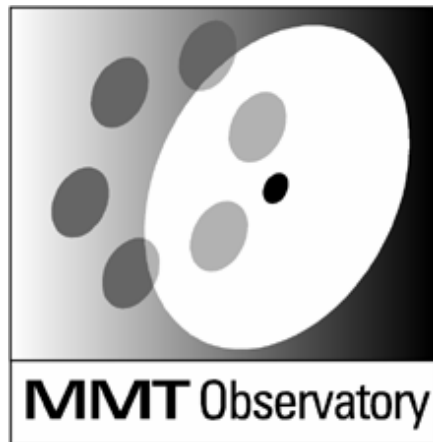


## **MMTO Internal Technical Memorandum #03-2**



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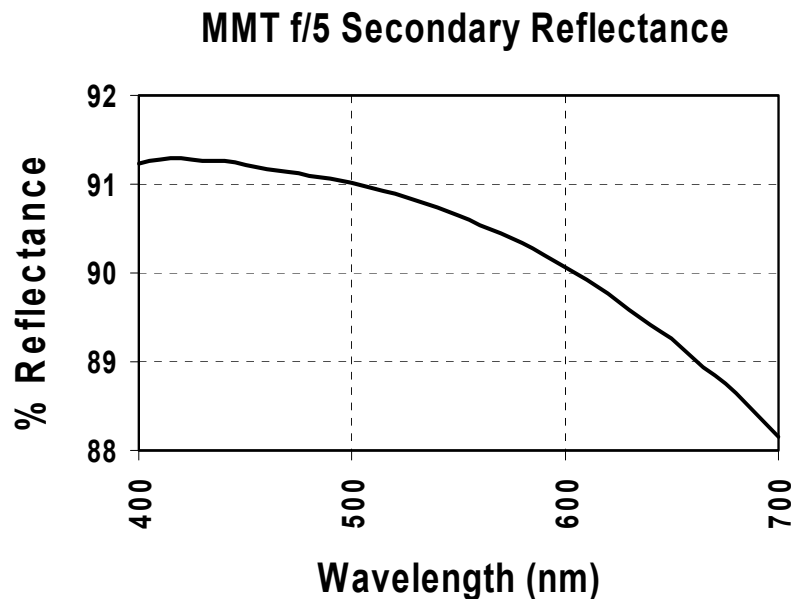
### **Aluminizing the MMT F/5 Secondary Mirror**

**B. Kindred**

**January 2003**

To: For the Record  
From: Bill Kindred  
Subject: Aluminizing the MMT f/5 Secondary Mirror  
Date: January 22, 2003

On January 13, 2003 the MMT f/5 secondary was successfully aluminized. This followed several weeks of preparation by MMT and SO staff. As can be seen in the figure below, the results were excellent.



The Zerodur<sup>®</sup> substrate arrived with a hard substance, which was very difficult to remove, splattered over much of the surface. At first, after normal cleaning procedures had no effect, I convinced myself the artifacts were depressions in the substrate. I discovered later that these “depressions” were somewhat soluble in alcohol and eventually all were removed. My best guess as to what they were is cured cyanoacrylate (super glue).

There are a number of large-radius (~1m) scratches in the substrate and some minor gouges. While visible, their impact on performance will be negligible.

The previously unused lifting fixture required extensive modification but ultimately worked very well—no discernable axial or radial shift of the mirror occurred when turning the assembly over.

Deposition parameters were as follows:

Pressure after initial pump down:	$4.6 \times 10^{-6}$ mmHg
Glow discharge:	45 min. Ar + O <sub>2</sub> , 15 min. Ar
Time between end of glow and evaporation:	5 min.
Pressure at beginning of evaporation:	$4.8 \times 10^{-6}$ mmHg
Peak evaporation rate:	35 Å/sec
Film thickness:	897 Å

Because this was a new mirror we elected to initially pump as long as our N<sub>2</sub> supply would allow. Furthermore the glow was extended beyond our normal 45 min. and a mixture richer in O<sub>2</sub> was used. Aggressive adhesion tests with Scotch tape on a witness slide and around the outer 3/8" zone lifted no aluminum.

Our thanks go to Gary Poczulp (NOAO) for measuring the witness plate with his Minolta CM-2002 Spectrophotometer. The MMT Reflectometer and our CM-2002 are both temporarily out of commission.