



OPTICON Board. 27 October 2005 Network Overview.



# **OPTICON BOARD MEETING**

**27 October 2005, Rome**

## **Network Overview**

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## 1. OVERVIEW

This document summaries progress and future plans of the various OPTICON networking activities. The board members may recall that the EU referees required that we reduce the number of networks originally proposed, and this was achieved by merging certain activities. Thus Network N2, the 2nd largest network in terms of budget, comprises 3 activities all relating to the ORM/OT. Network 3 is a merger of six, otherwise independent activities brought together as individual work packages within a single network and with limited oversight by the Project Scientist. These are presented individually as they are very different in size and scope.

This document was prepared by soliciting input from each activity leader, with some editing and additional information being added by the Project Scientist to provide a coherent overview.

A financial overview and recommendations are presented at the end

## 2. N1. Management – *J Davies*

Management activities at UKATC project office have now stabilised at a steady state, following the extensive efforts during 2004 to prepare the contract, distribute the first tranche of funds and write the technical sections of the first annual report. At present our staff effort is close to the baseline plan of 1.25 direct staff years/year, although it has been running a little below that over the last four months and our effort allocation system predicts an outturn 5% below the nominal value at present. (Note that the UKATC reporting system operates April to March, not January to December but given that the tasks repeat in a yearly cycle any 12 month estimate should be representative of a typical OPTICON year.)

The majority of this effort goes on:

Preparing the technical sections of the annual report . Checking and attempting to de-construct the financial information supplied by contractors in terms of individual activities to assess the cost breakdown per activity. It is of note that the clarity of reporting by the contractors varies enormously. Monitoring budgets and preparing advice on payments to be executed by the Cambridge Office. Preparation of papers for, and attendance at, executive and board meetings  
Monitoring networking activities, supporting network leaders and attending network meetings.  
Links with other I3 and EU funded astronomy activities.  
Publicity, eg Website, Newsletters, Handouts, JENAM meetings etc.

Financial overviews are prepared based on the projected spending reported by each individual activity (eg Network 3.1, or JRA 4) in its '18 Month forward plan'. These inputs, which are broken down as spend at each contractor as part of each such activity are combined to produce the table of projected spend per contractor which forms part of the annual report (section D, detailed implementation plan). Actual spend per activity is reconstructed from the financial reports provided by each contractor for the annual report (the Form C and its supporting 'Justification of spending reported') so that, within certain reporting uncertainties, the project office knows how much was spent on each activity in each year and can compare this to the promised deliverables. The progress towards the network deliverables are tracked using a large Gantt chart updated approximately 6 monthly. Progress toward the delivery of the Access programme is provided in the reports provided regularly by the Access office team. Individual JRA milestones are not tracked by the project office (there are too many of them to monitor within our existing resources).



There has been no opportunity in 2005 for the project scientist's attendance at JRA meetings but the Co-ordinator visited and reported on a meeting of JRA-3 in the spring.

Based on the 2004 UKATC spend of €98,000 for a part year (some of 2004 was covered by FP5 effort) and the outturn for 2005 of €141,536, then the final cost over 5 years would be of order €664000, compared to the baseline plan of €678000.

Activities at the IoA are dominated by the work of the Co-ordinator, G. Gilmore, and Suzanne Howard who are responsible for overall co-ordination of the entire OPTICON activity, distribution of funds and liaison with the EC. In particular there have been considerable efforts by Ms Howard in obtaining and then iterating the considerable amount of financial reporting documentation required by the commission as part of our annual report process.

Assuming that 2004 costs at IoA Cambridge can be extrapolated over 5 years then the IoA outturn would be €445,000, compared to a baseline of €516,000

The outcome is a predicted overall reduction in management costs compared with the budget of €95,000 over the entire 5 year period. However, in reaching this value no account is taken of the need to run on into 2009 to complete the final contract report and distribute the last payment so the complete 'saving' may not be achieved in practice.

### **3. N2. Co-ordination and Integration of ENO Facilities – J Burgos- Martin**

#### **3.1 Introduction**

The main aim of the NA2 is to foster co-operation among telescope operators at the European Northern Observatory (ENO) through different workpackages, including dissemination of good practices, the Site Characterization of the Canarian Observatories and coordination actions on Public Outreach among others.

#### **3.2 Progress to date**

The 3rd general NA2 meeting was held in Liverpool (May 2005) where it was emphasized that special efforts should be carried out to assess the different workpackages of the NA2, in order to guarantee that the NA2 activities initially planned for the first 24 months of the contract will be completely carried out, and any delay due to the receipt of the advance payment late 2004 will be resolved.

The 4<sup>th</sup> general NA2 meeting was held on 5 Oct 2005 to assess the progress of the different work-packages and activities under NA2. Activities and progress were reviewed and found to be running to schedule. The next meeting was set to be in the Spring, one day before a CCI meeting.

*WP1.2.: Laser Traffic Control System (LTCS) for ORM:*

The deliverable D1:Document on hardware specifications was achieved last May.



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At the end of June 2005 the working group organized a coordination meeting in La Palma, where the LTCS was demonstrated (priority rules between telescopes, multiple lasers, non-sidereal tracking, a collision prediction tool, etc.).

### *WP2: Site Characterisation of the Canary Islands' Observatories*

Continuous site-testing campaign of night-time at the Degollada del Hoyo Verde at the ORM based on seeing and meteorological characterization.

A new technician has been recruited to lead with the infrastructure needed to carry out a systematic day-time site characterization during the next years.

Meteorological parameters: air temperature and relative humidity at 2m, wind speed and wind direction, barometric pressure, soil and sub-soil temperature have been collected with a sample rate of 1 data point/minute. In August 2004 a rain gauge was installed on this site providing the only pluviometry data at the Observatory.

The automatic procedure developed to derive turbulence profiles from SCIDAR measurements, is being tested at the Observatorio del Roque e los Muchachos in La Palma, as a complement to the automated software to derive the velocity of the turbulence layers based on wavelet transforms.

Participation on the following forums: ELT Design Study Workshops at Nice in March 2005, and SUCOSIP 2005 at Liverpool in May 2005.

### *WP3.1.: Development of a Joint Information System for Solar Physics (JIS):*

This working group has already developed the first version of the JIS tool. An open workshop was organised at Instituto de Astrofísica de Canarias. The main goal was to present the tool to the other members of this project to get their feedback and new ideas. Some improvements have already been implemented.

A JIS brochure has been edited for distribution around Europe. The JIS tool is already online with the following URL: [www.solarJIS.com](http://www.solarJIS.com), being hosted at the IGAM servers'.

### *WP3.2.: Co-ordinated actions on transfer of knowledge and public outreach:*

The fourth meeting was held in La Laguna on May the 16th. Among the ongoing actions we emphasize the following ones: Edition and distribution of Joint Brochures for the promotion of facilities at ORM & OT, collection of contents for a joint Public Outreach Website in order to improve the exchange and distribution of information related to the ENO facilities, Participation in the conference about Communicating Astronomy with the Public (CAP'05), Munich, Jun'05 and Open Days at ORM & OT during the month of July 05.

## **3.3 Immediate plans**

### *WP1.2.: Laser Traffic Control System (LTCS) for ORM:*

To start testing in anger, initially between the WHT and the INT. Once everything works correctly, the system can start to incorporate other interested telescope facilities at ORM, testing them in an operational environment. Further work will concentrate on the development of software which takes into account the specific issues for the ORM.

### *WP2: Site Characterisation of the Canary Islands' Observatories*

Continuous data comparison of systematic seeing measurements of seeing and meteorology will be carried out by the participants; results will be made available and a progress report on these measurements will be delivered. An Automatic Differential Image Motion (DIMM) will be developed by an specialized company at Roque de los Muchachos Observatory (ORM). First tests will be carried out during September 2005.



After the final check of the S-DIMM and the Scintillometer mounted at OT, and once first results are obtained, a progress report will be delivered by the participants.

An Automatic weather station (AWS) will be implemented in the pre-selected site for an Extremely Large Telescope (ELT) in order to have on line weather conditions at both sites, once the permissions have been received.

Analysis of statistical turbulence profiles obtained with the SCIDAR.

Development of a Generalized Scidar, like Cute Scidar, and a Shack-Hartmann sensor running at the same time. We have to modify the mechanical design to support the weight of both instruments.

Contribution of Site characterization will be presented in the XI National Conference of Teledetección (September 2005).

*WP3.1.: Development of a Joint Information System for Solar Physics (JIS):*

The following activities are under schedule: Contact with beta-testers, Introduction of the use by means of a handbook, final version of the tool will be available and fully operative and sending of the brochures to the rest of European solar physics institutes.

*WP3.2.: Co-ordinated actions on transfer of knowledge and public outreach*

The fifth outreach meeting will take place next September in La Palma.

The following activities are under schedule: Audiovisual of the Canary Islands' astronomical observatories, Improvement of the observatories' display at the Science Museum in Tenerife, Translation and submission of the joint brochures (Spanish version) to the printer press, Launch of the Public Outreach Website and Promotion of the Annular Solar Eclipse which occurred on 2005 Oct 3rd

### 3.4 Long-term plans

Representatives of the NA2 will meet twice a year in order to keep a reasonable track of the whole NA2. Moreover, international funding opportunities will be identified as well as contacts of interest at European level.

*WP1.2.: Laser Traffic Control System (LTCS) for ORM:*

The last stage of the LTCS will be the software implementation at each ORM's facility interested in joining the system. A final report of the LTCS will be delivered by the end of 2006 (D5).

*WP2: Site Characterisation of the Canary Islands' Observatories*

A continuous comparison and complementarities of the simultaneous data provided individually by the different DIMMS are planned. Cross-calibrations and distribution of data and results will be also addressed under this task.

Using the scintillometers it is possible to recover the turbulent profile at lower layers which is of great value to the AO design of the presently installed solar telescopes. We will jointly explore these S-DIMM and Scintillometer arrays potentials at OT. Working sessions, distribution of data/results will be carried out.

In addition, the followings report/studies will be approached: Feasibility Study - CONCAM and sky monitor, Reports on techniques to get wind profiles and Report on discussion forums for site-selection

*WP3.1.: Development of a Joint Information System for Solar Physics (JIS):*

Report on new institutions interested in JIS will be produced as well as a final report of the JIS tool. Maintenance activities will be carried out if the European Commission accept our request concerning the change of the type of costs initially allocated for subcontract.

*WP3.2.: Co-ordinated actions on transfer of knowledge and public outreach*

Installation of expositive units and displays for public events related to exceptional astronomical phenomena.



Final design of the joint ENO Website will be fully operative and a report on public outreach activities carried out will be delivered.

Some of the activities already carried out, such as the Open Days, edition of promotional material and expositive units will be organized periodically along the contract, in order to optimize the real impact among the general public.

### **3.3 Budget Plan**

No increase in the budget is sought for the WP1.1, WP1.2 and WP3.1.

On the other hand, new activities focussed in the dissemination of the results achieved by the WP2 could be addressed by an increase in the initial budget, i.e: Site characterization hand book (20k euro), and development of a joint platform to share all the atmospheric parameters obtained by the different weather stations at the ORM and OT: (15k euro)

Likewise, the following co-ordinated actions on transfer of knowledge and public outreach could be addressed by an increase in the initial budget: Printed version of the outreach bulletin (10k euro / year), astronomy training school (60k euro), eno trans-national press service (40k euro / year) and promotion of other OPTICON facilities/activities (60k euro / year).

## **4. N3.1 ELT Science Case - I Hook, G Gilmore**

### **4.1 Introduction**

The objective of N3.1 is to further develop and promote the science case for an Extremely Large Telescope (ELT). The network involves over 100 astronomers from around Europe. The effort is coordinated by Isobel Hook and the budget is controlled by Gerry Gilmore, although it is presently held at and administered by UKATC.

### **4.2 Progress to date**

Since the 2004 annual report the following activities have been carried out or are underway

- Production of a top-level brochure, also known as an executive summary, (24 pages) summarising the science case for a 50-100m ELT. The brochure was printed and released in February 2005.

- A small sub-meeting to develop the "Galaxies and Cosmology" section of the science case. This was a one-day meeting held in Munich on 13 April 2005, involving 8 members of the OPTICON ELT SWG.

- Production of a full ELT science case document (about 150 pages). 3000 copies were printed and 3000 CDs were made.. This was released as hardcopy in July 2005 at the EU astronomy press day in Dwingeloo, NL and is also available for download on the web site. This document corresponds to WP1 D2.

- A summary article was written for the ESO messenger based on the above documents and appears in the September issue ( Vol 121 pp 2-10)



- Continued close interaction with the European ELT Design Study. Six Members of the OPTICON ELT working group (in addition to the Design Study Project Scientists) attended a meeting on Adaptive Optics requirements for ELTs in Florence, May 2005.
- Formation of three small panels to further develop several key science areas.
- Continued maintenance of the web site and the mailing list.

### **4.3 Immediate Plans**

- Continued development of the science case. In particular a number of scientific simulations are needed in order to set requirements for adaptive optics on ELTs. These are currently being done on a best effort basis but more, dedicated, manpower would be desirable.
- Planning of IAU symposium on Scientific requirements for ELTs, to be held in Cape Town, November 2005. We aim to have significant European presence at this meeting. It will replace the European ELT science case meeting for 2005 (WP1 M1).
- Formation of a joint working group with US/Japan to look at the dependence on the science case of different-sized telescopes.

### **4.4 Longer term plans**

Work with US/Japanese colleagues on a joint science case, aiming for a better understanding of the science that can be achieved with telescopes of different sizes. This will involve detailed simulations. Continued development of the full science case (noting new scientific results and technical developments). Annual meetings will be held in November 2006, 2007, 2008 (WP1 M1), working towards a final science case document to be produced at the end of the network activity in 2008 (WP1 D2).

### **4.5 Budget Plan**

Staff costs for Dr Hook are roughly as expected, but are coming in with a small saving over the original estimate.

In addition to late claims for the Florence ELT meeting (€5000) recent meeting costs have included a small amount of money used for the galaxies + cosmology case meeting in Munich. No OPTICON travel money was used for AO requirements meeting. The major cost items have been for the design, production and distribution of the 4000 ELT Brochures (€20,500), the 3000 Science Case Books (€26,660) and the 3000 CDs (€4,800) which contain both documents. Commitments for the rest of the year is dominated by the need to support travel to the ELT meeting in Cape Town, for which we estimate €20,000.

So total 2005 expenditure will be about €80,000.

In the longer term we anticipate more small meetings for scientists to further develop the science case and interact with the technical design study in Europe in future. We estimate €10000 per



year for this level of activity. We assume €20,000 for each of the three remaining large annual meetings giving a total travel/sundries budget for 2006-2008 of €90,000. This represents an outturn of €175,000 compared to the planned €220,000 budget over 5 years.

The balance, plus any additional funds which may become available, could be best targeted at obtaining additional staff effort to support scientific simulations of the various ELT parameters.

## **5. N3.2 Network for UV Astronomy (NUVA) - A-I Gomez de Castro**

### **5.1 Introduction /Objectives:**

The Network for UltraViolet Astronomy has been successfully established. Its objectives are to:

- Formulate and operate a UV astronomy Network
- Plan and execute a road mapping activity
- Make an exploratory analysis to define scientific requirements for the future and carry out a critical assessment of the data publicly available in various archives.

Colleagues from the EU countries France, Finland, Germany, Italy, The Netherlands, Spain, UK as well as from Russia, U.S.A. and Israel have joined the activity.

### **5.2 Progress to date:**

WP1 M1: Kick off meeting was held from the 21<sup>st</sup>-24<sup>th</sup> of September of 2004 in Madrid. 24 astronomers attended the meeting to define and prepare a science case for UV astronomy (see list below). The attendees worked together for a week to integrate a science case for UV astronomy ranging from the formation of the Solar System to Fundamental Physics and Cosmology. Several working groups have been established by specialties: Solar System, Cool Stars, Formation of planetary systems (from ISM to planets), Massive Stars, Interacting binaries, White Dwarfs, Galaxy formation and evolution, AGNs and QSOs, Intergalactic Medium and Cosmology and Instrumentation. A preliminary science case for each of these fields has been drafted. More than 40 astronomers have offered to collaborate in the further elaboration of the case. The final draft of the science case will be published as a special issue devoted to UV astronomy in *Astrophysics and Space Science*.

WP2.2 M3: Draft document on "The scientific requirements for a UV mission" is on-going. Each one of the working groups defined during the kick-off meeting has elaborated a review on the needs and characteristics of the UV data required to make progress in each field. These reviews are going through the *Astrophysics and Space Science* peer review system and they will be collected in a single issue devoted to UV astronomy. Around 50% of the contributions have already gone through the process. Two of them are under refereeing and 2 more are delayed. The ApSS special issue is expected to be finished by the end of October. The network will purchase ~100 copies and distribute these to influential Research Institutes, Space Agencies, etc, to ensure maximum awareness of the issues. This book represents the draft of the "White book" for UV astronomy.

WP3 D2: NUVA web site has been established ([www.ucm.es/info/nuva](http://www.ucm.es/info/nuva)). The web is handled by a contents manager so it works like an instrument for publication/interaction among the dispersed UV community.



### **5.3 Status of Milestones and Deliverables:**

WP 2.2 D2 – The final document will be delayed (from May 2006 to October 2006). The contents of the draft science case elaborated by the NUVA working groups will be discussed during the “Joint Discussion” on “The Ultraviolet Universe: stars from birth to death” to be held at the IAU General Assembly in August 2006. We want to incorporate into the final document any feedback from this Joint Discussion.

WP 3 M3 – We are planning to apply for IAU support to organize an IAU Symposium during the summer of 2007 on UV Astronomy.

### **5.4 Immediate Plans**

To organize a short (2-3 day) meeting with the leaders of the NUVA science working groups and the instrumentalists focussed on Instrumentation. This meeting will be held in Madrid before the end of 2005. This meeting was not originally scheduled but it is clearly required to produce a comprehensive definition of the key instruments and requirements.

To make some numerical simulations required for the science case.

### **5.5 Longer term Plans**

Review at the NUVA board meeting in October 2006 prior delivering the “Road map to UV astronomy in Europe” to OPTICON board/EU.

### **5.6 Divergences from contracted Plans**

The activity of the network requires, at least, one meeting/year. Henceforth, two meetings have been added to the initial plan (the Science-Instrumentation meeting) and the final meeting of the NUVA board.

Also, we have found that some numerical simulations are required to improve the science case. UV radiation is a key player in the chemistry of the inner young planetary disks. The UV radiation field is assumed to be attached to the stellar atmosphere however, recent numerical simulations show that the disk-star interaction produces large dissipative structures that extend up some 1 AU above the disk. The analysis of these structures and its radiative output is crucial for the UV astronomy science case.

### **5.7 Budget**

The budget for the period 01/01/04-30/06/05 has been expended as indicated in the 1<sup>st</sup> 18-month plan.

- €15.1k have been spent in the kick-off NUVA meeting plus the web-oriented content manager.

For the extended period 01/07/05-31/12/05



- €8k will be spent in the publication of the special ApSS issue devoted to UV astronomy before the end 2005.
- €10k for the instrumentation meeting in October-November 2005

For the period 01/01/06-30/06/07, the projections are:

- €15k to attend/organize/invite speakers to the JD on UV Astronomy during the IAU-GA 2006
- €1.2k to invite numerical astrophysicists to contribute to the science case.
- €15k for the final NUVA board meeting in October 2006

For the period 01/07/07-31/12/08, the projections are:

- €20k for co-financing an IAU Symp. on UV Astronomy if approved.
- *We are considering* to design some utilities for the evaluation of the contents of the UV archives to take advantage of the Virtual Observatory set-up.

This predicts an outturn of €80,000; a €20,000 increase on the baseline plan.

## **6. N3.3. High time resolution working group - *H Spruit***

### **6.1 *Progress to date***

The activities of the high time resolution working group have so far taken place in the form of meetings in conjunction with the meetings of JRA3, with little spending on the network budget.

The main planned activity of the working group, the preparation of a 'white book' summarising the state of the art in High Time Resolution Astronomy (HTRA), has been delayed by a serious lack of manpower to start the organization of this activity.

The manpower problem has now been solved for the next 12 months by an agreement with N3.3 partner UK ATC. In this agreement, network funds will be allocated to pay for 2-3 staff months of staff effort at UK ATC for the following tasks:

- organisation of a white book meeting early 2006,
- assistance in editing the contributions for the white book
- assistance production and the distribution of the white book.

This plan is expected to be developed and confirmed at the JRA3/N3.3 meeting in Galway on September 19<sup>th</sup>. A e-mail update on this meeting may be available at the time of the board meeting.

### **6.2 *Immediate plans***

A meeting in 2006 to bring together experts and interested users of HTRA technology and applications. In addition to the participants of JRA3 and network working group N3.3, the ambition is to attract the main representatives of the international HTRA community to this meeting. Contacts with the ARENA Antarctic astronomy network show a high level of interest in such a meeting.

A meeting of N3.3 at Galway, Ireland in September 2005 in conjunction with a business meeting of JRA3.



### **6.3 Longer term plans**

Editing and production of the white book, 2006 - early 2007.

With these plans we expect to meet, with some delay, the milestones and deliverables of N3.3.

### **6.4 Budget estimate**

Jan 2005 - Sept 2006:

- Staff effort €12k.

- Travel of N3.3 participants €12k.

- Travel of outside participants at the white book meeting: €23k

Projection till 9/2006 till 31/12/2008:

- Staff effort €24k

- Travel €25k

A total of €96,000 in agreement with the baseline plan.

## **7. N3.4. Astrophysical Virtual Observatory - P Quinn**

No detailed report or future plans have yet been received.

OPTICON AVO Network Travel in 2005 total €19,129, essentially using all of the presently allocated budget. There is no allocation past 2005 in the current planning as the AVO effort was expected to be self supporting by then.

## **8. N3.5. OPTICON Key Technologies Network - C Cunningham/C Norrie**

### **8.1 Introduction and Objectives**

The principal objectives of the Key Technology Network (KTN) are to identify key technology needs, look for opportunities which technology developments in other sectors provide for astronomy, encourage European collaborative technology development projects, and provide a forum for discussing potential routes for further development.

Following a meeting held in Grenoble the scope of the Key Technology Network were clarified.

- The focus of the KTN activities will be *enabling* technologies
- The KTN will support the development of facilities (telescopes) as well as instruments
- The core activity of the KTN will be in the wavelength region 300 nm to 35  $\mu$ m.
- The KTN will support a balanced portfolio of low risk and high risk technology developments



- The KTN should support the integration of telescope and instrument test facilities

## **8.2 Progress to Date**

Since the 2004 annual report the following activities have been carried out or are underway.

The outcomes from the First KTN Technology Roadmapping meeting have been collated and published on the internet.

Arrangements have begun for three of the four meetings described in the Annual Report.

A meeting with anticipated 30-40 attendees entitled OPTICON KTN Workshop "Challenges in Optics for ELT instrumentation" has been arranged for 10-11<sup>th</sup> October in Rome. This meeting is being arranged by the ATC in conjunction with Filippo Zerbi from INAF. The list of invitees has been selected to cover a broad range of optical specialisms and to include a balance of industrial and institute representatives. The objective of this meeting will be to identify the critical optical technologies which must be developed including large optics, coatings, filters, gratings, and mechanical support structures.

Gavin Dalton from RAL has agreed to lead a meeting on NIR detectors. The ongoing desire/need from the European astronomy community to have lower cost detectors will require a coordinated effort between nations and indeed sectors. Gavin will bring together the key personnel in HgCdTe and alternative technologies from around Europe. This meeting fits within the category of high risk enabling technologies. It is envisaged to hold this meeting in November/December 2005.

Rene Rutten from ING has agreed to host a meeting at the WHT in order to develop a proposal amongst the European astronomy community for the use of the WHT as a test-bed facility for technology demonstrators. The WHT Nasmyth platform could provide very valuable on-sky performance data for new technologies. This meeting will likely be held in January 2006.

## **8.3 Future Plans**

Arrange for an appropriate Key Technologies Network member to assist in the organisation of a meeting on large deformable mirrors where we will look to bring industry and institutes together, with a focus on contrasting main stream techniques with more alternative methods.

Undertake consultation with the KTN to update the Technology Roadmap in the light of recent developments in ELT instrumentation studies.

## **8.4 Budget Plan**

The budget is presently underspent on a pro-rata basis due to the slow start-up to the contract, and to our back-loading of meeting to the end of 05 -start of 06.

Costs incurred so far are Manpower €18,000 and Travel €6,500

The planned annual budget is Manpower €26,600 and Travel €24,000



With an average cost of meeting of €10,000, and with current meeting plans the budget outturn will be about €133,000 for staff and €120,000 for travel etc. Thus the planned will be fully accounted for though no increase is being sought. Any reduction in the budget will consequently impact one or more of the currently planned activities.

## **9. N3.6. Future Astronomical Software Environment Working Group (FASE) - P Grosbol.**

### **9.1 Introduction**

The N3.6 group is working on establishing requirements, general architecture and high-level specifications for future astronomical software environments for data analysis and processing. With reduced support of current systems (e.g. IRAF, Starlink and MIDAS), the need for a common future environment has become even more pressing. Although this effort is centred in Europe, the N3.6 has many associated members representing the worldwide community. This to ensure that all N3.6 recommendations are carried by a wide cross-section of possible users.

### **9.2 Progress to date**

The main work within N3.6 is done through monthly phone meetings and discussions on the TWiki web site. Minutes and documents can be found at <http://archive.eso.org/opticon/twiki/bin/view/Main/WebHome>.

The following major achievements since the 2004 report:

- 1) agreement on a general architectural concept
- 2) high-level requirements presented at face-to-face meeting and agreed on milestone M1

Meeting in Spain Sept 30/ Oct 1 with 17 participants the day before the ADASS meeting for

- a) Presentation of a full document version of basic high-level requirements
- b) Breakdown of architectural concept to general design

At the ADASS meeting itself, a poster on the work during the last year, summarizing the proposed architectural concept was presented.

The ADASS 2005 meeting included an evening session on 'Common Astronomical Software Environments' which was chaired by D.Tody and N3.6 Leader P. Grosbol. This started with a summary of the OPTICON N3.6 discussions followed by 3 short presentations and a general discussion. The session was well attended as the room with 70 seats was fully occupied with people standing at the back and others unable to join due to lack of space.

### **9.3 Future Plans**

We expect to arrange 2 face-to-face meeting per year for detailed discussions of the work done in the time in between. The next meeting with main topics are listed:



2006 May - a) Requirements for system services  
b) Subsystem structure and basic interfaces

2006 Oct. - a) Requirements for astronomical applications  
b) Final design and interface specifications

## 9.4 Budget Plan

The budget for N3.6 is used only for network meeting as no staff cost is included.

With 2 meeting per year and a cost of ~ €10 k per meeting (depending on location), we will be able to stay within the foreseen budget. On this basis the present outturn is €82,000 against a baseline budget of €96,000

## 10. N4. Mechanisms for Synergy in Space-Ground Coordination - *J-L Puget*

### 10.1 Introduction

OPTICON network N4 was set up to develop proposals to enhance synergies between space and ground-based astronomy. It has been decided to drop the “Elite Fellowships” idea that was part of the original discussions for this network. Under this new umbrella, the original work packages have been redefined and two activities have been started since January 2005:

- **WP1 Scientific Support:** to analyse the situation regarding scientific support for exploitation of European space- and/or ground-based astronomical infrastructures, and to propose mechanisms to improve situation by (a) reinforcing the competitiveness of the European astronomical community in the face of international competition and (b) supporting groups carrying out “key” programmes.
- **WP 2 Test Facilities:** to make a census of the unique test facilities developed by European institutes and laboratories for astronomical space and ground instruments/experiments and to identify facilities/capabilities that need to be developed to support the test and calibration of the next generation of instruments.

As necessary, additional initiatives relevant to space-ground synergy can be started.

### 10.2 Objectives

As described above plus, as appropriate, to prepare proposals to the EU (plus ESA, ESO).

### 10.3 Progress to date



Two meetings have been held to kick off the activities outlined above.

### **OPTICON N4 Scientific Support Meeting #1**

Held at IAS, Orsay, F on 24 February 2005

Present:

Th. Courvoisier (INTEGRAL), J.K. Davies (OPTICON PS, via phone), M.F. Kessler (N4 co-ordinator), B. Leibundgut (VLT/VLTI), M. McCaughrean (JWST), S. Oliver (Herschel), J.L. Puget (Planck, N4 co-ordinator), C. Turon (Gaia).

Summary:

Each participant gave a short overview of the mission they were representing, including a brief overview, the organization of data processing, the data products distributed and key projects or equivalent.

It was agreed that some form of additional “early time” support was needed to enable optimal exploitation of the data during its proprietary period to maximize European competitiveness and efficiency. (This need was explicitly distinguished from later longer-term support -including support for archival research- aimed at maximizing the long-term scientific output from each facility). All agreed that a simple system was needed to award such funding – no new administration should be set up for the difficult task of an informed and impartial peer review. It was considered whether ESA/ESO could handle this task. The possibility of pooling funds from a variety of sources (EU, ESO, ESA, ) was raised – could responsibility be delegated to a single simple process, possibility via a development of the MIRI/BepiColombo payload model? Two options were identified for further study: a link to the award of observing time and provision of a pool of Post Docs. Also, the obligations of recipients of this funding need definition.

It was concluded that the coordinators of the network should work further on these lines and then draft some ideas for discussion at a subsequent meeting.

### **OPTICON N4 Test/Calibration Facilities Meeting #1**

Held at IAS, Orsay, F on 25 February 2005

Present:

J.K. Davies (OPTICON PS), O. Le Fevre (LAM), M. Freyberg (PANTHER), M.F. Kessler (N4 co-ordinator), P-O. Lagage (IAS), J.L. Puget (IAS, N4 co-ordinator), W. Wild (SRON Groningen)

Summary:

The NETWORK has made a census of the unique test facilities developed by European Institutes and laboratories for astronomical space and ground experiments.

It is in the process of identifying any facilities or capabilities which are lacking and which must be developed to answer the needs of the next generation of experiments, as defined in the Cosmic Vision plan and long term plans of national agencies.

The existing facilities have been developed over the last 40 years with the support of national agencies and in some cases the support of European organizations like ESA and ESO.

This has provided a suite of unique facilities which can bring very specific test capabilities to the European Research Area in support of teams developing new instrumentation for space and ground European facilities. This suite could however be complemented and optimised in the years



ahead. The funding of such extensions will be discussed on a case by case basis, it could be shared between the national agencies and the European ones. There may be a possibility that part of this funding for the operations could be obtained through the access programmes of the EC, giving access to these facilities to countries which do not have such facilities but wish to start contributing to the development of astronomical instrumentation for World Class infrastructures (ground or space).

### **Census of facilities available in European laboratories**

The following laboratories and institutes were represented at the February 25<sup>th</sup> 2005:

PANTHER (Neuried, Germany) : Michael Fryberg  
SRON (Utrecht and Groningen, NL): Wolfgang Wild  
IAS-SAp (Orsay Saclay France): J.L. Puget+ P.O. Lagage  
LAM (Marseille, France): Olivier Le Fevre

RAL (UK): intended to participate to the meeting but could not due to travel problems on that day.  
ESO (Germany): expressed interest to be kept informed of the developments of the NETWORK but could not participate in the first meeting.  
CSL (Liège, Belgium): CSL people (Philippe Lemaire, M. Rocher) were not available for the first meeting.

Others facilities to be contacted were identified during the meeting:

Edinburgh/ Cardiff (UK): tests of Submillimeter broad band detectors and cold optics,  
Yebeles (Spain ): Cryo amplifiers  
IRAM: Beam measurements

The summary of facilities is built from the information gathered during the meeting and complemented by information gathered from the web sites of the facilities which were not represented at the meeting. It is being gathered in a document in preparation.

A list of unique facilities is already emerging and there is general agreement for most of them to study the funding of operations of these facilities in a context where they would be offered to laboratories outside the funding country. (ESO has an optical near infrared facility but it is saturated already and it cannot consider sharing it with others at this time) .

The test facilities lacking in the context of the future large astronomical European infrastructures as defined in the Cosmic Vision of ESA or the Scientific Strategic Plan of ESO will be the main topic to be discussed at the next meeting.

## **10.4 Status of Milestones and Deliverables**

- Summary document on existing test facilities in Europe to be finalized for the next meeting (October 05).

## **10.5 Immediate Plans**

- Short documents preparing the discussion on future new (or extensions of) facilities to be prepared by the different groups for the next meeting October 05).
- 02 Sept 2005: Meeting of Co-Chairs of N4 network



- Autumn 2005: Coordinators will organize meetings with ESO and ESA directors and EC executives to propose coordination and funding schemes in the FP7 framework.
- 23/24 November: Meetings of each of the networks at ESTEC.

## **10.6 Longer term plans**

The role and structure of a European Network of test facilities for instrumentation of major European astronomical facilities will have been discussed by the end of 2005 and if judged useful a plan for its funding will be studied during the spring of 2006.

For the scientific support funding schemes should be identified in the same time frame.

## **10.7 Budget**

The budget needed for the network up to mid 06 is only travel:

1 coordinators meeting at ESTEC or Paris September 05 (One travel Paris to Amsterdam) up to 10 people for each meeting.

1 meetings of each of the two groups (Paris or ESTEC)

1 meeting with ESO directorate

1 meeting with ESA director of science

1 meeting with EC of the 2 coordinators (1 travel Paris to Brussels, one travel from Noordwijk to Brussels).

This is estimated as €25000. Longer term budgets will depend on progress, but a further €50000 seems reasonable to maintain the activity to the end of the contract. On this basis the present outturn is €71,000 against a baseline budget of €80,000

## **11. N5. Interferometry - A Quirrenbach/ E Bakker**

### **11.1 WP1: Exchange Visitors Programme**

The exchange visitors program sponsors working visits of European astronomers to pursue research in optical / infrared interferometry. The program has now been named "Fizeau Exchange Visitors Program in Optical Interferometry". A poster was designed, printed, and distributed widely to astronomical institutions in Europe to advertise the program. Four exchange visits took place in 2004; five grants for visits were awarded in March 2005. From the first rounds of the exchange program it appears that we are meeting our goals: exchanges take place between institutions with little expertise in interferometry and places with experts, many exchanges involve astronomers from central Europe (Poland, Hungary, Czech Republic), and exchange visits of two to four weeks turn into lasting collaborations.

Immediate plans: The next call for applications will be issued within the next couple of weeks.

Long-range plans: Two calls for applications each year are foreseen.



## **11.2 Overview**

- The Network 5 web site is running and is being updated regularly (see [www.strw.leidenuniv.nl/~eurinterf](http://www.strw.leidenuniv.nl/~eurinterf))
- The exchange visitors program is running, with one application /exchange round completed, and exchanges of the second round occurring now
- Two working groups have been established. The first (on atmospheres and radiative transfer) is working, the second will have its first meeting in November 2005.
- Two three-day workshops on the science case and technology roadmap for a future interferometric facility have been organized
- An Interferometry Council with representatives from 16 European countries has been established to support networking activities
- Network 5 has supported the very successful ESO/OPTICON workshop "The Power of Optical/IR Interferometry"
- The budget of Network 5 is being spent at the rate foreseen

## **11.3 WP2: Working Groups**

The working groups are intended to foster collaborations on astrophysical topics that benefit from the introduction of interferometric techniques. The original intent was to establish two working groups, one on radiative transfer techniques, and one on stellar atmospheres. After consultation with potential working group members, it was decided to merge these two groups, because the topics are intimately related. The first meeting of this group took place in Nice in Dec. 2004. A second working group has now been established on the topic of asteroseismology, because it is expected that interferometry will provide important complementary information to seismic studies with instrument such as HARPS from the ground, and to data from COROT.

Immediate plans: The first meeting of the asteroseismology group will take place in Porto in Nov. 2005. The second meeting of the radiative transfer /stellar atmospheres group will take place in Nov./Dec. 2005.

Long-range plans: One or two meetings per working group are planned each year.

## **11.4 Support of general Networking activities**

Together with ESO and the Interferometry JRA, Network 5 organized a one-week conference on "The Power of Optical/IR Interferometry: Recent Scientific Results and Second Generation VLTI Instrumentation", which took place in Garching in April 2005. The first half of the week was devoted to astronomical results from interferometry, featuring very prominently observations with the VLTI. During the second half of the week, proposals for second-generation VLTI instruments were presented, including the results of the concept studies sponsored by the Interferometry JRA.



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The conference was very successful; interest was so large (>150 participants) that the venue had to be moved from the ESO Auditorium to a larger lecture hall at MPE.

An "Interferometry Council" with representation from 16 European countries (A, B, CH, CZ, D, E, F, GB, H, I, IL, NL, P, PL, ESO, ESA) has been established to support coordination of networking activities. The Council met in Sep. 2004 in Heidelberg and in April 2005 in Garching. At the latter meeting, the results from the ESO/OPTICON workshop were discussed, and recommendations to ESO about the second-generation instrumentation were formulated.

Immediate plans: The next meeting of the Interferometry Council will take place in Prague in Sep. 2005.

Long-range plans: The Interferometry Council will meet once per year.

### **11.5 WP3: Vision of "Next-Generation Interferometric Facility"**

A three-day workshop on the "Science Case for a Next-Generation Interferometric Facility" was held in Liege in Aug. 2004. The proceedings from this workshop have been printed and distributed to the workshop participants and other interested parties. (Copies available from Jean Surdej.) A second workshop on the "Technology Roadmap for Future Interferometric Facilities" was organized in conjunction with the JENAM meeting in July 2005, which also happened to take

place in Liege. This meeting included participants from industry, and experts on site selection issues.

Immediate plans: The proceedings from the second Liege workshop have to be edited and printed. A joint meeting with our colleagues from the US (and elsewhere, e.g., Japan, China) will be held in conjunction with the SPIE conference in Orlando in May 2006. This meeting will focus on a world-wide collaboration to develop the technology for a next-generation interferometric facility.

Long-range plans: The Science Case and Technology Roadmap have to be consolidated into a coherent document, which could serve as the basis for an FP7 Design Study proposal and for the next Decadal Review in the US.

### **11.6 Budget**

Leiden University is acting as the financial clearinghouse for all expenses incurred by Network 5. The University generously pre-financed the Network's activities when EU funding was delayed. The budget is currently being spent at the rate foreseen. Continued funding is requested at the level originally proposed (€260,000). Network 5 is currently supporting the activities of more than one hundred people through direct support or subsidies to the cost of meeting facilities etc. Any reduction in future funding would necessarily curtail the Network's capabilities to support its activities.

## **12. N6.1. OPTICON Telescope Directors Forum - J Davies**



## **12.1 Introduction.**

N6.1 is the OPTICON telescope directors forum. Its primary functions are to achieve better integration of existing 2-4m telescopes, find synergies between facilities and to oversee the trans national access programme.

## **12.2 Progress to date**

Since the 2004 annual report the following activities have been carried out or are underway

A panel was been set up to examine the operation of the Trans-national Access office. Its terms of reference were agreed and a visit to the IAC took place in August. The review panel presented its report to the telescope directors forum at its meeting in Paris on September 14/15. In summary the report noted the high standard of work done by the Access office to date but felt that a reduction in staffing was achievable for the remainder of the project now that activities have settled into a steady state. The IAC access office responded to the conclusions with a proposed reduction in the staffing level of the Office and accepted an additional role to develop activities to add value to the access programme. This proposal was accepted by the telescope directors and recommended to the Executive. The final version of the report (supplied as part of the papers for this meeting) was presented to the Executive who also accepted the report and endorsed the outcome.

Related Documents are:

**Access report 26 July 2005 (Access Programme statistics for 2004/5)**  
**Access Office Activity Description (Prepared by Access team for Review)**  
**Final Access Office Report (Prepared by review panel)**

The directors also reviewed the status of the UKST within the Access programme and revisited the issue of rationalising common application forms across whole network. A group to capture requirements for such a system was set up and will report by the end of the year. Assuming there is a desire to proceed with such a scheme a request for tender for such a package will be made.

A panel has been set up to oversee the accession of the Liverpool Telescope and the Aristarcos Telescope into the Access programme. A conformance matrix for this process has been prepared and circulated. Planning for a visit to the Liverpool Telescope is advanced but the LT team have not yet provided a date. A schedule for the review of Aristarcos will be established soon, once the final dates for the commissioning of the telescope are clearer. It is hoped that the telescope will be ready for operations by the summer of 2006 and that the next meeting of the Forum can take place at the time of the official inauguration of this telescope.

A 'fact finding' visit was made to the Rohzen observatory in conjunction with a French-Bulgarian bilateral mission. Plans for possible Franco-Bulgarian instrument swaps were discussed by the French representatives. A presentation on the OPTICON project, with special emphasis on the access programme, was made by the Project Scientist. A similar presentation was made to the Polish National Astronomy Meeting in Wroclaw on September 22<sup>nd</sup>.

## **12.3 Immediate Plans.**

Peer review of LT (Winter 05)

Agree strategy for Common application tools (Early 06)



Peer review of Aristarcos (Summer 06)

Directors meeting, (Autumn 06)

Catalyse discussions with Rhozen and Aristarcos on the co-ordinated use of these two telescopes in eastern Europe (TBD)

### **12.4 Longer term plans**

Define objectives for and mechanism of a Non advocate review of access programme in mid 2006 after 2 years of operation. Plans for this to be developed by the Chairman in late 05/early 06.

Continue to investigate options for synergy between European Med-tels, basically via one large directors meeting per year plus necessary sub-groups.

Prepare for the Access element of FP7 programme as it is announced.

### **12.5 Budget**

No staff effort is charged to N6.1, costs are entirely in networking meetings.

2004: The €8,000 spend for this year is unrepresentatively low since costs for the first meeting were absorbed by the final FP5 budget and the 2nd meeting fell close to the end of 2004 with many bills falling payable in early 2005.

2005: Actual spend to date is €19,000 including some carryover from the 04 directors meeting. Forecast spending to end 2005 is a further €25,000, for splinter group meetings at IAC, the Liverpool Telescope review plus the directors' annual meeting in Paris. This represents an annual total of €34,000, close to the €30,000/year baseline proposed in the contract.

2006 spending will be similar, with the Aristarcos review, a further annual meeting, visits to promote better co-operation and the establishment and execution of the non-advocate review.

No increase in the budget is sought. On this basis the present outturn is €150,500 against a baseline budget of €150,000

## **13. N6.2. Operation of the trans-national access office – J Burgos**

See the document prepared for the internal review and the report of the review to the telescope directors' forum.

## **N6.3. Enhancement of Research Efficiency Working Group – M Deneffeld**



### **13.1 Introduction**

This WG was set-up to analyse the needs to "Enhance the Efficiency of Research" in ground-based optical/IR astronomy, and to discuss means, and possibly implement them, to achieve this goal. As it is mainly concerned with telescopes and instrumentation, this activity has been naturally included as an item of the OPTICON Telescope Network as Workpackage 3.

The initial membership of the WG is:

M. Dennefeld (Paris, Chair)  
P. Garcia (Porto, Interferometry)  
R. Gredel (Calar Alto Obs.)  
H. Kuntschner (ESO)  
J. Ortner (Wien, Space Sciences)  
A. Pizzella (Univ. of Padova)  
M. Stavinschi (Bucarest, South-Eastern Europe)  
M. Ward (Univ. of Durham)

The group remains open to new members, in particular it is hoped to be joined by one Solar astronomer.

### **13.2 Objectives**

One of the recurrent actions of this activity is to support existing schemes, like the separately funded NEON school, by sending experts to each event in order to transmit their skills to a new generation of astronomers.

A similar activity could be implemented for an interferometry school or other schools of importance to the astronomical community.

The group will also address the widespread concern is the decrease in the number of astronomers with the practical experience needed for the development of modern instrumentation for future telescopes. The working group is hoping to find ways to reverse this tendency and, more generally, increase the instrumental/observational skills of "ordinary" astronomers.

There is also a general concern is about the decrease of the number of students in "hard sciences" in general, although astronomy seems to be less affected than other branches of science. This is a problem which goes far beyond the aims of the 13 OPTICON programme, but should be considered to try to ensure that the needs and views of the professionals are well known to those seeking to resolve this problem, and taken into account during the education process.

### **13.3 Progress to date**

These questions, and many others, were discussed at the first meeting of the WG in Padova on May 23th, 2005. Some initial points were identified:

-Raising the scientific level of students in general is a huge task, which can be only achieved by motivation of their teachers. Astrophysics, being still attractive to many people, should be used as



an incentive and practical tool to do this. Professional telescopes, and specifically designed robotic telescopes, can be used for this purpose. While this task is beyond the WG's aims and means, close contact has to be established and maintained between the professionals and those teams training the teachers to ensure a coherence over the whole educational process.

-Concerning astronomical instrumentation, it was realised that "normal" astronomers needed some training to appreciate basic instrumental issues.

One possibility is to propose specific training sessions, about specific types of new or difficult instrumental techniques (eg multi-object spectroscopy, integral field spectroscopy, spectro-polarimetry, etc...). These sessions could use archival data to be re-reduced by the participants, with guidance from experts. This possibility will be explored by the WG and a first attempt made to hold a workshop on IFU techniques in the next two years.

-The support to training sessions at the telescope, like the Neon school, is recognised as important and will be one of the tasks of this WG in the future. This concerns the selection of experts to be sent and supported.

A similar scheme could be applied to interferometry, where the needs are recognised, but its practical implementation has to await the result of their Marie-Curie proposal. Other topics along those lines will be discussed in future meetings.

-The constitution and goals of the South-Eastern Branch of European astronomy were presented and discussed. This coordination effort is recognised and should be supported to improve the contacts with the West and to develop some specific topics of interest to them.

Astrometric techniques was recognised as one possible topic of interest to this community but this issue needs to be discussed further. The organisation of one of the above mentioned workshop/training sessions in the East will be considered. Coordinated instrumental developments at the few 2m telescopes existing in those countries will also be discussed.

### **13.4 Future plans**

The WG considers that a yearly meeting is adequate to develop these topics and identify further points of importance, interim discussions being easily implemented via teleconferences or at the occasion of other OPTICON meetings. The budgetary projection is made accordingly.

### **13.5 Budget plan**

It is important to recognise the NEON schools are largely funded under the Marie Curie programme which provides resources for student travel, telescope user fees and tutoring costs. The OPTICON contribution is provision of limited travel support for a few experts to provide a significant uplift in the quality of the activity with only a small incremental cost. Thus the remaining cost for the activity over the remainder of the OPTICON contract are estimated as follows.

- Four further meeting of the WG for the remaining duration of the contract  $4 \times 10k = €40k$
- Fund trips of experts to participate in the NEON observing school, and possibly other similar events. Typically 4 experts per event, 6 NEON events plus a few others. Total 30 trips  $\times €1k$  each = €30k
- Travel, Secretary and equipment for the head of the working group: €30k



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On this basis the present outturn is €111,000 against a baseline budget of €100,000, specified in the original contract.



## 14. SUMMARY AND RECOMMENDATIONS

Most of the networks are proceeding along the lines originally envisaged and the budget is in good shape. In some cases activities began on time, despite the delay in the EU pre-financing, using the goodwill of local agencies to support the activity until funds became available. In other case, start-up was delayed by up to a year due to the financial uncertainties and local restrictions on pre-financing. Notably:

N2 start-up was delayed due to restrictions on purchase of hardware in the absence of the EU pre-financing but is rapidly recovering from this delay.

N3.3, HTRA, fell significantly behind schedule due to perturbations in management at the closely related JRA-3. A recovery plan brokered by the Project Scientist is in place and this activity should be restored to schedule in the next 18 months

N4: Space-Ground Synergy has evolved its remit significantly, dropping plans to develop elite fellowships and starting a new activity related to test facilities. This delayed start-up by about 1 year. To expedite progress the N4 co-PI (J-L Puget) has devolved some responsibilities for the test facilities efforts to P. O. LaGage

Under the present spending plans the overall networking budget, including the N1 management activity, is proceeding well within the financial envelope expected and is predicting that a small contingency, of order 300K, will be available towards the end of the project. This surplus results from a variety of factors;

- Close attention to detail and good financial stewardship by the project team at all levels
- Delayed start-up of some activities in a programme with a fixed final end date
- An inherently conservative approach to some costs used when estimating the contract details and designed to provide some downstream flexibility.

Accordingly there is no pressing need to adjust downwards any of the network budgets on purely financial grounds. The proposed uplift of the N3.2 NUVA budget and on N6.3, if actually realised, are easily affordable within the present projected outturn. Note that the N6.3 budget is likely to converge back to its original estimate during 2006. Adjustments on the grounds of programmatic priorities would be possible but would most likely come at the cost of perturbing what are presently successful, and rather visible, networking activities.

Therefore I propose that the board accept the present networking achievements, plans and budgets for 2006/7 and revisit them at its next annual meeting