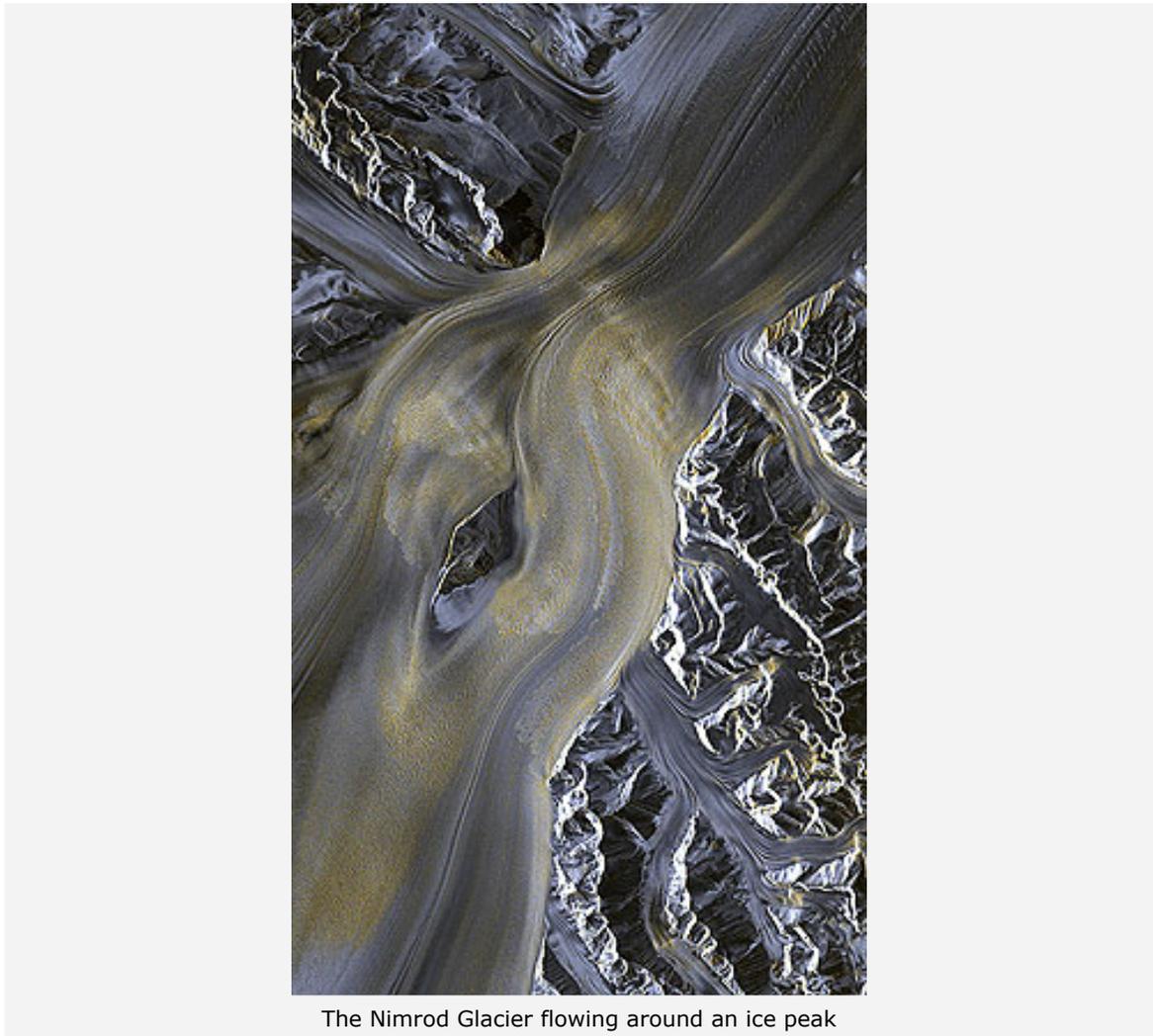


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TerraSAR-X image of the month: Ice flow like molten metal

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The Nimrod Glacier flowing around an ice peak

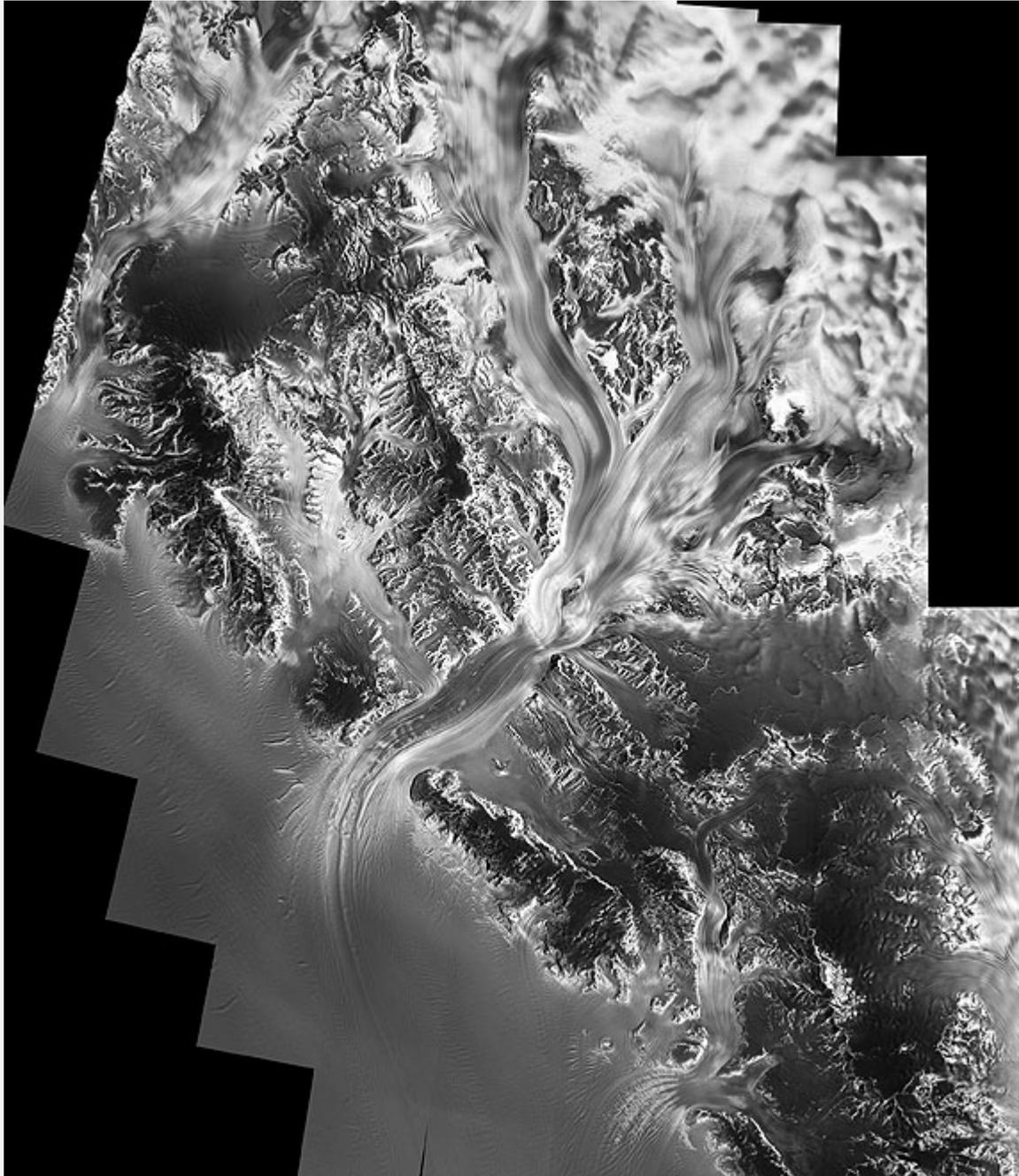
From over 500 kilometres up, as TerraSAR-X looks down on its icy surface, the Antarctic's Nimrod Glacier looks like molten metal. During its flight over the Antarctic, the German Aerospace Centre's (DLR) radar satellite is one of the few that can direct its view over this glacier in the Transantarctic Mountains. Researchers can use these images from space to determine the flow speed of the glacier.

Polar explorer Ernest Shackleton may not have completed his quest to be the first to stand on the geographic South Pole on his first Antarctic exploration (1907-1909), but his expedition was such a success that his ship, Nimrod, gave its name to the glacier. The glacier is 135 kilometres long (82.5°S, 160°E), working its way from the polar plateau through the Transantarctic Mountains, a range of mountains that runs across the entire continent of Antarctica at heights of up to 4500 metres. While it moves, it transports ice from eastern Antarctica to the Ross Ice Shelf. The glacier can move up to two metres per day. "The flow speed is an important indicator in understanding the dynamics of the polar

ice sheets," says Dana Floricioiu from the DLR Remote Sensing Technology Institute. "The polar regions play an important role in the Earth system – changes influence climate models with a local impact on the properties of the polar oceans as well as a global impact on rising sea levels." This detailed image – acquired by the TerraSAR-X radar satellite and having a width of about 30 kilometres, shows the glacier flowing around the Kon-Tiki Nunatak, a rock protruding through the ice sheet. It is even possible to pick out the fissures in the glacier's main body.

The South Pole in view

DLR researcher Dana Floricioiu has made a collage out of 62 individual TerraSAR-X images like these, each covering an area spanning 30 kilometres. All together, they show the entire 300-kilometre-wide glacier region. The ice can be clearly seen flowing into the Ross Ice Shelf through a 20-km-wide fjord-like a funnel (bottom left of the image). The DLR scientists had the satellite look to the left to capture these images. "Radar satellites are typically designed so that their line-of-sight is to the right of their flight path. That's why they cannot observe regions with a latitude of more than 80° south over the Antarctic," explains Floricioiu. "But with TerraSAR-X, by rotating the satellite we can select the direction of the antenna beam so we can even capture areas close to the South Pole." Because the radar satellite images the Earth's surface regardless of cloud cover or time of day, it can systematically observe the properties of land and oceanic ice even in remote regions, all year round. At a very high resolution of three metres, the researchers are able to observe and analyse in detail the complex in-depth structure of ice and snow-covered regions.



Flowing movement of the Nimrod Glacier

Contact

Manuela Braun

Deutsches Zentrum für Luft- und Raumfahrt (DLR) - German Aerospace Center
Corporate Communications
Tel: +49 2203 601-3882
Fax: +49 2203 601-3249
E-Mail: manuela.braun@dlr.de

Dr.rer.nat. Dana Floricioiu

German Aerospace Center (DLR)
Remote Sensing Technology Institute, SAR Signal Processing
Tel: +49 8153 28-1763
Fax: +49 8153 28-1420
E-Mail: Dana.Floricioiu@dlr.de

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