic magma systems'. KEYNOTE.
- IUGG-IAVCEI meeting 2011 (Melbourne, Australia), session 'V01 Magma Chambers and Their Dynamics: how big are they, their time scales of formation and longevity, how do we detect them, crystals and their stories'
- EGU meeting 2011 (Vienna, Austria), session, 'GMPV12-Measuring and modelling of volcano eruption dynamics: I. shallow magma storage and ascent'
- AGU Fall meeting 2010 (San Francisco, USA), session 'V24C-Volatiles in Magmas: Breath of the Deep Earth'
- EGU meeting 2009 (Vienna, Austria), session 'GMPV4- Unraveling magma generation and differentiation: Field, analytical, experimental and numerical investigation of magmatic and volcanic systems'
- AGU Fall meeting 2008 (San Francisco, USA), session 'V43J- Thermobarometry and implications for magma storage and transport'
- \*AGU Fall meeting 2008 (San Francisco, USA), session 'MR21C- Diffusion and related transport processes in Geomaterials'
- AGU Fall meeting 2006 (San Francisco, USA), session 'V53E- From crystals to plutons: crystal-scale records of magmatic processes'
- Goldschmidt Conference 2005 (Moscow, Idaho, USA), session 'SS25- Geochemical evolution of silicic magma systems'
- AGU Fall meeting 2004 (San Francisco, USA), session 'V23C-Quantitative Constraints on Rates of Reaction, Deformation, and Mass Transfer: Crustal Processes'.
- AGU Fall meeting 2004 (San Francisco, USA), session 'V23D- Arenal Volcano: Magma Genesis, Volcanological Processes, and Societal Responses'

Session chairman/(special) session organizer in conferences

- Theme coordinator (06: Magmas and Volcanoes) of 15 sessions at the Goldschmidt Geochemistry Conference 2019 August (Barcelona, Spain).
- Co-convenor: Session SE18: Linking Numerical, Analytical and Experimental Modelling with Remote and Local Volcano Monitoring Data, Asia Oceania Geosciences Society 2019, Singapore
- Co-organizer: SessionS-VC39, Pre-eruptive magmatic processes: petrologic analyses, experimental simulations and dynamics modeling at the Japanese Geological Union, Chiba, May 2018
- Co-organizer: Chapman Conference (AGU) Merging Geophysical, Petrochronologic, and Modeling Perspectives of Large Silicic Magma Systems. Chile, January 2018
- Co-convenor: Session V13F: Crystal Records of the Timescales and Thermal Evolution of Plutonic, Hydrothermal, and Volcanic System, American Geophysical Union Fall Meeting, 2016 (San Francisco, USA)
- Co-convenor of Symposium 8e: Crystallization Histories and Degassing: From Melt Inclusions to Plumbing Systems. 26th Annual Goldschmidt Conference, 2016
- Co-convenor: Session V12B. Petrologic Insights on Magmatic Processes Controlling Shifts in Eruption Style, American Geophysical Union Fall Meeting, 2012 (San Francisco, USA)
- Co-convenor: Session SE105-107 Magmatic Processes and Possible Links to Volcano Monitoring Data, Asia Oceania Geosciences Society 2012, Singapore.
- Co-convenor: Session SE52 Volatiles in Volcanic Processes, Asia Oceania Geosciences Society 2011 (Taipei, Taiwan)
- Co-convenor: Session Time-scales of Magmatic Processes and Volcanological Implications, IUGG-IAVCEI Conference, 2011 (Melbourne, Australia)
- Co-convenor: Symposium '5h Kinetics of Metamorphic and Igneous Processes', 19th Annual Goldschmidt Conference, 2009 (Davos, Switzerland)
- Co-convenor: Symposium "V38: Minerals, Inclusions and Volcanic Processes: Crystal-scale records of magma dynamics", American Geophysical Union Fall Meeting, 2008 (San Francisco, USA)
- Co-organizer: Geological Society of America Field Forum 'Assessing the state of our knowledge of continental arc volcanism: The Tataro-San Pedro complex, 36 oS, Andean Southern Volcanic Zone' Chile, 2007
- Co-convenor: Symposium 'Links between radioactive isotopes and diffusion modelling to constrain the timescales of magmatic processes' 17th Annual Goldschmidt Conference, 2007 (Koln, Germany)
- Co-convenor: Symposium 'Will the real phenocrysts please stand up?', American Geophysical Union Fall Meeting, 2005, (San Francisco, USA)

#### External research funding

##### Pending

- Tier 3: Healthy air: Reaching beyond clean air Source/Sink relationships of bioaerosols in indoor and outdoor environments. Principal Investigator: Stephan Schuster, Collaborator on volcanic environments.
- CNRS-NTU collaborative grant: Understanding the role of halogens in volcanic systems. Principal Investigator; Co-PI from CNRS, Bruno Scaillet, CNRS, Orleans, France

##### Awarded

2019-2021: Singapore-China collaborative grant: Evaluation of hazards from Chaibaixan

Volcano, 500 k\$. Collaborator  
 2017-2018: Eos project- Geochemical equipment. 1.1 M\$. Principal Investigator  
 2017-2022: NRF Investigatorship. funded by NRF Singapore. “Lifetimes of magma reservoirs”: 2.73 M\$, Principal Investigator  
 2017-2019: NRF-JSPS Joint Research Proposal” Assessing volcano hazards to megacities: Tokyo and Singapore”. 53 k\$, Principal Investigator  
 2015-2017: Tier-2 Project funded by MoE Singapore. Research proposal “Causes, Processes, and Forecasts of Eruptions of Open Vent Volcanoes in SE Asia”, \$559,730. Principal Investigator  
 2013-2014: Wovodat project funded through EOS-ERC grant, 95 k\$. Principal Investigator  
 2013-2014: Crystal zoning project funded through EOS-ERC grant, 20 k\$. Principal Investigator  
 2013-2014: Open vent project funded through EOS-ERC grant, 20 k\$. Principal Investigator  
 2012-2013: MERLION grant of collaboration with France research institutes (Clermont Ferrand, CNRS, France). Principal Investigator for the Singapore side. 24 000 euro  
 2011-2013: ‘Rabaul project’ funded through EOS-ERC grant 79 k\$. Principal Investigator  
 2010-2014: ‘Magma Plumbing system’ project, funded through EOS-ERC grant 929 k\$. Principal Investigator  
 2009-2011: Ministerio de Educacion y Ciencia de España ‘Análisis de la peligrosidad volcanica asociada a la actividad explosiva del Teide’. 150000 euro. Co-Principal Investigator  
 2008-2009: Ministerio de Educacion y Ciencia de España ‘Los tiempos de residencia de los magmas antes de la erupción: contribución a la cunatificación del riesgo volcánico en Tenerife’ 12000 euro. Principal Investigator  
 2006-2009: Ministerio de Educacion y Ciencia de España ' Riesgos geológicos en Tenerife: analisis de susceptibilidad y peligrosidad' 60000 euro. Co-Principal Investigator  
 2006-2008: Ministerio de Educacion y Ciencia de España ' Determinación experimental y modelización cinética de las variables intensivas pre-eruptivas y tiempos de residencia de los magmas del Volcán Teide' 15000 euro. Principal Investigator

## **Service and Outreach**

### Other services to the University

2019: Review Panel Member of NRF and NRFi applications, NTU  
 2018: Associate Chair (Faculty) of the Asian School of the Environment  
 2018: Review Panel Member of NRF and NRFi applications, NTU  
 2018: Review Panel Member of China-Singapore NRF projects  
 2017-2018: Acting Chair of the Asian School of the Environment  
 2016-present: Captain of EOS/ASE/SCELSSE running team (2nd place in NTU run in 2018)  
 2016: Member of the NTU Senate (Faculty Development committee)  
 2016: Member of Review panel of Physics EP5 research proposals, of NTU  
 2016-2017: Associate Chair (Faculty) of the Asian School of the Environment  
 2015: Fellow of the University Scholars Program (HSS, NTU)  
 2012-2015: Chair of committee for Graduate studies (DES)

### Service to professional bodies

2018: Member of International Scientific Review Panel for the EUROVOLC program of European Union  
<https://eurovolc.eu/>



- 2018: Member of Evaluation Panel for European Research Council “Consolidator Grants”. Earth System Science (PE10)  
<https://erc.europa.eu/document-category/evaluation-panels>
- 2016: Core founder of the “Asian Chapter” of the Marie Curie Association
- 2015-present: Steering committee member of the Global Volcano Model  
<http://globalvolcanomodel.org/>
- 2015: Core founder of the Asian Consortium of Volcanology  
<http://acv.html.xdomain.jp/>
- 2013- present: Leader of the WOVodat project  
[www.wovodat.org](http://www.wovodat.org)
- 2011-2012: American Geophysical Union: Executive Committee of the Volcanology, Geochemistry, Petrology section. Chair of the Western Pacific Meeting

#### Outreach

- July 2010: Participation in activities of 'What's in a rock' within the frame of Young Scientist Challenge of Singapore
- July 2011: Participation in activities of ‘Forecasting volcanic eruptions’ within the frame of Young Scientist Challenge of Singapore
- 3-7 June 2012: Co-organiser of field trip to Merapi volcano with geography teachers from Singapore and NIE
- Co-producer of a short film “Knowledge capsule” about the work of volcano petrologists to understand the driving forces behind eruptions  
<http://vimeo.com/58225787>.
- Collaborator on an iPad interactive book about Merapi volcano with artist in residence in EOS, I. Kerlow.
- 2016: Marie Curie Association (Asian Chapter). Seminar on “Research Experience in SE Asia and why would you like to apply for Maire Curie Fellowships”
- 2017: German School (Singapore)– “Las Lilas” seminar on “Volcanoes of SE Asia”

#### Courses taught

- 2010/2011: Summer semester 2011; Teaching a new graduate course (3 AUs) ES 7005, ‘Foundations of Earth Sciences’
- 2011/2012: Summer semester 2012; Teaching of graduate course (3 AUs) ES 7005, ‘Foundations of Earth Sciences’
- 2013/2014: Winter semester 2013. Teaching a new undergraduate course SP004, Planet Earth (3 AUs), within the University Scholars Program. Taught two separate classes, equivalent to teaching two semesters at once.
- 2014/2015: Winter semester 2014. Teaching undergraduate course SP004 Planet Earth (3 AUs), within the University Scholars Program. Taught two separate classes, equivalent to teaching two semesters at once.
- 2014/2015: Summer semester 2015. Co-Teaching of a new graduate course Volcanology (3 AUs)
- 2015/2016: Summer semester 2016. Teaching of new undergraduate course Earth Materials (4 AUs)
- 2016/2017: Winter semester 2016. Co-teaching of undergraduate course “Introduction to Geochemistry” (3 AUs)
- 2016/2017: Winter semester 2016. Independent Studies class for graduate students on thermodynamics and kinetics of magmatic systems (3 AUs)
- 2016/2017: Summer semester 2017. Co-teaching of new undergraduate course “Advanced Field Geology”. (4 AUs)

2017/2018: Winter semester 2017. Co-teaching of undergraduate course ES3003 “Introduction to Geochemistry” (3 AUs)  
2018/2019: Winter semester 2018. Coordinator and main instructor of undergraduate course ES3003 “Introduction to Geochemistry” (3 AUs)  
2018/2019: Winter semester 2018. Lead “Independent Studies” class for graduate students on volcano monitoring tools (3 AUs)  
2018/2019: Summer semester 2019. Co-teaching Introduction to Volcanology (3 AUs)

### **Publications**

65 papers and 4 book chapters in Scopus. Total citation (Scopus) about 2200; h-index = 26

\* PhD or RA or RF that I have supervised (since 2013)

# corresponding author when not the first author

### In prep

Costa, F. Clocks in Rocks. *Annual Reviews of Earth and Planetary Sciences* (invited review paper to be submitted by July 2019).

Costa, F et al. Timescales of magmatic processes. *Nature Reviews of Earth and the Environment* (invited review paper to be submitted by September 2019).

### In review

\*Li, W., and Costa, F. (in review) A new thermodynamic model of F-Cl-OH partitioning between apatite and melt for constraining magmatic volatile budgets. *Geochimica Cosmochimica Acta*

Shea, T., Hammer, J., Hellebrand, E., Mourey, A., Costa, F., First, E., Lynn, K., Melnik, O. (in review) Phosphorus and aluminium zoning in olivine: contrasting behaviour of two nominally incompatible trace elements. *Contributions to Mineralogy and Petrology*.

### In press

**Costa, F.**, et al. (in press). WOVOdat platform - The global volcano unrest database as a resource to improve eruption forecasts. Global Assessment Report on Disaster Risk Reduction, UNISRD.

### 2019

\*Albert, H., **Costa, F.**, DiMuro, A., et al (2019). Magma interactions, crystal mush formation, timescales, and unrest during caldera collapse and lateral eruption at ocean island basaltic volcanoes (Piton de la Fournaise, La Réunion). *Earth and Planetary Science Letters* 515: 187-199.

**Costa, F.**, Widiwijayanti C, Humaida, H. (2019) Data from Past Eruptions Could Reduce Future Volcano Hazards. *Eos*, 100, <https://doi.org/10.1029/2019EO118941>.

### 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, K., Shea, T., 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., Corte's 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*. 19. <https://doi.org/10.1002/2017GC007346>

## 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.
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\* Indicates results of PhD student which I have mentored

## Abstracts

Abstracts from conferences and meetings

### 2017

- Albert, H.; Costa, F.; Herrin, J.; Di Muro, A.; Métrich, N.: Timescales of the 2007 caldera forming eruption of Piton de la Fournaise (La Réunion Island) recorded in olivine crystals and their melt inclusions. IAVCEI, Portland, Oregon, U.S.A, 2017.
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- Barrington, C., Allard, P., Fernandez, D., Barairo, M.C., Costa, F., Taisne, B (2107) First volcanic gas compositions obtained from airborne MultiGAS at Mayon volcano, Philippines. 2nd Asian Consortium of Volcanology, Kagoshima (Japan).
- Cheng, L., Fidel Costa (2017) Quantification of multiple plagioclase crystal populations using fractal analysis of mineral and glass inclusions. IAVCEI 2017 Scientific Assembly. Portland, Oregon, U.S.A.
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- Didonna, R., Fidel Costa, Heather Katherine Handley, Simon Turner, Jenni Barclay (2017) A new view of mafic silicic magma interactions at Soufrière Hills Volcano, Montserrat. IAVCEI, Portland, Oregon, U.S.A.
- Druitt, T., Maxime Mercier, Taya Flaherty, Etienne Deloule, Juan Andujar, Anita Cadoux, Fidel Costa, Bruno Scaillet (2017) Plumbing system architecture and magma ascent timescales at Santorini caldera. IAVCEI, Portland, Oregon, U.S.A.
- Flaherty, T., Tim Druitt, Gareth Fabbro, Fidel Costa, Katie Preece, Chad Deering (2017) Timescales of final magma chamber assembly prior to the Minoan eruption of Santorini from Fe-Mg diffusion chronometry in pyroxenes. IAVCEI, Portland, Oregon, U.S.A.
- Larrea, P.; Albert, H.; Costa, F.; Widom, E.; Siebe, C.: Magmatic processes of Parícutin volcano: rapid fractionation with no crustal assimilation? IAVCEI, Portland, Oregon, U.S.A, 2017.
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- Reid, M., Fidel Costa (2017) Insights Into Intracontinental Basaltic Magma Sources, Transport, and Storage. IAVCEI, Portland, Oregon, U.S.A.
- Ruth, D., Costa, F (2017) Unraveling processes and time scales recorded by multiply zoned plagioclase crystals. IAVCEI 2017 Scientific Assembly.
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- Utami, S.B., Costa, F., Widiwijayanti, C., Humaida, H. 2017. The magmatic plumbing system and pre-eruptive conditions for the 1990 Kelud eruption and its relation to seismic and lake chemistry data. Paper presented to the Asia-Oceania Geosciences Society Annual Meeting, Singapore, 6-11 August 2017.
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