A guide to successful ESRF beamtime application

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While reviewing the ESRF beamtime applications, where I am involved already for quite a number of years, I often see that similar mistakes are coming back again and again in different proposals. The main concern of the review panels is to promote the most exciting scientific cases. It is a pity to see that sometimes the result is strongly affected by secondary factors such as incompleteness of the information provided or poor formulation of the proposal. Here I would like to give advices on how you can increase the chance of your beamtime application being allocated beamtime at the ESRF. For other synchrotrons some details can vary but the main principles are the same.

To give an idea what happens with your application, let me invite you to "the other side of the fence" and give a quick tour through the beamtime review process. 1st of March and 10th of September are the deadlines for beamtime applications. It takes the ESRF a couple of weeks to test a number of formalities and to make all submitted proposals available to the review panels. Each panel has a few ESRF beamlines and receives all their proposals. The chairperson of each panel assigns 3 graders for every proposal. A panel member has to review about 35-40 proposals depending on the panel and the round. I can ensure you it is quite a pile of proposals! For me grading proposals and chairperson duties cost more than a week of full-time job twice a year. It is quite a load for a non-paid job! This hard job is however fully compensated by the pleasure of learning so many beautiful ideas of how one can use synchrotron radiation to solve various scientific problems. About a month later, at the end of April/October, the home-work is done and the grades are submitted. The panels assemble at the ESRF for a one and a half day meeting to discuss and evaluate all proposals together. Every application is introduced by one of the graders, the so-called spokesperson. The remaining graders share their vision with each other and the rest of the panel resulting in grades being often revised after a hot debate moderated by the chairperson. After the meeting our recommendations are passed to the ESRF management, which has the last word in the decision who are invited to the ESRF to do their exciting synchrotron experiments. Unfortunately, these happy users are the minority among the applicants because beamtime is limited and the competition is high. To raise your chances to appear amongst the winners, please consider the following recommendations based on several years experience of reviewing ESRF proposals.

Experimental Method Form is the main document describing your proposal, which you have to prepare. Before you start, make sure that you use the correct template; the ESRF changes the template from time to time. Think of a figure to support your description. Remember that one good picture can tell us more than a thousand words! It may contain a general scheme illustrating the process you want to study. It can illustrate your previous in-house or synchrotron data where you pinpoint the problem you would like to tackle this time around. You can present the model that you are going to use to fit the future synchrotron data. You can also combine some of those but do not make your figure too crowded.

Better choose a scientific and informative presentation rather than a 'too sexy' image suitable for highlights. Write down a draft of your proposal in advance to allow for final polishing and thorough proof-reading of your document before submission. Poorly designed text with too many typos is for us a signature of your limited interest in getting to the ESRF. Closely follow the structure suggested and respect the length limitation of 2 pages. A failure to meet these requirements can result in a rejection of your proposal on a formal basis. The current ESRF template contains the following sections.

- ***Proposal summary*** is the most important part. Think of it as an abstract of a scientific paper. Describe the essence of your proposal in one paragraph consisting of 3-5 sentences. You can briefly indicate the importance of your research topic but make it no longer than one sentence. Describe what question you wish to answer and which technique(s) you want to use. Do not say that you want "to extend previous studies" or "to confirm earlier results" without clear explanation of what is still missing in your data. A sentence on the importance of the expected results can also be useful. Remember that during the discussion of your proposal at the panel meeting every member will mostly look at this part since time per proposal is very limited, typically < 5 minutes. With a well-prepared summary you have a chance to score support of other members of the panel who did not study your proposal at home!
- ***Scientific background*** section is meant to set the scene for the proposed experiments and to get the reviewers interested in your proposal. Keep in mind that they can originate from a rather different field of research. Indicate the fundamental and societal importance of your work. Lead us to the open question, which you would like to address in this particular synchrotron experiment. Be concise and better keep this part within 2-3 paragraphs with the total length of 15-25 lines: there are other important parts to describe in your proposal.
- ***Experimental details*** section tells us how well you are prepared for the hard work at the ESRF. Describe details and quantity of samples you intend to bring. Which technique and which setup do you need? Do you need to have any extraordinary modification? What is your experiment strategy? You can mention some other technicalities so that your graders can see that your proposal is thought through very well but do not exaggerate. If you are a new user, discussing in advance details of your future experiment with the beamline scientist is often a good idea. This section is also very important for your future local contact who will prepare the beamline for your experiment.
- ***Beamlines and beamtime requested*** section overlaps somewhat with the previous part. You can keep it relatively short but please do collect here your arguments to support the choice of the beamline(s). Explain your reasoning for the duration of your experiment and how this is calculated on the basis of the details described in the previous section.
- ***Results expected*** part is a summary/outlook of your proposal. Describe the significance of the expected results to let us believe that your experiment will lead to a breakthrough in your field of research. But be realistic and do not exaggerate, it can work against you.
- ***References*** section is also important, take it seriously! It can be used to illustrate the importance if you cite one or two milestone papers in your field. Is there any recent exciting development in/around the specific topic of the proposal? Then give us a reference! You can illustrate the level of your research by citing a couple of own recent publications with or without ESRF data, which are relevant for the topic of your proposal. Your referees will glance through the References section.

Once you have prepared a very strong description of your future experiment, your way to success is not yet fully paved. The ESRF Internet application form requests multiple additional pieces of information. Be prepared to invest some time into getting all these pieces right. Did you register in the ESRF database? Do you remember your password? It is a good idea to log on into the User Portal and start filling in the application form in advance. You will be able to save your work as a draft before the final submission. Your graders will look into some of those pieces of information. Let me get through those parts which can affect the result of evaluation.

- ***ESRF publications*** is an important factor which illustrates your productivity. Have you been at the ESRF before for an experiment? Did you publish the results? Make sure then that these papers are submitted through the corresponding site of the ESRF-ILL library! Submit only those publications, which contain ESRF data. Do not try to cheat if you do not want to ruin your reputation. All references will be carefully checked by the librarian. In the Application form, the last section is the place where you can attach references to your papers registered in the library. Attach all recent (last 3 years) ESRF publications of the main proposer ***and*** the co-proposers. The publications do not need to be closely linked to the topic of your proposal; this section is a measure of the output of the *whole* group of proposers.
- ***Publications of the ESRF personnel*** is a special case. Obviously, an external user has on average less ESRF publications than an ESRF employee working together with many user groups. There is no formal rule defined by the ESRF in this case but I can give you a friendly advice if you happen to work at the ESRF or have an ESRF co-proposer. You do not create a good impression if you flood the publication list with too many papers published by other user groups. There is a good informal tradition that, in addition to all publications of external (co-)proposers, only relevant publications of ESRF staff are attached. Please support it!
- ***Relevant reports*** are very useful to support your application. By attaching examples of your recent reports, you provide your graders with extra information, which cannot fit into the two pages of the Experimental Method Form. The reports are especially important if you have been at the ESRF but did not yet publish any results. In this case we can get an idea what you have done and how exciting and publishable the results maybe. Unless you are a new user, your proposal without a record of previous ESRF publications and attached experimental reports will look suspicious! Make sure that the report mentioned in your application has been already submitted. Check carefully the experiment number typed in the corresponding box otherwise no report or a report of another group might be attached. Surely, you do not want such a silly event to happen to your application!
- Describe clearly ***the technical reasons*** why you think you need to get to the ESRF. We sometimes consult this part of the application.
- Tick the ***A resubmission of*** box if your previous similar application was not successful. You will get an additional very important box to fill in, where you can summarize how you improved your proposal. Do not say anything like: This is the same proposal, which was “very well received but available beam time was insufficient”. Do consider ways to improve your application and describe the changes made!

- If you ticked the ***A continuation of*** box, make sure that the report of your previous experiment is attached or explain clearly why not in the text (e.g., if it took place just before the application deadline). In the latter case, briefly describe your previous results in the text.
- There are some pieces of information that are requested by the politicians and funding organizations such as the ***Societal Themes***. By far the most popular answer here is Fundamental Science, which is the *wrong answer* in the majority cases. Of course, we do a lot of forefront fundamental research at the ESRF which is, however, motivated by important ***societal*** challenges such as environment, health, ICT, energy or the development of other advanced materials. If you select Fundamental Science here, you declare that your research is ***absolutely useless*** for the society apart from the general curiosity. Please don't get me wrong: apparently useless research such as astronomy or high-energy particle physics is also important. But, to my mind, 99% of the research at the ESRF is ***very useful*** for various Societal Themes! Please choose the correct answer here not because it will affect your chance but to get the ESRF statistics right!

To summarize, here are my recommendations in a nutshell. If you scored beamtime before, publish your ESRF results as soon as possible. Do not forget to acknowledge the ESRF in your paper, otherwise it will not be justified to be an ESRF publication. Register your publications and submit the experimental reports at the ESRF site. Keep in mind that reviewing beamtime applications and selecting the best of them is a very challenging job for us. Therefore, prepare a clear Experimental Method Form so that we are able to share your excitement. Do your best to provide us with complete and honest information in all parts of the Application Form. Show that your intention to come to the ESRF is very serious. Remember that it is crowded around the cutoff line; the difference between accepted and rejected applications can be very tiny!