

**Report of the activities carried out by Dr. A. Cellino during his
COST-funded visit to the Armagh Observatory (March 17-24,
2013)**

During his visit, A. Cellino worked with Dr. S. Bagnulo on a number of topics of common interest, related to the general subject of polarimetric studies of small Solar System bodies.

In particular, the main subjects of the work were the following:

1. Solving some problems related to a task of data reduction of an observing run of polarimetric observations of asteroids carried out in the past using the Liverpool telescope. The reasons of some apparent difficulties in deriving reliable results from these observations were identified and partly solved. A new version of a numerical code for data reduction to be applied to Liverpool telescope observations, previously written by S. Bagnulo, was developed, in order to allow for a better derivation of the instrumental polarization, based on observations of standard zero-polarization stars. This is expected to produce soon a better a new reduction of available Liverpool telescope data for asteroids.
2. A proposal for spectropolarimetric observations of selected asteroid targets using the ESO VLT 8-m telescopes was written and submitted to ESO for approval. If accepted, this project would be the first serious attempt to carry out spectropolarimetric measurements of minor Solar System bodies, something which is expected to produce interesting results both for the derivation of asteroid physical properties, and for providing some observational evidence of the highest interest for theoretical studies of the phenomena of visible light scattering by atmosphereless planetary bodies.
3. Dr. Bagnulo accepted to be involved in an on-going research project developed by Dr. Cellino, in particular for what concerns the developments of numerical techniques to derive correct estimates of the errors to be assigned to some parameters appearing in some new analytical formulations of the albedo - polarization relation tentatively developed by Dr. Cellino. This is another project which is expected to have a strong impact in the field of the studies of asteroid polarimetry.

The activities mentioned above took a great advantage from the possibility to have a direct meeting of the two researchers funded by the COST contract. This seems to be a proof of the importance of having at disposal this source of funding which make it possible to strongly strengthen the collaborations between European researchers active in the field of polarimetry.