



## **Autonomous instrumentation for astronomy on the polar plateaus**

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The Antarctic plateau contains the best sites on earth for conducting astronomical observations. Arctic sites in Greenland and Canada may also have advantages over temperate latitude observatories.

To facilitate observations at remote, unmanned sites, we are developing a second generation AASTINO (Automated Astrophysical Site Testing International Observatory) for deployment during the International Polar Year. The first AASTINO ran successfully at Dome C in Antarctica with no on-site human presence during 2003 and 2004. It generated 2kW of heat and 500W of electricity from Jet-A1 fuel, with bidirectional communication using an Iridium modem. Our 2004 results showed extraordinarily stable atmospheric conditions above Dome C (*Nature*, 431, 278–281).

The instrumentation on-board the AASTINO ranges from passive weather sensors, SODARs, CCD cameras and sub-millimetre sky monitors, to completely autonomous star-tracking telescopes.

The second generation AASTINO will use a bank of low-cost diesel generators and solar panels. Computer control is via a reliable PC/104 computer running GNU/Linux from solid-state disks. Data communication is via inverse-multiplexed Iridium modems. Several of the new AASTINOs will be built to support IPY activities at locations from Dome A in Antarctica, to Greenland.