

# **DOT Fold-down Protective Domes**

## **High Strength**

## **Full Fold-down - Low Weight**

### ***Features***

These engineered domes can be opened and closed in winds up to 90 km/hr (25 m/sec) and when closed withstand hurricane force winds up to 252 km/hr (70 m/sec). Note: the maximum wind speed in Category 4 on the Saffir-Simpson Hurricane Scale is 249 km/hr. A factor of safety of 1.4 was applied in the designs, thus in a rare Category 5 hurricane the domes are likely to hold up too.

The double-curved high strength cloth membranes allow low weight construction and full fold down.

Proven design: 7 m diameter dome in operation for 14 years and 9 m diameter dome for 6 years.

Preliminary designs for 23, 28 and 33 m diameter domes have been made.

Available in single wall and double wall construction.

Shape of dome and non-stick coated fabric causes snow and ice deposits to mostly slide off naturally.

## ***Applications***

Protection of telescopes and other instruments or installations functioning only or best in open air.

Open air equipment which needs covered maintenance.

Helicopter pads on ships for oceanographic research, dive support, rescue and naval missions, offshore drill platforms, in remote areas, where loading or unloading under cover is desirable, and/or where lack of space makes it desirable to use helicopter pads also as covered work spaces.

## ***History***

Originally developed to protect solar telescopes by providing a dome that can be folded down flat to minimize temperature and wind effects, this concept can also be used for other situations. The two solar telescope domes that were built are located on top of towers at an altitude of approximately 2300 m on mountains on the Canary Islands, where occasionally severe hurricane/cyclone type storms occur. This created an unexpected and unique opportunity to observe how well this concept performs in severe weather situations. It met the requirements of these situations very well. Tropical storm "Delta" hit the GREGOR telescope site on 28 November 2005 with 245 km/hr (68 m/sec) winds without any damage to the dome. Snow and ice did not cause any problems either, as these mostly slide off the coated fabric skin naturally.

See figures 1, 2 and 3 for photographs of the two dome installations and the GREGOR dome in assembly in fully closed, half open and fully open positions.

The design concept is flexible and can be adapted to special requirements.

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Figure 1: Dutch Open Telescope (DOT) with full fold-down 7 m diameter dome enclosure. Left: enclosure fully open, leaving the telescope in a desired natural wind flow. Right: enclosure closed in winter - note the substantial snow and ice build-up on the ladder and elevator frame work, but not on the dome – it slides off naturally.

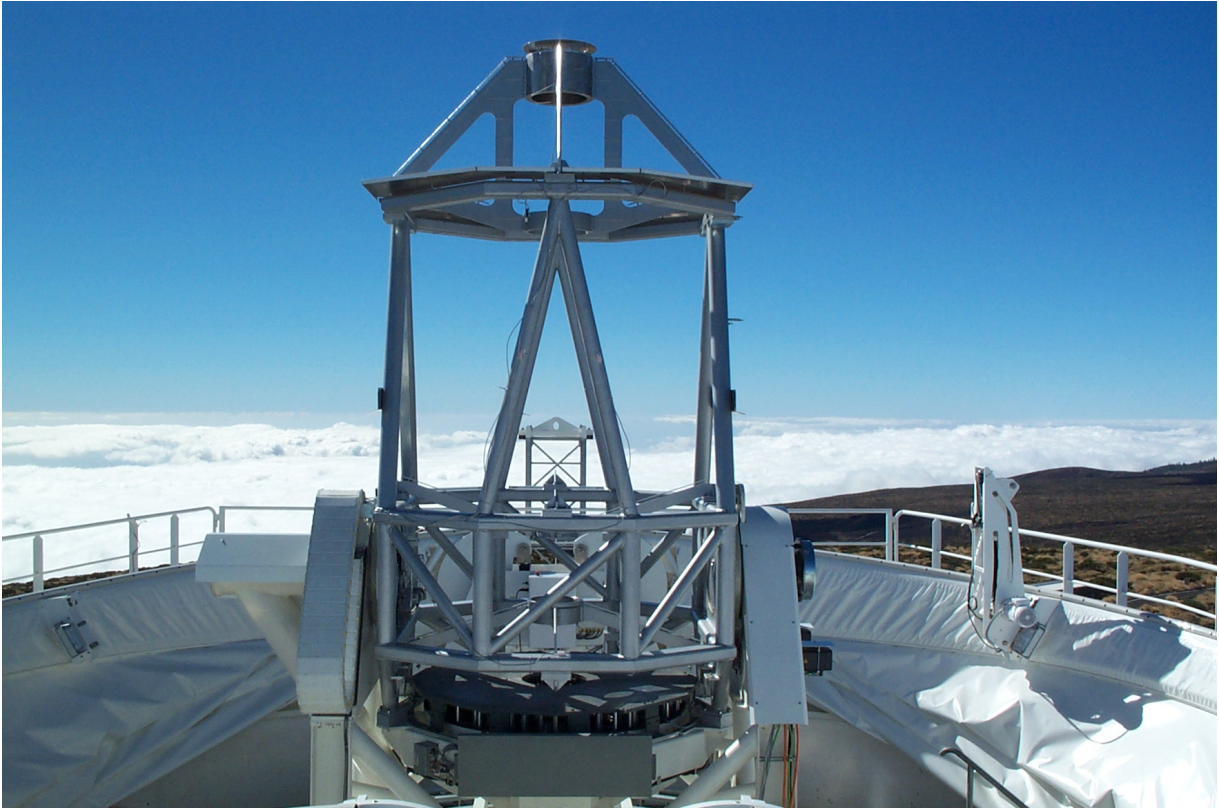


Figure 2: German GREGOR Telescope with full fold-down 9 m diameter enclosure.



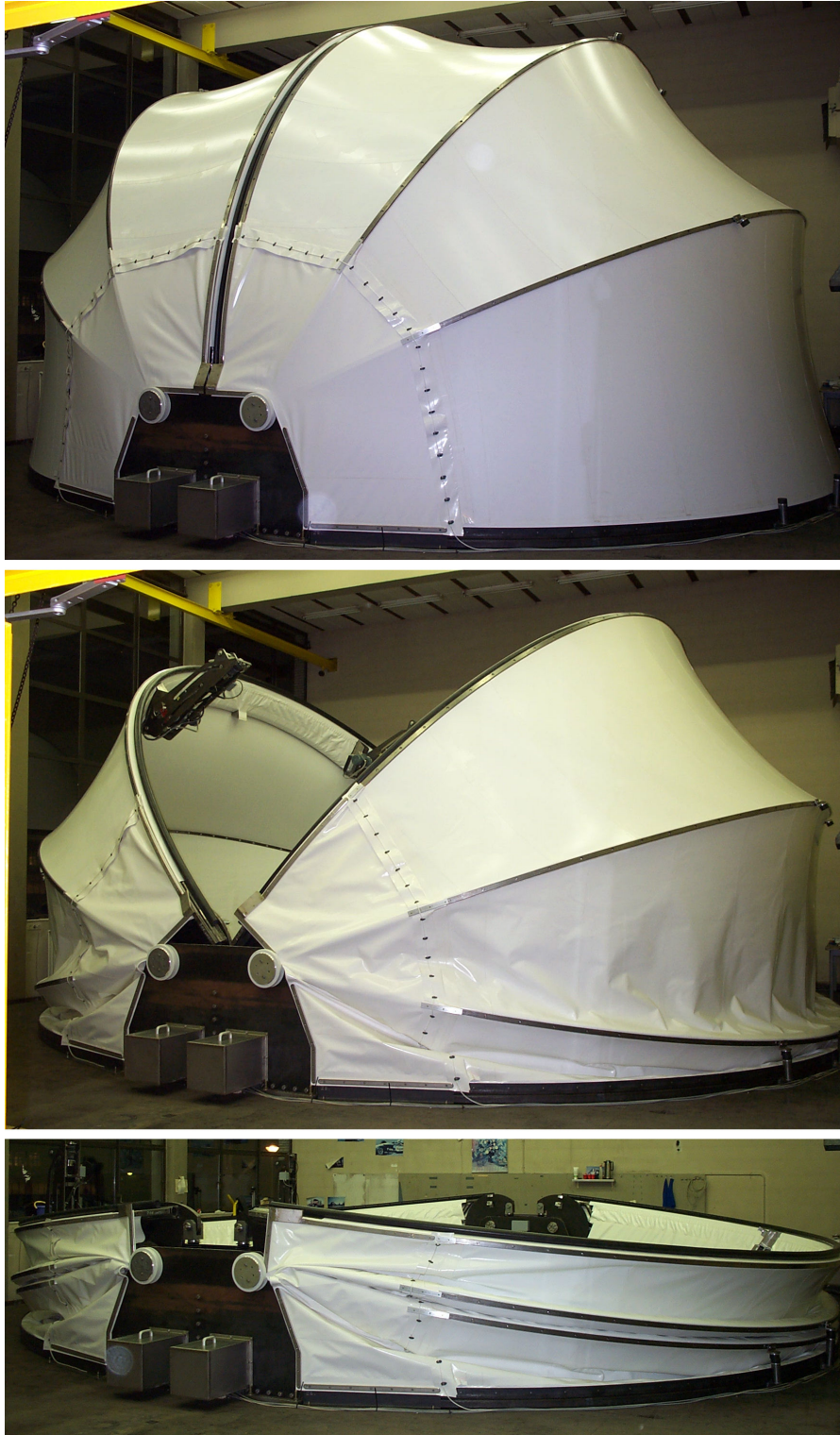


Figure 3: GREGOR dome enclosure in assembly shop, fully closed, half open and fully open