STATEMENT OF INTEREST

Data Products for Public Surveys: the VLT Survey Telescope (VST)

Prof J.P. Emerson, QMUL, VDFS Project Leader, & VISTA Consortium Director, Dr RG McMahon, Cambridge, VDFS co-I, Prof A. Lawrence, Edinburgh, VDFS co-I & UKIDSS Consortium Leader, Dr MJ Irwin, VDFS Pipeline at Cambridge Astronomical Survey Unit, Dr PM Williams, VDFS Science Archive at Wide Field Astronomy Unit, Edinburgh.

Project Description: Expand the remit of the VDFS system (for producing IR survey products from WFCAM and VISTA data) to include products from those VST visible surveys with UK involvement. This will enable UK groups to meet ESO requirements for carrying out public surveys by showing they have the capacity to deliver survey products, and thereby ensure UK groups can lead VST survey programs which will begin to be chosen later this year.

Scientific Impact: The VST is a 2.6m visible survey telescope equipped with a 1 square degree field of view camera 'OmegaCam' operating in the visible wavelength range from U to I. The UK has a long and continuing history of world leadership in survey astronomy and many UK astronomers certainly intend to be strongly involved in, and lead science programs with VST surveys. Such astronomers include many of those involved in UKIDSS and VISTA surveys for many different scientific programs of which complementary visible data (colours, redshifts) to the IR data is needed. Although ESO's selection of surveys will be based solely on scientific criteria, their selection of groups to carry out such surveys will, as explained below, involve other factors, in particular their ability to produce the necessary survey products. For large surveys this would cause great difficulty, as explained below, were no UK based support for this available. Furthermore the availability of such support will strengthen the UK's role in collaborations involving astronomers from other ESO member states.

Context: The UK's VISTA and UKIDSS Consortia went about defining their large scale public surveys to simultaneously cover many scientific goals. Following their lead ESO have adopted a similar methodology for its VST survey telescope due for delivery to Chile later this year. (An Announcement of Opportunity for Public Surveys is expected from ESO after this summer.) ESO have made it clear to the community that it cannot undertake the processing of the data from these public surveys into data products and catalogues. ESO expects the teams proposing to carry out the surveys to undertake to create the data products themselves, and to deliver them in formats consistent with the ESO/STEFC SAF and VO standards for use by the wider community (ESO Science & Technology Committee paper STC-353b dated April 22-23 2004, and following STC recommendations). The reduction of large surveys and delivery of products in this form is a large undertaking, so it is very unlikely that standalone groups have the capability to process such large volumes of data in a controlled and timely manner, or to deliver them to the standard required. Those groups that have access to facilities that can meet these requirements (such as VDFS) will be in a much better position to take the leadership role, and also to ensure data is also reduced as needed for the group's particular science goals.

Within the UK the VISTA Data Flow System (VDFS) has been funded (with escience monies) to set up a pipeline and science archive to process and make available products initially from WFCAM data (as it arrives first), and ultimately VISTA data, and is on target awaiting arrival of actual WFCAM data. The processing of data from a visible survey instrument bears many similarities to those for IR imagers (e.g. WFCAM & VISTA) and is somewhat simpler, so the natural and cost effective way to handle processing of large UK led surveys with VST would be through enhancement on VDFS to also handle VST data. This SoI proposes setting aside of funds to enable this to be done, so that UK groups applying to lead surveys can convince ESO that they will indeed be able to handle the data volumes.

Timescales and competitiveness: The actual amount of VST surveys UK groups will win will remain unknown until the allocation process is complete, but a reasonable estimate can nevertheless be made. 40% of VST time is proprietary to the telescope/instrument builders, and for the remainder it is expected that 40% would go on public surveys and 20% to more traditional work by individuals. Given the UK's strengths in surveys and WFCAM and VISTA it would thus be reasonable to imagine that ~25% of VST time would be devoted to public surveys involving the UK.

The UK member of ESO's STC said "In my report to PPARC, I point out that we can expect an AofO to conduct Public Surveys with the VST this summer, and that we must ensure that UK groups can respond competitively. This is a concern because of the new annual grant application dates." This SoI is intended to deal with this point.

Summary:

The VST survey allocation process will involve undertakings to process data and deliver data products, so there is a potential difficulty for UK groups if this cannot be demonstrated. This SoI is intended to prepare the ground so that UK groups can offer to lead the data processing, and hence gain PI status on VST programs.

Setting aside ~£190k should help enable UK groups to take scientific leadership of some public surveys with ESO's VLT Survey Telescope (VST) should they be successful in winning this time in open competition. (The period covered by the first call for VS public surveys will be 2 years).

PPARC Resources Needed:

Developing and setting up the software, hardware and commissioning a UK VST pipeline at CASU would cost about 90K, the science archive at WFAU would need a similar sum to set up a science archive for the data, which would be mirrored to ESO's ST-ECF in Garching. Costs of running the system (which are not needed until ~Apr 05) will be sought together with running costs for WFCAM & VISTA data.

	Oct 04- Sep05	Total
Staff (CASU) dsy	1dsy	
Staff (CASU) £k	40	40
Staff (WFAU) dsy	1dsy	
Staff (WFAU) £k	40	40
Management £k	10	10
Equipment (CASU) £k	50	50
Equipment (WFAU) £k	50	50
Total £k		£190k