

Cambridge University Caving Club



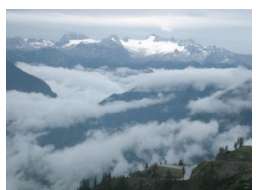
Austrian Cave Science Expedition 2009

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1. Introduction and Overview

1.1 Introduction

Since 1976, Cambridge University Caving Club has been exploring the deep cave systems of the Loser Plateau in the Totes Gebirge Mountains of the Austrian Alps. We are a student club with limited resources but despite this, over the past three decades we have discovered many notable cave systems and vastly increased our understanding of the geology and hydrology of the Loser Plateau. Amongst our discoveries is the Schwarzmooskogelhöhlen System, currently over 1km deep and 55km in length.

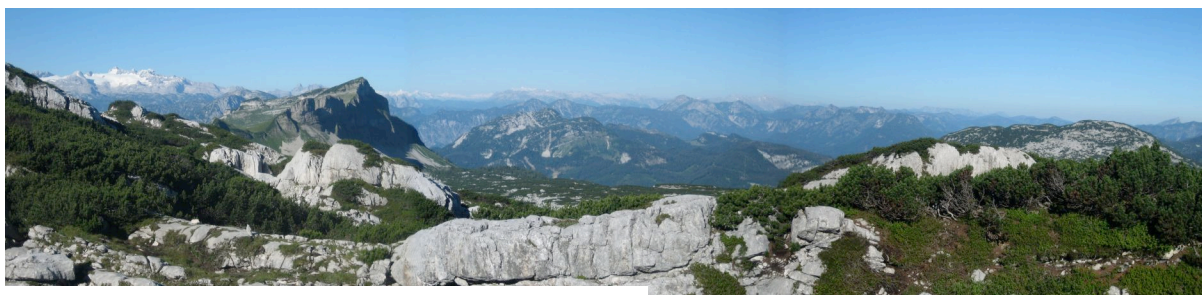


In summer, 2009 we propose to return once more to the Loser Plateau to continue exploring and documenting its vast cave systems. The potential for further discovery in the area is huge. In particular, owing to the work done by the club on previous expeditions, the stage is now set for some spectacular discoveries as we seek connections between various cave systems. This document contains details about our proposed expedition; our objectives, caving techniques, budget and what we think sets us apart from other caving expeditions.

Left: Gigantic ice formations in Eishöhle.

1.2 Expedition Details at a Glance

- Title:** Cambridge Austrian Cave Science Expedition 2009
- Expedition Dates:** 18th July – 22nd August (5 weeks including 1.5 days travel in each direction).
- Location:** The Loser Plateau, Totes Gebirge mountains, Austria.
- Expedition Type:** Exploring, surveying and documenting new caves.
- University Approval:** We are approved by Cambridge University Expeditions Committee and have charitable status (registration number 311460).
- Specific Objectives:**
1. Exploration of Kaninchenhöhle with a view to finding connection to southern parts of Steinbrückenhöhle.
 2. Exploration of Tunnockschacht with a view to finding a connection to northern parts of Steinbrückenhöhle.
 3. Continued exploration of Steinbrückenhöhle upper levels.
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<http://www.cucc.survex.com/expo/years/2009/>



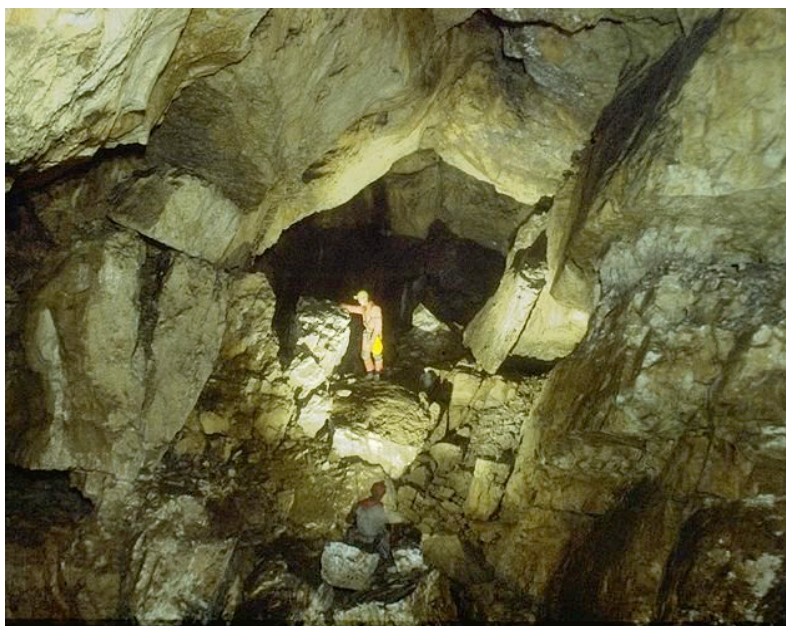
Above: Panoramic view from Top Camp

2. Expedition Background

2.1 The History of Cambridge University Caving Club Expeditions

Cambridge University Caving Club first visited the high alpine karst of the Loser-Augst-Eck Plateau in 1976 and has returned almost every year since, bit by bit exploring and mapping the caves found. We have been allocated area 1623 in the Austrian kataster (cave registration database). There are now hundreds of documented cave entrances in our area and more are found every year.

Over the past thirty years, we have developed excellent relationships with the local authorities. The Loser Plateau is part of a national park. Therefore in addition to obtaining permission to explore the caves (which is unusual for a foreign expedition) we are regularly in touch with park authorities, local hunters and the organisation responsible for the toll road which winds its way up the mountain towards our Top Camp.



Left: Exploration of Kaninchenhöhle in 1988.

The cave systems in the areas adjacent to ours are currently being explored by the local Austrian caving club Verein für Höhlenkunde in Obersteier and a German caving group ARGE. The caves are all interlinked and we often swap survey data with the other groups as together we seek to increase our understanding of the caves.

There is still a huge amount of potential for new cave passages to be found for many years to come. Many entrances are yet to be fully explored and within the known caves there are thousands of unexplored leads that are documented and stored in a database for future expeditions.

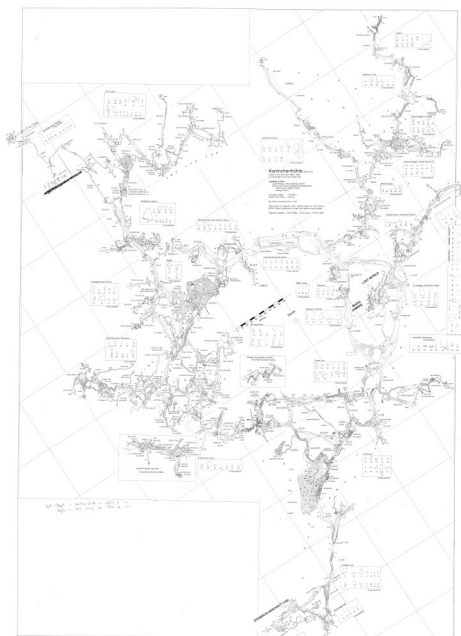
2.2 Some of the Major Cave Systems found to date

The first major cave system explored by the club, on the lower reaches of the Loser Plateau, was **Stellerweghöhle** in the late 1970s and early 1980s. A streamway was eventually followed, 680m below the entrance, which sumped at the level of the valley floor near Altaussee. Diving in the lake at Altaussee revealed impenetrable uprisings where the water from Stellerweg is believed to emerge. The depth of the system was increased in subsequent years as new entrances higher up on the plateau were one by one connected to Stellerweghöhle. By the late 1990s, connections had been found with other cave systems (most notably the stunningly beautiful



Above: Diving in Altaussee in 1989

Schwarzmooskogelishöhle) explored by French, German and local groups. This resulted in a 22km long, 973m deep cave system.

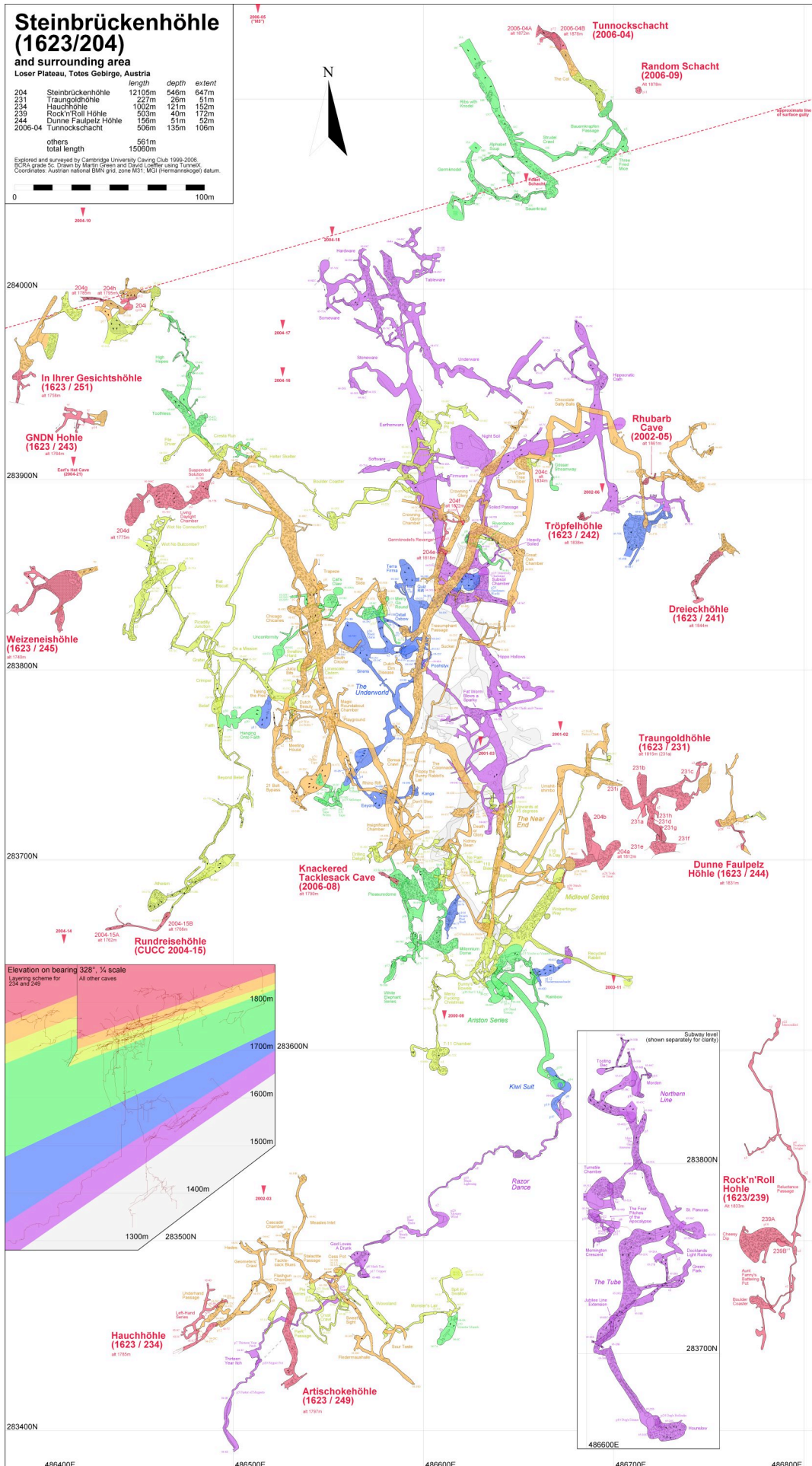


Above: Kaninchenhöhle survey

Throughout the 1990s the main focus of the expeditions was **Kaninchenhöhle**, whose entrances lie further north and at higher altitude than the Stellerweg system. Kaninchenhöhle was explored to 22km in length and contains some huge caverns and phreatic passages. In 2002 after several years of searching for a connection, Kaninchenhöhle was finally connected to the Stellerweg system. The resulting cave is known as the **Schwarzmooskogelhöhlen** system and is now over 55km long and 1032m deep. There is scope to extend the depth of this system as we gradually explore the caves higher up on the plateau.

The past ten years of expeditions have seen the discovery and subsequent exploration of **Steinbrückenhöhle** and **Tunnockschacht**. These are both found higher up on the plateau than the current known extent of the Schwarzmooskogelhöhlen system. On putting our survey data into computers at Base Camp we discovered that the southern reaches of Steinbrücken are only a few dozen metres away from the northern most parts of Kaninchenhöhle whilst the southern areas of Tunnockschacht are equally close to the northern extremities of Steinbrücken. The major goal of the expeditions is now to link the three systems (more on this in the expedition objectives section).

The figure below is the 2006 survey of Steinbrückenhöhle (the 2005 version won the Arthur Butcher survey award at Hidden Earth 2005). The different colours represent horizontal levels in different strata of rock.



2.3 Innovation on Cambridge Expeditions

Cambridge University Caving Club has a history of being innovative on its expeditions. In the late 1980s we were one of the first clubs to pioneer the use of drill bolting underground to make exploration safer and quicker. More recently we have begun using the 'Shetland Attack Pony' and 'Distos' which are laser based instruments to replace the traditional compass, clinometer, tape-measure combination used to survey caves. This makes cave-surveying both faster and more accurate.

Tunnel is a program for drawing up cave surveys (such as the Steinbrückenhöhle survey above) that was created by an expedition member (Julian Todd) for use on our expeditions and is now also used by other caving groups. 'Survex', is used to display three-dimensional cave systems on a computer screen (some screenshots are in the expedition objectives section) and calculate 'loop closure errors'. Similarly it was also written by expedition members (Olly Betts and Wookey) and is now a very popular piece of software among cavers worldwide.

Keeping track of the many thousands of unexplored leads and keeping our cave descriptions and surveys up to date after each trip underground is becoming an increasingly difficult problem for the club as the amount of data gathered continues to increase. With this problem in mind, expedition members are writing a piece of software known as Troggle, which aims to automate this process as much as possible. Troggle will provide a caver returning to Base Camp with a single computer interface in which to enter information about the trip. Troggle will then automatically update the database of unexplored leads, the cave description and the expedition logbook. We hope to give Troggle its first trial 'in the field' this summer.

Right: At Top Camp we use a system of solar panels to charge an old car battery. This enables us to recharge lamp, drill and mobile phone batteries, extending the amount of time we can spend at Top Camp. (Mobile phones are used to liaise between Top and Base Camps and keep track of who is where).



3. Location

3.1 Geographical Location of the Expedition Area

The Loser Plateau lies to the north of Altaussee between the mountains of the Schönberg and the Loser and at an altitude of approximately 1800m. More specifically, the latitude and longitude of the expedition area are at 47°38' and 13°48' respectively.



Because of the large amount of caving gear that must be transported to Austria, flying is not a viable mode of transport. We will travel to Austria using several cars and a van (this will take approximately 1.5 days in each direction). Petrol costs will be split between all expedition members to account for the communal caving gear (ropes, metalwork etc) that must be transported.

3.2 Top Camp and Base Camp

During the expedition each member's time will be split between Top Camp and Base Camp. Top Camp is a simple bivouac shelter in a rocky arch on the plateau known as the Stone Bridge. It is within an hour's walk of most of the cave entrances and three hour's walk from the nearest road: the Loser Panoramastrasse. Top camp will be furnished with tarps, petrol stoves, food hammocks, solar panels and a rainwater collection system. In the event of a particularly dry period of weather, snow taken from the bottom of nearby holes will be melted.

Base Camp is a campsite at the Gastoff Staud n'Wirt. The club has been staying at this campsite on many previous expeditions and has built up an excellent relationship with the owner. We now have the loan of a shed in which the expedition computer will be kept.

Expedition members will typically spend 4-5 nights at Top Camp before returning to Base Camp for 2 nights. Returning to Base Camp will enable the cavers to recover after particularly strenuous caving trips. In addition it provides an opportunity to replenish food supplies at Top Camp, charge any batteries that are not compatible with the solar panel system at Top Camp, repair caving gear, and input survey data into the expedition computer. Having a Base Camp in the valley will also enable us to minimise our impact on the environment around the plateau, which is a national park.



*Above: Sunset at Top Camp
Below: The expedition computer*

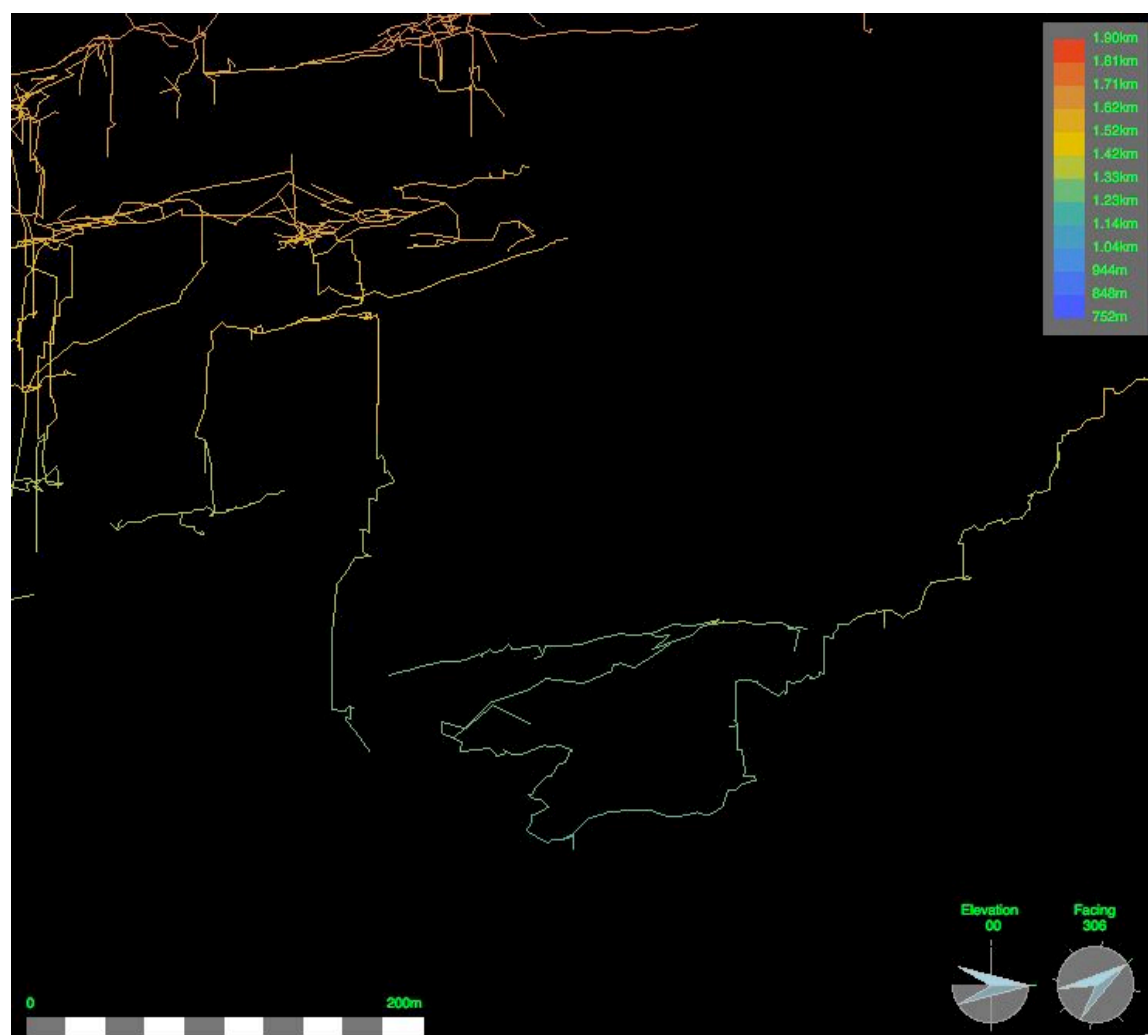


4. Specific Objectives

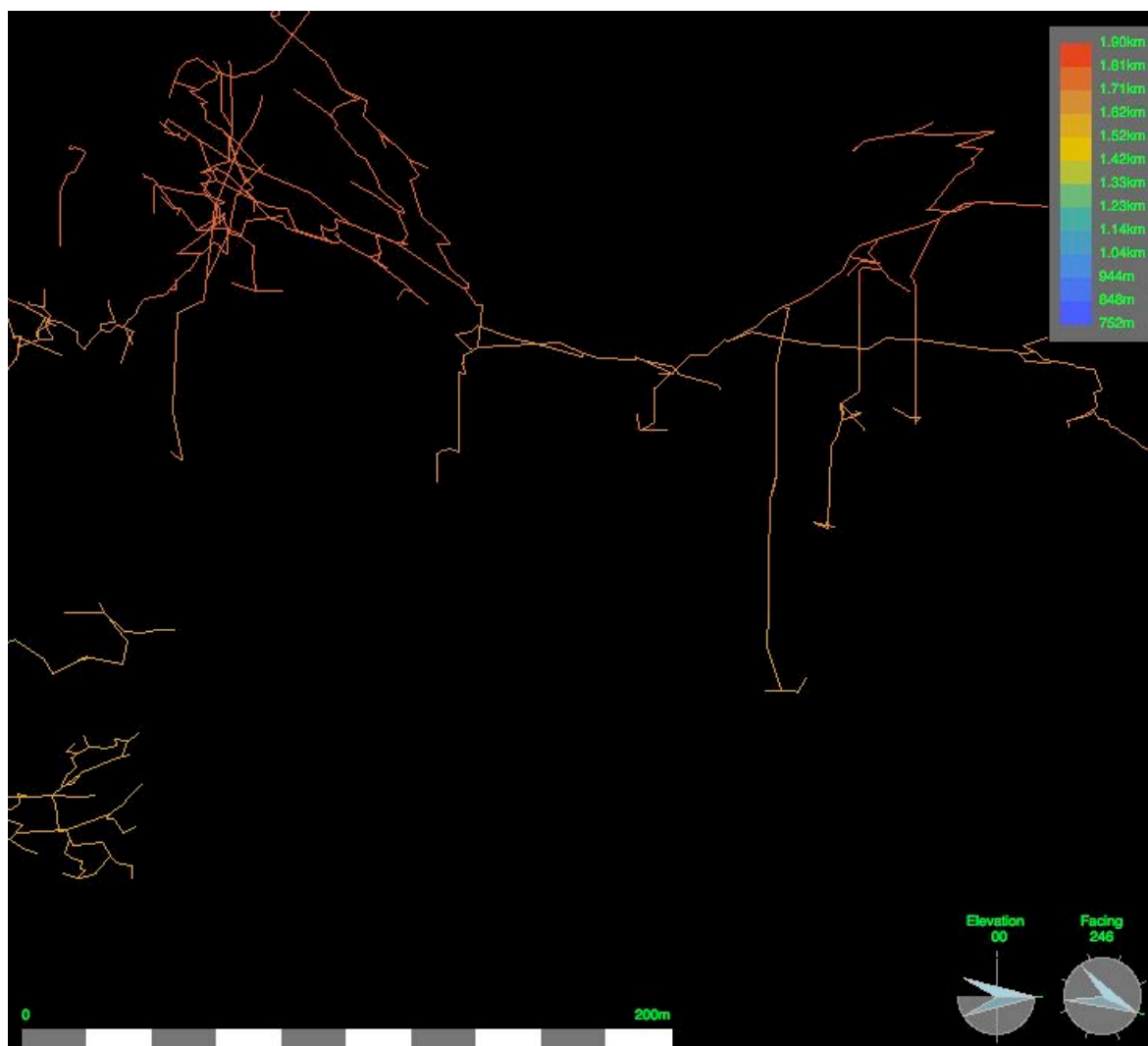
4.1 Speleological Objectives

Our primary objective for the 2009 expedition is to return to the far north of Kaninchenhöhle to seek a connection with Steinbrückenhöhle. There are many undescended pitches in Kaninchenhöhle – more than enough to warrant further exploration. Successfully finding a connection would increase the length of the Schwarzmooskogelhöhlen system to well in excess of 70km and would place it in the top 30 of the worlds longest caves (with further connections to other systems in future years a real possibility). This would be a major achievement for any caving club, not least one run by university students on a tight budget.

The figure below shows an elevation plot (drawn using Survex) of the area we are primarily interested in. The passages on the left form part of the northern extremities of Kaninchenhöhle, whilst those on the right belong to the deepest and southernmost parts of Steinbrückenhöhle. It is clear to see that we are tantalisingly close to making the connection this year!



Our secondary objective is to continue the exploration of the more recently discovered Tunnockschacht. The upper and left-hand passages in the Surverx plot below show the current known extent of Tunnockschacht (in elevation). The area in the bottom left is the north of Steinbrückenhöhle. We propose to search for the expected deeper horizontal levels in Tunnockschacht. Finding these would give a real possibility of a connection to Steinbrückenhöhle, significantly increasing the length of the Schwarzmooskogelhöhlen system.



Our final caving objective is to continue exploring and ‘ticking off’ leads in the upper levels of Steinbrückenhöhle.

We will survey, photograph and document the cave passages and shafts that we find.

4.2 Additional Objectives

During the expedition we have four additional objectives:

1. To continue surface prospecting on the Loser Plateau in order to find and document new cave entrances for future exploration.

2. To minimise our impact on the local environment (we will do this by sticking to the same routes over the plateau, avoiding picking plants/disturbing wildlife, and leaving as little trace of our presence as possible).
3. To record in detail how certain ropes are used so that samples can be returned to the British Cave Research Association for 'drop testing' after the expedition.
4. To test the new caving software 'Troggle' (described in section 2.3).

After the expedition we have the following objectives:

1. To report our findings at 'Hidden Earth' the UK national caving conference.
2. To publish an expedition report in *Speleology*, the BCRA caving journal.
3. To provide expedition reports, reviews and photographs to any sponsors we have.
4. To use Tunnel to produce high quality surveys of the caves explored.



Above: Using a rotary-hammer drill to place an anchor in the rock above an un-descended shaft.

5. Members and Budget

5.1 Expedition Members

One of the strengths of the Austria expeditions is the mix of experienced older club members and new undergraduate cavers with less experience. The expedition is a fantastic way for older cavers to pass on their knowledge and experience and teach a new generation how to cave safely.

During the expedition we will ensure that all cavers are caving within their capabilities and that no team consists solely of very inexperienced cavers. We expect approximately 20 cavers to participate in this year's expedition.

5.2 Budget

Expedition Costs (based on accounts from previous years):

International Travel	£2500
Local Travel	£300
Accommodation, food and general subsistence	£2200
Equipment (ropes, metalwork, personal camping gear etc)	£1100
Insurance	£650
Post-expedition costs (reports, conference etc)	£200
Expedition training weekend	£100
Contingency	£700
Total Costs	£7950

The £7750 will be met by a contribution of £400-£500 per team member. We hope to receive some grants and sponsorship to reduce this cost.



Left: Snow at Top Camp in mid-July!

6. Training and Techniques

6.1 Vertical Caving Techniques

Owing to the vertical nature of the Austrian cave systems we make extensive use of 'Single Rope Technique' (SRT). Traverse lines are be rigged to enable a caver to move from a safe area to a pitch-head before abseiling down to the bottom of the pitch using static caving rope. To return to the surface the caver prusiks up the same rope that was used to abseil. There are many other aspects to this technique including the use of 'deviations' and 'rebelays' (to keep the rope away from sharp rocky protrusions and waterfalls) and Tyrolean traverses. All of our members will be thoroughly trained in SRT.

During the early part of the expedition the known parts of the caves and the 'trade routes' to unexplored areas will be rigged with ropes where necessary. These ropes will be left rigged for the duration of the expedition. In order to explore new vertical pitches, rock-anchors will be placed (either using drill-bolting or hand-bolting) in the cave walls to enable the safe descent and ascent of pitches.

The bulk of our equipment requirement for the expedition is due to the rope and metalwork required to explore caves using SRT.



Above: A pitch head rigged for SRT

6.2 Training

All expedition members will be fully proficient in SRT. In addition to this, an expedition training-weekend will be run prior to the departure of the expedition. This will involve learning, revising and practising relevant first aid techniques, mid-rope rescue (to recover an unconscious caver from a rope mid-pitch), hauling techniques and stretcher handling. Although there are cave and mountain rescue services in Austria, if an accident occurs deep underground it could be many hours before such rescuers arrive. The skills learnt during the training weekend will enable us to begin evacuating a casualty from a cave beforehand if necessary.