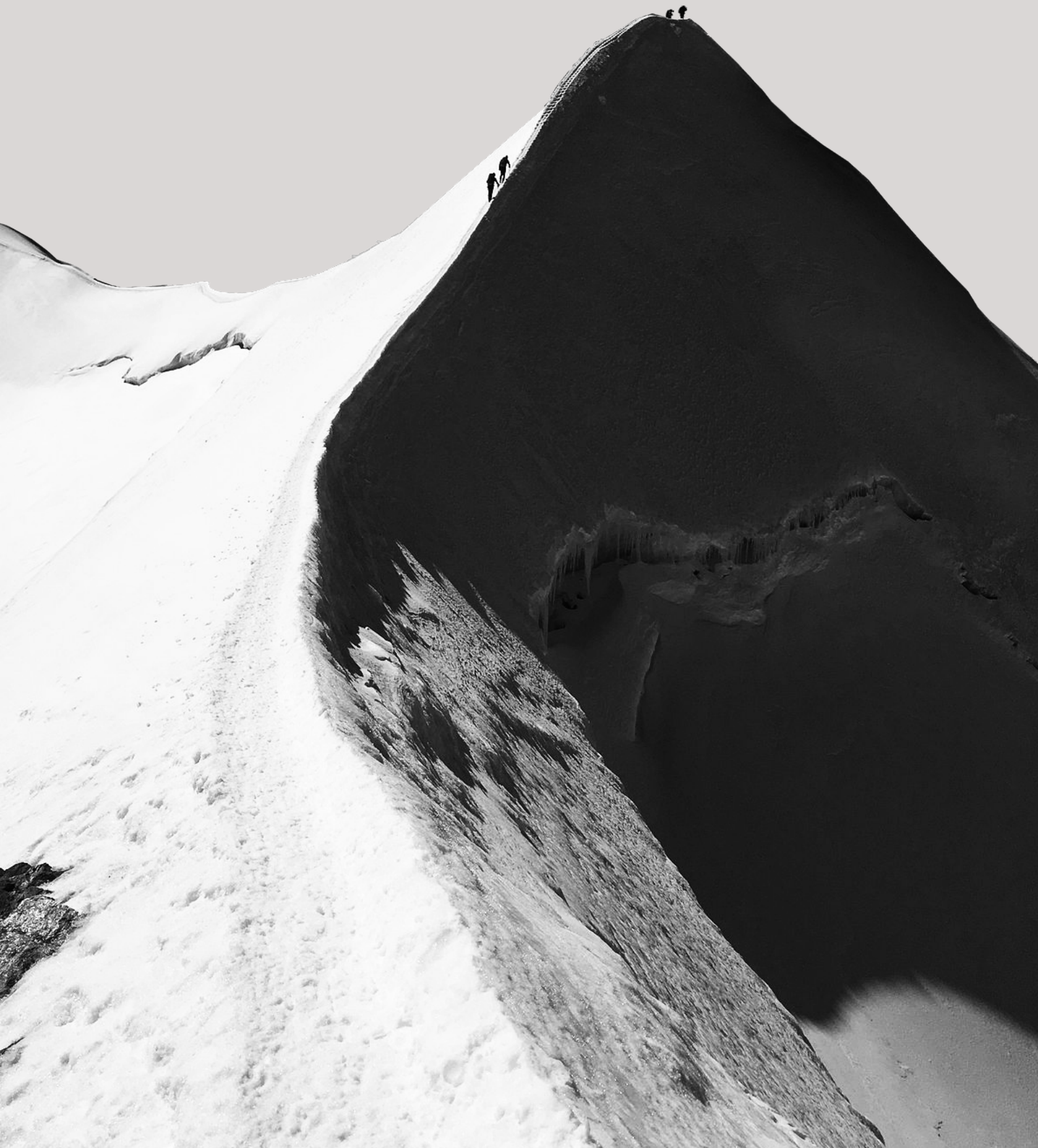


Mountaineering in the Monte Rosa Massif.



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Overview.

SUMMARY

This report gives an overview of an alpine tour conducted in the Monte Rosa massif in August 2020, supported by the Exploration Board of Imperial College London and the Old Centralians' Trust. The common interest of our team was to take our first steps in high-altitude mountaineering. We were also keen to explore how the adverse environmental impact of such a trip may be minimized through choices made at the planning stage. The report covers preparatory work, an alpine training course in the Scottish Cairngorms and details of the tour in the Swiss and Italian alps taking in several peaks above 4000m.

AIMS

- Train mountaineering skills
- Summit more than ten peaks above 4000m in one week
- Minimise environmental impact



TEAM



LAURA BRAUN



ROLE: EXPEDITION LEADER
OCCUPATION: PHD STUDENT, IMPERIAL COLLEGE LONDON
AGE: 29

Laura researches technical interventions in the fight against neglected tropical diseases. Her passion for the outdoors manifests itself in the many hours spent climbing every week. Whenever London becomes too hectic, her touring bike quite literally becomes her escape. But often the downward facing dog, the warrior or child's pose will also have the desired effect.

BENEDICT KRUEGER



ROLE: DEPUTY EXPEDITION LEADER, MED. OFFICER
OCCUPATION: PHD STUDENT, IMPERIAL COLLEGE LONDON
AGE: 27

Ben's research focuses on exploring novel treatment technologies for human waste to improve sanitation in low- and middle-income countries. He spends his free time singing in a choir and playing sports. Every year he embarks on some form of outdoor adventure, from climbing snow-capped summits in the Atlas Mountains to trekking through beautifully rugged Icelandic landscapes.

NICOLAS FELKA



ROLE: LOGISTICS AND TREASURER
OCCUPATION: PILOT
AGE: 28

As a pilot Nico specializes in propeller-driven aircraft, servicing destinations in the alpine region. He enjoys an active lifestyle through cycling, football and mountaineering. Examples from his track record include the GR20 in Corsica and the Watzmann Ridge Traverse. He takes a particular interest in the research and preparation of adventurous tours, where fellow mountaineers benefit from entertaining background knowledge en route.

JACK MORFORD



ROLE: ALPINE TECHNICAL LEAD
OCCUPATION: TECHNICAL PROJECT MANAGER
AGE: 29

Completing his doctorate in Astrophysics at the end of 2016, Jack turned to the world of 'fintech start-ups'. A combination of indoor climbing and yoga keeps him focused throughout the busy weeks. Weekends offer escapes to UK crags to climb, or the hills of Surrey and Kent for on- (and off-) road cycling. As an environmentalist and with a passion for the outdoors, his holidays revolve around the next climbing destination.

BACKGROUND



Background.

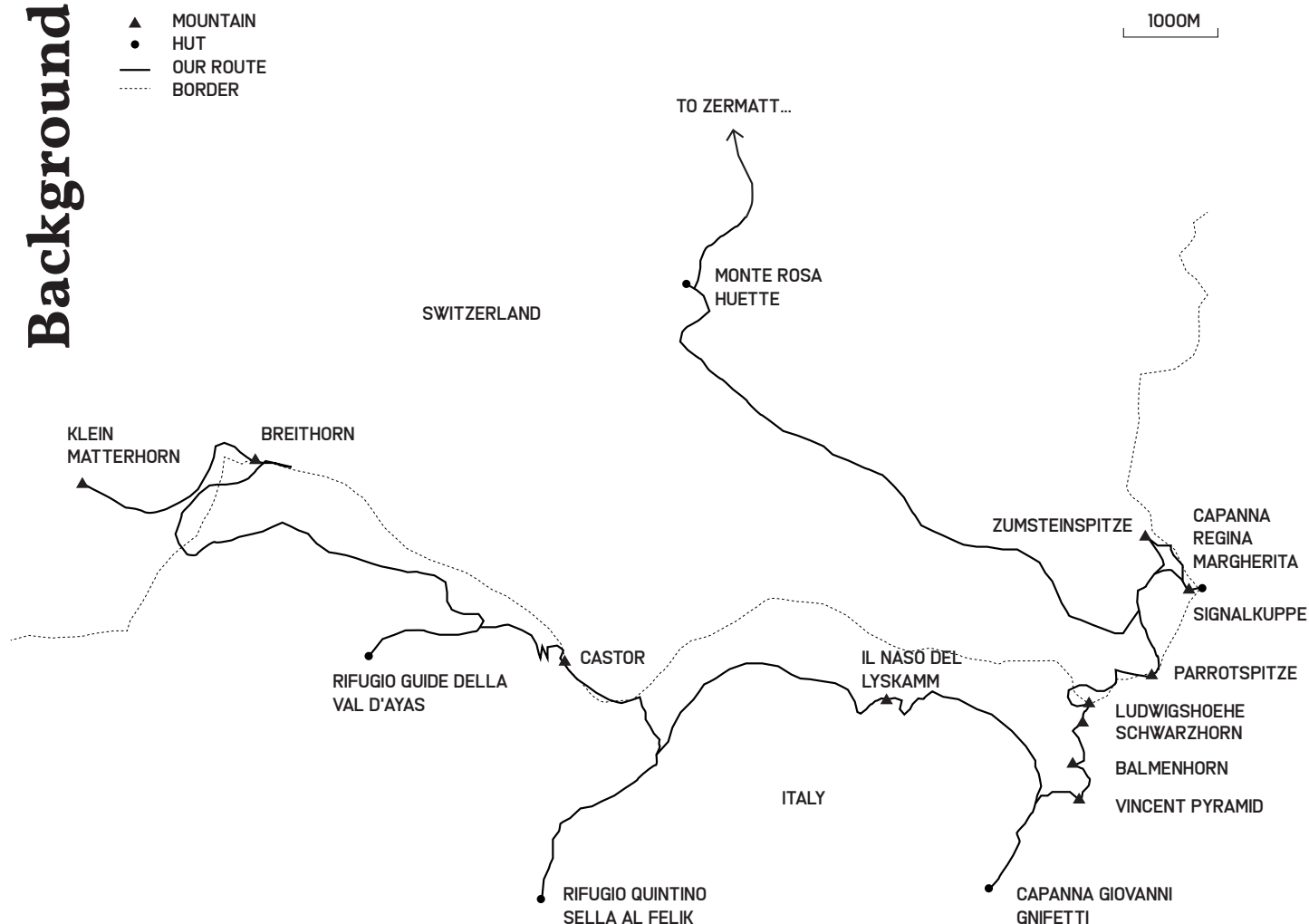
MONTE ROSA

The Monte Rosa mountain massif is set in the Swiss-Italian border region and is part of the Pennine Alps. The peaks of the Monte Rosa are among the highest and most challenging peaks in the Alps. The highest summit is the Dufourspitze, rising 4634m above sea level. The region is known for its glaciers and steep east walls which are adventurous playgrounds for well-trained and appropriately equipped mountaineers. One of the alpine huts located in Monte Rosa, the Capanna Regina Margherita, holds the record of being the highest hut in the entire Alps. It is also known as “headache box” due to its remarkable altitude and the fact that the international centre for high-altitude research is based in the refuge.



THE CAPANNA MARGHERITA
HUT SITTING ATOP THE
SIGNALKUPPE MOUNTAIN

Background.



"SPAGHETTI TOUR"

The so-called Spaghetti Tour gets its name from the Italian huts along this iconic route. The cuisine which is served here seems to impress the mountaineers as much as the spectacular scenery. It is a six-day high-altitude alpine tour including more than ten peaks over 4000m. As most of the tour is spent above 3500m, the major challenges of the Spaghetti Tour are dealing with the typical phenomena of great heights, technical ice and rock climbing, crossing of glaciers and walking on narrow ridges.

The start and end point of the tour is the alpine village Zermatt in Switzerland. The first half of the tour leads from west to east, crossing the Swiss-Italian border

several times. The second part of the U-shaped route runs from east to west in the heart of the Pennine Alps, where summits are higher and closer together than anywhere else in the Alps.

The personal requirements to successfully master this tour involve both physical and mental fitness, as mountaineers must be able to climb over 1500m of altitude a day in regions with decreased oxygen levels for as long as nine hours a day. Besides professional equipment, basic technical skills in handling ice axes and crampons are required. The difficulty of the Spaghetti Tour is classified as easy to moderate on the scale for high-altitude expeditions of the German Alpine Club (DAV).

Background.



LOW IMPACT TRAVEL

Our undertaking aims to show that it is possible to enjoy a great adventure whilst trying to minimise adverse environmental impact based on the choices we make at the planning stage. The first choice was to stay as close as possible, where we arranged for a tailored alpine preparation course in the Scottish Cairngorms in winter instead of training for the necessary mountaineering skills in the alps in summer as we had initially thought to do. Concerning the alpine tour, we resisted the lure of heading to the Himalayas and sought out a tour in the alps that maximised our time at altitude. Secondly, we agreed not to travel by air and take the train where possible. And thirdly, we planned on hiring mountaineering equipment or sourcing it secondhand.



ABOVE INSTRUCTOR AND BEN PRACTISING CREVASSE RESCUE

BELOW LAURA FAMILIARISING HERSELF WITH ICE AXE TECHNIQUES

PLANNING & FINANCIALS

LAURA, JACK AND
NICO ASCENDING THE
ZUMSTEINSPITZE



Planning and financials.

Expenditure	pp [£]	Total [£]
Trains to Scotland (return)	75	300
Glenmore Lodge (training and full board)	475	1900
Petrol London – Zermatt (return)		160
Road tolls		100
Eurotunnel (return)		360
Mountain huts (half board)	490	1960
Camping Zermatt	15	60
Cable cars	30	120
Parking		60
Local trains	30	120
Total		5140 (1285 pp)

Financing	Total [£]
Total cost	-5140
Funding (Exploration Board, Imperial College London)	+1500
Funding (Old Centralians' Trust)	+1800
Personal contribution	+1840 (+460pp)

Given the coronavirus pandemic, the initial tour plan was slightly modified. While some of our earlier planning choices proved beneficial to the new and dynamically changing regulations, other aspects of the planning had to be compromised. The choice to minimise distances saved this project. We were able to travel to Scotland for mountaineering training before the lockdown started in March and could complete the tour in Switzerland and Italy once the international travel restrictions were loosened in August. Unfortunately, we largely had to buy equipment as the stores of alpine clubs were temporarily closed.

Further, reduced baggage services on the Eurostar meant that it was impossible to transport crampons and ice axes, forcing us to travel from London to Switzerland by car.

SCHEDULE

- 6 – 10 March 2020
Mountaineering training,
Glenmore Lodge, Scotland
- 5 – 16 August 2020
Spaghetti Tour, Monte Rosa
Massif, Switzerland and Italy
including contingency days
before and after the tour

Equipment list.

Description	Quantity pp
Helmet	1
Ice axe	1
Harness	1
Quick draw	2
Rope	2 (total)
Crampons	1
Sling	2
Prussik	3
Ice screw	2
Screwgate carabiner	3
Walking pole	1
Belay plate	2 (total)
Rucksack	1
Boots	1
Gaiters	1
Headtorch	1
Glacier goggles	1
First aid kit	2 (total)
Map	1
Compass	1
Whistle	1
Water bottle	1
Thermoflask	1
Mobile phone	1
Powerbank	1
Charger	1
Knife	1
Sleeping bag liner	1
Face mask	1
Toiletries	1
Clothing: hardshell jacket, softshell trousers, gloves, buff, midlayer, socks, beanie	

MOUNTAINEERING TRAINING



NICO PLAYING THE ROLE OF AN UNCONSCIOUS MOUNTAINEER
AWAITING RESCUE FROM HIS ROPE TEAM PARTNER

Mountaineering training.



ALPINE PREPARATION AROUND COIRE AN T-SNEACHDA IN THE CAIRNGORMS NATIONAL PARK

ITINERARY

We set out to Scotland with a mindset of wanting to learn about how to deal with alpine emergencies. How do you catch a fall? How do you navigate in a whiteout? How do you conduct a crevasse rescue? We learned about all these things, but we returned from our training with a changed attitude.

It is important to learn about dealing with alpine emergencies, but the most important part is avoiding them in the first place. How do you move safely in high-altitude alpine conditions? How do you avoid poor weather and avalanches? How to minimise the risk of crevasse falls? During our three-day training course, we covered the following areas.

Day 1:

- Assessing weather conditions and avalanche risk
- Moving in snowy and icy conditions with crampons and ice axe
- Self-arrest

Day 2:

- Moving in steep alpine terrain and placing protection
- Building ice anchors/buried axe
- Navigating in alpine terrain

Day 3:

- Moving in a rope team
- Crevasse rescue
- Tour planning



ABOVE BEN TRAVERSING THE COIRE AN T-SNEACHDA

BELOW LAURA PRACTISING SELF-ARREST





ABOVE JACK BRUSHING UP ON HIS CRAMPON TECHNIQUES

BELOW THE TEAM DESCENDS AFTER A COLD AND WET DAY IN THE SCOTTISH MOUNTAINS

TOUR ITINERARY



Tour itinerary.



EDELWEISS, A RARE ALPINE BEAUTY FOUND ABOVE 1800M, GROWING BESIDE THE TRAIL

↑ 1400M ↓ 0M ⌚ 3H 45M

DAY 1: TAESCH (1449M) TO DOMHUETTE (2940M)

This hiking tour of moderate difficulty took us up into breathtaking alpine landscapes, spotting Edelweiss and marmots along the way. Sleeping at nearly 3000m was a crucial part of acclimatising in preparation of nights spent above 3000m and the many peaks above 4000m that were awaiting us the following days.

↑ 0M ↓ 1400M ⌚ 2H 30M

DAY 2: DOMHUETTE TO TAESCH

For further acclimatisation we spent the morning on the Domhuetten discussing our plans for the following days and enjoying the beautiful scenery. Following this, we descended to Taesch, crossing the world's longest pedestrian suspension bridge at a length of 494m.



Tour itinerary.

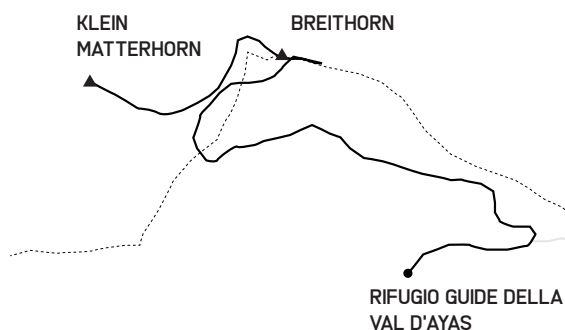
TEAM YOGA SESSION ON THE DOMHUETTE,
FEATURING THE 'VRIKSHASANA' OR 'TREE' POSE



MATTERHORN



ARRIVING AT THE RIFUGIO D'AYAS HUT



↑ 400M ↓ 850M ⌚ 6H

DAY 3: ZERMATT (1608M) TO RIFUGIO GUIDE DELLA VAL D'AYAS (3425M)

A series of cable cars transported us to the beginning of our tour. After climbing Breithorn Occidentale (4164m) and continuing along the ridge to Breithorn Centrale (4259m) we trekked over a glacier until we reached the Refuge Guide d'Ayas. This was the first test of our newly acquired alpine skills, moving in two rope teams. We perceived how important our training had been, especially when one team member crashed through a snow bridge over a crevasse and got stuck waist deep, legs dangling freely in the void. It was also the first day that altitude made itself noticeable and hydration, food and rest became increasingly important.



APPROACHING THE BREITHORN ALONG A WELL-TRODDEN PATH;
NICO (FOREGROUND) & BEN (BEHIND)

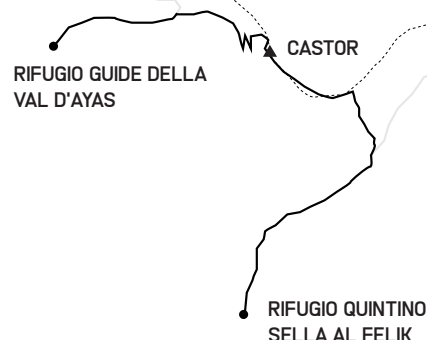


BEN AND NICO CROSSING THE RIDGE TO CASTOR SUMMIT

↑ 800M ↓ 650M ⌚ 5H 15M

DAY 4: RIFUGIO GUIDE DELLA VAL D'AYAS TO RIFUGIO QUINTINO SELLA AL FELIK (3585M)

Backtracking our steps up the glacier, we proceeded to the peak of Castor (4223m) and onwards to the next hut. More technical than the previous day, one stage required the placement of ice screws for protection, followed by a hair-raising narrow ridge leading to the peak. The scenery was spectacular and matched by the gorgeous food served on the Italian huts. By the end of day two we had witnessed two incidents on exposed ridges,



where other teams had taken unnecessary risks leading to precarious situations saved by their rope teams.

Tour itinerary.

ABOVE LAURA RISKS A GLANCE INTO THE ABYSS

BELOW BREATHTAKING SCENES ON THE DESCENT FROM CASTOR





A QUICK PHOTO WHILST JACK ASSESSES THE UPCOMING ICY PITCH UP IL NASO DEL LYSKAMM

↑ 1000M ↓ 1200M ⌚ 7H 30M

DAY 5: RIFUGIO QUINTINO SELLA AL FELIK TO CAPANNA GIOVANNI GNIFETTI (3647M)

Today's challenge was to overcome the steep approach to il Naso del Lyskamm (4272m). Jack, the alpine technical lead, ascended first and placed ice screws for protection. The remaining team was then belayed up until the slope of the face decreased to a safer angle. A hurried descent due to an incoming thunderstorm saw us clearing crevasse infested ground to reach the Capanna Gnifetti in time for lunch.



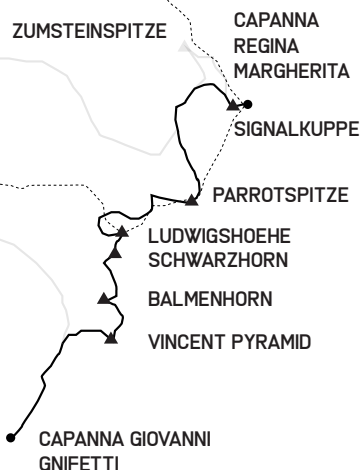
Tour itinerary.



ABOVE A WELCOME REFUGE AFTER A TIRING DAY

BELOW THE CAPANNA GNIFETTI HUT IS RENOWNED FOR ITS FOOD

Tour itinerary.



↑ 1600M ↓ 800M ⌚ 7H

DAY 6: CAPANNA GIOVANNI GNIFETTI TO CAPANNA REGINA MARGHERITA (4554M)

Cumulatively, we reached six peaks above 4000 metres in one day: Vincent Pyramid (4215m), Balmenhorn (4167m), Schwarzhorn (4321m), Ludwigshöhe (4341m), Parrotspitze (4432m) and Signalkuppe (4554m). This terrain can suitably be described as a mountaineer's playground, boasting the highest density of peaks above 4000m anywhere in the alps. The last peak was home to Europe's highest inhabited structure and our stopover for the night, the Capanna Margherita.



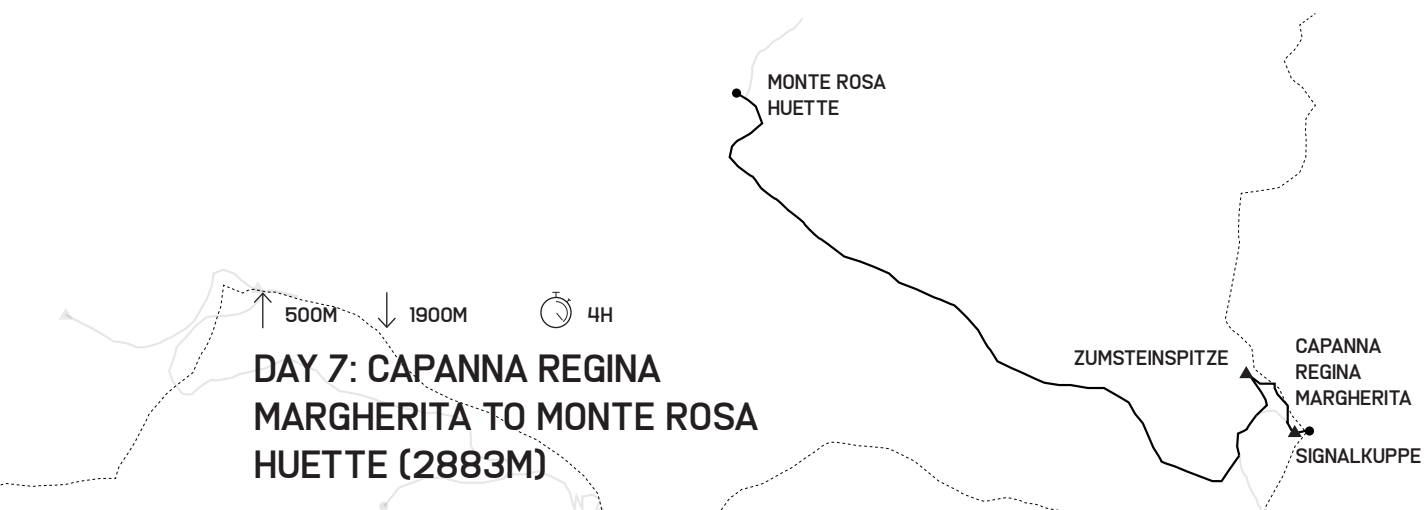
VIEW OF THE SCHWARZHORN ON THE DESCENT FROM VINCENT PYRAMID

ABOVE LAURA AND JACK ASCENDING VINCENT PYRAMID AS
THE SUN RISES

BELOW VIEW FROM THE CAPANNA MARGHERITA







After scaling Switzerland's second highest mountain, the Zumsteinspitze (4563m), we followed the Grenzgletscher downhill until we reached the futuristic and beautifully located Monte Rosa hut.

Tour itinerary.

ABOVE NICO FINDING A ROUTE ALONG THE GRENZGLETSCHER

BELOW LAURA AND JACK WALKING ON A LONG ROPE FOR ADDED SAFETY DUE TO THE FREQUENCY OF CREVASSES IN THE AREA



↑ 300M

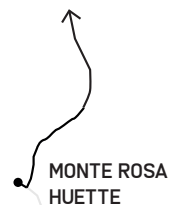
↓ 1600M

🕒 3H 30M

DAY 8: MONTE ROSA HUETTE TO ZERMATT

A long and exciting week came to a close after we crossed the Gornergletscher, climbed up the Gornergrat and descended down into Zermatt. Crossing glacier territory for one last time, we were in awe of the beauty of the landscape that we were leaving behind us.

TO ZERMATT...



LOOKING BACK ON THE GORNERGLETSCHER FROM THE GORNERGRAT



CONCLUDING REMARKS





REFLECTIONS

This trip has developed us both individually and as a team. We have acquired the skills necessary to manage and navigate through alpine risks. But we have also tested our personal boundaries and strengthened our team spirit by supporting each other through the strenuous effects of altitude and unexpected fears of moving through extremely exposed terrain. While we were not able to meet all of our environmental targets, we would like to encourage anyone who is planning an adventurous trip to think about how they can minimise their environmental impact.

ACKNOWLEDGEMENTS

First and foremost, we would like to express our gratitude towards Imperial's Exploration Board and the Old Centralians' Trust. We appreciate not only the generous financial support, but also the guidance during the planning phase.

Further thanks go to Nikwax, the Ordnance Survey, Eat Natural, Huel and RXBAR for supplying us with water proofing products, maps and food supplies.

