

The volcano man

Volcanologist Sam Poppe has just received a grant to pursue his passion

Senne Starckx

Who's willing to sponsor a dream these days? Most funding agencies only support projects that have well-defined goals, ones that can present a detailed budget and a nice set of milestones.

But the Belgian foundation Vocatio is an rare exception. Every year, this society gives out grants of €10,000 to enable young people to pursue their dream, their life's work: yes, their vocation.

Sam Poppe, 25, from Zele in East Flanders, is one of this year's laureates. He managed to convince the jury with a plan to turn an unknown volcano entirely inside out: Mount Karthala, a notoriously active volcano that dominates the biggest of the Comoros Islands, an archipelago in the Indian Ocean.

Mount Karthala has an impressive history of eruption: It has belched out lava, ashes and deadly gas more than 20 times since the 19th century. And Poppe has twice stood on the crater's edge, a huge caldera complex that was formed when the volcano's roof came down after several eruptions.

Poppe's not an amateur. In fact, he's one of the few professional volcanologists in Flanders – not surprisingly, in an area that belongs to the quietest pieces of the earth's crust. He works at the Free University of Brussels (VUB) with five fellow volcanologists. So what is a normal day for a volcanologist, with no volcano within 2,000 kilometres?

"We spend a lot of time on the GeoRisCA project, in which we focus on the volcanoes in the Virunga national park, on the borders between the Democratic Republic of the Congo, Rwanda and Uganda," says Poppe. "In fact, the city of Goma, in the east of the DRC, lies in the direct neighbourhood of no fewer than five volcanoes, of



Sam Poppe at the crater of Mount Karthala on the Comoros Islands

which two are active and three are dormant. We have identified several additional small volcanic cones that lie within the city boundaries.

"We have also found out that Niyragongo, the central volcano to which these cones belong, has an eruption interval period of between roughly 25 and 100 years. Luckily, when it erupts, it produces gently flowing lava streams without giant explosions. However, it should be clear that the people of Goma (there are more than a million of them) can use some expertise to maintain a reliable surveillance system on their volcanoes."

For the young volcanologist, it's the fieldwork that gives him the biggest satisfaction. "When you're up on a volcano, you find yourself in the midst of the most intriguing landscape on Earth." The difference between that and a small office at the VUB couldn't be bigger, this layman would think. But it's not only paper and computer work

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that keeps Poppe busy when he's in Brussels.

"We actually rebuild dynamic volcanoes – miniature ones, of course – in our lab," he says. And there's a discipline called experimental volcanology. Poppe:

"This may sound like we're playing in a sandpit, but we construct our volcanoes with sand and dry plaster. And for the magma, we use ordinary syrup."

So if the syrup comes under pressure, it's belched into a volcano made of sand and dry plaster? "Indeed. We choose the materials based on their properties relative to each other. The effect the sand has on the syrup is of the same proportion as that the bedrock has on the magma in a real volcano." By building miniature volcanoes, Poppe and his colleagues were the first in the world to study a "volcano" under a CT scan, using X-rays. "For the first time, we were able to witness the deformation inside a miniature volcano," he says.

With the Vocatio grant, Poppe wants to go back to "his personal volcano", Karthala. His plan is to camp for a few weeks just next to the crater. His goal: To map thoroughly the volcano's "collapse history" and identify all the remnants in the form of solidified lava streams, deposited volcanic ashes and the numerous overlapping calderas and craters. By mapping the collapse history, Poppe aims to make a model that enables the local authorities to take the volcano's whims into account. "When we know the flowing pattern of the lava streams and the mud flows, we can identify areas on the island that are at higher risk during or shortly after an eruption."

And Poppe is sure that many will follow. "The average period between two eruptions of the Karthala is eight to 11 years. The last one was in 2007, so the islanders should prepare themselves for the next one." During the 2005 eruption, 30,000 people had to leave because of the risk of deadly volcanic gas and lava flows, and the fall-out of volcanic ashes.

► <http://georisca.africamuseum.be>

WEEK IN INNOVATION

UGent needs hailstones

Ghent University (UGent) scientists are collecting the large hailstones that fell during last weekend's storms, most notably in West Flanders. They are seeking undamaged hailstones that people may have put in their freezers to use for an international research project focusing on damage to airplanes. "The new materials from which the most recent, light-weight airplanes are constructed are very sensitive to damage by the impact of large hailstones," explained professor Patricia Verleysen.

The recent storm provided a unique opportunity to make progress in the research, since it is very difficult to develop hailstones in a laboratory. Usually, hailstones have to be shipped in from Denmark. Anyone who has appropriate hail to donate can email info@vikar.be.

Koreans charmed by "lab-on-a-chip"

Samsung, the world's biggest producer of mobile phones, announced the development of Simband, a prototype of a wristband that delivers real-time health and fitness information to wearers – and to their health care providers, if necessary. The Korean electronic giant's CEO, Young Sohn, recently told journalists in Brussels that they had chosen Leuven nanotech company imec to provide the hardware for a prototype.

The so-called lab-on-a-chip technology is one of the showpieces of the world-famous nano-electronics research centre. The kind being used to test the Simband is iLab, a tiny diagnostic tool that's able to obtain blood and analyse it, after which it sends the results to a health-care provider.

System to prevent growth disorders

Flanders' family services agency Kind en Gezin (Child and Family) has developed an innovative automatized system to measure children's growth over several years. Because the system interprets data automatically, it will help nurses detect growth disorders more easily. Growth disorders can be a sign of a variety of physical or emotional problems or nourishment issues.

Apart from the traditional measurements of weight, length and head, the system includes the Body Mass Index (BMI), the "weight for length" (G/L) curve and the balance between the length and the weight of youngsters from birth to 20 years. The G/L curve is used for children under the age of two; for older children, a BMI measurement is used.

Dansercoer sets record during Greenland expedition

Flemish polar explorer Dixie Dansercoer and his Canadian companion, Eric McNair-Landry, have carried out the first ever complete circumnavigation of Greenland's ice cap without motorised vehicles and without any assistance. The cap is the second largest in the world.

On their Greenland Ice expedition, the two adventurers used only wind kites for transport on the more than 4,000-kilometre route. On 4 June, they arrived back where they started, at their campsite at Greenspeed Ridge on the east coast of Greenland. They were picked up by a helicopter two days later.

By achieving this feat, the explorers also broke the world record for the longest non-assisted kite expedition on polar ice, which had been held since 2009 by British explorer Adrian Hayes. Hayes's tour was 3,120km.

Dansercoer and McNair-Landry started out on 10 April, thinking it would take them about 80 days to travel the planned 5,000km. The tour was shortened due to weather and terrain difficulties, and the explorers managed to finish in just 55 days.

"Pioneering new routes requires the spirit of an audacious dreamer," said Dansercoer. "Carrying out the project to the very end required on-edge performance, every day all day."

During their expedition, the duo collected scientific data, which will be used by an international scientific committee to investigate the impact of climate change. To promote ecological sustainability, the explorers strictly limited their waste during the trip and used solar energy to charge batteries.

Dansercoer has a long career in polar exploits. His previous adventure



lasted from November 2011 to February 2012, when, with fellow Fleming Sam Deltour, he carried out the Antarctic Ice expedition, covering 5,013km in 74 days in the

largely unexplored territory of East Antarctica. This was also a record-setting feat. **Andy Furniere**

► www.greenlandice.be