Plutonic-volcanic links: Field trip to transcrustal magmatism (Ivrea zone) and the tertiary calc-alkaline Adamello batholith (Italy)

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Short description / intro:
Summary: The Ivrea zone is a world-renowned Permian transcrustal magmatic section with exposed rocks from the crust-mantle boundary to the surface. The Adamello is the largest Tertiary plutonic complex related to Alpine subduction and orogeny. Combing the two places provides unique insights into what happens beneath volcanoes. A few processes that will be discussed are:

- Incremental pluton emplacement and assembly
- Differentiation mechanisms and assimilation processes in the deep and shallow crust
- Magma mixing and mingling of gabbroic and intermediate plutonics, subvolcanic feeding systems and megabreccias related to super-eruptions
- Syn-magmatic deformation, interaction with country rocks, physics and chemistry of assimilation processes
- forceful and “passive” emplacement of magma batches at upper crustal level
- origin and evolution of tholeiitic to calc-alkaline magmas

When: Post-conference, Saturday 5th to Wednesday 9th of July 2025

Start: Geneva, **Finish**, Geneva **Program:**

- **Day 1:** drive to Varallo (Val Sesia) (3-4h), Val Sesia crustal section part I: Peridotites, pyroxenites, layered gabbros, metasedimentary enclaves. Overnight in Varallo (Hotel)
- **Day 2:** Val Sesia crustal section part II , Magma mingling, crustal melting, granitoids, ignimbrites and Megabreccias related to Permian supervolcano. Drive to Val Gaver (3h30) Overnight in Hotel Blumon break (Hotel), Val Caffaro
- **Day 3:** Gaver - Tita Secchi: Walking from (metamorphic) sediments into a sheeted sill complex and incrementally assembled plutons and intraplutonic contacts. Overnight Rifugio Tita Secchi (mountain hut)
- **Day 4:** Blumone, complexities of a magmatic feeding system, and assembly of incremental plutonic units Overnight Tita Secchi (mountain hut)
- **Day 5:** (Ultrahigh-temperature) Contact metamorphic sediments and coeval mafic dikes, walk to Val Gaver (Malga Cadino) drive to Bergamo /Geneva for return.

Level of fitness: good, walking on well maintained mountainous footpaths, and also coarse blocks and rubble up to 2800m asl is required, there may be some snowfields

Required Equipment: Passport or ID-card valid for Italy, usual field equipment (hammer, hand-lens, field book), must include solid hiking boots, sun protection, warm, wind- and waterproof jackets; light (linen or silk) sleeping bag for 2 nights in the hut (2300m). Euros for drinks, camera is recommended. Daypack for lunch and cloths. Note that for the last two days, luggage for 2 days needs to be carried by backpack.

Hiking: The field trip includes hiking in mountain areas up to 2800m altitude and partly in rough terrains; once area is reached, transfer will be mainly on foot (hopefully with sunny weather!).

Accommodation type: Small hotels, Albergo Monte Rosa (http://albergomonterosa.it), Albergo Blumon Break (https://www.blumonbreak.it/maneggio-gaver), Rifugio Tita Secchi (https://www.rifugi.lombardia.it/brescia/breno/rifugio-tita-secchi.html), double to 4-bed rooms, dinner and breakfast included, lunch bags provided.

Transportation: Mini-vans (8 seats), Departure: 5th of July 2025: Geneva Conference site, Arrival, 9th of July 2025: Bergamo Airport (~15h) or Geneva Train station (20h)

Number of participants: maximum 21

Costs 600€ (for transport from/to Geneva, accommodation with breakfast, dinner and lunch)

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Pictures (Ivrea and Adamello)

Spinel Plagioclase pyroxenite cutting fresh Balmuccia lherzolite (Balmuccia peridotite, Ivrea Zone, Val Sesia), Foto Othmar Müntener

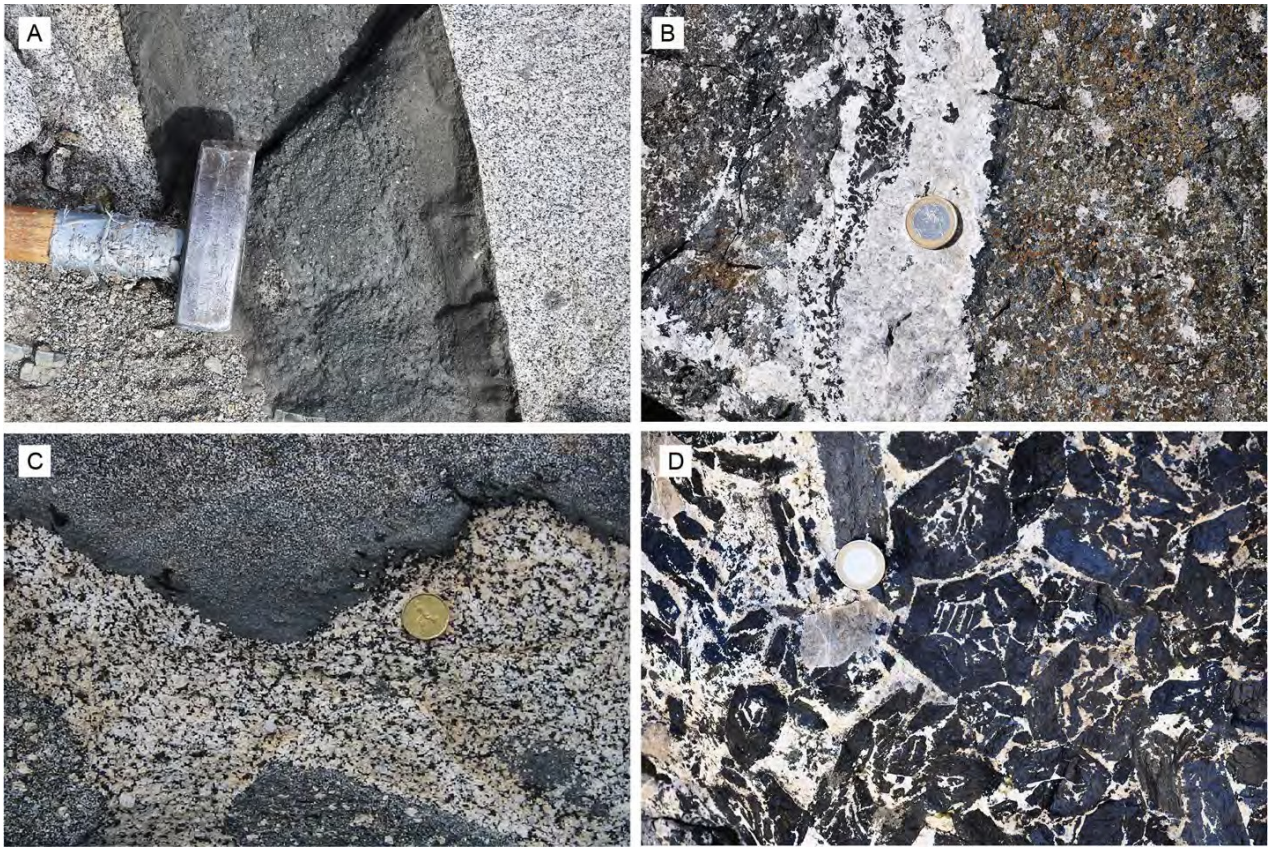
Layered pyroxenites and gabbro-(norite) from the Ivrea lower crust (Isola, Val Sesia, Ivrea Zone) Foto Othmar Müntener

Outcrop of mingled granites and monzonites and metasedimentary enclaves (Borgosesia, Val Sesia, Ivrea Zone) (Foto Jean-Luc Epard)

Monte Blumone, an Eocene subvolcanic feeding system in the Adamello (Foto Peter Ulmer)

Lago della Vacca and Monte Frerone, field area of first excursion day: Igneous rocks in the foreground, deformed and metamorphosed Triassic sediments in the background (Foto Peter Ulmer)

Field aspects of the Adamello Pluton (Italy). (A) High-MgO basalt dike with chilled margins cutting Adamello tonalites. Photo: Othmar Müntener. (B) Subvertical layering of olivine gabbro (darker rocks) and plagioclase-rich hornblende gabbros (lighter rocks). Photo: Othmar Müntener. (C) Magma mingling: mafic magmas (dark grey) quenching into partially solidified tonalites (light grey). Photo: Jon Blundy. (D) Hornblende pegmatite from the Southern Adamello. Photo: Othmar Müntener (Figure 2 from a recent Elements volume: Müntener et al. 2021, Elements 17, 35-40. Superhydrous arc magmas in the Alpine context)



Folded metasediments crosscut by mafic dikes (“en echelon”) – Monte Frerone (Foto Peter Ulmer)