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## Discovery-led learning: Academic follows passion for adventure with aid from supercomputer

Posted by [ap507](#) at Jul 04, 2016 02:35 PM | [Permalink](#)

Suzie's story is about supercomputers, undiscovered Incan ruins, dodging land mines, climbing South American mountains which have never been traversed by humans before and battling temperatures cold enough to freeze anti-freeze

Suzie Imber is a 32-year-old lecturer and research scientist in Space Plasma Physics at the University of Leicester.

She is also an experienced mountaineer and has a passion for discovery.

In 2015, Suzie and fellow climber Maximo Kausch, 34, came up with the idea of cataloguing every unlisted mountain over 5,000 metres in the Andes range.

This was their first objective.

Suzie was in good company as Max holds the world record for 6,000 metre climbs in the Andes.

So, using the University of Leicester's supercomputer, known affectionately as SPECTRE, and with data from the Earth Observation Science research group Suzie began writing code to automatically identify all of the independent, unexplored mountains in the PUNA region of the South American range Andes mountain range, which spans Chile, Peru, Bolivia and Argentina.

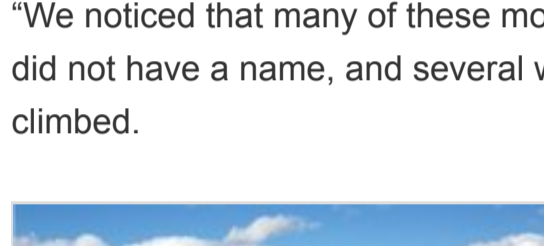
"We had about 36,000 local peaks to check," said Suzie. "And it took some time, even on the supercomputer, to generate our 5000m peak list.

"We concluded that there were 1,129 mountains over 5000 metres -plus mountains in the Andes, and generated a Google Earth file showing their locations.

"Max obtained a map showing the known names of mountains in Chile, Bolivia and Argentina, and we researched past expeditions to see which of these mountains had been climbed.

"This included looking for past trip reports, and talking to local mountaineers, such as Johnson Reynoso, based in Famatina.

"We noticed that many of these mountains, particularly in the PUNA region, did not have a name, and several with names did not appear to have been climbed.



Credit: Caio Vilela

"We decided to launch an expedition to climb some of these nameless, potentially unclimbed – as far as we could tell – mountains in the Andes.

"Only by getting to the top could we ascertain whether there were any signs of previous expeditions to be found there."

Which is where the ambitious team's second objective comes in.

In September, 2015, Suzie, Max and driver - and climber - Pedro Hauck, 34, began to prepare to scale the first uncharted peak.

They had mapped out 15 of the mountains Suzie had catalogued using SPECTRE, and received sponsorship from the Mount Everest Foundation, and the British Mountaineering Council for their expedition.

They embarked upon a two-month journey in Pedro's Landrover Discovery (named Conway after a British mountaineer from the late 1800s), covering hundreds of miles through the remote desert PUNA region of northern Argentina and Chile, climbing remote mountains on Suzie's list.

Their expedition was totally self-reliant, relying on Max and Pedro's knowledge of potable water in the region, and taking a huge amount of dried food.

The trio returned to civilization only when they ran out of fuel and when repairs to the car or equipment were needed.

There were no roads and they saw only a handful of other people in the desert region, driving up rivers and remote valleys and at times even rebuilding old mining tracks that had been washed away by flash flooding.

Joined for part of the expedition by friends Caio Vilela and Jovani Blume, their accommodation consisted of two tents, offering some shelter from the elements.

The PUNA is well-known for being an extreme desert environment however, and these storms can develop rapidly.

Suzie recalls one incident that stuck in her mind, when the team had summited a mountain called Sierra Aliste in Chile.

"We had arrived at the summit under blue skies with wispy clouds, and had stopped a while to enjoy the breathtaking view," she said. "I had got cold on the summit and so raced ahead on the decent.

"I arrived at the camp noting that and the wind speed was increasing rapidly.

"The next thing I knew, a huge gust of wind hit the tents and smashed them; breaking poles and ripping fabric.

"These were specialist high altitude tents that had been used for years in the Himalayas and were designed to withstand such conditions.

"With the structural integrity of our tents destroyed, our belongings were scattered to the winds, and we faced the challenge of recovering food, sleeping bags and belongings from a huge area."

As the team faced winds that tore their specialist high altitude tents to shreds, and temperatures so low that the antifreeze in their vehicles froze, stones were being picked up by the wind and smashing the car windows.

Along the Argentinian-Chilean border, it was land mines which occupied the climbers' thoughts more than the extreme temperatures.

Suzie said: "We obtained a map of known areas of land mines along the Argentinian-Chilean border.

"This was not an extensive catalogue, but provided some indication of regions to be avoided.

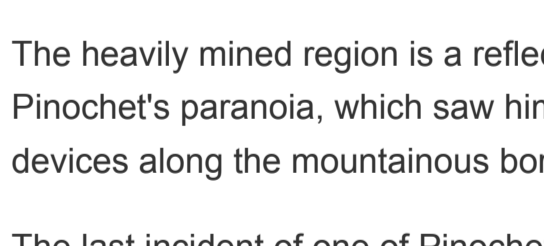
"We also searched on Google Earth imagery for any indication of exploded mines in the areas we were approaching.

"The land mines are generally located on or close to the border, and care must be taken when approaching this region."

The heavily mined region is a reflection of Chilean dictator General Pinochet's paranoia, which saw him place more than 180,000 explosive devices along the mountainous border.

The last incident of one of Pinochet's mines killing someone was in 2012, so the trio took no chances.

After two months, and numerous summits climbed, the three mountaineers



Credit: Caio Vilela

finished their expedition at Copiapo, Chile.

Suzie said: "Max, Pedro and I fulfilled our dream of climbing some of the most remote mountains in the Andes, having discovered them with the mapping technique we developed.

"We discovered a rare Incan Apocheke on the summit of one mountain, and brought back a wealth of GPS altitude data to compare with our digital elevation model. By the end of the expedition we were able to ascend these mountains at a rate of two per day.

"We did not manage to get to all of the mountains on our list, and indeed have since identified several more mountains that we believe may be unclimbed in the region.

"We are currently planning a return to this region sometime between October and December 2016, to continue our quest to visit the most remote mountains on the planet.

"Furthermore, I am now running the mapping code on the Himalayan altitude data that is available and comparing the results with previously compiled lists, to see whether there are any mountains to be discovered in that region."

To read more about the expedition and the project to catalog the Andes, read Suzie's blog: <http://andesexpedition.co.uk/ab/index.php/suzies-andes-blog/>

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