

Astronomers find coldest, driest, calmest place on Earth

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The search for the best observatory site in the world has lead to the discovery of what is thought to be the coldest, driest, calmest place on Earth. No human is thought to have ever been there but it is expected to yield images of the heavens three times sharper than any ever taken from the ground.

The joint US-Australian research team combined data from satellites, ground stations and climate models in a study to assess the many factors that affect astronomy - cloud cover, temperature, sky-brightness, water vapour, wind speeds and atmospheric turbulence.

The researchers pinpointed a site, known simply as Ridge A, that is 4,053m high up on the Antarctic Plateau. It is not only particularly remote but extremely cold and dry. The study revealed that Ridge A has an average winter temperature of minus 70C and that the [water](#) content of the entire atmosphere there is sometimes less than the thickness of a human hair.

It is also extremely calm, which means that there is very little of the atmospheric turbulence elsewhere that makes stars appear to twinkle: "It's so calm that there's almost no wind or weather there at all," says Dr Will Saunders, of the Anglo-Australian [Observatory](#) and visiting professor to UNSW, who led the study.

"The astronomical images taken at Ridge A should be at least three times sharper than at the best sites currently used by astronomers," says Dr

Saunders. "Because the sky there is so much darker and drier, it means that a modestly-sized telescope there would be as powerful as the largest telescopes anywhere else on earth."

They found that the best place in almost all respects was not the highest point on the Plateau - called Dome A - but 150km away along a flat ridge.

"Ridge A looks to be significantly better than elsewhere on the Antarctic plateau and far superior to the best existing observatories on high mountain tops in Hawaii and Chile," says Dr Saunders.

The finding is published today in the *Publications of the Astronomical Society*. Located within the Australian Antarctic Territory (81.5° S 73.5° E), the site is 144km from an international robotic observatory and the proposed new Chinese 'Kunlun' base at Dome A (80.37 S 77.53 E).

Interest in Antarctica as a site for astronomical and space observatories has accelerated since 2004 when UNSW astronomers published a paper in the journal *Nature* confirming that a ground-based telescope at Dome C, another Antarctic plateau site, could take images nearly as good as those from the space-based Hubble telescope.

Last year, the Anglo-Australian Observatory completed the first detailed study into the formidable practical problems of building and running the proposed optical/infra-red PILOT telescope project in Antarctica. The 2.5-metre telescope will cost over AUD\$10million and is planned for construction at the French/Italian Concordia Station at Dome C by 2012.

"Australia contains no world-class astronomical sites, and Australian astronomers face a choice between being minor players in telescopes in Chile or joining Chinese or European efforts to build the first major Antarctic observatory," says Dr Saunders.

Source: University of New South Wales ([news](#) : [web](#))

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