

EUROVOLC

European Network of Observatories and Research Infrastructure for Volcanology

Deliverable Report

D3.1 – Etna School on Monitoring

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Work Package number:	<i>3</i>	
Work Package leader:	<i>Rosella Nave</i>	
Task (Activity) name:	<i>Training</i>	
Task number:	<i>3.1</i>	
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Lead beneficiary:	<i>INGV</i>	
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Summary

1. Introduction. 2

2. Preparation of the School 2

3. The Summer School 4

4. Student survey..... 10

Annex 1 – Results of the student survey 14

1. Introduction.

The workplan of the EUROVOLC project includes within Task 3.1 (Training) the organization of two summers schools addressed to PhD or post-doc students. During the Kick-off meeting, the team of Task 3.1 did a preliminary evaluation of the schedule for the two summer schools, considering the actual starting date of the project. The analysis suggested a new schedule for the summer schools, included in the 1st Amendment of the G.A. According to the new plan, the Etna Summer School would be organized in summer 2019, and the Iceland Summer School in summer 2020. The topic of the Mt. Etna school is “Understanding sub-surface volcanic processes”, while that of the Iceland school is surface processes (e.g., explosive eruptions, pyroclastic flows, lava effusion, volcanic degassing, etc.).

This deliverable reports on the Summer School at Mt. Etna, which was held in September 2019, including from its preparation to execution. The results of a post-school survey involving all the participating students are also reported.

2. Preparation of the School

During the early months of 2019 the Organizing Committee was set up, including Paolo Papale, Gilda Currenti and Raffaella Pignolo, Giuseppe Puglisi (all from INGV). Two main deadlines corresponded to the launch of the 1st Circular (15 March 2019) and of the call for applications (28 April 2019), which were both fulfilled.



The Organizing Committee defined the overall school structure, the subject of the individual lessons, and the maximum number of students allowed; identified and invited the teachers; found a proper location for the school, and managed all aspects of the organization. It was decided to adopt a well-tested format consisting of lectures in the morning and practical exercises in the afternoon, plus a full day of field work on the outcrops and monitoring stations of Mt. Etna.

The topics identified were: volcano seismology, geodesy, geochemistry, petrology, physical and numerical modelling, and volcanic hazard. It was also established that both lessons and practical exercises should refer, as much as possible, to Mt. Etna as a test case. A set of skilled teachers was identified accordingly, also considering their proven capability to provide lectures and exercises on the selected topics.

In order to optimize the scheduled time (five days) and to facilitate the field work, the organizing committee identified the NE sector of the volcano (namely the Linguaglossa town) as the location of the school, and found a hotel that could conveniently host the school.

A preliminary assessment of the school costs was made. The adopted cost model is co-funding: EUROVOLC supports the costs of the teachers and the general organization costs (conference rooms, catering, etc.), and the students support their own travel and accommodation costs, with no additional fee besides the real costs onsite.

The first circular (Figure 1) was distributed on March 15, 2019, and publicized through the project web site as well as through a number of channels available to the volcanological community (from the Volcano-list and other academic networks), to flier distribution at major conferences in geophysics, e.g., the EGU General Assembly, and at other meetings and workshops of the international volcanological community, to direct contacts with a large number of colleagues in Europe and abroad).

ISTITUTO NAZIONALE DI GEOFISICA E VULCANOLOGIA

EUROVOLC Summer School

Understanding sub-surface volcanic processes

TARGET:


The school is aimed at young scientists at PhD and Post-PhD level. The participants will be selected on the basis of the relevance of the course for their current research activities.

2-6 September 2019

(arrival 1 Sep, departure 7 Sep)

Linguaglossa (CT)

on the shoulders of Mount Etna



PROGRAM DESCRIPTION:

The students will be introduced to multi-parametric modelling, data analysis and interpretation, and modelling of the sub-surface volcano dynamics. The school includes 2 days of frontal lessons, 1 day of excursion on Mount Etna visiting the multi-parametric monitoring stations, and 2 days of practical activities by the students in analyzing, processing and interpreting real data from Mount Etna. An icebreaker party will be held on September 1 at h20:00. A social dinner will be held on September 3. Each student will be asked to bring a poster on their current research activities, that will be on display for the entire duration of the school. All participants should bring their own laptop.

PRELIMINARY LIST OF TEACHERS:

Chris Bean, Alessandro Bonforte, Stefano Branca, Fabrice Brito, Flavio Cannavò, Daniele Carbone, Rosa Anna Corsaro, Gilda Currenti, Cinzia Federico, Filippo Greco, Francesco Guglielmino, Antonio Paonita, Paolo Papale, Eugenio Privitera, Giuseppe Puglisi, Antonio Rizzo, Gilberto Saccorotti, Giuseppe Salerno, Laura Sandri, Jacopo Selva, Freysteinn Sigmundsson.

SCHOOL COSTS:

There are no registration fees. Each student shall pay a contribution to the true costs, amounting to a forfeit of 490 euros to be paid on-site, inclusive of accommodation in double room, breakfast, lunch, coffee breaks, icebreaker party, social dinner, school materials, transfer from/to Catania city or airport at scheduled times, and additional transfers during the school days. The excursion on Mount Etna on Sep 4 costs additional 30 euros, to be paid on-site to the service providing company.

REGISTRATION:

Deadline for registration: 31 March 2019

Information on acceptance: 15 April 2019

Registration available at: eurovolc/...

EUROVOLC

(European Network of Observatories and Research Infrastructures for Volcanology) is a EU/H2020 project aimed at promoting an integrated and harmonized European volcanological community able to fully support, exploit and build-upon existing and emerging national and pan-European research infrastructures, including e-Infrastructures of the European Supersite volcanoes. For this purpose, EUROVOLC will carry out Networking and Joint Research activities, and offer Transnational and Virtual Access to the main European Volcano Observatories and Volcano Research Institutions. Summer schools are the most relevant EUROVOLC teaching initiative addressed to young scientists.

Graphics: P. Pantani

Figure 1. First circular of the EUROVOLC Etna Summer School 2019, released on March 15, 2019.

In order to collect the students' applications, a specific on-line form was implemented by IMO on the EUROVOLC project website. The requested information was name/surname, affiliation and contacts of the applicant, short CV, and a paragraph expressing the motivations for participating in the school. The form for the pre-registration was available from March 28 to May 2, that was identified as the deadline for applications. Advertisements were sent around through the same means as the first circular.

We collected 42 applications, mostly from Early Stage researchers (ESR) a majority of which were PhD students. 29% of the applicants were from non-EU countries in the Americas, Asia, Africa and Australia. The applications exceeded the number of allowed positions, which we had estimated to be around 30 to guarantee manageability of the practical lessons and smooth organization. On the other

3

hand, a number of applications came from students with curricula poorly fitting or not appropriate for an international school in volcanology. We took that into account when evaluating the applications, together with the student's curricula and motivation letters. At the end, 31 students were selected, making a well-skilled group and maximizing the benefits offered by the school. One of the selected students did not show up, so the actual participants were 30. The distribution between countries of provenance of the participating students is reported in Figure 2.

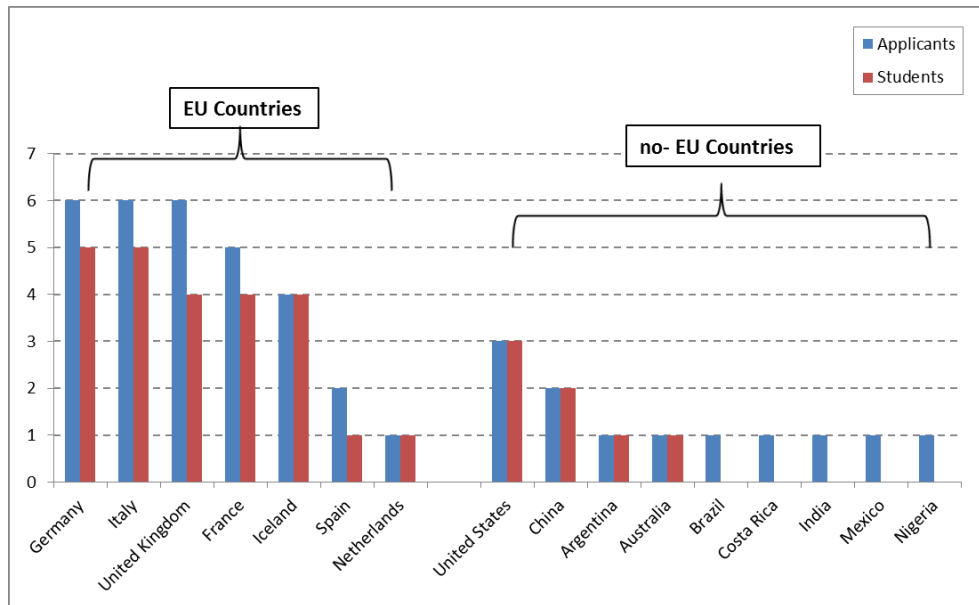


Figure 2. Distribution of the countries of provenance for the applicants and the selected students for the EUROVOLC Etna Summer School 2019.

3. The Summer School




The Summer School was held in Linguaglossa (Catania district, Italy), Hotel Mareneve Resort, from 2 to 6 September 2019. The final program of the lectures and exercises, agreed upon among the Organizing Committee and the teachers, is reported in Figure 3. Additional information concerning useful references and special requirements for the practical lessons and exercises was also provided to the students well before the school (Figure 4). Furthermore, the students were offered the opportunity to present their research activities through posters to be display during the school.

The school developed as planned. The exercises were carried out in the classroom, while the practicals were organized in the field around the hotel (Figure 5). The reception of the hotel hosted a permanently open session with students' posters on display (Figure 6).

As explained above, the school included a field trip on Mount Etna, for practical activities on outcrops and at the monitoring stations constituting the Mt. Etna Monitoring and Surveillance network managed and run by INGV. The field-trip was focused on the NE-rift, one of the main geologic structures and a major magma intrusion zone at Etna. The students were introduced to the network of sub-parallel eruptive fissures characterizing the area, and its relationships with the most prominent tectonic feature of Mt. Etna (the Pernicana-Provenzana fault system). The multidisciplinary monitoring stations installed in this area were also illustrated in some detail, including a discussion on the advantages of having synchronized records of multiple geophysical signals from the same area for understanding the deep volcano dynamics and forecasting the short-term volcanic hazards. The planned path of the field-trip is reported in Figure 7. Due to unfavourable weather conditions, the field trip was concentrated in the areas within the blue circles in the Figure. The pictures in Figs. 8 and 9 were taken during the field trip.

			
EUROVOLC Summer School (Linguaglossa, Etna, Italy)			
2-6 September 2019			
Understanding sub-surface volcanic processes			
Monday – 2 September			
08.30	09.00	Introduction	
09.00	10.00	Gilberto Saccorotti (L): <i>Introduction to volcano seismology: generalities on sources, methods, instruments, current issues</i>	
10.00	10.30	Luciano Zuccarello (L): <i>Seismic and acoustic monitoring at Etna Volcano, with case histories</i>	
10.30	11.00	COFFEE BREAK	
11.00	12.00	Chris Bean (L): <i>Source and path effects</i>	
12.00	12.30	Luciano Zuccarello (L): <i>Advances in data analysis of seismic-acoustic measurements</i>	
12.30	14.00	LUNCH	
14.00	16.00	G. Saccorotti, L. Zuccarello, C. Bean (P): <i>Practice on station installation, data retrieval, basic analysis</i>	
16.00	16.30	COFFEE BREAK	
16.30	18.30	C. Bean (P): <i>Tutorial on wave propagation</i>	
Tuesday – 3 September			
09.00	09.25	Giuseppe Puglisi (L) - <i>Overview on geodetic methods in volcano monitoring</i>	
09.25	09.45	Salvatore Gambino (L) - <i>Tilt and Strain measurements on volcanoes</i>	
09.45	10.30	Freysteinn Sigmundsson (L) - <i>SAR Interferometry</i>	
10.30	11.00	COFFEE BREAK	
11.00	11.25	Alessandro Bonforte (L) - <i>GPS and ground-based methods</i>	
11.25	11.45	Francesco Guglielmino (L) - <i>Methods to integrate ground deformation data</i>	
11.45	12.30	Filippo Greco (L) - <i>The application of time-variable microgravimetry to the understanding of volcanoes activity</i>	
12.30-14.00		LUNCH	
14.00	15.00	A. Bonforte, E. Boissier and F. Guglielmino (P) - <i>GPS data processing: "SAR data processing"</i>	
15.00	16.00	F. Greco (E) - <i>Vertical gravity gradient: measurements and data analysis</i>	
16.00	16.30	COFFEE BREAK	
16.30	17.00	Stefano Branca (L) - <i>Geological evolution of Etna Volcano</i>	
17.00	17.45	Rosa Anna Corsaro (L) - <i>Petrology of magmas to investigate the roots of a volcano</i>	
16.30	18.30	Stefano Branca (L) - <i>Introduction to the field-trip of Etna</i>	
Wednesday – 4 September			
Field-trip (about 9-10 hours).			
Minimum equipment: mountain shoes, backpack, piled jacket (or similar), raincoat			
Thursday – 5 September			
9.00	10.30	Chiara Montagna (L) <i>Multi-component gas-melt equilibria: theory and solution of equations</i>	
10.30	11.00	COFFEE BREAK	
11.00	11.45	Flavio Cannavò (L) <i>Modelling based assessment of geophysical data</i>	
11.45	12.30	Gilda Currenti (L) <i>Notions of Data Science in Geosciences</i>	
12.30	14.00	LUNCH	
14.00	16.00	Chiara Montagna (P) <i>Multi-component gas-melt equilibria: exercises and applications to underground magmatic systems</i>	
16.00	16.30	COFFEE BREAK	
16.30	18.30	Flavio Cannavò and Gilda Currenti (P) <i>Practical exercise on geophysical data modelling</i>	
Friday – 6 September			
09.00	10.00	Antonio Caracausi (L) <i>Magmatic degassing at Mt Etna by using the fluids geochemistry (peripheral areas and high temperature fumaroles)</i>	
10.00	10.30	Mike Burton (L) <i>Open vent degassing processes and monitoring</i>	
10.30	11.00	COFFEE BREAK	
11.00	12.30	Laura Sandri (L) <i>Probabilistic Hazard Assessment for Volcanic Unrest</i>	
12.30	14.00	LUNCH	
14.00	15.00	Mike Burton (P) <i>Practical and exercises on open vent degassing monitoring.</i>	
15.00	16.00	Laura Sandri (P) <i>Practical and exercises on Hazard Assessment.</i>	
16.00-16.30		COFFEE BREAK	
16.30-18.00		Laura Sandri (P) <i>Practical and exercises on Hazard Assessment</i>	
<i>(L): Lecture Lessons;</i>			
<i>(P): Practical and exercises</i>			
The venue of the school is Mareneve Resort Hotel (https://www.mareneveresort.com/en/).			

Figure 3. Agenda of the EUROVOLC Etna Summer School 2019.

EUROVOLC Summer School (Linguaglossa, Etna, Italy)

2-6 September 2019

Understanding sub-surface volcanic processes

Special requirements:

Seismology classes: None.

Geodetic classes: None.

Modelling classes: laptop with unix-linux OS, FORTRAN compiler and MATLAB

Geochemical classes: None.

Hazard classes: check the requirements at: <https://vhub.org/wiki/PyBetToolUserGuide#pybetunrest>

Selected readings and other references

Bonaccorso, A., A. Linde, G. Currenti, S. Sacks, and A. Sicali (2016). The borehole dilatometer network of Mount Etna: A powerful tool to detect and infer volcano dynamics. *J. Geophys. Res. Solid Earth*, 121, 4655–4669. doi:10.1002/2016JB012914.




Caracausi, A., R. Favara, S. Giammarco, F. Italiano, A. Paonita, G. Pecoraino, A. Rizzo, and P. M. Nuccio, (2001). Mount Etna: Geochemical signals of magma ascent and unusually extensive plumbing system, *Geophys. Res. Lett.*, 29(0), XXXX, doi:10.1029/2002GL015463.

Chouet, B. A. and Matoza, R. S. (2013). A multi-decadal view of seismic methods for detecting precursors of magma movement and eruption. *J. Volcanol. Geotherm. Res.* 252, 108–175. <http://dx.doi.org/10.1016/j.jvolgeores.2012.11.013>

Corsaro R.A., Pompilio M. (2004). Dynamics of Magmas at Mount Etna. In: "Etna Volcano Laboratory" Calvari, Bonaccorso, Cottrell, Del Negro, Falsaperla (Eds), AGU (Geophysical monograph series), N. 143, pp 91-110. (attached)

Di Renzo V., Corsaro R.A., Miraglia L., Pompilio M., Chetta L. (2019). Long and short-term magma differentiation at Mt. Etna as revealed by Sr-Nd isotopes and geochemical data. *Earth-Science Reviews*, 190, 112-130. doi: 10.1016/j.earscirev.2018.12.008.

Drouin, V., and Sigmundsson, F. (2019). Countrywide observations of plate spreading and glacial isostatic adjustment in Iceland inferred by Sentinel-1 radar interferometry, 2015–2018. *Geophysical Research Letters*, 46, 8046–8055. <https://doi.org/10.1029/2019GL082629> (See also the supplementary material).

Gambino S., Faltone G., Ferro A., Laudani G. (2014). Volcanic processes detected by tiltmeters: A review of experience on Sicilian volcanoes. *Journal of Volcanology and Geothermal Research* 271 (2014) 43–54. <http://dx.doi.org/10.1016/j.jvolgeores.2013.11.007>.

McNutt S. R., Thompson G., Johnson J., De Angelis S. and Fee D.(2015). The Encyclopedia of Volcanoes (Second Edition) 2015, Pages 1071-1099 Chapter 63 - Seismic and Infrasonic Monitoring. <https://doi.org/10.1016/B978-0-12-385938-9.00063-8>

Paonita A., et al. Geochemical evidence for mixing between fluids exsolved at different depths in the magmatic system of Mt Etna (Italy). *Geochim. Cosmochim. Acta* (2012), doi:10.1016/j.gca.2012.01.028.

Peccerillo, A., (2017). Cenozoic volcanism in the Tyrrhenian Sea Region. In: Nemeth, Karoly (Ed.), *Advances in Volcanology*, 2nd ed. Springer International Publishing, pp.399. <https://doi.org/10.1007/978-3-319-42491-0>.

Sigmundsson et al., Magma Movements in Volcanic Plumbing Systems and their Associated Ground Deformation and Seismic Patterns, In: Volcanic and Igneous Plumbing Systems, Understanding Magma Transport, Storage, and Evolution in the Earth's Crust (ed. Steffi Burchardt), 285-322, Elsevier. <http://dx.doi.org/10.1016/B978-0-12-809749-6.00011-X>.

A useful link to visit before the school is the "University of Iceland edX online course on monitoring volcanoes and magma movements". Videos are available at dedicated Youtube channel: https://www.youtube.com/playlist?list=PL_WaImOUADKDMMV5HKYh9a6ca2hD6.

In particular, for Volcano Geodesy, watch carefully Module 2 videos.

For full experience of the edX course, register as participant at: <https://www.edx.org/course/monitoring-volcanoes-and-magma-movements-2>

Figure 4. Special Requirements and references for the students of the EUROVOLC Etna Summer School 2019.



Figure 5. Exercises (volcanic hazard) and Practicals (gravity measurements) during the EUROVOLC Summer School 2019.



Figure 6. Poster session on students' research activities during the EUROVOLC Summer School 2019.

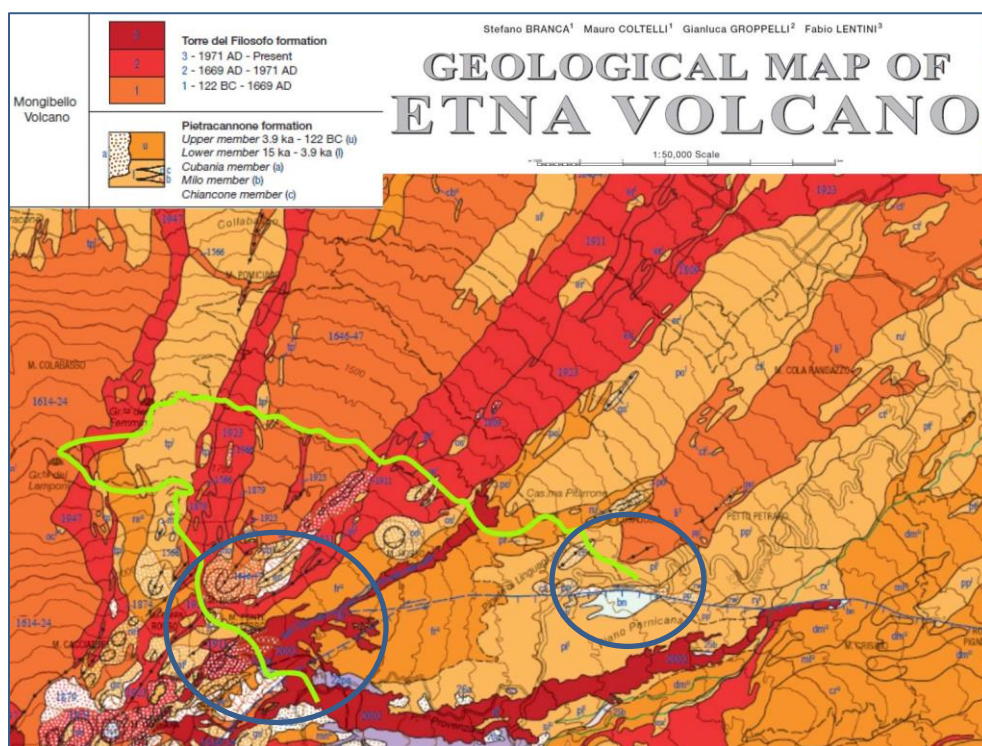


Figure 7. Planned path of the field-trip of the EUROVOLC Etna Summer School 2019.



Figure 8. The Students and the Teachers of the EUROVOLC Etna Summer School 2019 during the field trip.



Figure 9. Pictures from the field trip of EUROVOLC Etna Summer School 2019.

4. Student survey

In order to have a feedback on the quality and usefulness of the school, the teachers and the organizers set up a specific survey among all participating students, with the aim of collecting their opinion and suggestions to be used for the second EUROVOLC summer school in Iceland. The survey was conducted online via Google Form. 16 students provided their feedback through the form. The Annex 1 summarizes the results of the survey.

The questions and possible choices offered in the form are reported below.

1. What is your overall level of satisfaction with the event?

	1	2	3	4	5	
Not that much	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very high

2. How was the school compared to your expectations?

- ☐ Below my expectations
- ☐ In line with my expectations
- ☐ Above my expectations

3. Was the school relevant and useful for your study/work?

	1	2	3	4	5	
Not much	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	very relevant

4. What are the main concepts you have learnt in this school?

5. What is your satisfaction with logistics?

1 = Very unsatisfied 5 = Very satisfied

	1	2	3	4	5	N/D
Accommodation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Transportation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communications	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Venue	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. Additional comments on logistics

7. What do you think about the school topics?

	True	Maybe	False
Too many topics, I would prefer something more focused	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Good balance on the covered topics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Some topics that I would have liked to hear were missing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. Do you have a topic you would like to learn more about in a next school?

9. How do you deem the school costs?

- ☐ Cheap
- ☐ Appropriate
- ☐ Expensive

10. Did the school provide you hints for new research perspectives?

- ☐ Yes
- ☐ No
- ☐ Maybe

11. Was the school useful to extend your research network?

- ☐ Yes
- ☐ No
- ☐ I'm too shy

12. Which sessions did you find most relevant?

	Not relevant	Relevant	Very relevant	I didn't participate
G. Saccorotti "Introduction to volcano seismology"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
L. Zuccarello "Seismic and acoustic monitoring at Etna Volcano"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
C. Bean "Source and path effects"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
G. Puglisi "Overview on geodetic methods in volcano monitoring"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
S. Gambino "Tilt and Strain measurements on volcanoes"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
F. Sigmundsson "SAR Interferometry"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A. Bonforte "GPS and ground-based methods"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
F. Gugliemino "Methods to integrate ground deformation data"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
F. Greco "The application of time-variable microgravimetry to the understanding of volcanoes activity"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
S. Branca "Geological evolution of Etna Volcano"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
R. Corsaro "Petrology of magmas to investigate the roots of a volcano"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
C. Montagna "Multi-component gas-melt equilibria: theory and solution of equations"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
F. Cannavò "Notions of Data Science in Geosciences"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
G. Currenti "Modelling based assessment of geophysical data"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A. Caracausi "Magmatic degassing at Mt Etna by using the fluids geochemistry"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
M. Burton "Open vent degassing processes and monitoring"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
L. Sandri "Probabilistic Hazard Assessment for Volcanic Unrest"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. What is your satisfaction with the contents of the lectures?

Were they easily understandable and clear?

	1	2	3	4	5	
Poor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Excellent

14. What is your satisfaction with the contents of the practical sessions?

	1	2	3	4	5	
Poor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Excellent

15. How do you rate the field trip?

Contrassegna solo un ovale.

	1	2	3	4	5	
Very low	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very high

16. Would you recommend a similar future school to a colleague?

- ☐ Yes
- ☐ No at all!!
- ☐ Maybe

17. Do you have any general comments or suggestions on the event?

18. How was the dedicated time for ...

	Too short	Enough	Too much
lectures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
exercises	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
posters	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
discussions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

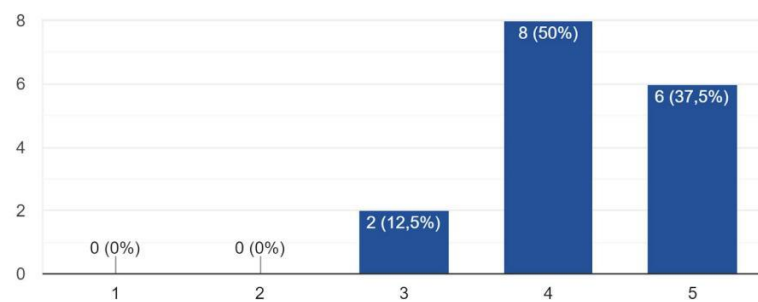
19. Name (optional)

Annex 1 – Results of the student survey

EUROVOLC Summer School 2019 *Survey results*

What is your overall level of satisfaction with the event?

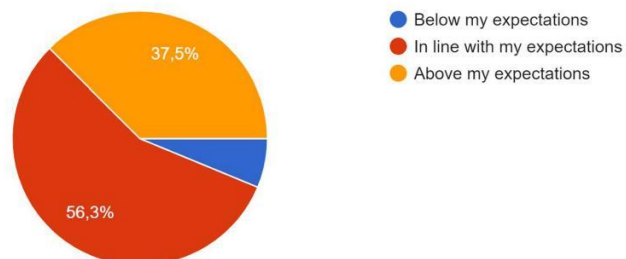
16 risposte



1 - strongly unsatisfied 2 - unsatisfied 3 - fair 4 - satisfied 5 - enthusiastic

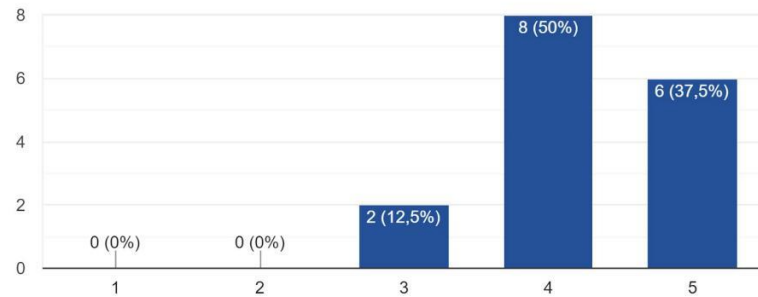
How was the school compared to your expectations?

16 risposte



Was the school relevant and useful for your study/work?

16 risposte



1-completely irrelevant 2-not relevant 3-partially relevant 4-relevant 5-strongly relevant

What are the main concepts you have learnt in this school? 11 risposte

Volcano processes, volcano monitoring, and modelling of acquired multi-technique data

That all different disciplines must come together to achieve a more complete view of volcanic processes. I also gained a better grasp on some geophysical concepts outside of my field and considered how they relate to my work.

SAR interferometry and its interpretation, interperation of seismic signals, gas-melt equilibria

Seismology and geodesy overlap in certain areas, machine learning is already proving useful in Earth Sciences, Bayesian Event Trees allow for a forecase of volcanic activity that combines many different kinds of data and expertise from several sources, petrology tells us about the source of magmas which can tell us something about whether an eruption is likely to continue or not and how explosive

Basic elements of volcano monitoring techniques and general investigations of volcanic plumbing systems. Practical application of modelling techniques to geodetic and satellite based informations of ground deformation at volcanoes.

I gained more appreciation for the different disciplines studying volcanoes

multidisciplinary approach in volcanic monitoring

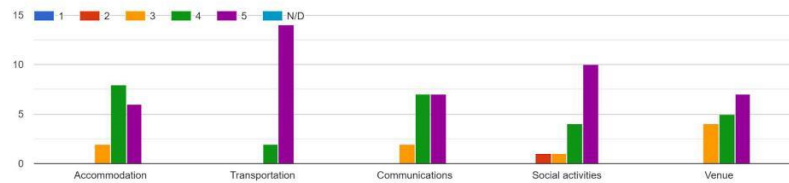
Seismology in volcano monitoring, gravimetry monitoring, hazard assessment protocol

Overviews of seismicity, InSAR, geochemistry, and modeling of volcanic systems

Volcano seismic signals and different types of them, and the thermal dynamics calculation

I was previously unfamiliar with InSAR data, and found it very valuable to learn about the fundamentals of the different types of data that are collected and can help to recognize volcanic unrest quickly. I found it useful to be reminded (again) of how critical a multi-disciplinary approach is for recognizing and acting quickly on hazard.

What is your satisfaction with logistics?



Additional comments on logistics 6 response

It is just okay for me

Logistics were very well handled. The poster sessions could have been better logistically but were still very good.

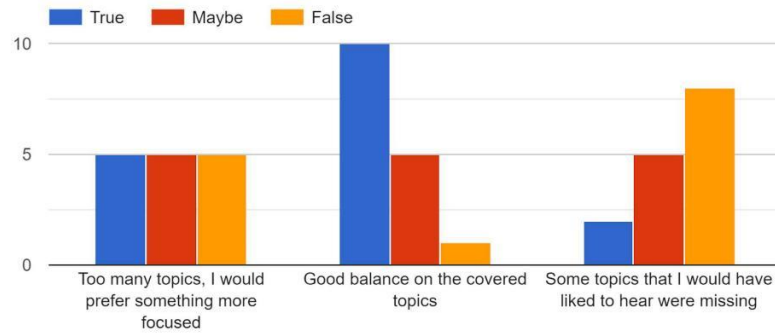
The only inconvenients I found are related to the lossy wifi link (especially when doing the practicals) and electrical problems in the rooms in the last days.

I should be greeted about having information about the transfer some days before the trip.

Please no clouds next time.. :)

The lecture room was a bit too small for the amount of people

What do you think about the school topics?



Do you have a topic you would like to learn more about in a next school? 9 response

Seismic imaging of volcanoes

I found Mike Burton's gas geochemistry very interesting and would like more along these lines

Being a geochemist, I would love to see more topics related to that covered next schools (e.g. timescales of pre-eruptive magmatic processes, geochemical monitoring of tephra, etc...)

Modelling of volcanic deformation observed by InSAR

practices about geological cartography, gas geochemistry interpretations more deeply

How to interpret geochemistry data, common pitfalls to look out for in studies

Numerical model

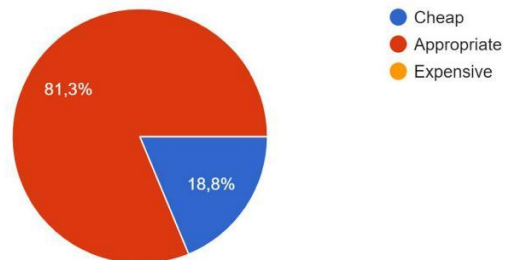
Mechanical conditions and modelling of magma emplacement/propagation in volcano roots.

Especially because we had a field trip to NE rift zone and would have been nice to explain mechanism of propagation of magma during eccentric activity.

Field based measurements of gas geochemistry

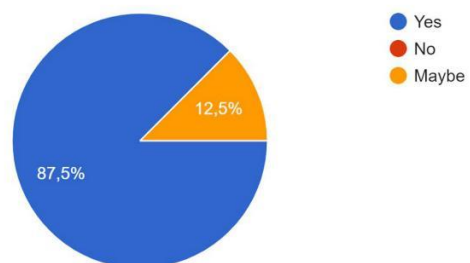
How do you deem the school costs?

16 risposte



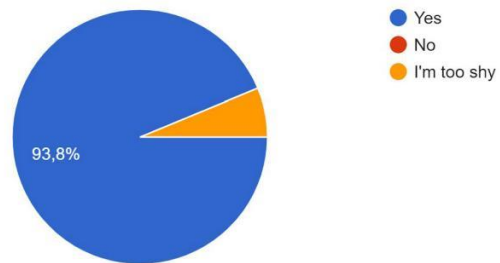
Did the school provide you hints for new research perspectives?

16 risposte



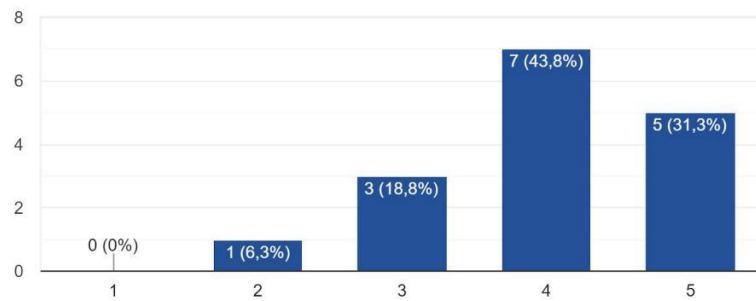
Was the school useful to extend your research network?

16 risposte

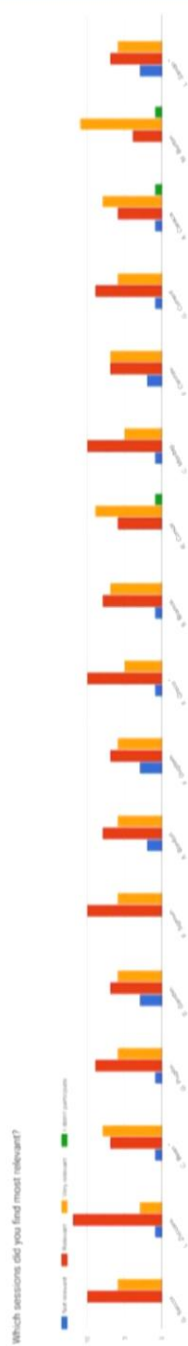


What is your satisfaction with the contents of the lectures?

16 risposte

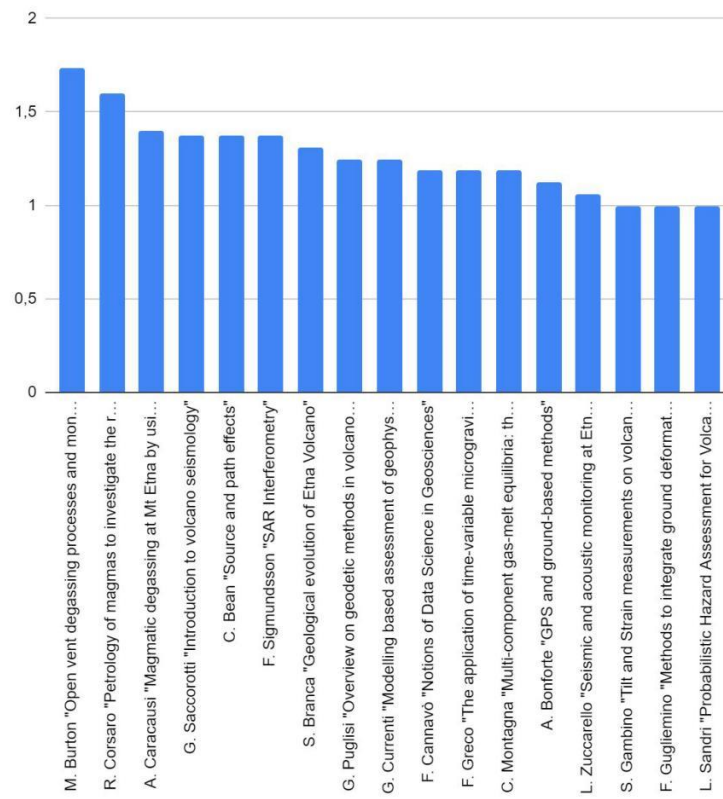


1-unsatisfactory 2-poor 3-fair 4-interesting 5-excellentl contents



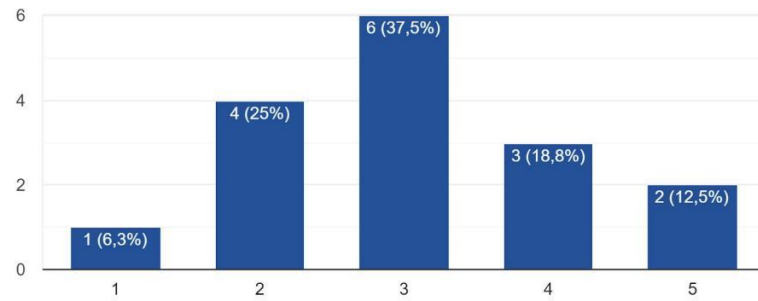
What session did you find most relevant?

(average results) 1 Relevant; -1 Not Relevant; 2 Very relevant



What is your satisfaction with the contents of the practical sessions?

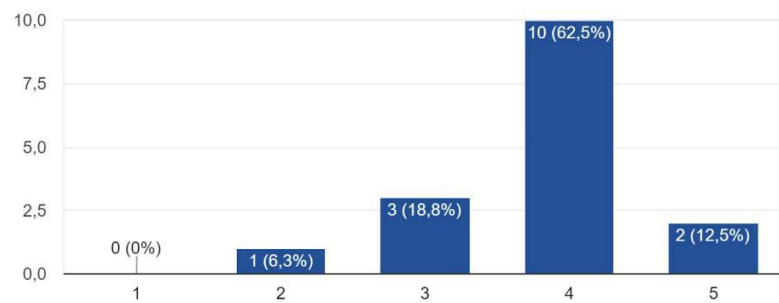
16 risposte



1-unsatisfactory 2-poor 3-fair 4-interesting 5-excellent practical sessions

How do you rate the field trip?

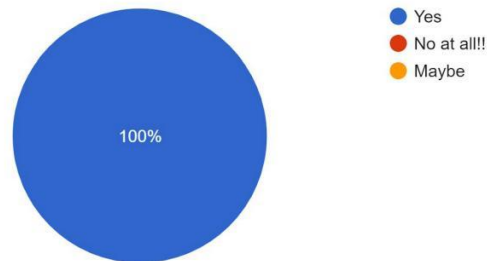
16 risposte



1-unsatisfactory 2-poor 3-fair 4-interesting 5-perfect

Would you recommend a similar future school to a colleague?

16 risposte



Do you have any general comments or suggestions on the event?

9 risposte

I really enjoyed the event and learned and consider a lot of different concepts from different angles. The range of backgrounds of the different people at the event really broadened my perspectives. I think some of the practicals needed more time, more resource availability and maybe more time to work in groups with someone who's field is that area and can explain some of the finer details.

To say something, I think the poster sessions could be organized by topics, in correspondence to the topics covered in the lessons of the day. For example, my background is geochemical and my poster was on Monday, but for me it would have been interesting to show the poster later in the week, where more geochemical topics were covered in the lectures. Overall, I would like to remark the excellent ambience we had every day during the course, one of the best (if not the best) of the similar events I have attended. Congratulations!

The field trip took a very relaxed rhythm

Most lectures (particularly in geodesy) tended to be more like a talk at AGU than a lesson - content was covered too quickly and without spending enough time explaining how things worked, pros and cons of data, etc. The seismology lectures were excellent at this.

Maybe more than one field trip.

1.) I would have liked to have more time for posters and discussion. Maybe one or two extended poster sessions in the afternoon, possibly with drinks and snacks. The 30 min coffee breaks were too short. Also all posters should be up for the whole time, especially since the teachers changed during the course. In that regard, I also found it difficult to discuss questions with the teachers since there was little time and occasion. 2.) Computer practicals should be better prepared, e.g. prepare virtual machines with all required software and pass them around BEFORE the lesson. Otherwise, I think they could be omitted. 3.) I found the practical of Laura Sandri on Volcanic Hazard was a nice wrap-up of the course and for that purpose it might deserve a whole day and perhaps a bit more organization. I liked that we finally had to discuss a task using our knowledge. This sort of thinking helps me realize that, first, every discipline has a little bit to contribute and second, that also I might be able to contribute something useful. Maybe forming multidisciplinary groups, each moderated by one of the teachers for discussion would be an idea and then compare the results using HVBetUnrest.

Even though I really find all topics relevant I would reduce a bit of the content in order to have more time for discussions because we often had to rush through the lectures. Furthermore I do find it very problematic to teach programming in such a short amount of time. This exercise could have been modified. Especially if there are students who don't have much experience with it. I would more show people what kind of codes exist and what you can do with them. And later on provide them so that people can use/try them out. There is still parts of the lectures missing from Friday which would be nice to have them.

Give more time for discussing posters - maybe make more space so all posters can be up the whole event.

Focus course on modeling practicals on two or three pieces of software only.

How was the dedicated time for ...

