

Draft minutes of the Opticon « Enhancement » meeting
Bucharest, June 21-22, 2007

Present were:

WG members: M. Dennefeld (Paris, Chair), R. Gredel (Heidelberg), A. Pizzella (Padova),
M. Stavinschi (Bucharest), M. Ward (Durham)
Invited: G. Perrin (Paris; Interferometry WG), T. Venturi (Bologna; Radionet),
K. Panov (Sofia; SREAC), V. Mioc (Bucharest), P. Popescu (Bucharest)
M. Rusu (U. of Bucharest, part time)
Apologies: From the WG: J. Davies (Opticon), H. Kuntschner (ESO), J. Ortner (Vienna)
From the invited: Z. Aslan (Turkey), Z. Knesevic (Serbia), J. Seiradakis (Greece)
Absent: D. Gillet (OHP)

The meeting started on the 21th at 10am at the Bucharest observatory, host of the meeting. Prof. Vasile Mioc, Director, warmly welcomed the participants, thanked Opticon for having chosen his observatory to hold this important meeting which he expected would be very fruitfull for the training of young astronomers, introducing them to western observatories, and represent a milestone in the enlargement of scientific relations.

The agenda was adopted (see Annex)

M. Dennefeld presented past activities and plans of the Opticon “Enhancement” Working Group. The core of the activity is the support to observing schools, which train young PhD students (or post-docs) in observations and data reductions. Two type of schools are organised: either schools directly at the telescopes, where small groups execute research programs (observations and reductions) under the supervision of experienced tutors; or “archive” schools where the data reduction and science analysis is done on archival data from ground or space. The NEON schools are mainly financed by a Marie-Curie grant running until the end of 2008, Opticon’s participation is in sending experts. Three schools have been organised since the beginning of the FP6 program in 2005, and 3 more are planned in the coming 18 months. The pressure factor of applications is always high (around 4), showing that the need exists. Following recommendations of the WG at its past meeting, plans are going ahead for the organisation of training workshops in new observations techniques: the first of those schools should take place in Postdam in may 2008, and deal with Integral Field Spectrographs. The financial situation of the program is satisfactory at present, but may become worrisome towards the end of the program, as the working plan is ramping up while the Opticon Board has recently cut the resources by 33%: a total of 66 kE is so available over the 5 years, and additional funding will be requested if so required. Further workshops are planned, like the one on Adaptive Optics, but may have to be delayed until the FP7 program is financed. There are still no solutions to finance the participation from FSU members, most notably Russia and Ukraine where the population of interested astronomers is large. On the other hand, efforts are presently made to favour the participation from young astronomers from South-Eastern Europe and around. For the future, it is suggested to hold some Neon type schools in Eastern Europe, probably centered on the use of archival data, so that they could be held anywhere provided computer facilities and Internet links are available, but a combination with some direct observations would

be useful too. A participation in the spectroscopic school planned in Bulgaria this year is possible also.

T. Venturi presented similar activities going on within the Radionet network. They organise a one week school every two years, ERIS (European Radio Interferometry School) devoted to centimetre astronomy, and support the IRAM Interferometry school (millimetre radio-astronomy) the alternate years. These schools are mainly consisting of lectures where science takes a part, and the general lines of the reduction procedures are presented, with only some practical work on computers. The design of a proposal (choice of instruments, and observing sequence, but not specifically writing the proposal) is also part of those schools. The next ERIS school will take place in Bonn in September 2007.

Radionet is also partly supporting the Young Radio-Astronomers workshops (YERAC) regularly organised by the IAU. The participation of non-EU radio astronomers is supported by some of the western institutes, not by the I3. Radionet is supporting those activities at the level of 20~30k€ per year, thus ~150k€ over the five years plan.

For the future, the plans would be to separate science workshops, and training workshops in separate networks.

M. Ward presented the UK perspective. He showed the funding situation for UK astronomy, where the majority of funds is coming from Government Councils, but a large contribution to infrastructures and salaries is coming from Higher Education Councils. Only 40 of the 120 UK's universities run undergraduate astronomy courses. A concern is growing that the "Bologna" scheme of university studies (3+2 +3(PhD)) is not adequate and the UK is preferably having a 4 + 4(PhD) scheme. About 150 PhD's studentships are available in astronomy per year and the majority that want to can get a first post-doctoral position, after which the situation gets more difficult...

The UK government via PPARC (now STFC) puts very strong emphasis on the Lisbon statement (knowledge based society) and spends about 1.8 ME per year on skills training (1.2 k€ per student). A one week introductory course in astronomy is run every year at the end of summer for all PhD students just before they start their PhD (cost about 60 k€). STFC is running 6-8 weeks summer courses for high achieving undergraduates: they include lectures, workshops and research projects supervised by senior academics, are highly oversubscribed (5:1) and cost about 75 k€. Specialised targeted courses, e.g. in Astrobiology, are also regularly organised and the National Astronomy Meeting (NAM) at Easter each year is also targeting early stage researchers. Being the Director of the astronomy school held in Durham in 2007, he offered to host 3 or 4 new graduate students in astronomy from SE Europe, if Opticon could fund them (about 600€ per student, plus travel). He concluded by suggesting to get EU money to provide infrastructure for video links, which would allow a much larger number of students to attend a given lecture, but agreed that one still needed the "personal touch".

H. Kuntschner had transmitted the training situation in ESO, with emphasis on instrumentation, which was read by M. Dennefeld. ESO has about 20 PhD students positions (in Garching plus Chile) and gets 6 other positions from the International Max-Planck Research School for Astrophysics. The PhD is awarded by the home institution. About 10% of the PhD students are involved in instrumentation projects. Students have no functional duties, thus are not necessarily connected to observatory tasks or instrumentation. In contrast, the fellowship program focuses on independent research and the fellows have a 25% functional duty on various observatory tasks. Instrumentation needs are high, requiring excellent astronomers with good instrumentation understanding. The level of instrumentation PhD's at ESO will not raise above the 10% level it has now, as the timing of a PhD with a 1-2 years stay at ESO (out of a total of 3 years) is difficult

to adjust with long instrument projects. Furthermore, the challenge is high, as a good balance has to be kept between astronomical research (jobs are offered essentially in judging the production of papers!) and instrumentation development which is time consuming.

It is suggested to raise awareness for instrumentation in summer schools (like the NEON one), in organising workshops on instrumentation specifically for students, and organising visits of individual students to instrument building groups. Exploring the boundaries with physics (e.g. quantum optics, high speed photometry, etc...) could also bring some additional candidates.

G. Perrin presented the activities in the Interferometry community. A first international school had been organised already in 2002 in Les Houches. The topics comprised the theory of interferometry, a description of the VLTI and the preparation of observations. About half of the school consisted in practical sessions: students had a project, namely made an observing program for the VLTI. 54 students from EU countries, Eastern Europe and the US attended, and a good fraction of them have become VLTI users. This first school was supposed to have followers, but the Marie-Curie proposal was successful only in 2005 after two failures. This program, "On the Fringe", is lead by Paolo Garcia (Porto) and plans 4 schools of two weeks duration each over 3 years: two data reduction schools and two thematic schools. The first took place in 2006 in Goutelas (France), on "Observation and data reduction with the VLTI", was attended by 50 students and comprised theoretical lectures, practical sessions on 30 computers (rented), seminars to illustrate the use of interferometers and personal projects (observing proposal and data reduction). Two thematic schools are planned in 2007 (Interferometry and Young stellar objects in Porto in June; and Interferometry and AGN's in Torun, Poland, in September) and the next data reduction school is foreseen in Hungary in June 2008 and will deal with the PRIMA instrument.

The goal of this first series of schools was to generate a VLTI boom in the community. The pace can now be changed, and one interferometry school every two years should be enough to train PhD students and astronomers. Other efforts comprise students training at the master level in several countries (France, Portugal, UK, etc...) which could perhaps be developed into a common high angular resolution program with the support of the EU, and an exchange program for students and researchers allowing for a few weeks to a few months exchanges (the Fizeau exchange program) which needs to be pursued.

The suggestion was to build a Network for schools in the future Opticon proposal. The participants noted that this exists already: it is precisely this "Enhancement Network" which is presently inside the Opticon Telescope Network (as Workpackage N6.3) for convenience, but could be presented as an independent Network if so preferred, and could easily include the interferometry school.

K. Panov presented the SREAC (Sub-Regional European Astronomy Committee) and reported about their recent activities. SREAC gathers SE European countries, plus Turkey and Ukraine, and associates Armenia also. They got in 2005 a 25k\$ grant from UNESCO-IBSP (International Basic Scientific Program) for the project entitled "Enlargement of Collaboration in Ground-Based Astronomical Research in SEE Countries; Variable Stars Research and Studies of Small Bodies of the Solar System". During the first year of the program, several research programs have been developed with observing campaigns, leading to 9 publications; four international conferences organised, as well as two schools; and funds provided to buy computers in several institutes, and upgrade observing facilities. The Rozhen National Astronomical Observatory, with its 2m telescope, became the regional center for the implementation of this project and benefited from Unesco funds to build an auto-guiding system. This telescope is offered as a regional facility open to all the SREAC participants. It is noted that

the yearly running costs of this telescope (without salaries) amount to about 100 kE, half of which is needed for electricity and heating.

Common problems for all the SEE countries include: the difficulty to maintain subscriptions to the main astrophysical journals due to constant increase of their costs; the difficulty to submit papers to A&A, as page charges are to be payed because these countries are not participating to the general funding of this journal; the shortage of funds for travel and exchange of people; the lack of fast Internet connexions; the need to upgrade some of the observing facilities which, despite their “small” size, remain essential not only for research but also for training and education (in particular the 2m telescope which could bring a valuable contribution to the identification of objects detected in space surveys).

Immediate plans are to develop the scientific collaborations, with some more astronomical meetings, and a spectroscopy school for young astronomers in Rozhen in the fall. The participation of experts from the West would be welcome, if additional funding can be secured.

Summary of the discussions

-The importance of the observing training schools for PhD students or PostDoc's was unanimously recognised and is highly considered in all structures (Opticon, Interferometry Network, Radionet, SREAC).

-This program should be continued and reinforced in the FP7 programs. The disappearance of the Marie-Curie programs in FP7 implies however that financing will have to be found elsewhere (the typical cost of a school is of the order of 50-60 kE). This will be requested within the various I3 proposals, provided the FP7 rules allow it (still unclear at this stage)

-The high pressure factor of good applicants means also a high rejection factor, with the risk of discouraging many applicants. It would be desirable to increase the number of schools, but all participants felt that with the present scheme, the load was already at the limit of what was possible. The main limitation is the availability of experienced tutors and lecturers for a period of as long as two weeks.

-The possibility of accepting more students in a given school should be explored. While this is difficult at the telescope, it is perhaps possible with “archive” schools, if enough computer facilities are available (renting of computers was suggested as a solution) and if one tutor can take care of more than one group of students. Video conferencing is a possible solution, but only for lectures.

-Workshops or schools on innovative techniques have to be developed. Available manpower is also the limitation here.

-As far as instrumentation is concerned, the need to raise interest in instrumentation development is re-emphasized. Workshops/schools like those running in Alpbach around Space projects could be organised. It was felt that the best solution was probably to organise the projects in simulating the “development” of already existing instruments, to avoid too much time lost in trial and error. Availability of experienced engineers is essential for such projects. The remaining question is at which stage of studies to organise this: too early, the risk is that the students will go somewhere else than in astronomy; too late (if the PhD topic is already chosen), it may have no effect on their orientation.

-For the FP7 plans, it was agreed that the Neon type schools and the Interferometry schools could easily be combined in a single scheme, with two schools per year: one interferometry school every two years (with an “observing” Neon school the same year), and two Neon schools (one at the telescope, and one with archives) the alternate year. Radio schools would run in an independent scheme as presently.

-An effort will be made to run some of those schools in SE Europe.

Second day (session opened to the local astronomical community)

A series of general presentations were made to describe the various on-going activities and encourage participation from SE-European astronomers.

M. Dennefeld presented Opticon (on behalf of J. Davies), with its three main components: the Joint Research Activities, the Networking, and the Access program. He insisted on the importance of the Networking, which was open to any willing new participant, as the place where future projects were discussed, including new funding proposals. The Access program represents a unique chance to access first class observing facilities, some of which are also used for training purposes. He emphasised that those opportunities could be used much more by the SE-European community than they are now, and it was hoped that under the FP7 proposal, which should look rather similar to the actual Opticon set-up, this situation would improve.

T. Venturi presented Radionet, whose structure was rather similar to the Opticon one, and who offered access to all the major Radio observation facilities, including the Very Long Baseline Interferometry. Their training system was also presented and students encouraged to apply. The proposal was made to foresee for FP7 a common school in Interferometry, which would include both radio and optical aspects, perhaps driven by a specific science case: this was agreed.

G. Perrin presented an introduction to Interferometry techniques in the visible and near-IR, with some scientific examples and results from the ESO-VLTI. He stressed the intention of the group to continue within FP7 with a Network and a JRA, to develop the second generation of VLTI instruments and prepare the next generation of interferometers. A Design Study has already been submitted to work on an "Imaging optical km Array". The community is preparing worldwide, and in particular in the US, for an array of 20 to 30 8m telescopes with several km baseline; the telescopes could be as small as 2m for a similar sensitivity if the array would be established in Antarctica. All these projects were open to interested participants.

R. Gredel presented in more details some of the optical telescopes available in the Access Program and some of the novel instrumentation they offer. He underlined the enormous progress registered in recent years in the use of 3 Dimensional spectroscopy, in particular with the PMAS instrument at Calar Alto, and in Adaptive Optics which is greatly enhancing the resolution of ground based observations. He re-emphasised the goal of the telescope Network to achieve some coordination of the instrumental offer over Europe, to increase the efficiency of "medium-sized" telescopes: in those conditions, they will still have a major role to play for scientific programs and training purposes.

The general discussion was introduced by M. Stavinschi who summarised the needs from SE astronomers. These include a scheme to improve local conditions and keep competent astronomers in the country, ease the use of local archives, develop contacts with and access to western institutes and facilities to develop modern research topics, use and improve the local observing facilities like the Rozhen telescope to attract and train new students in astronomy, develop outreach activities to raise interest in astronomy. Prof. Rusu concurred in those goals, insisting on the fact that astronomy should be used to attract more students in "hard sciences" in general, to then select good ones to eventually engage into astronomical research. The increasing shortage of scientific students was of great concern in Roumania.

The participants agreed on the general principles but felt that many of the needed actions had to take place long before students entered into a PhD track, starting probably in colleges, and that

this was largely outside the scope of this meeting and the possibilities of the collaborations. A vigorous effort was needed at the level of colleges and universities in each country: the network could perhaps help in providing limited support to some initiatives, and raising the attention of the authorities to the problem, but the main task was in the hand of local teachers at all levels.

It was agreed that conferences or workshops to describe the “hot questions” in astronomy would be one way to raise interest, which could be supported by the collaborations. For instance, a one week school of the type organised in the UK for starting astronomers would be a good way to attract attention to astronomy of potential students, if organised at the right moment in the curriculum. Conferences on science goals of the next decade, as for instance presently assembled for the E-ELT project, would also be usefull: some of these could be more widely broadcast via teleconference equipement. At the higher level, direct collaborations between active observatories could help some of the eastern ones to improve their facilities by transfer of knowledge and/or equipment. Schools of the type described in the various presentations should also be organised more frequently in the East. All those activities will be included in the FP7 proposals presently prepared.

The meeting was closed by thanking warmly M. Stavinschi and the local hosts for their kind and efficient support in the organisation of this meeting.