

# A tourist attraction below undefined boundaries

by Katherine Lehmuller

**The Dachstein Glacier borders two Austrian states: Upper Austria and Styria. Exactly where these two borders meet was vaguely declared in 1949, after Linz and Graz, the capital cities of the two federal states, decided to end their parliament meeting by declaring that the border between the states ran along the watershed and the rocky cliffs.**

In 1969, after the completion of the Dachstein cable car, which leads to the Hunerkogel Upper Station on the Styrian side of the glacier, the area became a popular destination for walkers and skiers. Over the last twenty years, mass tourism found its way to the glacier when Styria completed the Skywalk, the Suspension Bridge and the Ice Palace, top tourist attractions that were always believed to have been built on Styrian land. In recent years, the glacier has decreased and the watershed dividing the borders has changed in volume and flow.

In order to define and digitalise data for future cadastral maps an official measurement of the glacier's topography was carried out using modern surveying technology. In doing this, one of Styria's top tourist destinations, the Dachstein Ice Palace, has become a topic of discussion because exactly where, more

specifically, in which state, the attraction is located has still to be decided.

The Ice Palace is located underneath the Dachstein Glacier, in its inner depths and is a mystical experience out of ice, light and sound. It is only a three minutes' walk from the upper station of the cableway to the Ice Palace. An exact measurement of the tourist attraction with its 40 metre (131 ft) long tunnel system was never made and it was decided to select the long-standing Leica Geosystems customer, Consultant Surveying Engineer Peter Badura, to produce precise 3D animations and maps of the underground Ice Palace.

Mr. Badura's many years of surveying experience on the Dachstein Mountain, working on such projects as lift towers extensions and reconstructions of the Ice Palace, both inside and outside made him the logical choice. Mr. Badura decided to use the Leica TPS 1200 total station and the Leica ScanStation P20 because they wanted to try out the often-heard-of 3D surveying technology and also be able to offer more value to their end customers by handing over a virtual 3D visualisation of the entire Ice Palace.

The Badura Surveying Team defined the coordinated points with the TPS1200 robotic total station that are needed to geo-reference on a map and then began



scanning with the ScanStation P20. They could easily set up and scan from station to station, throughout the entire tunnel, because the ScanStation P20 is similar to using a Leica Geosystems Total Station and has the same intuitive user interface. "We can easily switch between the entire Leica Geosystems product portfolio. This brings us quite a few technical advantages and also saves us considerable time. I think we get substantial value for our money." says Peter Bedura, who together with his young and competent surveying team, measured the entire tunnel system of the Ice Palace. "The ScanStation P20 had to be capable of scanning smooth, rounded surfaces because the lines in the Ice Palace have been

carved out of the ice and are not straight. This is the industry's best performing laser scanner; no other scanner even came in question for us." explains Mr. Badura. Another factor that needed to be taken into consideration were the icy cold temperatures of the underground tunnel system. The products selected had to be robust and be able to withstand extreme temperatures, "The Leica ScanStation P20 was absolutely the perfect product for us to use to scan the Ice Palace. It's very robust and can withstand temperatures of  $-20^{\circ}\text{C}$ . The Ice Palace is about  $-10^{\circ}\text{C}$  and not all scanners can do that."

The Ice Palace's realistic 3D colour point cloud also has an extra advantage: It can be used for marketing purposes. Global visitors can take an interactive virtual tour through the entire tunnel system from anywhere via the Ice Palace website or it can be used as a marketing film at the entrance to the cableway. "This project should help us to make this technique more public – also, it should show the Ice Palace from a completely different perspective; one never seen by visitors before." ■

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■ The ScanStation P20 scanning the Ice Palace.