

Evaluation of the request for additional funds for the Auger programma

(Draft 21 Sept 2016)

Preamble

This is the third proposal for additional funding that has been received by the WAR within a year. Because the proposals were submitted at different times, we have evaluated each proposal individually. However, we feel that this process is of limited value. As could be expected, each proposal has significant scientific merit, however, we feel that more meaningful assessment, when it comes to re-distribution of funds, can only be made if multiple proposals must be ranked, including the programs which are affected by any re-distribution.

Scientific evaluation

The war has received the request from the Auger group with interest. The proposal puts forward the case for additional funding for the auger program in the form of two PhD positions and travel funds for the two PhD students and two seniors in the group. The scientific case outlines two separate projects, with a common theme of learning more about the composition of cosmic rays:

- Using the upgraded Surface Detector array to study the composition of cosmic rays at the highest energies.
- Using the radio detection techniques developed by the Dutch group to provide additional constraints on the cosmic ray composition at energies of 10^{18} GeV, where extra-galactic sources are expected to start playing a role.

The WAR agrees that the determination of the composition of cosmic rays is of scientific relevance, since it provides information on matter and structure formation in the universe. No detailed information is provided about the relative merits of the Surface Detector and the radio techniques; however it is clear that the Dutch group has pioneered radio detection and is therefore in an excellent position to retain leadership in this field. Or, equivalently: the leading role of the Dutch team in the developments means that a relatively small effort in this area may lead to large scientific benefits. However, the statement that without Dutch involvement the investment in the radio detection would be lost is somewhat alarming, as it seems to imply that there is no uptake of this technique by the collaboration as a whole.

Summarising, our overall evaluation of the scientific merits of the proposal is positive. The WAR does not have a complete overview of the resource situation at Nikhef and can therefore not provide a detailed recommendation for the size of the funds. It is clear from the proposal that at least one new PhD position is needed to continue participation in Auger in the time frame of the updates (2018 and later). If resources are limited, one could consider a staggered approach, i.e. attracting one PhD student in 2017 and postponing the (executive) decision on the second student, who will be attracted in 2018, to take into account the situation at that point in time.

It is also clear that even with two new PhD students, the manpower situation in the group will remain critical; the WAR hopes that future funding proposals for the Auger/cosmic ray group will be successful, and if they are, whether there are possibilities to 'refund' any additional funding in case this is provided.

Organisational/resource aspects

The proposal brings up the following organisational/resource aspects:

- Already invested money, manpower, etc. The proponents argue that it would be a waste of capital/resources to break off/wind down the programme now
- Staffing of the group; a target ratio of 1PhD student per staff member is mentioned
- Critical mass; it is argued that a minimum of two PhD students are needed to create a stimulating environment for discussion etc. In addition, a team of two or more student is more effective in sharing and maintaining knowledge and experience.

The WAR in principle subscribes to all these points, but would like to make the following critical remarks:

- The point about investments made is always true to some extent. We, however, agree with the proponents that the current time seems to be an especially bad moment to scale down the Auger effort, since the upgrade detector will soon be starting operations, so now is the time to collect the scientific harvest.
- About the number of PhD students per staff member: the war agrees that ideally a group should have one or possible even more than one phd student per research staff member. However, we also note that this ratio is not reached in several other groups; in particular, the ATLAS and LHCb groups.
- The critical mass argument is valid, but the above criticism, i.e. that this is also true for other programs, pertains to this argument as well.