# Danilo Di Genova

National Research Council (CNR), Institute of Environmental Geology and Geoengineering (IGAG), Italy
Honorary staff member of the Bayerisches Geoinstitut, University of Bayreuth, Germany
Honorary staff member of the School of Earth Sciences, University of Bristol, UK
danilo.digenova@cnr.it; danilo.di-genova@uni-bayreuth.de; danilo.digenova@bristol.ac.uk
Language skills: Italian (Mother tongue), English (fluent), German (basic)
www.danilodigenova.org

## EDUCATION AND PROFESSIONAL APPOINTMENTS

| | |
|---|---|
| 01.09.2022 – ongoing | Senior Researcher. Institute of Environmental Geology and Geoengineering (IGAG-CNR), Rome, Italy. |
| 15.12.2021 – 31.08.22 | Researcher. National Institute of Geophysics and Volcanology (INGV), Rome, Italy. |
| 01.03.2020 – ongoing | Akademischer Rat (until 14.12.2021). Currently honorary staff member. Bayerisches Geoinstitut, Universität Bayreuth, Germany. |
| 01.07.2018 – 29.02.2020 | Research Associate. Institute of Non-Metallic Materials, Clausthal University of Technology, Clausthal-Zellerfeld, Germany. |
| 01.10.2016 – ongoing | Research Associate (until 30.06.2018). Currently honorary staff member. "Quantifying disequilibrium processes in basaltic volcanism (NSFGEO-NERC - DisEqm)". School of Earth Sciences, University of Bristol, Bristol, UK. |
| 16.12.2013 – 30.09.2016 | Postdoctoral position. "Explosive volcanism in the Earth system (ERC Advanced Grant 247076 - EVOKES)". Department of Earth- and Environmental Sciences, Ludwig-Maximilians-Universität, Munich, Germany. |
| 22.05.2013 – 30.11.2013 | Fellowship position at Vulcamed Project. "Monitoring of volcanic risks". National Institute of Geophysics and Volcanology (INGV – Napoli). |
| 01.11.2011 – 21.05.2013 | Postdoctoral position. "The effect of $H_2O$ and $CO_2$ on magma rheology". Department of Science, Università degli studi di Roma Tre, Italy. |
| 01.11.2008 – 31.10.2011 | PhD in Environmental and Resource Geology. "Experimental investigation of physical and chemical properties of magmas. Application to magma degassing". Department of Science, Università degli studi di Roma Tre, Italy. Supervisor: Prof. Claudia Romano. |

## SKILLS

**Analytical Techniques**
Electron microprobe (EMP), scanning electron microscope (SEM), Fourier-transform infrared spectroscopy (FTIR), Raman spectroscopy, wet chemistry, rotational viscometer, dilatometer, differential scanning calorimetry (DSC), simultaneous thermal analysis (STA), thermal gravimetric analysis (TGA), synchrotron X-ray tomography and diffraction, small- and wide-angle X-ray scattering (SAXS-WAXS)

**Experimental Techniques**
High-temperature synthesis, gas mixing, piston cylinder, multi-anvil, titanium zirconium molybdenum pressure vessel (TZM), cold seal pressure vessel (CSPV)

**Numerical modelling and data analysis**
*R*, MATLAB

## GRANTS AWARDED AND TEACHING QUALIFICATION

2021-ongoing German Research Foundation € 225K, Bayerisches Geoinstitut. "Rheology of nanocrystal-bearing technical and natural silicate melts" (Principal investigator).

2021-ongoing German Research Foundation € 230K, Technical University of Clausthal. "Rheology of nanocrystal-bearing technical and natural silicate melts" (Co-investigator, Prof. J. Deubener principal investigator).

2018 European Synchrotron Radiation Facility (France), BM26A proposal number ES-793: "In situ study of nano- and micro-crystallisation in volcanic melt under different $fO_2$" (Principal Investigator).

2018 EPOS Multi-scale laboratories facilities proposal n. EPOS-TNA-MSL 2018-009: "Effect of oxygen fugacity on melt properties" (Principal Investigator).

2017 Diamond Light Source (UK), I15 proposal n. EE17615-1: "In situ study of crystallisation in molten iron silicate" (Principal Investigator).

2016 Diamond Light Source (UK), I12 proposal n. NE/M018687/1: "Mobilising magma in the largest eruptions: In situ observation of microstructural controls on multi-phase fluid rheology" (Co-Investigator).

2022 National Academic Qualification as Full Professor (Italy).

2018 National Academic Qualification as Associate Professor (Italy).

2016 Qualification Maître de conférences (Assistant Professor) in "Structure et évolution de la terre et des autres planets (France)".

## PROFESSIONAL SERVICES AND AWARDS

2019 "The melt and fluid inclusion message in Earth and Planetary Sciences" Convener: Di Muro, A., co-convener Di Genova, D., Morizet, Y., GMPV 2.2 – Geochemistry, Mineralogy, Petrology & Volcanology, EGU 2019, Vienna.

2016 – 2018 "Storage, activation and transport processes in magmatic system" Conveners: Balcone-Boissard, H., Montagna, C., Di Genova, D., GMPV 5.7 – Geochemistry, Mineralogy, Petrology & Volcanology, EGU 2016-2018, Vienna.

2015 "Structure, dynamics and properties of silicate melts and magmas" Convener: Di Genova, D., Co-Conveners: Henderson, G., Neuville, D. V33F, AGU 2015, San Francisco, USA.

**OSPA** (Outstanding Student Presentation Award) liaison of scientific oral and poster sessions.

**Editorial Board Member:** Journal of Volcanology and Geothermal Research.

**Reviewer** for international projects: Projects of national interest (PRIN, Italy). German Research Foundation (DFG, Germany).

**Reviewer** for Nature Communications, Icarus, American Mineralogist, Chemical Geology, Contributions to Mineralogy and Petrology, Planetary and Space Science, Journal of Raman Spectroscopy, Mineralogical Megazine, Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy, International Journal of Applied Glass Science.

**Awards:** Alfred Rittmann 2022 medal (Italian Association of Volcanology).

## JOINED RESEARCH PROJECTS

| | |
|---|---|
| 2016 – ongoing | NSFGEO-NERC Grant: "Quantifying disequilibrium processes in basaltic volcanism" (DisEqm). PI Prof. M. Burton (University of Manchester) and Prof. H. Mader (University of Bristol, UK). |
| 2013 – 2016 | ERC Advanced Grant: "Explosive volcanism in the earth system: experimental insights (EVOKES)". PI Prof. D. B. Dingwell (Ludwig-Maximilians-Universität, Munich, Germany). |
| 2012 – 2013 | ENI S.P.A.: "Raman spectroscopy analysis of carbonaceous material as a geothermometer in low-high grade metasediments". PI Prof. S. Corrado (Università degli studi di Roma Tre, Italy). |
| 2008 – 2010 | COFIN/PRIN 2007: "Proprietà fisico-chimiche dei fusi silicatici in presenza di componenti volatili: sperimentazione, modellizzazione ed applicazioni al degassamento magmatico". PI Prof. C. Romano (Università degli Studi di Roma Tre, Italy). |
| 2007 – 2009 | FIRB Air Plane: "Piattaforma di ricerca multidisciplinare su terremoti e vulcani". PI Prof. F. Barberi (Università degli Studi di Roma Tre, Italy). |

## SUPERVISION OF PhD STUDENTS

| | |
|---|---|
| 2021 | Supervisor Pedro Valdivia Munoz (Bayerisches Geoinstitut, Universität Bayreuth, Germany). |

## STUDENT SUPERVISION

| | |
|---|---|
| 2020 – 2021 | Supervisor MSci student Rizaldi Putra (Bayerisches Geoinstitut, Universität Bayreuth, Germany). |
| 2019 | Supervisor *ForschungspraktikumB* Darleen Jana Rau (Clausthal University of Technology, Germany). |
| 2019 | Co-supervisor MSci student Isabel Stanley (University of Bristol, UK). |
| 2018 | Supervisor *ForschungspraktikumA* Darleen Jana Rau (Clausthal University of Technology, Germany). |
| 2017 | Supervisor Erasmus+ student Alberto Caracciolo (Università di Pisa, Italy). |
| 2015 | Co-supervisor BSci student Laura Höltgen (Ludwig-Maximilians-Universität, Munich, Germany). |
| 2015 | Co-supervisor Alessandro Pisello (Università di Perugia, Italy). |

## MEDIA ATTENTION

- Following the publication Di Genova, D., et al 2017. *Nature*, Link.

Nature Podcast, University of Bristol, Earth Magazine, Phys.org, Top News in Geochemical News, EurekAlert!, Il Fatto Quotidiano, Ansa, Science Daily, Focus, Ria, ABC, International Business Times, Geology Page, Science News Line, Earth.com, Public Now, Daily Star, Dailymail.

- Following the publication Di Genova, D., et al 2020. *Science Advances*. Link.

University of Bayreuth, University of Bristol, Clausthal University of Technology, Diamond Light Source, Scientific American, Physics World, Phys.org, Heritage Daily, Terra Daily, Analytical Science, Express, Notizie In, Kurier, GZ live, Die Rheinpfalz, Actualidad, Sputnik Brasil.

## PUBLICATIONS

38 Arzilli, F., Polacci, M., La Spina, G., Le Gall, N, Llewellin, E., Brooker, R.A., Torres-Orozco, R., **Di Genova, D.,** Neave, D., Hartley, M., Mader, H.M., Giordano, D., Atwood, R.C., Lee, P., Heidelbach, F., Burton, M., **2022.** Dendritic crystallization in hydrous basaltic magmas controls magma mobility within the Earth's crust. *Nature Communications.* Link.

37 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.* Link.

36 Bondar, D., Zandonà, A., Withers, A.C., Fei, H., **Di Genova, D.,** Miyajima, N., Katsura, T., **2022.** Rapid-quenching of high-pressure depolymerized hydrous silicate (peridotitic) glasses. *Journal of Non-Crystalline Solids.* Link.

35 Dingwell, D.B., Hess, K.-U., Wilding, M.C., Brooker, R.A., **Di Genova, D.,** Drewitt, J.W.E., Wilson, M., Weidendorfer, D., **2022**. The glass transition and the non-Arrhenian viscosity of carbonate melts. *American Mineralogist.* Link.

34 Langhammer, D., **Di Genova, D.,** Steinle-Neumann, G., **2021**. Modeling the viscosity of anhydrous and hydrous volcanic melts. *Geochemistry, Geophysics, Geosystems.* Link.

33 Cassetta, M., **Di Genova*, D.,** Zanatta, Z., Boffa Ballaran, T., Kurnosov, A., Giarola, M., Mariotto, G., **2021**. Estimating the viscosity of volcanic melts from the vibrational properties of their parental glasses. *Scientific Reports.* Link.

32 Le Gall, N., Arzilli, F., La Spina, G., Polacci, M., Cai, B., Hartley, M.E., Vo, T.N., Atwood, R.C., **Di Genova, D.,** Nonni, S., E., Llewellin, E., Burton, M.R., Lee, P. **2021**. In situ quantification of crystallisation kinetics of plagioclase and clinopyroxene in basaltic magma: implications for lava flow. *Earth and Planetary Science Letters.* Link.

31 Stabile, P., Sicola, S., Giuli, G., Paris, E., Carroll, M.R., Deubener, J., **Di Genova, D., 2021**. The effect of iron and alkali on the nanocrystal-free viscosity of volcanic melts: A combined Raman spectroscopy and DSC study. *Chemical Geology.* Link.

30 La Spina, G., Arzilli, F., Llewellin, E.W., Burton, M., Clarke, A.B., de' Michieli Vitturi, M., Polacci, M., Hartley, M., **Di Genova, D.,** Mader, H.M., **2021**. Explosivity of basaltic lava fountains is controlled by magma rheology, ascent rate and outgassing. *Earth and Planetary Science Letters.* Link.

29 **Di Genova, D.,** Brooker, R.A., Mader, H.M., Drewitt, J.W.E., Longo, A., Deubener, J., et al., **2020**. In situ observation of nanolite growth in volcanic melt: A driving force for explosive eruptions. *Science Advances.* Link.

28 Hughes, E.C., Buse, B., Kearns, S.L., Brooker, R.A., **Di Genova, D.,** Kilgour, G., Mader, H.M., Blundy, J.D., **2020**. The microanalysis of iron and sulphur oxidation states in silicate glass - Understanding the effects of beam damage. *IOP Conference Series: Materials Science and Engineering.* Link.

27 **Di Genova, D.**, Zandona, A., Deubener, J., **2020**. Unravelling the effect of nano-heterogeneity on the viscosity of silicate melts: Implications for glass manufacturing and volcanic eruptions. *Journal of Non-Crystalline Solids*, 545, 120248. Link.

26 Dobson, K.J., **et al., 2020**. Quantifying microstructural evolution in moving magma. *Frontiers in Earth Science*. Link.

25 Al-Mukadam, R., **Di Genova*, D.**, Bornhöft, H., Deubener, J., **2020**. High rate calorimetry derived viscosity of oxide melts prone to crystallization. *Journal of Non-Crystalline Solids*, 536, 15. *Corresponding author. Link.

24 Bamber, E. C., Arzilli, F., Polacci, M., Hartley., M., Fellowes, J. **Di Genova, D.**, Chavarria, C., Saballos, J.A., Burton, M., **2020**. Pre- and *syn*-eruptive conditions of a basaltic Plinian eruption at Masaya Volcano, Nicaragua: The Masaya Triple Layer (2.1 ka). *Journal of Volcanology and Geothermal Research*. Link.

23 Arzilli, F., La Spina, G., Burton, M., Polacci, M., Le Gall, N, Hartley, M., **Di Genova, D.,** Cai, B., Vo, N., Bamber., E., Nonni, S., Atwood, R.C., Llewellin, E., Brooker, R.A., Mader, H.M., Lee, P. **2019**. Highly explosive basaltic eruptions: magma fragmentation induced by rapid crystallisation. *Nature Geoscience*, 12, 1023–1028. Link.

22 Giordano, D., González-García, D., Russel, J.K., Raneri, S., Bersani, D., Fornasini, L., **Di Genova, D.**, Ferrando, S., Kaliwoda, M., Lottici, P.P., Smit, M., Dingwell, D.B, 2019. A calibrated database of Raman spectra for natural silicate glasses: implications for modelling melt physical properties. *Journal of Raman spectroscopy*. Link.

21 Arzilli, F., Morgavi, D., Petrelli, M., Polacci, M., Burton, M., **Di Genova, D.**, Spina, L., La Spina, G., Hartley, M.E., Romero, J.E., Fellowes, J., Diaz-Alvarado, J., Perugini, D., **2019**. The unexpected explosive sub-Plinian eruption of Calbuco Volcano (22-23 April 2015; southern Chile): Triggering mechanism implication. *Journal of Volcanology and Geothermal Research*, 378, 35–50. Link.

20 **Di Genova, D.** Caracciolo, A., Kolzenburg, S., **2018**.Measuring the degree of "nanotilization" of volcanic glasses: Understanding syn-eruptive processes recorded in melt inclusions. *Lithos*. 318–319, 209-218, Link.

19 Hughes, E., Buse, B, Kearns, S.K., **Di Genova D.**, Blundy, J., **2018**. Analysis of Redox Changes in Silicate Glasses Using EPMA and Raman Spectroscopy. *Microscopy and Microanalysis* 24 (S1), 2022-2023. Link.

18 Fuglignati, P. Gioncada, A., Costa, S. **Di Genova D.**, Di Traglia, F., Pistolesi, M., **2018**. Magmatic sulfide immiscibility at an active magmatic-hydrothermal system: the case of La Fossa (Vulcano, Italy). *Journal of Volcanology and Geothermal Research*, 358, 45-57. Link.

17 Polacci, M., Arzilli, F., La Spina, G., Le Gall, N., Cai, B., Hartley, M., **Di Genova D.**, Vo, N., Nonni, S., Atwood, R., Llewellin, E., Lee P., and Burton., M. R., **2018**. Crystallisation in basaltic magmas revealed via in situ 4D synchrotron X-ray microtomography. *Scientific Reports*, 8, 8377. Link.

16 Hughes, E., Buse, B, Kearns, S.K., Blundy, J., Kilgour, G., Mader, H., Brooker, R.A., Balzer, R., Botcharnikov, R., **Di Genova, D.**, Almeev, R.R., Riker, J.M., **2018**. High spatial resolution analysis of the Iron oxidation state in silicate glasses using the electron probe. *American Mineralogist*, 103 (9): 1473–1486. Link.

15 Kolzenburg, S., **Di Genova, D.**, Giordano, D., Hess, K.U., Dingwell, D.B., **2018**. The effect of oxygen fugacity on the rheologic cut-off of basalts. *Earth and Planetary Science Letters*, 487, 21-32. Link.

14 **Di Genova, D.,** Kolzenburg, S., Wiesmaier, S., Dallanave, E., Neuville, D., Hess, K.-U., Dingwell, D. B., **2017**. A subtle chemical tipping point governing mobilization and eruption style of rhyolitic magma. *Nature*, 552, 235-238. Link.

13 **Di Genova, D.,** Sicola, S., Romano, C., Vona, A., Fanara, S., **2017**. Effect of iron and nanolites on Raman spectra of volcanic glasses: a reassessment of existing strategies to estimate the water content. *Chemical Geolog*, 475, 76-86. Link.

12 **Di Genova, D.,** Vasseur, J., Hess, K.-U., Neuville, D. R., Dingwell, D. B., **2017**. Effect of oxygen fugacity on the glass transition, viscosity and structure of silica- and iron-rich magmatic melts. *Journal of non-crystalline solids*, 470, 78–85. Link.

11 **Di Genova, D.,** Hess, K.-U., Chevrel, M. O., Dingwell, D. B., **2016**. Models for the estimation of $Fe^{3+}/Fe_{tot.}$ ratio in terrestrial and extra-terrestrial alkali- and iron-rich silicate glasses using Raman spectroscopy. *American Mineralogist*, 101, 943–952. Link.

10 Spina, L., Cimarelli C., Scheu, B., **Di Genova, D.,** Dingwell, D. B., **2016**. On the decompressive response of volatile- and crystal-bearing magmas: an analogue experimental investigation. *Earth and Planetary Science Letters,* 433, 44–53. Link.

9 **Di Genova, D.,** Cimarelli, C., Hess, K.-U., Dingwell, D. B., **2016**. An enhanced rotational rheometer system for highly fluid melts at high temperature. *American Mineralogist,* 101, 953–959. Link.

8 **Di Genova, D.,** Kolzenburg, S., Vona, A. Hess, K.-U., Chevrel, M. O., Neuville, D. R., Ingrisch, W. E., 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, 5, 740–752. Link.

7 Yilmaz, T., Duschl, F., **Di Genova D., 2016**. Feathery and network-like filamentous textures as indicators for the crystallization of quartz from a silica gel precursor at the Rusey Fault, Cornwall, UK. *Solid Earth Discussion,* 7, 1509–1519. Link.

6 **Di Genova, D.,** Morgavi, D., Hess, K.-U., Neuville, D. N., Borovkov, N., Perugini, D., Dingwell, D. B., **2015**. Approximate chemical analysis of volcanic glasses using Raman spectroscopy. Journal of Raman Spectroscopy. *Journal of Raman Spectroscopy*, 46, 12, 1235–1244. Link.

5 Giordano, D., Nichols, A.R.L., Potuzak, M., **Di Genova, D.,** Romano, C. and Russell, J.K, **2015**. Heat capacity of hydrous trachybasalt from Mt Etna: comparison with $CaAl_2Si_2O_8$ (An) – $CaMgSi_2O_6$ (Di) as basaltic proxy compositions. *Contribution to Mineralalogy and Petrology*, 170:48. Link.

4 **Di Genova, D.,** Romano, C., Giordano, D. Alletti, M., **2014**. Heat capacity, configurational heat capacity and fragility of hydrous magmas. *Geochimica et Cosmochimica Acta,* 142, 314–333. Link.

3 **Di Genova, D.,** Romano, C., Alletti, M., Misiti, V., Scarlato, P., **2014**. The effect of $CO_2$ and $H_2O$ on Etna and Fondo Riccio (Phlegrean Fields) liquid viscosity, glass transition temperature and heat capacity. *Chemical Geology,* 377, 72–86. Link.

2 **Di Genova, D.,** Vona, A., Romano, C., Hess, K.U., Poe, B.T., Giordano, Dingwell, D.B., Behrens, H., **2013**. The rheology of peralkaline rhyolites from Pantelleria Island. *Journal of Volcanology and Geothermal Research, 249*, 201–216. Link.

1 Poe, B.T., Romano, C., **Di Genova, D.,** Behrens, H., Scarlato, P., **2012**. Mixed electrical conduction in a hydrous pantellerite glass. *Chemical Geology*, 6, 320-321. Link.