The IAU Working Group on Wide-Field Imaging

Let me begin by wishing all WG members and other friends of Wide-field Astronomy a Happy and Prosperous New Year with plenty of interesting opportunities! 1993 will obviously be an important and busy year for our WG. The publication of the 3rd WG Newsletter signifies the half-time of the present term. We have made good progress since the creation of the WG in Buenos Aires, and we must soon start to think about the continuation at the following IAU General Assembly in Amsterdam next year.

1. The Potsdam Meeting

However, before then we shall meet in Potsdam in just about seven months time. You will find more details about this meeting inside the present issue. By the way, you did remember to send back the form with your preliminary registration, didn't you?!

As you will remember, the Scientific Organizing Committee (SOC) sent an application to the Executive Committee of the IAU for support of our proposed meeting as an *IAU Colloquium*. This was discussed at the EC meeting in Bangalore (India) in early September last year and the outcome was unexpected: not only did the EC members agree to this, they also upgraded it to become *IAU Symposium 161*! I was later told that this decision was influenced by the apparent, very broad interest in this subject which is supported by the fact that six IAU Commissions, nos. 5, 9, 24, 27, 28 and 33 have agreed to be official sponsors of the meeting. This expectation has been confirmed by the large number of responses, well above 150, which have already been received to the First Announcement which was sent out in late October 1992. In the meantime, a beautiful wide-format conference poster has also become available and is now displayed at most major astronomical institutes — it may well induce even more colleagues to come.

The recognition of our meeting as an official IAU Symposium is certainly a most welcome and prestigious development, and it approximately doubles the IAU financial support which we had hoped for. Together with the expected local money, it now looks as if we will be able to provide travel and subsistence support to a substantial number of participants. The SOC expects to allocate an important part of this support to participants who come from far-away and also to many young astronomers. It is moreover the intention to take advantage of the central European location of Potsdam and ensure that many astronomers from Central and Eastern European countries will be able to participate.

In this connection, it should be noted that the annual meeting of the European Astronomical Society (EAS), this year with the title 'Extragalactic Astronomy and Observational Cosmology' will take place in Toruń, Poland, from 18 – 21 August 1993, i.e. just before our meeting and at close geographical distance. This will facilitate participation in both. For further information about the EAS meeting, please contact **Richard Wielebinski (Chairman of SOC), MPI für Radioastronomie, Auf dem Hügel 69, D-5300, Germany**, or **Jan Palouš, EAS Secretary, Astronomical Institute, Budečská 6, CS-12023 Prague 2, Czech Republic (email: ASTDSS@CSEARN.bitnet).**

2. The Noble Art of Photon-Catching

The interest in Wide-field observations is clearly increasing, especially among CCD astronomers. Several new projects now aim at putting very large CCD mosaics at the foci of medium-size telescopes with fields of the order of 2° – 3°. In all cases, the driving ideas are of a rather specific scientific nature, ranging from the search for distant long-period comets well before perihelion to the recognition of the largest structures of the Universe by means of very large numbers of accurately determined galaxy redshifts. We shall certainly hear much about these and other exciting projects in Potsdam.

I believe that this particular interest in Wide-field Astronomy may be interpreted as the most recent and obvious expression of the eternal desire of astronomers to exploit the available technology to the limit. Astronomical and astrophysical advances have almost always been technology driven and

during the past years we have witnessed a tremendous evolution that has taken place in several well-considered steps. With the risk of being accused of oversimplification, I think that the main problem of observers has always been to obtain the largest possible number of relevant photons in the shortest possible time and at the highest possible signal-to-noise ratio, i.e. while suppressing all extraneous, non-relevant photons. More photons basically equal more information, and in the best case this information leads to important new insights.

The first major step forward was the introduction of *more sensitive detectors*, from the human eye to photographic plates, and then via photomultipliers and image intensifiers to CCDs and other digital devices. When quantum efficiencies close to 100% had been reached in the early 1980s, the natural next step of the photon-hungry observers was to *increase the collecting surface* of their telescopes. This is now happening as 8-metre and larger telescope projects are underway at various organisations. These new giant telescopes will of course be placed at sites with the largest possible number of clear nights, again increasing the total photon flow.

Another line of attack has been to *improve the angular resolution.* This had been achieved by choosing observing sites with the best possible seeing, optimizing telescope domes and actively controlling the telescope optics. There are new and important developments within the difficult art of speckle interferometry and adaptive optics at single telescopes now guarantees that the light from individual objects is better focused throughout an observing session. This reduces the number of simultaneously recorded photons from the sky background and, all other things being equal, increases the S/N-ratio and therefore the information content of the observation. And the large optical interferometers at the Keck and ESO VLT facilities will soon follow.

In order to further increase the information flow from above, the only way forward is then to *increase the field* and enable the simultaneous observation of as many objects as possible! Multiple-slit techniques is one example which however only cover a (small) part of the available field; full-field coverage by truly panoramic detectors is even more efficient. For the time being, the available (non-interferometric) astronomical optical systems which are applicable to very large (i.e. non-Schmidt) telescopes do not allow to increase the field-of-view beyond 1° – 1.5°, if an angular resolution which is equivalent to the best seeing conditions shall be maintained, but serious theoretical efforts are now underway to push towards larger, high-definition (i.e. 0.2 – 0.3 arcsec) fields.

3. The Importance of Wide-Field Techniques

In other words, the presently increasing interest in Wide-field Astronomy may be seen as a logical development which occurs at the time when other photon-catching techniques are beginning to approach their natural limits. Simultaneous observations of large numbers of objects not only increase the overall efficiency in terms of time spent and efforts invested, it also facilitates comparative studies by removing many of the calibration problems that plague sequential observation techniques. Moreover, the data recorded during a few precious observing hours at a Wide-field instrument may provide so much material that even today's advanced computers will need months to digest the new information.

And then there is of course always the wonderful element of serendipity in wide-field work — who knows which new and strange phenomena will some day be discovered this way?

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