



CALIFORNIA INSTITUTE OF TECHNOLOGY

Physics Division – Space Radiation Laboratory
1200 E. California Blvd., MC 290-17
Pasadena, California 91125

Dear Dr. Stappers,

The regular monitoring of the Crab pulsar undertaken by the Jodrell Bank Centre of Astrophysics, using the 42ft telescope is crucial for many large projects. The NuSTAR (Nuclear spectroscopic telescope array) mission is no exception. NuSTAR is a X-ray satellite which was successfully launched in June 2012. Studying neutron stars is one of the science drivers behind this mission and this can only be achieved by being able to time-tag each received X-ray photon with sufficient precision. An important aspect of the post-launch commissioning phase was therefore to ensure the expected timing precision could be achieved in practice. An essential step in this verification process was to observe the Crab pulsar, which is extremely bright in X-rays, and compare the X-ray timing with those obtained from ground-based radio observations. The timing ephemeris provided by Jodrell Bank allowed us to confirm that NuSTAR was indeed operating as expected. The Crab pulsar, although well studied, keeps surprising the astronomical community. We can be sure that the NuSTAR observations of the Crab will provide new insights. Of great significance of any study of the Crab is the multi-wavelength aspect. How do our observations relate to what is seen in different parts of the electromagnetic spectrum? Again, the contribution of Jodrell Bank is very valuable, enhancing the scientific reward from the NuSTAR mission. We hope that this great service will continue throughout the NuSTAR mission, and for future projects as well.

Sincerely,

A handwritten signature in cursive script, appearing to read "Fiona Harrison".

Fiona Harrison
Benjamin M. Rosen Professor of Physics and Astronomy