

# Ario Expedition 2023



Final Report, March 2024

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## Summary

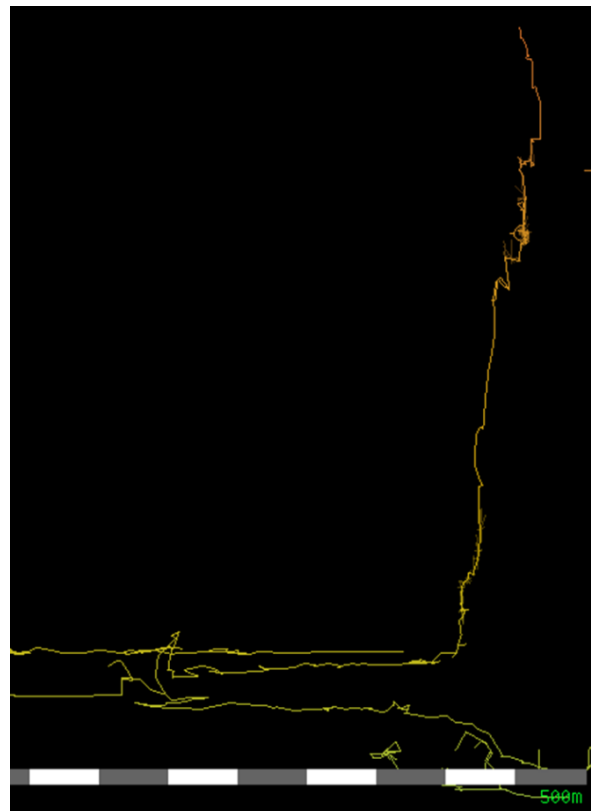
The 2023 Ario expedition was a 28 person 3 week expedition to the Western Massif of the Picos de Europa in late June and early July 2023. Based at and around the refugio at Vega de Ario, the expedition team worked on four main caves which are described below. In total approximately 1.5km of new cave passage was mapped, which is a significant amount for the Ario area in recent years. As well as these successes, a number of exciting leads have been left for future expeditions.

## Detailed Findings: Main Caves

### *Cave of the Singing Pasteur (27/9 or Bill's Cave)*

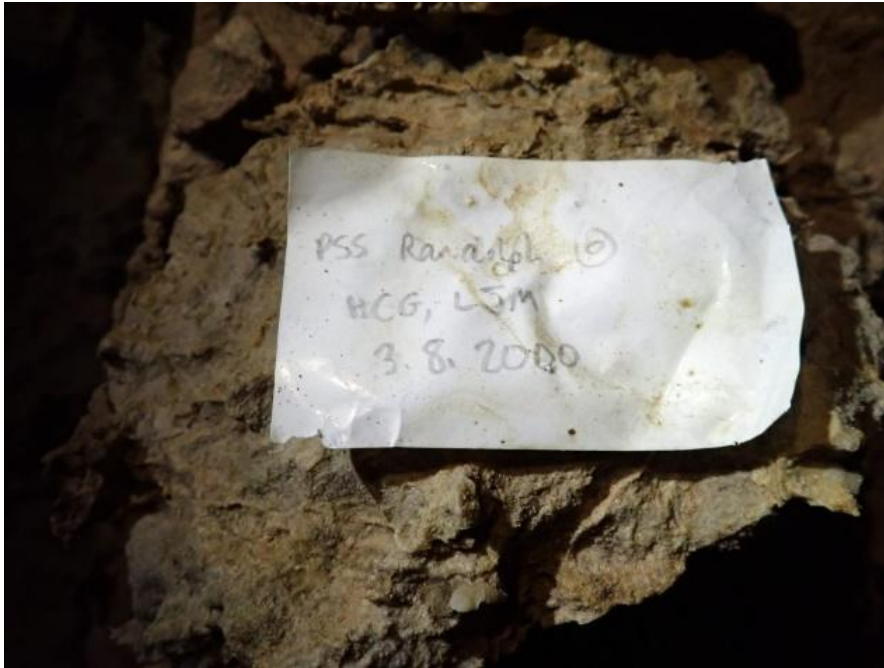
Surveyed passage: 593.84 m (total length now 737.10 m; total depth 430.29 m)

This cave was first explored in 1998 down a series of shafts separated by tight pitch heads and ending at a too tight yet tantalisingly draughting rift. This little cave that has been playing hard to get for years, despite repeated interest due to the draught. However, it is now is part of a big system following the culmination of several years efforts.



*Left: Entrance to Cave of the Singing Pasteur. Right: A survex snapshot of the 27/9 shaft series dropping down to meet the 2/7 streamway*





*The 23-year-old survey marker at the connection with 2/7 (Photo: Aileen Brown).*

Enlargement of the original terminal rift and hard pushing of some further tricky rifts in recent years left open cave to explore in 2023. Despite the unrelentingly awkward upper part, this year's discoveries began with a series of spacious pitches in a deep shaft . At 430m depth, the cave finally dropped into The Randolph area of upstream Cave of the Witches Eye (2/7). This is just downstream from the sump that connects to Torca del Regalon (C4). This connection opens the possibility of access to a remote part of Cave of the Witches Eye by an shorter er (but not easier) entrance. This would require setting up a camp in the upstream 2/7 area to access this area which has received little attention . In addition, leads were left open higher up the shaft, off a large ledge, that may lead to new areas of cave, including the possibility of a dry connection to Torca de Regalon.

### *Sistema Verdelluenga (C4)*

Surveyed passage: 136.8 m

A three quarters of an hour walk up the hill from 27/9 is the entrance to Torca del Regalon (C4) itself. Although discovered much earlier, the main exploration here was in the mid 1990's. Major upstream extensions were made in 2016 by climbing a waterfall and these included a large chamber called The Sanctuary, subsequently used for underground camping. In 2017 the downstream sump was connected to Cave of the Witches Eye (2/7).

This year exploration camps based at Bugger Bognor in the main shaft series resulted in:

- discovery of a new upstream sump from an inlet to The Sanctuary.
- continued upstream bolt climbing until it was clear there would be no speedy conclusions.

In addition a long overdue full derig of the cave was carried. This included the upstream camp at the Sanctuary and the camp at Bugger Bognor. This was a huge team effort carried out over two camping and one day trip, and also involved significant surface carries of equipment away from the cave entrance.



*A brief photo stop below The Monster, C4 (photo: Bartek Biela)*

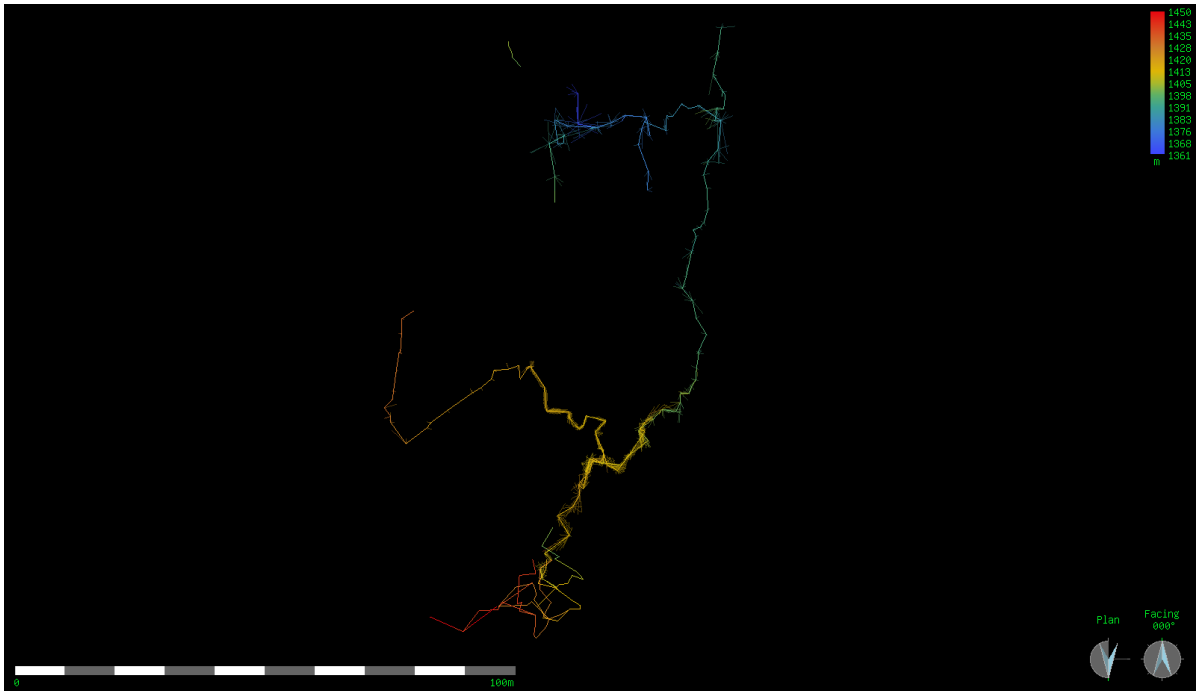
### *Cueva de la Rana (53/5)*

Surveyed passage: 718.62 m (partial resurvey; approx. 550 m of new passage)

The third main cave explored was Cueva de la Rana. This smaller cave in the Extremero Valley is at lower elevation but tantalising poised between the Xitu system and downstream Cave of the Witches Eye. A howling gale emits from its entrance. Previously pushed primarily downstream (and towards Xitu) by Oxford UCC, recent work has focused on following the draught. This has led to new upstream extensions heading south (towards Cave of the Witches Eye). This year a full resurvey of the old cave was started (but not finished), as well as mapping new discoveries from last year and further extensions from this year. While the new upstream passages do not contain the same strength of draught as the entrance, the final trip of this year uncovered a new lead with a strong draught also heading south. It's small and may require modest enlargement, but is very excitingly placed. Page 10 includes a summary of draught testing in the cave.



*Inside Cueva de la Rana*



*2023 Surveys survey of Cueva de la Rana*

*Cueva de la Pluma Negra (6/8)*

Surveyed passage: 83.90 m

The fourth cave we worked on this year was Black Feather (6/8). This entrance was identified decades ago but had not been visited for a long time. The snow at -20m reported from previous visits was long gone in 2023 and a further 30m pitch was descended to a chamber. From here a climb up reached yet another rift with a good draught which we will work on next year.



*Fiona Zhang in the entrance to Cueva de la Pluma Negra*



# Cave Descriptions

## *Cave of the Singing Pasteur (27/9 or Bill's Cave) 2023 Extensions*

593.84 m (total length now 737.10 m; total depth 430.29 m)

### *Foot Hang alternative*

Descending part way down Foot Hang, and alternative route is possible. The right hand wall was bolted and traversed across to the passage leading off, it quickly narrowed down to a rift that became challenging to stay at the correct height to continue forward, a chunk of rock was removed to aid progress along 'pass the hammer' passage. A wall of calcite was reached that has a small opening leading through at a 30 degree angle, on the other side the rift was far too narrow to continue any further.

### *Shaft Series from Darkness My Old Friend to The Randolph in upstream Cave of the Witches Eye*

At the base of Darkness My Old Friend, a ramp rises on the right hand side. Following a traverse line up this ramp leads to the Head of the Coffee Pot. This pitch follows an oblong shaped space to arrive at the head of a spacious rift: The Wright Stuff. Traverse to the pitch head which is rigged from both walls. This leads via rebelay that span the rift, to the head of Sticky Fingers, named for the seemingly impossible bolt deviation on the left hand wall.

From the base of Sticky Fingers, traverse on the right wall to the head of another major pitch. Here the cave really opens up. The rigged route passes a pool on a ledge before swinging around to reach a major drippy ledge via two further hangs.

Below the drippy ledge a canyon passages descends. A wide, slightly sloping, 34-metre pitch has a rebelay at -7 metres and a further deviation (potentially 2) to avoid rub. It *almost* arrives on a small and loose ledge/rock chute - however a y-hang is installed just above the ledge. A large rock boss allows a deviation to reach the main ledge some 7 metres below the y-hang.

This main "balcony" ledge has a boulder floor and is about 6 metres wide - large enough to leave the rope safely if required. To the right (with rope behind you) there is a pitch around the corner (estimated 15-20m by stone toss), which was assumed to join below, but a subsequent look indicated this may not be the case. The main continuation however is to the left on the balcony ledge.

A y-hang on the left- hand wall starts a traverse past a large, precarious boulder, to the head of the next pitch. Another y-hang leads to a rebelay 25 metres below, with a final 6 metres to another ledge. A couple of small steps lead to the head of the next pitch, Augmented Reality. Here a lovely, solid right hand wall leads forward for a few metres to give a clear hang down the next pitch (15 m ) into the base of the gully where the water is met. Bolting is fairly minimalist from this point at the time of writing due to the sight of further drops below and a desire during exploration to make the connection! A series of 3 rebelay down the left wall follows, finishing with a 12 m pitch down to a pool, using a deviation to avoid the ledge.

This section between the 15 m pitch and the pool could well get quite damp after wet weather. An alternative option could be to stay high on the left hand side of the gully rather than dropping to the floor.

Staying on the rope beyond the pool, another pitch (9 m) carrying a significant draught is descended, immediately leading to an airy 19 m pitch landing at The Randolph.



### *The Randolph and Beyond*

Old in-situ ropes from the upward exploration in the 90s were cut down, and the top of the Randolph pitch was remodelled to provide a better hang. Some material around the top of the pitch head appear(ed) well cemented-in and secure, but some effort proved otherwise.

Following the ropes down leads to a muddy slope with a sandy platform that may be suitable for a camp. Following the slope down leads to the streamway. Turning right and proceeding upstream for a few minutes leads to the upstream sump that connects to C4. It was possible to get to/from the sump with getting wet feet, although this probably would not be possible walking in the streamway throughout.

The sandy platform was probably between ten and twenty square metres and seemed high enough to be out of any obvious flood risk. As the platform was a ledge, only one solid wall is available for rigging ropes to suspend a tent. However, there may be a route to the wall on the other side of the passage via what appeared to be a high rock bridge slightly downstream.

### *Sistema Verdelluenga (C4) 2023 Upstream Extensions*

#### *Upstream sump*

Above the last pitch comprising the 2017 upstream limit, a climb up in the rift leaving the water behind emerges after 12 m of ascent through a narrowing into significantly larger space above ("Look Around You"). A rope was left in place for this climb in 2023. Here a couple of minor inlets enter in one corner, but the other way a sandy ascent gains a short boulder-floored section of passage that soon reaches a drop with water audible below. A split descent of 26 m reaches stream level, where the stream disappears into a choke shortly upstream of the C12 mentioned above. The streamway can be followed for just 30 m before the roof descends and the passage is sumped. The sump was beautifully clear and appeared to gently descend in spacious-looking passage. In total there are 137m of new passage in this extension.

#### *Sanctuary*

The big bolt climb up sanctuary ends with no way on. A free hanging muddy traverse on the left hand wall part way up this climb was bolted further towards the left until a corner was reached. This opens out as far as the eye can see and seems to head towards the big waterfall coming into sanctuary- an interesting prospect for the future but a very big project.

### *Cueva de la Rana (53/5) Resurvey and 2022-3 Extensions*

The narrow entrance series contains the outstandingly-strong draught, and it emerges at the head a short (8 m) SRT pitch down – the Pterodactyl. SRT kits can be donned either at the pitch head, or more comfortably in a small chamber immediately before the pitch head. The pitch lands in a much larger and higher passage, where the draught is much less obvious.

#### *Upstream extensions*

Mark Sims, Sandy Wright and Bartek Biela had turned left at the base of Pterodactyl (facing outwards at the pitch head) in an upstream direction. This direction leads to a 5-10m climb up, in two stages, now with a SRT rope, and into a narrow roof passage that has some stalactites ("Silence of the Sheep", explored in 1991). The passage is a crawl that leads to a short squeeze, which was hammered in 2023 to allow larger caves to fit, and is assumed to be the 1991 limit. This upstream passage has a very strong draught, and appears to have most (but not all) of the howling draught in the entrance series. The continuation of this passage crosses a pit, which is traversed above and bypassed using an in-situ rope. The pit has been descended, and is immediately too narrow both upstream and downstream.

The upstream passage, still carrying the draught, now enlarges, and there are 4 or 5 short ascending SRT pitches (~5 m) that were originally free-climbed. This series of short upward pitches eventually leads to a climb up into a Pretty Chamber, from which there are two ways on. (It is also possible to traverse back above the passage from which you enter for a short distance too).

#### *Upstream Smaller Inlet*

The smaller and less obvious inlet passage ascends steeply from the Pretty Chamber, continuing with some good formations, until a chamber is eventually seen at the base of a short climb-down from the ascending passage. That lower chamber is blind, but an exposed climb over the top of the chamber continues. However, eventually further progress was not possible. This inlet passage does carry a slight draught (smoke is blown sideways), but that draught is very weak and hard to discern without such a smoke test. It seems that the inlet carries a very small amount of the howling draught felt at the entrance.

#### *Main upstream continuation*

The larger and more obvious upstream passage from the Pretty Chamber continues to ascend. There is a very strong draught at this point, although not as strong as the howling draught in the entrance series, but suggesting this is probably the main way on. The passage leads to a slightly descending traverse that originally had a hand line. This 10-15m long traverse then led to a ~7m SRT pitch (or tricky climb) up, followed immediately by a hammered squeeze at floor level, and further upward climbs. The upwards climbs include very loose boulders, and they lead into the start of the Big Chamber.

However, two upward pitches (18m and 15m) also lead into the Big Chamber from the start of the descending traverse. These bypass pitches were bolted (from the top down) in 2023, and they allow the Big Chamber to be reached without having to do the loose boulder climbs, where a boulder fall caused a broken foot in 2023. From the top of these 18 m and 15 m SRT pitches, a descending tube is then followed down the start of the Big Chamber area.

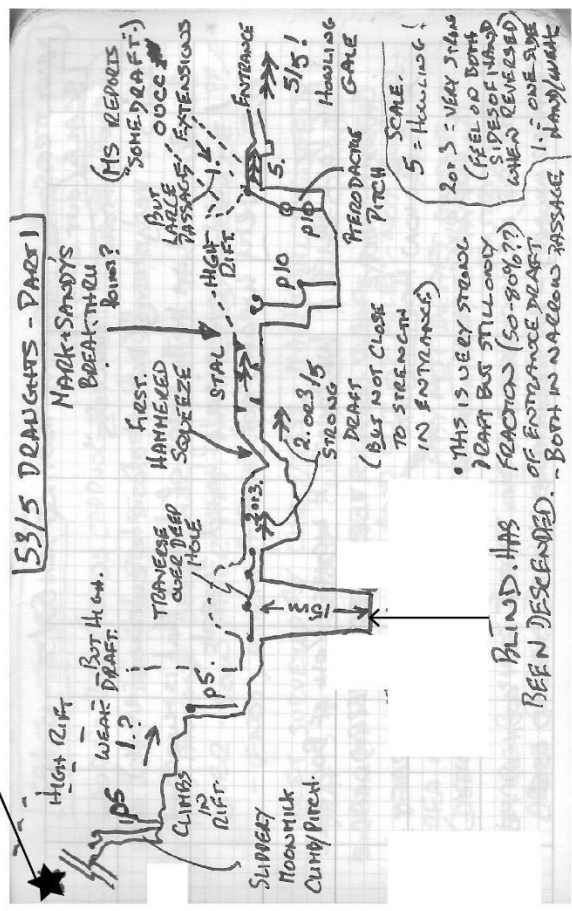
#### *Big Chamber*

This is a complex area, and various possibilities were explored. After arriving in Big Chamber, an exposed step round a muddy arete, leads to the foot of a short (2m) upward climb, starting above a sheet of dropped survey paper in the floor. Continuing upwards via a series of sometimes exposed climbs leads to a bolt climbing project undertaken in 2023. This area and its bolted avens have no draught, and they are likely not to be the main way on.

Close to where there is the sheet of dropped paper, and just below the first climb up, there is a narrow rift. It is that horizontal rift ("Laura's Rift") that appears to carry the strong draught, judging from systematic smoke tests. Laura pushed the rift for ~15-20 m, to a narrow squeeze down that needs enlarging, especially for the way back up, and more generally for larger cavers. This is probably the most promising lead in the cave, as it carries the most draught (refer to figure overleaf). However, although strong, this draught is still not as strong the remarkably strong draught found in the entrance.



Same location



- Scale for Draught Intensity
- 5 = absolutely howling (entrance)
  - 2 or 3 = very strong (but not as strong as entrance...)
  - 1 or 2 = cold on both sides of a hand when reversed
  - 0.5 = very weak or not sure if draught

NB. Smoke from piece of lit toilet roll (aka 'the bog roll spliff') tells you if (i) smoke blown horizontal then definite draft, and (ii) direction of draught. But does not measure the strength of the draught

Figure 1. Summary of Draught Testing in 53/5

### *Downstream from Pterodactyl Pitch*

Back at the base of the first pitch, obvious downstream continuation is right, facing out from the pitch head. This downstream direction leads to a series of easy traverses and obstacles that are easily passed without a rope, until a large diameter 15 m deep-pit is reached (Pointless Piranas). The pit itself is blind as confirmed during 2023 resurveying. The original explorers left a rope across the pitch (an 'umbrella') which was recrossed in 2023 to reach what was described in 1991 as "a broken chamber with three possible routes on". The "squeeze through stal leads to a second squeeze into a well decorated rift which closes down and was not fully pushed" was not investigated in 2023, and the climb down appeared pretty loose and was also left alone. The climb above was investigated and the ramp above the Cement Garden was investigated and found to be extremely slippery and muddy, leading to a blockage with no draught and a dribble of water entering from above.

No additional exploration was carried out below Big Biscuits rift in 2023, but it was noticed that a minor but not insignificant part of the entrance draught was coming from this route.

### *Cueva de la Pluma Negra (6/8)*

Descending from 27/9, the entrance is on the left (steep) side of a broad hollow. The main hollow has several shakeholes that all choke with no discernable draught.

**Note, the entrance and entire cave is very loose.** The entrance pitch is rigged from a y-hang and descends ~20 m to a boulder floor, which was originally blocked by a snow plug during the initial exploration in the 90's. A short climb down, rigged with a traverse line, leads to wedged boulders overlooking the second pitch. *NB, the through bolt here should not be used.* Do not descend here, instead continue the traverse line through a short crawl then along a rift with a false floor to a better hang to rig the second pitch. Crawling along the false floor dislodges stones that fall into the chamber at the bottom of the second pitch, so due care should be exercised by people both above and below the second pitch.

The second pitch lands in a large chamber that is roughly V- or Y-shaped when viewed from above. As of July 2023, there was a small snow pile near the bottom of the pitch. On one side (left-hand side with one's back to the pitch) is a boulder choke that does not appear to go but has not been pushed. On the other side is a loose boulder and scree slope leading up to the start of a bolt climb, which begins on the right hand wall. Where the loose boulders are reached the bolt climb switches to the left hand wall, where a y-hang has been bolted, and continues up. A series of ascending pools can be seen and water can be heard dripping. It is suspected that there may be a parallel shaft behind but this was not reached. Exploration was terminated at this point due to time and equipment constraints. The scree slope leading to the bolt climb appears to be safe from falling rocks due to crawling over the false-floor traverse—although the slope itself, and scarring on the walls, indicates rock fall at some point.

Continuing along the traverse past the second pitch through the enlarged window leads to an alternative pitch (~25 m) that drops into another sinuous, though reasonably spacious, rift. The pitch head rock is very fractured and this should be rigged as a multi-hang (5 bolts). There is no obvious way on at the base of this pitch with the rift being blocked at both ends within a few tens of metres. However it emits a strong draught from the floor and warrants further investigation. The rock changes from an ochre colour at the pitch head to a dark grey in the rift, and changes physically from being sufficiently friable to break off with fingertips to reasonably solid. The walls have a "knobbly" texture, like un-spikey cave popcorn, in places.



## Other Caves Visited

31/4

As this is a very substantial entrance it was re-investigated to confirm there is no way on. A substantial boulder was removed from a choke at the entrance to allow for a descent of a short pitch leading into the same fossil choked passage accessible from climbing over RHS of the boulder choke.

33/4

Nothing located to match description

83/4

10m pitch rigged from natural and Petzl Pulse. Choked rift at bottom, no draught, no way on.

45/9

A large (5mx2m) entrance on the track to C4. At the entrance a rope was belayed to a large jammed boulder to protect approach down steep scree slope, with a further re-belay in the roof. This leads to a pitch of approx. 5m dropping into a rubble floored chamber. Downslope leads to remains of a waterworn shaft now choked with scree. However, at the base of the pitch a strongly draughting crawl of 2m leads to a short drop down into a fossil calcited chamber. Doubling back under this a short squeeze/climb down into a chamber, from here a further, smaller squeeze leads to a climb down into another boulder chamber. The floor chokes in both directions, although there is a strong draught present. There is a further, unpushed squeeze in the direction of the draught. This appears to choke at floor level, but there is a space above that may go. Enlargement would likely be required for majority of cavers. Strong draught and location suggest this entrance would eventually end up in 27/9.

33/11

Rigged 15m pitch from naturals to a choked floor with no draught and no way on.

## Objectives for 2024

*Cave of the Singing Pasteur (27/9) to Cave of the Witches Eye (2/7)*

Easier (but not easy) access to upstream 2/7 (Cave of the Witches Eye), offers up opportunities for examination of numerous formerly remote leads. There are three main upstream branches:

a) Tapeworm Passage – 27/9 enters here and a camp will be used to aid exploration. A number of inlets are mentioned in the 2000 description but not described and need to be located, explored and surveyed as required.

b) Canals on Mars – downstream Tapeworm leads to a large chamber called Buy the Ticket Take the Ride (BTTTR). An up pitch (going downstream) will need to be climbed to enter here. From BTTTR, another inlet called Canals on Mars can be accessed. The canals will need to be inspected and either bolted or boats brought in. Upstream in the canal are a number of leads: (i) “a waterway on the left at a right-hand bend in this passage has not been investigated”; (ii) “an inlet on the left-hand wall is passed and has been explored to an immediate aven” which can be checked for climbing; and (iii) a final choke that is to be revisited. The upstream end of Canals on Mars is tantalisingly heading into blank space.

c) Holier than Thou. Downstream from BTTTR the main stream passes a torturous small inlet with a climb up to black space at the end, before arriving at the third major inlet. Holier than Thou, despite

sumping at the end, draughts strongly and the 2000 expedition identified climbs back from the sump which require further investigation. There are also unclimbed avens in this area. In addition downstream from Holier than Thou, is the chamber Fear and Loathing in Las Brujas, which the 2000 descriptions says has not been thoroughly explored.

### *Cave of the Singing Pasteur (27/9) to Sima Verdelluenga (C4)*

This connection has been searched for without success from the upstream end. However, the shaft series in the lower part of 27/9 has many black spaces that could provide a dry connection.

### *Pluma Negra*

The cave remains ongoing, albeit requiring some enlargement. It sits in an interesting location between Tras La Jayada and Canalizos and in line with (but beyond) the upstream limit of Holier Than Thou in 2/7.

### *Tras La Jayada*

Although it was nominally on the cards for 2023, no one even did so much as visiting the entrance. It seems no one has been since 1980, well before the upstream 2/7 passages were explored. It is now known that the terminal choke is close to a passage in 2/7 that draughts strongly. If visited, a resurvey should definitely be carried out. An added bonus in the context of many of the ongoing projects is that it is not restricted to thin cavers!

### *Cueva del Rana (53/5)*

#### *Continue resurvey of "old cave"*

The upper section of the original exploration has been resurveyed, but the down pitches have not yet. For completeness, these should be resurveyed next time. A job for the thinner cavers (as is the rest of the cave)!

#### *Continue exploration of 2022-3 extensions*

From the results of the draught testing, "Laura's rift" seems the prime candidate for ongoing exploration, carrying more draught than any other part of the cave. Some enlargement may be required initially, but it looks larger beyond the constriction.

## **Alex Pitcher Awardees**

Pauline and Rosie relate their first expedition experiences.

### *Paulina*

Ario was the very first caving expedition I learned about so it's perhaps fitting that it ended up being my first caving expedition. I'm beyond grateful for the Alex Pitcher Award for allowing me to buy a rucksack and walking poles! - Which certainly meant walking back and forth to camp (and to C4!) much more pleasant! I'm happy to say it survived the expo and will no doubt return!

I was also able to use the money to buy a small tackle sack and pack-a-mac which certainly made standing around underground much more pleasant!

As this was my first expedition, I didn't really know what to expect- or rather I suppose I had set my expectations to carrying gear where needed and occasionally poking a hole but I had the opportunity to do so much! From learning how to bolt climb, to belaying a bolt climb, to bolting pitches, surveying and even camping in C4! I had an amazing time! Thank you for helping make it possible and thank you to everyone there for being so welcoming and friendly! I was honestly so upset when we had to go back home- wish I could stay there forever!

## *Rosie*

When doing my Nth rebelay in C4 I was quite relieved to have spent most of the money from my Alex Pitcher award on a simple, having previously been a rack user. Ario 2023 was the first (and so far only!) expedition that I've been on and I don't know quite what I was expecting, but I was thrilled to find myself helping to derig a 600m cave, learning to bolt and survey, contorting myself into rifts, and investigating all kinds of previously snowplugged holes. I had a very idyllic time in the mountains away from ordinary life, surrounded by the limestone peaks, and writing this in the middle of English winter is making me miss my time there very much, even if I can still hear the cowbells in my sleep! It was very exciting to learn so many new skills and I'm really grateful to everyone who patiently took me through bolting, capping, and surveying and to have been part of such a lovely team of people.

## Team

Laura Bennett	LB	York CC
Bartek Biela	BB	Dudley CC
Paulina Biela	PB	Dudley CC
Ollie Brain	OB	South Wales CC
Aileen Brown	AB	Shannon Group
Chris Curry	CC	Red Rose CPC
Shane Diffily	SD	
Phil Hawcroft	PH	Yorkshire SS
Reuben Harding	RH	Oxford UCC
Jean-Luc Heath	JLH	York UCPC
Martin Hoff	MH	South Wales CC
Rich Hudson	RH	Bradford PC
Becka Lawson	BL	Red Rose CPC
Fleur Loveridge	FL	Red Rose CPC
Rosie Marshall	RM	York UCPC
Stephen McCullagh	SMCu	Shannon Group
Stephen Macnamara	SMCn	Shannon Group
Eoghan Mullan	EM	
Graham Naylor	GN	Oxford UCC
Paulina Poterlowicz	PP	York UCPC
Tony Seddon	AS	Northern Pennine Club
Mark Sims	MS	York CC
Victoria Smyth	VS	York UCPC
Pete Talling	PT	Red Rose CPC
Jess Tomlinson	JT	Sheffield USS
Rocky Yu	RY	Oxford UCC
Fiona Zhang	FZ	Oxford UCC



## Expedition Diary

Date	Activity	Who
25/6	First arrivals in Los Lagos and first carries	
26/6	Setting up camp	
27/6	Survey in 53/5	BL, RY, PB
27/6	Set up camp in C4	RH, PP, VS, JLH, BB, SD
27/6	Partial descent of The Coffee Pot in 27/9	MS, RH, RM
27/6	Start rig of parallel shaft in 27/9	FZ, OB, PH
28/6	27/9 familiarisation	FL, BL
28/6	Push parallel shaft (Pass the Hammer) in 27/9	OB, PH
28/6	Survey in 53/5	MS, PB, VS, BB, MH
28/6	Revisit 45/9	JLH, PP, RY, RH, RM
29/6	Survey in 53/5	JT, CC, BL, RY, PT, SD
29/6	Shaft bashing Area 8 & 9. First new descent of 6/8	FL, EM, AB, FZ, PH
29/6	Take equipment to the Sanctuary in C4 and camp on exit	BB, PB, OB, RH
30/6	Rig the Wright Stuff and Sticky Fingers in 27/9	FL, PH, AB, FZ
30/6	Rig 6/8	BL, RM, VS, MH
30/6	Surveying new route in 53/5	CC, JT, EM
30/6	Bolt climbing the Sanctuary in C4, camp and exit next day	MS, RH, JLH, PP
30/6	Prospecting near 53/5	PT
1/7	Continue pushing and rigging down 27/9 until the drippy ledge	BL, RM, EM
1/7	Survey 6/8	RH, SD, RY, RZ, BB
1/7	Survey new route in 53/5	CC, JT
1/7	53/5 enlargement	PT, FL
1/7	Revisit 33/4	MH, PH, OB, VS
2/7	Re-rigging and pushing beyond drippy ledge in 27/9	AB, FL, RH
2/7	Start rigging pitch series in old cave (53/5)	PT, MS, RM
2/7	Survey and derig Pass The Hammer parallel shaft in 27/9	SMCn, OB, VS, SD
2/7	Start to remove surplus gear from camp in C4	SMCu, PH, FZ, RY
2/7	Area E prospecting	JLH, MH, BL, PP
3/7	Sanctuary derigging trip, camp on exit	BL, CC, VS, RM
3/7	Surveying in 53/5	EM, GN, PT, MS, PH
3/7	Rigging more pitches in 27/9 Attempting 27/9	PP, SMCn RH, SMCu
3/7	Shaft bashing: 33/11, 83/4, 31/4	JLH, MH, SD
4/7	C4 derig back to camp, camp on exit	MS, EM, AB, JLH
4/7	Surveying in 53/5	SMCu, SMCn, RH
4/7	Revisiting 31/4	PP, MH
5/7	C4 final derig	FL, SMCn, SMCu, RH, PP, RH
5/7	Surveying in 53/5	RM, VS, BL, FZ, CC
6/7	Rigging Augmented Reality in 27/9. Make connection to upstream 2/7	BL, AB, MS
6/7	Surveying and sorting rigging "upstream" in 53/5	CC, GN, FZ
6/7	Collecting gear from C4 entrance	PT, LB, AS, SMCu, EM, RM, RH
7/7	Surveying in 53/5	RH, SMCu

Date	Activity	Who
7/7	Cleaning gear removed from C4	Almost everyone else
8/7	Camp site reconnaissance in upstream 2/7 via 27/9	RH, CC
8/7	Hammering in the old cave in 27/9	LB, FL, AS
8/7	85/5 and shaft bashing	PT, FZ
9/7	Draught chasing in 53/5	PT, LB, AS
10/7	Aid climbing in 6/8	LB, RH, FZ, AS
11/7	Aiding climbing and traversing in 6/8	LB, RH, FZ, AS
12/7	Packing up and making inventories, carries down	
13/7	Packing up and making inventories, carries down	
14/7	Final departures	

## Summary Accounts

### Expedition Income:

Grant income Ghar Parau Foundation	£500
Contribution from past expeditions	£98.75
Contribution from Ario Cave Projects funds	£483.15

### Expedition Expenditure:

Underground tent material	£47.24
Stainless steel bolts bolts	£65.88
Rigging gear and rope	£408.00
Underground camp food	£297.94
Communal underground food (not camping)	£229.47
Survey consumables	£33.27

### Personal expenditure:

In addition to the above communal costs, all expedition participants funded their own travel, personal equipment and subsistence costs in the field. Some expedition participants additionally paid accommodation costs to stay within the Refugio Vega Ario.