

January 23, 2003

National Science Foundation
Atmospheric Sciences Division
Washington, D.C.

To whom it might concern:

I am writing to express my strong support for a proposal submitted to the Major Research Instrumentation program by Prof. Philip Goode of New Jersey Institute of Technology. The proposal seeks to replace the 65 cm solar telescope at Big Bear Solar Observatory (BBSO) with an open, off-axis 1.6 m clear aperture telescope. My understanding is that the main scientific driver of the upgrade is to support, in a campaign mode, some of the upcoming major solar space missions, such as Solar-B, Stereo, and Solar Dynamics Observatory, all of which will be in operation several years before the National Solar Observatory's major initiative—Advanced Technology Solar Telescope—sees first light. Prof. Goode has proposed a low-cost, heavily leveraged, solution to bridging the scientific gap between the present US complement of solar instruments, which mostly are out-dated with respect to modern European solar facilities in the Canary Islands, and the future state-of-the-art ATST. The aforementioned NASA missions fall squarely in that gap, and it is scientifically unconscionable for US solar physicists not to be at the forefront in providing the highest level of groundbased support to these critical space observatories.

A 1.6 m open telescope will achieve spatial resolutions at the important magnetic lines in the 1.56 μm region comparable to that delivered by the 0.5 m Solar-B telescope in the optical. Big Bear is an excellent site, with demonstrated good seeing for extended periods of time. It also is well-separated in longitude from the major European solar facilities, allowing the possibility of extended temporal coverage in joint observing programs. The staff of BBSO is highly competent and productive. Together with outside collaborators, they will make good use of the new

facility. Incidentally, the 1.6 m telescope will be largest in the solar world until the advent of 4 m ATST, and thus will be particularly well suited for near-term explorations in the thermal infrared (where telescope size definitely matters). I believe that the proposed BBSO upgrade will supply exciting new advances in solar physics leading up to the major leap forward we all anticipate with ATST. However, even in the ATST era, the BBSO 1.6 will continue to play a central role in US solar physics, owing to its highly complementary mission (large-scale filter imaging at moderately high spatial resolution vs. the photon-hungry full Stokes polarimetry at even higher spatial resolutions possible with ATST). Both of these strategies will be needed in the coming decade of solar physics to make continued progress in understanding the fundamental complexities of our nearby star, and its influences on planet Earth.

Sincerely yours,

Thomas R. Ayres

Fellow,

Center for Astrophysics and Space

Astronomy

Research Professor,

Dept. of Astrophysical and Planetary

Sciences