

# VONA Alessandro

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## Academic career and Education

- 2020-Present Associate Professor of Petrology and Petrography at Dept of Sciences of Roma Tre University (Italy)
- 2017-2020 Research Associate (RTD/B) in Petrology and Petrography at Dept of Sciences of Roma Tre University (Italy)
- 2011-2017 Postdoct. position at Dept of Sciences of Roma Tre University (Italy)
- 2007-2011 PhD in Environmental and Resource Geology, Roma Tre University (Italy)
- 2005 M.Sc. *cum laude* in Geological Sciences at Roma Tre University (Italy)

## Main Scientific interests

- Experimental Volcanology and Petrology
- Magma physical and chemical properties
- Magma multiphase rheology
- Magma crystallization and degassing
- Thermal evolution and timescales of volcanic processes.
- Reconstruction of eruptive sequences and interpretation of eruptive dynamics
- Analytical methods applied to volcanology and petrology (SEM, EPMA, Raman spectroscopy, viscosimetry, calorimetry, dilatometry)

## Field Experience

Field activity has been carried on at several volcanoes worldwide

- Italy: Vesuvius, Campi Flegrei, Etna, Stromboli, Colli Albani
- Iceland: Askja, Krafla
- Costa Rica: Arenal, Turrialba
- Japan: Miyakejima, Fuji
- Chile: Llaima

## Research and Teaching fellowships

- July 2019, Erasmus+ Visiting Professor at Technische Universitat Clausthal (Germany)

## Teaching

- 2010-2016 Magmatology (assistant), Experimental Mineralogy (assistant), Volcanology (assistant), Introduction to Geology (assistant), Geological Sciences, Department of Science, Roma Tre University
- 2013-present Petrography (Optical Petrography) (72 hours/year 3CFU/year), Geological Sciences, Department of Science, Roma Tre University
- 2015-present Experimental Volcanology (Laboratory) (12 hours/year 1CFU/year), Geological Sciences, Department of Science, Roma Tre University
- 2016-present Volcanology Field Trip (48 hours/year 2CFU/year), Geological Sciences, Department of Science, Roma Tre University

- 2017-present Introduction to Volcanology (48 hours/year 6CFU/year), Geological Sciences, Department of Science, Roma Tre University
- 2021-present Petrography (48 hours/year 6CFU/year), Natural Sciences, Department of Science, Roma Tre University

Supervisor of 10 bachelor thesis and 3 Ph.D. level theses in the Geological Sciences. Co-supervisor for 6 bachelor, 6 master and 6 Ph.D. level theses in the Geological Sciences.

### **Academic responsibilities**

2017 – present, Board of PhD course in Earth Sciences, Roma Tre University

2017 - present, Member of Student Guidance Commission, Roma Tre University

### **Achievements**

- 2018, National Scientific Qualification of the Italian Ministry of Education, University, and Research (MIUR) as Associate Professor - sector 04/A1

### **Participation to funded research projects**

- 2007-2010 Progetto FIRB Air Plane 2007-2010 “Piattaforma di ricerca multidisciplinare su terremoti e vulcani” (protocollo RBPR05B2ZJ) – Coordinator Prof. F. Barberi.
- 2008-2010 Project Cofin/PRIN 2007 (2008-2010). “Physical and chemical properties of volatile-bearing silicate melts: experiments, modeling and application to volcanic degassing Principal investigator: Dott. C. Romano.
- 2011-2013 Project PRIN 2009 (2011-2013) “Caratteri tettono-magmatici di margini di placca divergenti”. Coordinator: Dott. V. Acocella.
- 2012-2013 Project INGV-DPC 2012-2013. Subproject V1 Valutazione della pericolosità vulcanica in termini probabilistici. Research Unit UR6 Principal investigator Dott. C. Romano.
- 2013-2014 Project INGV-DPC 2013-2014. Subproject V1 Valutazione della pericolosità vulcanica in termini probabilistici. Research Unit UR6 Principal investigator Dott. C. Romano.
- 2015-2016 Project PRIN 2010-11 (2010TT22SC\_003) “Genesi e differenziazione dei magmi in relazione all’ambiente geodinamico ed alla caratteristiche petrologiche e geochemiche delle loro sorgenti: implicazioni per l’evoluzione del sistema convergente Africa-Europa”. Coordinator: Prof. Sandro Conticelli.
- 2016-2017 Project Regione Lazio “SMART ENVIRONMENTS (TASK 1.3.4 Risparmio Energetico e sostenibilità urbana). Principal investigator Prof. Guido Giordano
- 2018 NSF Collaborative Research: Exploring the Magmatic, Crustal, and Conduit Conditions Required for Mafic, Plinian Volcanism (Grant #1831213). Principal Investigator Prof. Brittany Brand.

### **Appointments at Scientific Societies**

- 2021 – present, Secretary and Member of the Board of Directors, Associazione Italiana di Vulcanologia (AIV)

### **Membership at Scientific Societies**

- IAVCEI - Int. Assoc. Volcanology and Geochemistry of the Earth Interiors

- AIV - Associazione Italiana di Vulcanologia
- SIMP - Società Italiana di Mineralogia e Petrografia

### **Editorial Appointments**

- 2020 - present, *Periodico di Mineralogia* (Petrology Section Editor)
- 2018 – present, *Frontiers in Earth Science*, section Volcanology (Review Editor)

Journal reviews for: *Earth Planetary Science Letters*, *Bulletin of Volcanology*, *Journal of Volcanology and Geothermal Research*, *Chemical Geology*, *Scientific Reports*, *Journal of Non-Crystalline Solids*, *Annals of Geophysics*, *Journal of Disaster Research*, *Measurements*, *AGU Geophysical Monographs*.

### **Steering and scientific committees of national and international congresses**

- *3a Conferenza A. Rittmann Giovani Ricercatori* (2019, Roma, Italy)
- *5a Conferenza A. Rittmann* (2022, Catania, Italy)

### **Convener at national and international Congresses**

- 2017 SIMP-SGI-AIV-SoGel Conference, Pisa, Italy. Session S27: "Magma chamber and eruptive dynamics resolved by natural and experimental evidences".
- 2018 IAVCEI Cities on Volcanoes 10, Napoli, Italy. Session S1.38 "The contribution of experimental and numerical investigations of eruptive processes for improving hazard assessment at volcanoes"
- 2019 IUGG Conferencs, Montreal, Caanada. Session V19: "Experimental Volcanology Approach to Investigate Magma Generation, Ascent and Eruption".
- 2019 SIMP-SGI-SoGel Conference, Parma, Italy. Session: "New developments and challenges in experimental volcanology".

### **Invited talks at International Congresses and Workshops**

- Vona A., Romano C., Giordano D., Russell J.K. Combined effects of crystals and bubbles on the rheology of trachytic magmas from Monte Nuovo (Campi Flegrei, Italy) – AGU 2013 fall meeting, San Francisco, U.S.A.
- Vona A., Di Piazza A., Nicotra E., Romano C., Viccaro M., Giordano G. The complex rheology of megacryst-rich magmas. - IAVCEI 2017 Scientific Assembly, Portland, U.S.A.

### **Field Leader at International Congresses**

- 2018 IAVCEI Cities on volcanoes 10 (Phleagrean Fields)

### **Publications**

Author of 39 scientific notes on peer-reviewed international Journals and more than 70 congress abstracts

Citation data (as of 16 June 2023)

H index Scopus 16, total citations 807

H index Google Scholar 16, total citations 981

*Articles published or in press*

1. DI FIORE F., **VONA A.**, SCARANI A., GIORDANO G., ROMANO C., GIORDANO D., CARICCHI L., MARTIN LORENZO A., RODRIGUEZ F., COLDWELL B., HERNANDEZ P., PANKHURST M. (2023). Experimental Constraints on the Rheology of Lavas From 2021 Cumbre Vieja Eruption (La Palma, Spain). *Geophysical Research Letters* 50, e2022GL100970. <https://doi.org/10.1029/2022GL100970>
2. MOSCHINI P., MOLLO S., PONTESILLI A., NAZZARI M., PETRONE C.M., FANARA S., **VONA A.**, GAETA M., ROMANO C., SCARLATO P. (2023) A review of plagioclase growth rate and compositional evolution in mafic alkaline magmas: Guidelines for thermometry, hygrometry, and timescales of magma dynamics at Stromboli and Mt. Etna. *Earth-Science Reviews* 240, 104399. <https://doi.org/10.1016/j.earscirev.2023.104399>
3. DI FIORE F., **VONA A.**, COSTA A., MOLLO S., ROMANO C. (2022) Quantifying the influence of cooling and shear rate on the disequilibrium rheology of a trachybasaltic melt from Mt. Etna. *Earth and Planetary Science Letters* 594, 117725. <https://doi.org/10.1016/j.epsl.2022.117725>
4. SCARANI A., ZANDONÀ A., DI FIORE F., VALDIVIA P., PUTRA R., MIYAJIMA N., BORNHÖFT H., **VONA A.**, DEUBENER J., ROMANO C., DI GENOVA, D. (2022) A chemical threshold controls nanocrystallization and degassing behaviour in basalt magmas. *Communications Earth Environment*. 3, 284. <https://doi.org/10.1038/s43247-022-00615-2>
5. FRONTONI A., COSTA A., **VONA A.**, ROMANO C. (2022). A comprehensive database of crystal-bearing magmas for the calibration of a rheological model. *Scientific Data* 9, 247. <https://doi.org/10.1038/s41597-022-01363-w>
6. BONECHI B., GAETA M., PERINELLI C., MOSCHINI P., ROMANO C., **VONA A.** (2022). Micro-Raman water calibration in ultrapotassic silicate glasses: Application to phono-tephrites and K-foidites of Colli Albani Volcanic District (Central Italy). *Chemical Geology* 597, 120816. <https://doi.org/10.1016/j.chemgeo.2022.120816>
7. SCARANI A., **VONA A.**, DI GENOVA D., AL-MUKADAM R., ROMANO C., DEUBENER J. (2022). Determination of cooling rates of glasses over four orders of magnitude. *Contributions to Mineralogy and Petrology*. 177, 35. <https://doi.org/10.1007/s00410-022-01899-5>
8. SCHITO A., PENSA A., ROMANO C., CORRADO G., **VONA A.**, TROLESE M., MORGAVI D., GIORDANO G. (2022) Calibrating carbonization temperatures of wood fragments embedded within Pyroclastic Density Currents through Raman Spectroscopy. *Minerals* 12, 203.
9. DI FIORE F., MOLLO S., **VONA A.**, MACDONALD A., UBIDE T., NAZZARI M., ROMANO C., SCARLATO P. (2021) Kinetic partitioning of major and trace cations between clinopyroxene and phonotephritic melt under convective stirring conditions: New insights into clinopyroxene sector zoning and concentric zoning. *Chemical Geology* 584, 120531.
10. DI FIORE F., **VONA A.**, KOLZENBURG S., MOLLO S., ROMANO C. (2021) An extended rheological map of pāhoehoe - 'a'ā transition. *Journal of Geophysical Research: Solid Earth* 126, e2021JB022035.
11. COPPOLA M., CORREALE A., BARBERIO M.D., BILLI A., CAVALLO A., FONDRIEST M., NAZZARI M., PAONITA A., ROMANO C., STAGNO V., VITI C., **VONA A.** (2021). Meso-to nano-scale evidence of fluid-assisted co-seismic slip along the normal Mt. Morrone Fault, Italy: Implications for earthquake hydrogeochemical precursors. *Earth and Planetary Science Letters* 568, 117010.

12. SICOLA S., **VONA A.**, RYAN A.G., RUSSELL J.K., ROMANO C. (2021). The effect of pores (fluid-filled vs. drained) on magma rheology. *Chemical Geology*, 569, 120147.
13. GIORDANO D., **VONA A.**, GONZALEZ-GARCIA D., ALLABAR A., KOLZENBURG S., POLO L., JANASI VALDECIR DE ASSIS, BEHRENS H., DE CAMPOS C., DE CRISTOFARO S., GUIMARAES L.F., NOWAK M, MÜLLER D, GÜNTHER A., MASOTTA M., ROVERATO M., ROMANO C, DINGWELL D.B. (2021). Viscosity of Palmas-type magmas of the Paraná Magmatic Province (Rio Grande do Sul State, Brazil): implications for high-temperature silicic volcanism. *Chemical Geology*, 560, 119981.
14. PETRONE P., GIORDANO G., VEZZOLI E., PENSA A., CASTALDO G., GRAZIANO V., SIRANO F., CAPASSO E., QUAREMBA G., **VONA A.**, MIANO M.G., SAVINO S., NIOLA M. (2020). Preservation of Neurons in an AD 79 Vitrified Human Brain. *PloS one*, 15(10), e0240017.
15. **VONA A.**, ROMANO C., GIORDANO G., SULPIZIO R. (2020). Linking magma texture, rheology and eruptive style during the 472 CE Pollena Subplinian eruption (Somma-Vesuvius). *Lithos* 370-371, 105658.
16. ROMANO C., **VONA A.**, CAMPAGNOLA S., GIORDANO G., ARIENZO I., ISAIA R. (2020) Modelling and physico-chemical constraints to the 4.5 ka Agnano-Monte Spina Plinian eruption (Campi Flegrei, Italy). *Chemical Geology* 532, 119301.
17. DI PIAZZA A., **VONA A.**, MOLLO S., DE ASTIS G., SOTO G.J., ROMANO C. (2019) Unsteady magma discharge during the "El Retiro" subplinian eruption (Turrialba volcano, Costa Rica): Insights from textural and petrological analyses. *J. Volcanol. Geotherm. Res.* 371, 101-115.
18. RYAN A.G., RUSSELL J.K., HEAP M.J., KOLZENBURG S., **VONA A.**, KUSHNIR A.R.L. (2019) Strain-dependent rheology of silicate melt foams: importance for outgassing of silicic lavas. *J. Geophys. Res. Solid Earth* 124. doi:10.1029/2019jb018099
19. RYAN A.G., KOLZENBURG S., **VONA A.**, HEAP M.J., RUSSELL J.K., BADGER S. (2019) A proxy for magmatic foams: FOAMGLAS®, a closed-cell glass insulation. *J. Non-Crystalline Solids* X 1, 100001. doi: 10.1016/j.nocx.2018.
20. GIORDANO G., ZANELLA E., TROLESE M., BAFFIONI C., **VONA A.**, CARICCHI C., DE BENEDETTI A.A., CORRADO S., ROMANO C., SULPIZIO R., GESHI N. (2018) Thermal interactions of the 79AD Vesuvius pyroclastic flow deposits at Villa dei Papiri (Herculaneum). *Earth and Planetary Science Letters* 490, 180-192.
21. ANZOLINI C., PRENCIPE M., ALVARO M., ROMANO C., **VONA A.**, LORENZON S., SMITH E.M., NESTOLA F. (2018) Depth of formation of super-deep diamonds: Raman barometry of CaSiO<sub>3</sub>-walsstromite inclusions. *American Mineralogist* 103, 69-74. doi: 10.2138/am-2018-6184
22. DI GENOVA D., SICOLA S., ROMANO C., **VONA A.**, FANARA S. Effect of iron and nanolites on Raman spectra of volcanic glasses: A reassessment of existing strategies to estimate the water content. *Chemical Geology* 475, 76-86.
23. PISTOLESI M., BERTAGNINI A., DI ROBERTO A., ISAIA R., **VONA A.**, CIONI R., GIORDANO G. (2017) The Baia–Fondi di Baia eruption at Campi Flegrei: stratigraphy and dynamics of a multi-stage caldera reactivation event. *Bulletin of Volcanology* 79, 67. doi: 10.1007/s00445-017-1149-1
24. DI PIAZZA A., DEL BELLO E., MOLLO S., **VONA A.**, ALVARADO G.E., MASOTTA M. (2017) Like a cannonball: origin of dense spherical basaltic ejecta. *Bulletin of Volcanology* 79, 37. doi: 10.1007/s00445-017-1121-0
25. **VONA A.**, DI PIAZZA A., NICOTRA E., ROMANO C., VICCARO M., GIORDANO G. (2017) The complex rheology of megacryst-rich magmas: the case of the mugearitic "cicirara"

- lavas of Mt. Etna volcano. *Chemical Geology* 458, 48-67. doi: 10.1016/j.chemgeo.2017.03.029
26. **VONA A.**, RYAN, A., RUSSELL J. K., ROMANO C. (2016) Models for viscosity and shear localization in bubble-rich magmas. *Earth and Planetary Science Letters* 449, 26-38. doi:10.1016/j.epsl.2016.05.029
  27. CAMPAGNOLA S., ROMANO C., MASTIN L.G., **VONA A.** (2016) Confort 15 model of conduit dynamics: applications to Pantelleria Green Tuff and Etna 122 BC eruptions. *Contributions to Mineralogy and Petrology* 171, 60. doi: 10.1007/s00410-016-1265-5
  28. DI GENOVA D., KOLZENBURG S., **VONA A.**, CHEVREL M.O., HESS K.-U., NEUVILLE D.R., ERTEL-INGRISCH W., ROMANO C., DINGWELL D.B. (2016) Raman spectra of Martian glass analogues: a tool to approximate their chemical composition. *Journal of Geophysical Research – Planets* 121, doi:10.1002/2016JE005010
  29. CAMPAGNOLA S., **VONA A.**, ROMANO C., GIORDANO G. (2016) Crystallization kinetics and rheology of leucite-bearing tephriphonolite magmas from the Colli Albani volcano (Italy). *Chemical Geology* 424, 12-29, doi: 10.1016/j.chemgeo.2016.01.012
  30. SPERANZA G., **VONA A.**, VINCIGUERRA S., ROMANO C. (2016) Relating natural heterogeneities and rheological properties of rocksalt: new insights from microstructural observations and petrophysical parameters on Messinian halites from the Italian Peninsula. *Tectonophysics* 666, 103-120, doi: 10.1016/j.tecto.2015.10.018
  31. **VONA A.**, GIORDANO G., DE BENEDETTI A.A., D'AMBROSIO R., ROMANO C., MANGA M. (2015) Ascent velocity and dynamics of the Fiumicino mud eruption, Rome, Italy. *Geophysical Research Letters* 42, doi: 10.1002/2015GL064571
  32. CARICCHI C., **VONA A.**, CORRADO S., GIORDANO G., ROMANO C. (2014) 79 AD Vesuvius PDC deposits' temperatures inferred from optical analysis on woods charred in-situ in the Villa dei Papiri at Herculaneum (Italy). *Journal of Volcanology and Geothermal Research* 289, 14-25, doi: 10.1016/j.jvolgeores.2014.10.016
  33. DE PADOVA P., OTTAVIANI C., QUARESIMA C., OLIVIERI B., IMPERATORI P., SALOMON E., ANGOT T., QUAGLIANO L., ROMANO C., **VONA A.**, MUNIZ-MIRANDA M., GENEROSI A., PACI B., LE LAY G. (2014) 24 h Stability of Thick Multilayer Silicene in Air. *2D Materials* 1, 021003, doi:10.1088/2053-1583/1/2/021003
  34. MOLLO S., **VONA A.** (2014) The geochemical evolution of clinopyroxene in the Roman Province: A window on decarbonation from wall-rocks to magma. *Lithos* 192-195, 1-7, doi: 10.1016/j.lithos.2014.01.009
  35. **VONA A.**, ROMANO C. (2013) The effects of undercooling and deformation rates on the crystallization kinetics of Stromboli and Etna basalts. *Contributions to Mineralogy and Petrology* 166, 491-506, doi: 10.1007/s00410-013-0887-0
  36. **VONA A.**, ROMANO C., GIORDANO D., RUSSELL J.K. (2013) The Multiphase Rheology of magmas from Monte Nuovo (Campi Flegrei, Italy). *Chemical Geology* 346, 213-227, doi: 10.1016/j.chemgeo.2012.10.005
  37. DI GENOVA D., ROMANO C., HESS K.-U., **VONA A.**, POE B.T., GIORDANO D., DINGWELL D.B., BEHRENS H (2013) The rheology of peralkaline rhyolites from Pantelleria Island. *Journal of Volcanology and Geothermal Research* 249, 201–216, doi: 10.1016/j.jvolgeores.2012.10.017
  38. **VONA A.**, ROMANO C., DINGWELL D.B., GIORDANO D. (2011) The rheology of crystal-bearing basaltic magmas from Stromboli and Etna. *Geochimica et Cosmochimica Acta* 75, 3214–3236, doi: 10.1016/j.gca.2011.03.031