

The Italian Volcano Observatories and Research Infrastructures (CNR)

1. Infrastructure offered for the first call

Name and acronym of RI	Name: Institute of Geosciences and Earth Resources
	Acronym: IGG-CNR Pisa Branch
Main contact person	Name: Antonello Provenzale
	Email: direttore@igg.cnr.it
List of individual installations	<p>1. Laboratories of elemental and isotope geochemistry:</p> <ul style="list-style-type: none"> a) Thermal Ionization Mass Spectrometry Laboratory b) Stable Isotope Laboratory c) Ar⁻⁴⁰/Ar⁻³⁹ Geochronology Laboratory <p>2. Lithotheque</p>

2. Information of the installations and facilities offered for the first call

Name of the installation and facility	1. Laboratories of elemental and isotope geochemistry - Thermal Ionization Mass Spectrometry Laboratory (TIMS)
Contact person	Name: Samuele Agostini
	Email: S.Agostini@igg.cnr.it
Location	Address: via Moruzzi 1, 56024, Pisa
	Country: Italy
Description of the installation and facilities	<p>The TIMS lab provides measurement of:</p> <ul style="list-style-type: none"> – B isotope composition on borosilicates, borates, rocks and silicate minerals, carbonate minerals and fluid matrices such as volcanic, geothermal, thermal waters and freshwaters. – Sr isotope composition on silicate and carbonate rocks and minerals, and fluid matrices such as volcanic, geothermal, thermal waters and freshwaters. – Sr isotope composition of small samples (50-500 ng of Sr in the processed sample). – Pb isotopic composition on silicate and carbonate rocks and minerals, fluid matrices, industrial manufactures (e.g. metals) archaeological manufactures (coins, other manufactures). – Nd isotopic composition on silicate rocks and marine carbonates. – Cr isotope composition on aqueous matrices and mafic and ultramafic silicate rocks. <p>The TIMS lab is equipped with Thermal Ionization Mass Spectrometers:</p> <ul style="list-style-type: none"> – Multi-collector Finnigan MAT 262 mass spectrometer (Installed 1991); – Multi-collector Finnigan MAT 262 mass spectrometer (built 1990; installed at IGG-CNR: 2016). – The access to a Neptune Plus installed in IGG-CNR at the

	<p>end of 2017 will be available once the analytical set up of the analytical isotopic routines will be completed</p> <p>Before TIMS analyses, samples are prepared and purified from solid and liquid matrixes in cleanrooms (class 10000, 1000, and 100).</p> <p>Other instruments of the TIMS lab include: Pfeiffer Balzer filament heating device (hosting up to 30 filaments); Laminar flow hood Faster BIO48 for sample loading.</p>
Scientific support offered	Training for the use of the installation: Offered.
	Duration of the training course: 1 day.
	Number of scientists supporting the activity: 2.
	Type of scientific support: “In person”; data acquisition and interpretation.
Technical support offered	Training for the use of the installation: Offered.
	Duration of the training course: Continuous training.
	Number of technicians supporting the activity: 2.
Safety	Training offered: Personal training. A health/life insurance is mandatory to access this installation.
	Duration of the safety training course: 2 hrs.
	Safety equipment provided: All protective equipment required by the Italian law.
Available accommodation facilities at infrastructure or nearby	B&B, hostel, hotels nearby CNR (selected according to their relative offer).
Available space/electricity/internet connection access for external users	All cited facilities available.
Administrative support offered	Available.

Name of the installation	1. Laboratories of elemental and isotope geochemistry - Stable Isotope Laboratory
Contact person	Name: Chiara Boschi
	Email: c.boschi@igg.cnr.it
Location	Address: via Moruzzi 1, 56024, Pisa
	Country: Italy
Description of the installation and facilities	<p>The laboratory’s facilities allow the measurement of both the content of total hydrogen, nitrogen, sulphur, organic and inorganic carbon (H, TN, TS, TOC, TIC) in solid, liquid and gaseous samples and their isotopic composition.</p> <p>Moreover, the laboratory is currently involved in developing new analytical methods for improving the sample injection into the IRMS (or into the instruments interfaced with the IRMS) and in the research</p>

	<p>of new techniques for the isotopic analysis of substance found in complex matrix (head-space gases) or very low in concentration (dry fumarolic gas sample or environmental air compounds with very low concentration).</p> <p>Four mass-spectrometers IRMS (Thermo Delta Plus XP, Thermo Delta Plus Adv, Finningan MAT Delta Plus, Finningan ThermoQuest Delta Plus) interface with:</p> <ul style="list-style-type: none"> - Laser - fluorination extraction line for the determination of $^{18}\text{O}/^{16}\text{O}$ and $^{17}\text{O}/^{16}\text{O}$ ratios in silicates. - Gasbench II (Finningan) for the automated $^{18}\text{O}/^{16}\text{O}$ and $^{13}\text{C}/^{12}\text{C}$ ratios of carbonates using the CF-IRMS technique. - Off-line traditional vacuum preparation line for the extraction and clean-up of CO_2 for the $^{18}\text{O}/^{16}\text{O}$ and $^{13}\text{C}/^{12}\text{C}$ ratios determination from non-pure carbonates, rocks with variable (and low) carbonate content and carbonate mixtures (sequential extraction). - Gas Chromatograph Trace GC Ultra (Thermo Scientific) for the separation of carbon compounds (CO_2, hydrocarbons, biomarkers, etc) and for $\delta^{13}\text{C}$, and eventually $\delta^2\text{H}$, determination. - TC/EA (Finningan) for the oxygen and deuterium isotope analysis of waters and solids (with auto-sampler for liquid and solid). - Elemental Analyser Flash EA1112HT (Thermo Scientific) for the C, H, N, S, O elemental and isotope analysis of solids, liquids and gases (including head-space). - Elemental Analyser (Carlo Erba) for the C, H, N elemental and isotope analysis of solids and liquids (including cooking oil, wine, fuel oil, gasoline) and solids.
<p>Scientific support offered</p>	<p>Training for the use of the installation: Offered.</p>
	<p>Duration of the training course: 1 day.</p>
	<p>Number of scientists supporting the activity: 2.</p>
	<p>Type of scientific support: “In person”; data acquisition and interpretation.</p>
<p>Technical support offered</p>	<p>Training for the use of the installation: Offered.</p>
	<p>Duration of the training course: Continuous training.</p>
	<p>Number of technicians supporting the activity: 2.</p>
<p>Safety</p>	<p>Training offered: Personal training. A health/life insurance is mandatory to access this installation.</p>
	<p>Duration of the safety training course: 2 hrs.</p>
	<p>Safety equipment provided: All protective equipment required by the Italian law.</p>
<p>Available accommodation facilities at infrastructure or nearby</p>	<p>B&B, hostel, hotels nearby CNR (selected according to their relative offer).</p>
<p>Available space/electricity/internet connection access for</p>	<p>All cited facilities available.</p>

external users	
Administrative support offered	Available.

Name of the installation	1. Laboratories of elemental and isotope geochemistry - Ar⁻⁴⁰/Ar⁻³⁹ Geochronology Laboratory
Contact person	Name: Gianfranco Divincenzo
	Email: divincenzo@igg.cnr.it
Location	Address: via Moruzzi 1, 56024, Pisa
	Country: Italy
Description of the installation and facilities	<p>We provide an integrated system of expertise, and mass spectrometer and laser probes.</p> <p>The analytical system consists of: a) Mass Analyser Products Ltd. MAP 215-50 noble gas mass spectrometer (MS); b) low volume UHV gas inlet system; c) laser extraction system consisting of three different laser probes.</p> <p>The laser probe system includes two Nd:YAG lasers (a CW diode-pumped Nd-YAG infrared laser with ~20W maximum power and a pulsed flashlamp Nd-YAG ultraviolet laser, frequency quadrupled and Q-switched) and a MIR10-30 (New Wave Research) CW CO₂ laser system.</p> <p>The greatest advantage of the laser extraction method is that it permits analysis of very small samples (down to a few micrograms or even less in some cases). The ability to analyze very small samples allows a great analytical versatility. A geological problem maybe in principle approached using different extraction methods and just one instrument, including: 1) in-situ dating of rock chips, which allows to preserve textural information; 2) step-heating analysis of bulk samples, to date a whole population or analyze large samples, useful when dealing with young (<<1 Ma) and/or low-K systems; 3) total-fusion analysis of single grains, which enables to solve mixed populations of grains (e.g., detrital potassic minerals in clastic sediments).</p> <p>The method can be applied to a variety of K-bearing systems, including among others: feldspars, amphiboles, micas, silicate glasses, and volcanic groundmasses.</p>
Scientific support offered	Training for the use of the installation: Offered.
	Duration of the training course: 1 day.
	Number of scientists supporting the activity: 2.
	Type of scientific support: "In person"; data acquisition and interpretation.
Technical support offered	Training for the use of the installation: Offered.
	Duration of the training course: Continuous training.
	Number of technicians supporting the activity: 2.
Safety	Training offered: Personal training. A health/life insurance is

	mandatory to access this installation.
	Duration of the safety training course: 2 hrs.
	Safety equipment provided: All protective equipment required by the Italian law.
Available accommodation facilities at infrastructure or nearby	B&B, hostel, hotels nearby CNR (selected according to their relative offer).
Available space/electricity/internet connection access for external users	All cited facilities available.
Administrative support offered	Available.

Name of the installation	2. Lithotheque
Contact person	Name: Andrea Dini
	Email: a.dini@igg.cnr.it
Location	Address: via Moruzzi 1, 56024, Pisa
	Country: Italy
Detailed description of the installation	The Rock Repository of IGG-CNR is hosted in a 160 m ² room that is furnished with about 90 m of metal rack shelves (height: 3.5 m) and box-lifting systems. The Rock Repository is part of the Mineral Separation Laboratory where rock samples are cut/crushed/milled for the preparation of rock chips (petrographic thin sections), rock powders (geochemical and isotopic analyses) and mineral separates (isotopic dating, fission tracks, geochemical and isotopic analyses). Cleaning tools, diamond saws, drill press, rock splitters and stereomicroscopes are available on site for preparation, cataloguing, packing and labelling of the incoming samples and for selection/sampling of existing materials by visiting researchers.
Scientific support offered	Training for the use of the installation: Offered.
	Type of scientific support: Remote provision of samples.

3. Access modalities and call parameters of the services offered only for the first call

Installation	Accesses per call (in unit)	Max n. of users per project	Max n. of projects per call
1. Laboratories of elemental and isotope geochemistry - Thermal Ionization Mass Spectrometry Laboratory (TIMS)	7 working days	1	2
1. Laboratories of elemental and isotope geochemistry - Stable Isotope Laboratory	7 working days	1	2

1. Laboratories of elemental and isotope geochemistry - Ar ⁻⁴⁰ /Ar ⁻³⁹ Geochronology Laboratory	7 working days	1	2
2. Lithotheque	5 samples	1	1

Please note that for ‘working day’ is intended a day from Monday to Friday excluding feast days.

4. Financial support offered to the users

Installation	Max reimbursable travel cost (in euro)	Max reimbursable daily subsistence cost (in euro)
1. Laboratories of elemental and isotope geochemistry - Thermal Ionization Mass Spectrometry Laboratory (TIMS)	700	120
1. Laboratories of elemental and isotope geochemistry - Stable Isotope Laboratory	700	120
1. Laboratories of elemental and isotope geochemistry - Ar ⁻⁴⁰ /Ar ⁻³⁹ Geochronology Laboratory	700	120

5. Risk management

- a) **Expected conditions that can make the installations unavailable/inaccessible:** For all the labs - occurrence of technical problems of the instruments.
- b) **Functionality of the installations offered, before the access:** For all the labs - instruments are in principle in continuous operation.
- c) **Conditions to re-schedule the access to the same installation due to force majeure:** For all the labs - personal contact.
- d) **Conditions to plan the access to another location in case the access must be moved due to force majeure:** For all the labs - personal contact.