Requirements and Guidelines for ACA Summer Course Host Applications

The ACA Summer Courses are awarded to a specific site for a time period of four years. Traditionally two Courses are offered each summer, one on small molecule crystallography and the other on macromolecular crystallography, although applications for other topics are also open for consideration. For an applicant to organize/host such a summer Course certain *requirements* must be met, while one should also strive to meet other *suggested guidelines* although for the latter there is more flexibility depending on circumstances. The Courses are held every year in the summer and should run for 10 to 12 days, with the dates not conflicting with any ACA or IUCr meetings. Applicants should also check the ACA homepage for any late breaking changes or additional requirements beyond those provided here prior to proposal submission. Applications should clearly indicate how each of the issues below is to be addressed.

Requirements:

1) The hosting organization needs to be able to accommodate at least 20 students, should that number or more apply. To keep the Course effective the class should be comprised of 10 to 50 students, as classes of more than 50 students do not allow for intensive training, and fewer than 10 students per class is not cost effective. If housing for the students cannot be provided on-site, daily transportation must be provided.

2) The Courses must have both a theoretical and practical, hands-on character. A healthy mix between lectures, demonstrations and hands-on training/exercises is required. For example 35% lectures, 15% demonstrations, and 50% hands-on training/exercises would be fine, but other ratios can be acceptable as well. These numbers are averaged over the duration of the Course (ideally, a theory lecture should precede any practical session dealing with application of that theory).

3) Students must have access to adequate computing facilities and diffraction equipment in order to allow for effective hands-on training. For the duration of the Course, the following equipment must be accessible to both Course students and faculty:

- At least one **computer** for every two students (ideally one for each).
- For small molecule Courses, at least one operational **single crystal diffractometer** equipped with an area detector and low-temperature device, and at least one operational **powder diffractometer.**
- For macromolecular Courses, access to a synchrotron and/or local access to several operational in-house **protein crystallography data collection instruments (*e.g.* high-flux source, focusing optics, area detectors, low temperature devices, etc.)**

4) Every student should personally mount and, when appropriate, cryoprotect and freeze a crystal. Each student should collect and process data, ideally from that crystal; for the small molecule Course, each student should be involved in performing data reduction and absorption corrections, solve and refine at least one structure, and run a powder sample. For the small molecule Course students should be encouraged to bring their own crystals,

while for the macromolecule Course students should be encouraged to bring their own samples for crystallization setups and crystallization should be included in the lectures and lab.

5) At the end of the Course, every student needs to fill out an evaluation form pointing out and ranking course strengths, weaknesses, and whether or not the Course met their needs/expectations. The form should also include a field for suggested improvements. All forms should be collected and turned in promptly to the ACA with copies to the ACA's Continuing Education Standing Committee.

6) A thorough program plan with a reasonably detailed budget must be provided that includes organizers and host organization, tentative list of instructors, tentative syllabus, scientific and housing facilities, expected costs, expected income raised from student fees, amount requested from the ACA, and amount expected to be raised through donations, etc.

7) The organizer(s) of the Course must submit a written report to the ACA Standing Committee on Continuing Education (with a copy to the Buffalo Office) within 60 days of Course completion. This report should contain a summary of the Course, a list of student attendees with their home institutions, e-mail addresses, status (*i.e.* undergrad, grad student, postdoc, etc.), and which students, if any, received stipends. The report should also contain a breakdown of actual expenses by category and a list of participating faculty members present during the Course. The report may also contain items of special mention (*i.e.* reflections on potential improvements, exceptionally good results, etc.) as well as a list of any field trips or coordinated social activities.

Guidelines:

1) It is desirable to have a large faculty body. Well known, experienced crystallographers from all over the country and possibly abroad should be recruited as faculty. It may be a good idea to invite some young faculty members who are actually doing crystallography in their everyday lives, especially for the hands-on components. The Summer Course is also a place for the students to network; being exposed to a large number of teachers is helpful in this respect.

2) There should be some time for socializing between the students and also between students and faculty. Common lunchtime could be an opportunity, or some evenings ending not later than 9:00 p.m., perhaps with a general, open discussion period following. A picnic on the Sunday is also a good opportunity for networking. The contacts made at the Summer Course are as important as the knowledge taught.

3) At the last day of the Summer Course, it is desirable that every student would present a brief (*e.g.* five minutes) report to all students and faculty about his or her endeavors during the Course period. This enables the students to reflect upon the Summer Course productively and allows the faculty to get an overview over the whole class. In the last years, this has been done successfully at the small molecule Courses organized by

Charles Lake and any future Summer Course organizer should consider keeping the final student reports as an integral part of the curriculum.

4) Lecture hall, computing facilities and crystallization/diffraction laboratory should be located near to one another. The need to travel by car or bus to get from the diffractometer room to the lecture hall or computing facility would be disruptive (synchrotrons usually being an exception unless remote data collection is used). Students should ideally be housed on or near campus, so that they can walk to all required locations.

5) Ideally, faculty housing would be nearby too. Besides knowledge (theory classes) and skills (practical training), contacts to the faculty are an important aspect of the ACA Summer Courses. This kind of networking is greatly facilitated if students and faculty live on site for the whole Summer Course.

6) Networking between the students is important and a diverse student body is desirable. Full scholarships for deserving students as introduced by Charles Lake are an effective way to allow a diverse group of students to come together for the annual ACA Summer Courses. This is a great and highly effective way of supporting students from South- and Central-American and also not-so-well-off domestic universities. The organizer of an ACA Summer Course should try to allow as many students as possible to receive partial or full scholarships.

7) While the student attendees certainly gain valuable training, the Course could benefit a significantly larger group of ACA members and others if the lecture materials were also made available to the general public. Placing all lecture presentations on a website is therefore highly desirable. Andy Howard has done this for the macromolecular Course the past few years, and in some years those lectures were also videotaped. The Course organizer(s) should consider these or other options that could help educate a larger audience.