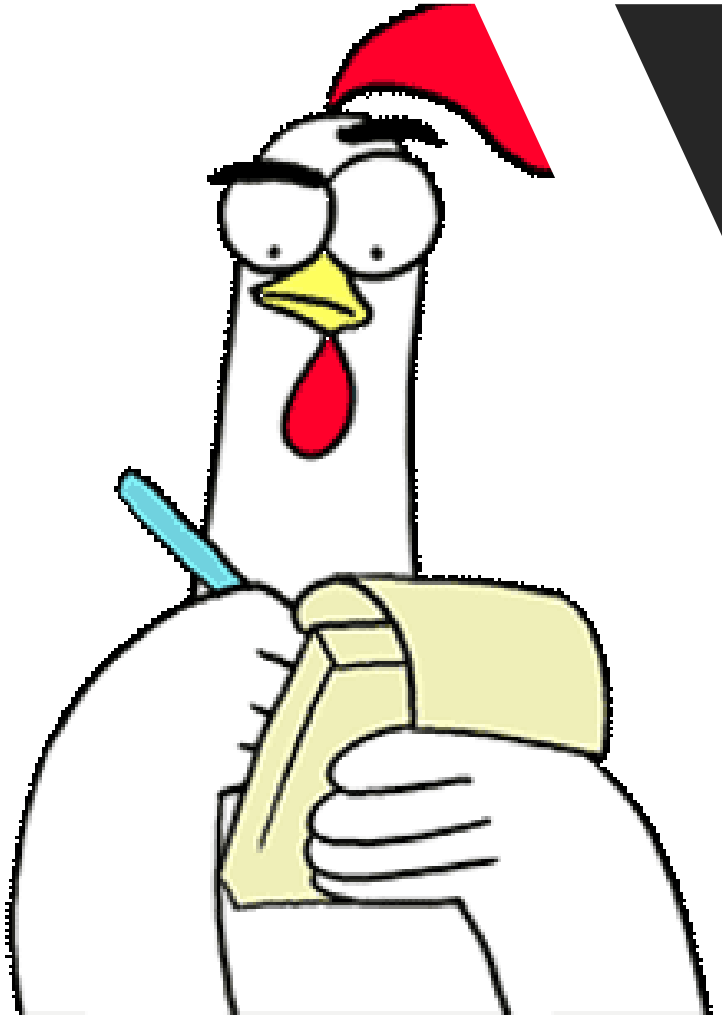


pro-pos-al
/prəˈpōzəl/

a plan or suggestion, especially a formal or written one, put forward for consideration or discussion by others.

Oxford Language

Goals for this talk

It will help you learn the basics of writing a proposal

If you have written a proposal already- it may help you improve your submission

If you, your advisor and/or collaborators think you need neutrons- start with some basic questions

- Are neutrons the appropriate tool to study the problem I'm investigating?

If yes,

- Which is the right instrument?
- What sample environment should I use? What sample preparation resources will I need?
- Where do I apply for neutron time?

Resources to help answer your basic questions!

Literature research

- Have other scientists used neutrons to find an answer to similar problems?

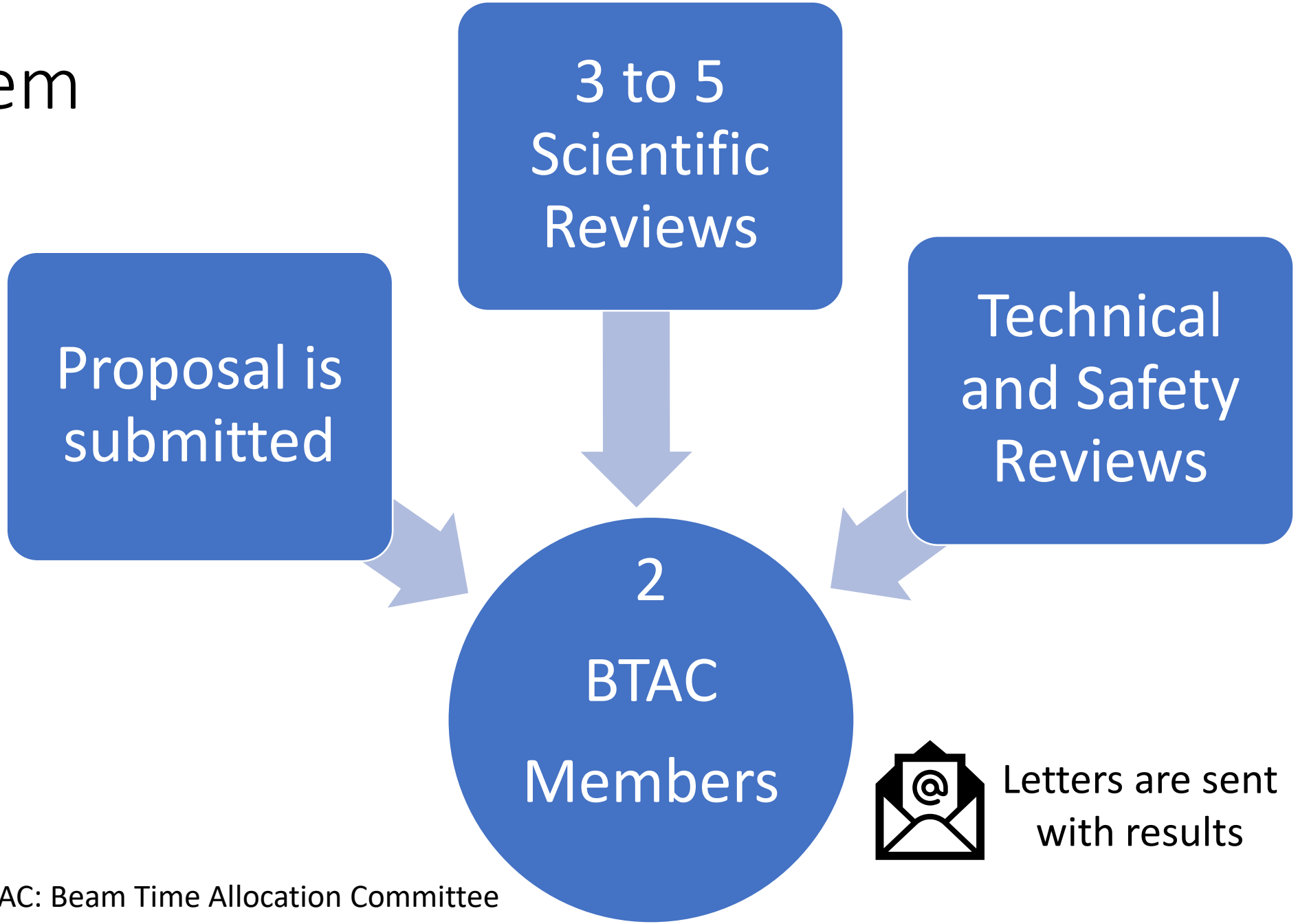
Web searches

- Research neutron scattering facilities, who works there, instrumentation, sample environments, etc

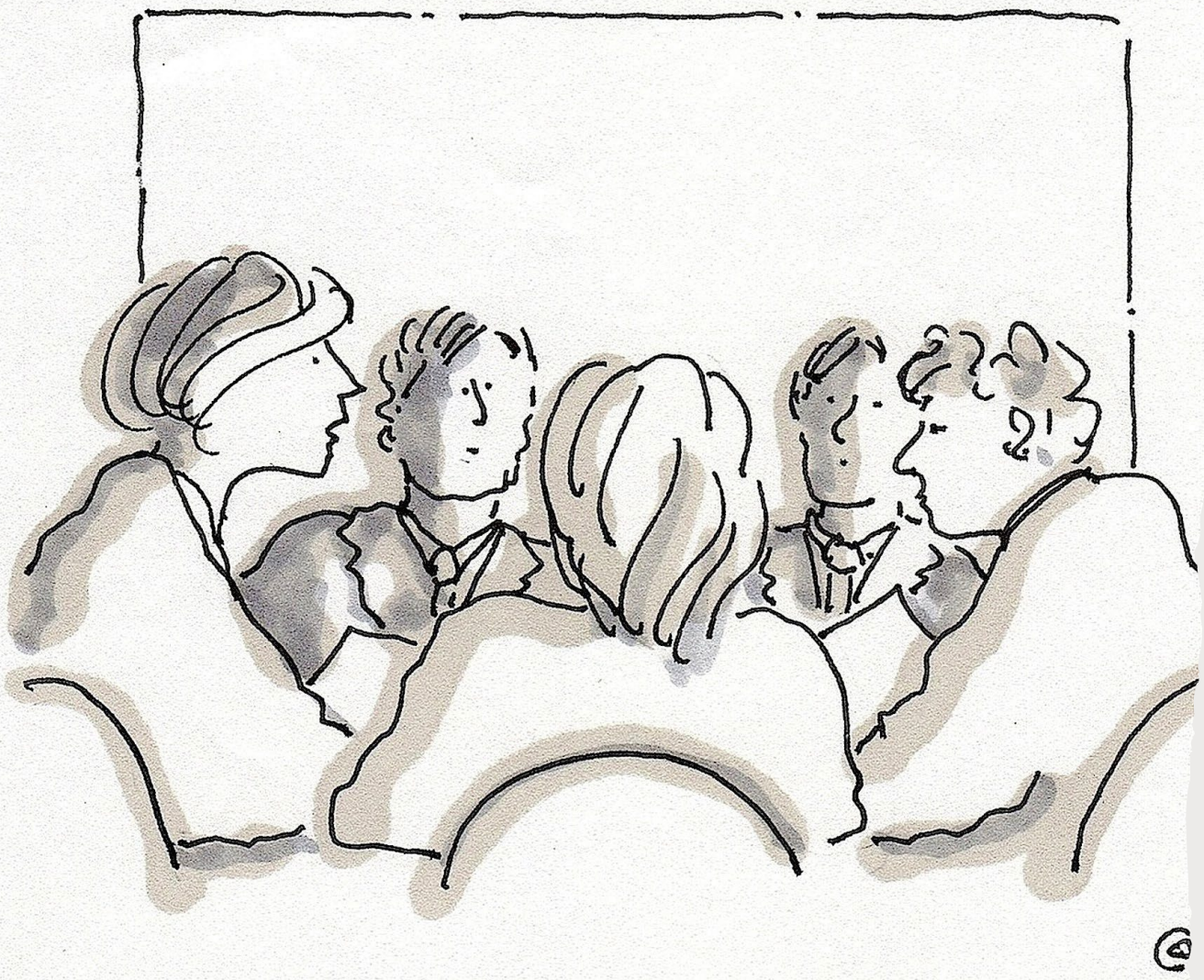
Instrument Scientists

- One of the most valuable resources that can help with all your questions!

How the system works; new proposals



BTAC: Beam Time Allocation Committee



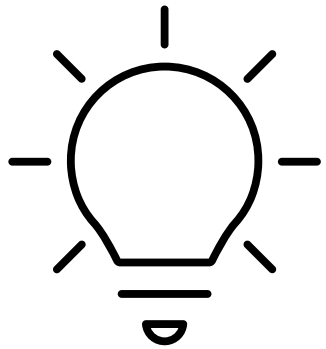
"Agreed. We fund only those proposals we can understand."

Before writing, here are tips about reviewers:

- are very busy, and they will not spend excessive time on your proposal.
- may not be an expert in your sub-field – but they also might be.
- may or may not have time to look at your references.

Your job is to make it **easy** for the reviewers to say "yes" in one quick read!

Before writing be aware!!!!!!!



The PDF of your proposal must not be longer than 3 letter-size pages in length-including references, nor more than 1500 kb in file size.

This is a proposal for ONE EXPERIMENT, it is not a 25-page multifaceted proposal to a funding body.

You can use high resolution images- recommended!

The main parts of a proposal

Motivation

Experimental Description

Justification

Start writing: Motivation (2-3 paragraphs maximum!)

- ✓ What is the general problem and why it is important (We will solve the world's energy crisis ...)
- ✓ State your **hypothesis** and what is the particular aspect of the problem being investigated by the team and how does it relate to the larger issue OR How is your project different from what has been done before? (Revealing new insights into the cooperative mechanism of proton conduction in ….)
- ✓ How this neutron scattering experiment will help answer the problem you are investigating? (The contrast factor will allow us to focus on just the proton ...)
- ✓ What are the expected outcomes? (Oh, a Nature paper you say! How may we help?) (We expect to be able to determine if the **hypothesized** coupling between H^+ and ….)

Start writing: Experimental description

Describe samples and the conditions for your experiment (shear, pressure, magnetic field, temperature) that relates to the problem you are studying. This should clearly relate to your hypothesis.

Would the sample be available for the experiment immediately? Do you need deuteration? Have you done characterization? Are there sample availability restrictions (Expense? Lifetime? Collaborator makes them?) Any troublesome isotopes?

Safety: Let us know if samples or experimental conditions may pose a risk or hazard

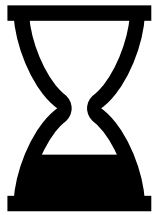
Include data from other techniques if appropriate (mw, SAXS, density, susceptibility, film thickness, transition temperature…)

Use equations and model calculations when possible for contrast/isotopic content/magnetic moment etc

Explain data analysis if non-standard

Modeling/data from preliminary results or if previously awarded beamtime

Start writing: Justification



It costs over $5,000 per day to run an experiment at the NCNR

- ***Can the goals of this experiment be achieved at my home lab?***

The NCNR like other facilities are oversubscribed!

- ***Can the goals of this experiment be achieved better at another facility? Could /should we get beamtime there?***

Make sure you provide additional justification for :

- ***the number of samples***
- ***the number of experimental conditions, or instrument settings***
- ***Time to collect data under each condition and total time***
- ***why neutrons? (if not done so already)***
- ***why this instrument? (if not done so already)***

Examples of comments from scientific reviewers

"This project concerns PDMS copolymers for photonic bandgap materials. This is certainly an interesting topic, but I found the proposal a touch unsatisfying in a few respects. First, the main application is to measure the d-spacing of copolymer lamellae, which is fine but hardly exciting. Two other projects are only mentioned in passing "studying phase segregation thermodynamics in a controlled temperature cell" for 48 hours. What does this mean? What samples, what measurements, what information? I think (hope?) the authors mean that they will take a sample with an accessible ODT and study the disordered phase S(q) vs T to get chi, but they don't actually say. Then they say "we will study the effect of solvent environment" for 36 hours. What solvent? What effects are expected? What concentrations? Dilute, concentrated? What M? This is simply not a compelling proposal as written."

Issues with motivation, experimental description, and justification

Examples of comments from scientific reviewers

"I did not like this proposal at all; I think the science is completely muddled. First, the conformation of a block in a block copolymer is not related to its conformation in a blend. the former is a tethered chain, and will be stretched; the latter will be a coil. Second, SANS has already been used to measure the conformation of blocks in ordered block copolymers, first by Hashimoto and by Hadziiouannou, in the 1980s. Third, the blends will not be interesting. If the PB interpenetrates the PS coil, they will phase separate, ruining the experiment. If the PB does not penetrate, it will induce PS coil shrinkage, but that has already been measured by many groups over the years. (See Graessley's recent book for a thorough discussion)."

Issues with not doing an appropriate literature search and motivation

Examples of comments from scientific reviewers

"Interactions between polymers and nanoparticles in nanocomposites are still not fully understood. This experiment proposes to study these interactions by probing changes to the centre of mass diffusion of a short chain polymer with and without nanoparticles using the NSE spectrometer. Data from molecular dynamics simulations show that the motion is in the window of the NSE spectrometer. To achieve 100ns will require long wavelength, 10-12Ang, so the counting times asked for look reasonable. I strongly support this experiment- good example of the importance of the simulation-neutron partnership."

Good motivation, good use of modeling data, and good justification.

Examples of comments from technical reviewers

Zero days recommended:
"Submission was for PBR, but the proposal describes work on ANDR. I cannot identify where the authors say exactly what they're going to do with the reflectometer. It may be a good experiment, but I cannot assess feasibility with the given information."

Fraction of days recommended:
"Higher temperatures, especially 100 K is hard to reach in the 11T dil fridge. 10 days are necessary to carry out all the proposed measurements at various temperatures and fields. But less temperatures are more reasonable."

10 days requested; 6 days recommended

All days recommended:
"Measurement is plausible. The standard PBR displex is wired for application of voltages up to 300 V. 6 days is reasonable."

Consult with the instrument contacts!

Beam Time Allocation Committee (BTAC)

KEY CONSIDERATIONS

- Scientific background and anticipated impact
- Methodology: sample preparation, specific concentrations
- Sample: Do you have the sample? – powders, crystals, deuterated materials
- Data analysis: anticipated method
- Justifications: #of samples, #of runs, Q-ranges, temperatures, fields, etc
- List of publications from prior NCNR instrument time

BTAC Comments

Zero days recommended

"Have structural changes in the protein been ruled out for the observed changes in the activity? Otherwise, hard to see how these measurements can be useful. Also, what pressures are going to be addressed? The dynamic range is too broad to be of use. Too much is being proposed for this type of study. Other types of measurements should be done to narrow the window of interest for HFBS."

"Proposal would be strengthened by including more magnetic characterization of multiple samples. If the reduced magnetization is due to interfacial effects, characterizing multiple samples of varying thicknesses would be an easier way to test this hypothesis."

BTAC Comments

Days recommended

“ Experimental goal and plan. Topic of significant current interest. …first single crystal experiment and very large single crystal available.”

“The BTAC recommends … days for the proposed experiment.”

Other things to consider when writing your proposal

Do make sure to read, revise, and re-read your proposal

Do make sure your grammar is correct and your sentences are clear

Do make sure if you copy and paste you update relevant information

Do make sure that your figures are clear and readable

Other things to consider when writing your proposal

Do not wait until the last minute to write your proposal

Do not submit the wrong pdf!

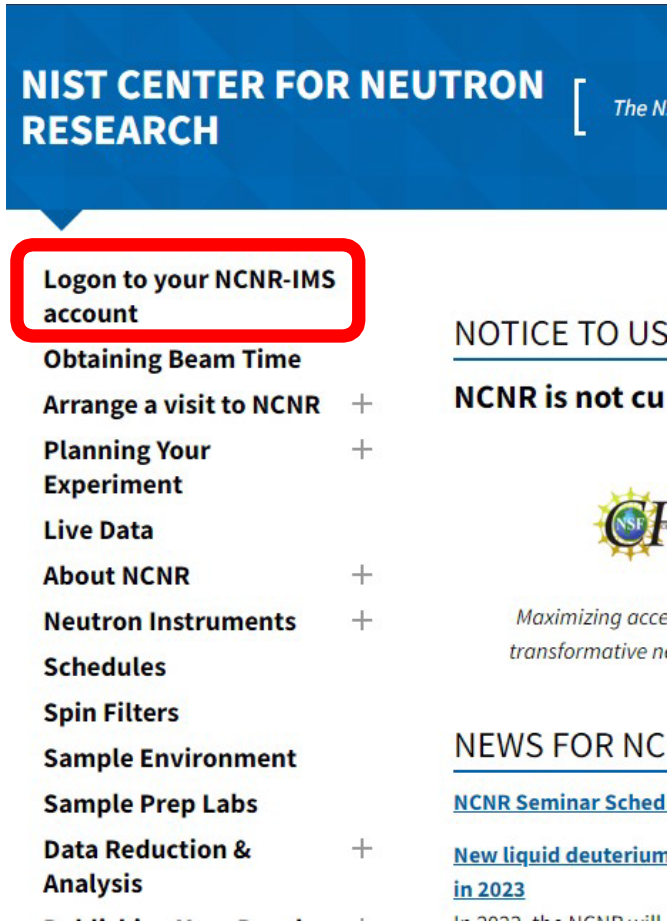
Do not use flamboyant language - this is a scientific proposal

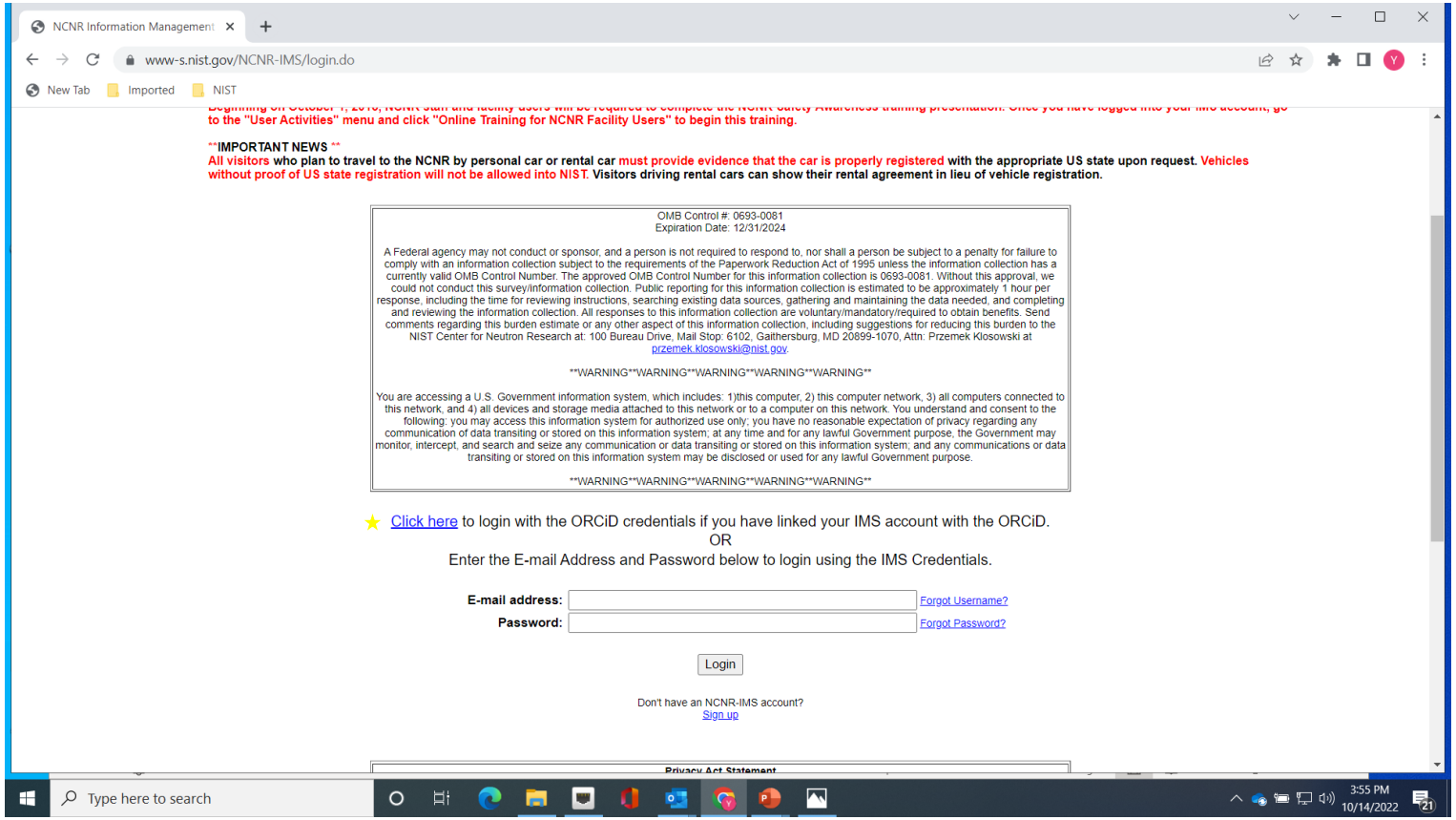
Do not tell the reviewers to contact you if they want more information!

Do not tell reviewers you would do great science without providing evidence!

NCNR Information Management System (NCNR-IMS)

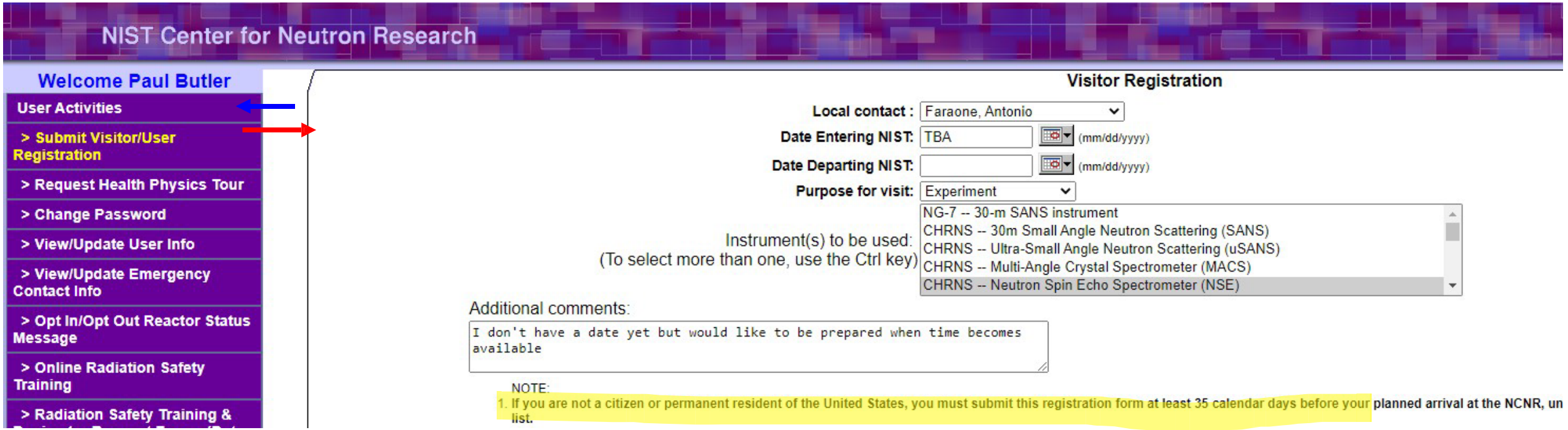
The whole process is managed through the NCNR-IMS





https://www-s.nist.gov/NCNR-IMS/login.do

NCNR Information Management System (NCNR-IMS)



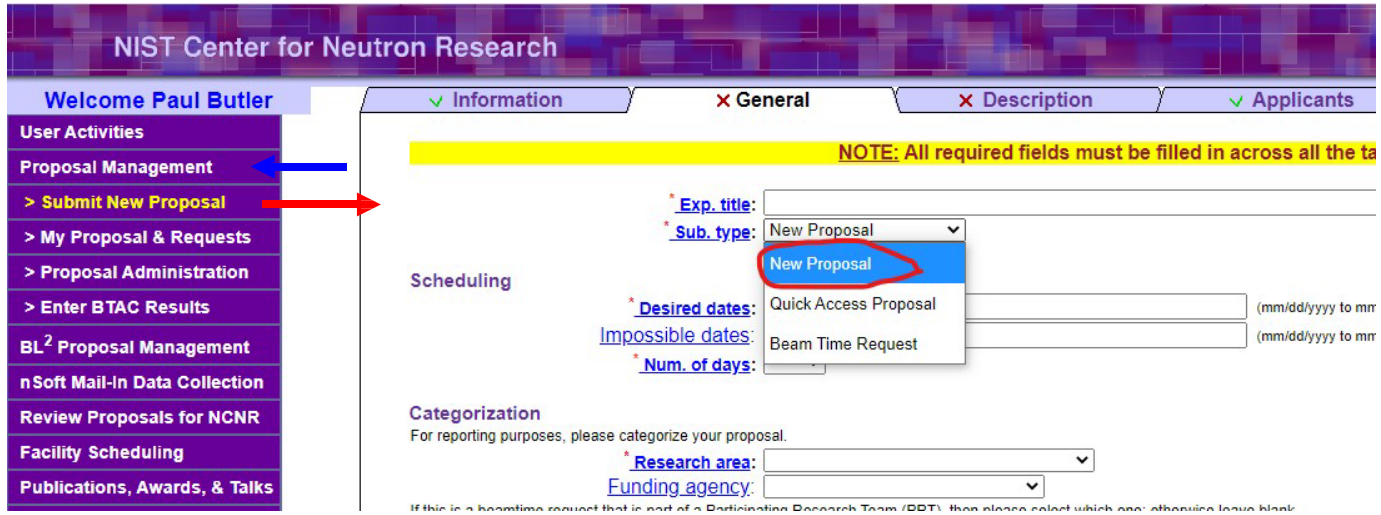
Make sure you can access the facility to DO the experiments

- VERY IMPORTANT. For first-time FN users, or returning FN users who have not been back in many years, *35 calendar day requirement*!!
  - Submit a request to come with a TBA date = gets the clock started on the background check
- EVERYBODY – you need to REGISTER to come to the NCNR 3 BUSINESS days in advance

* FN- foreign national

NCNR Information Management System (NCNR-IMS)

There are four ways to obtain beamtime!

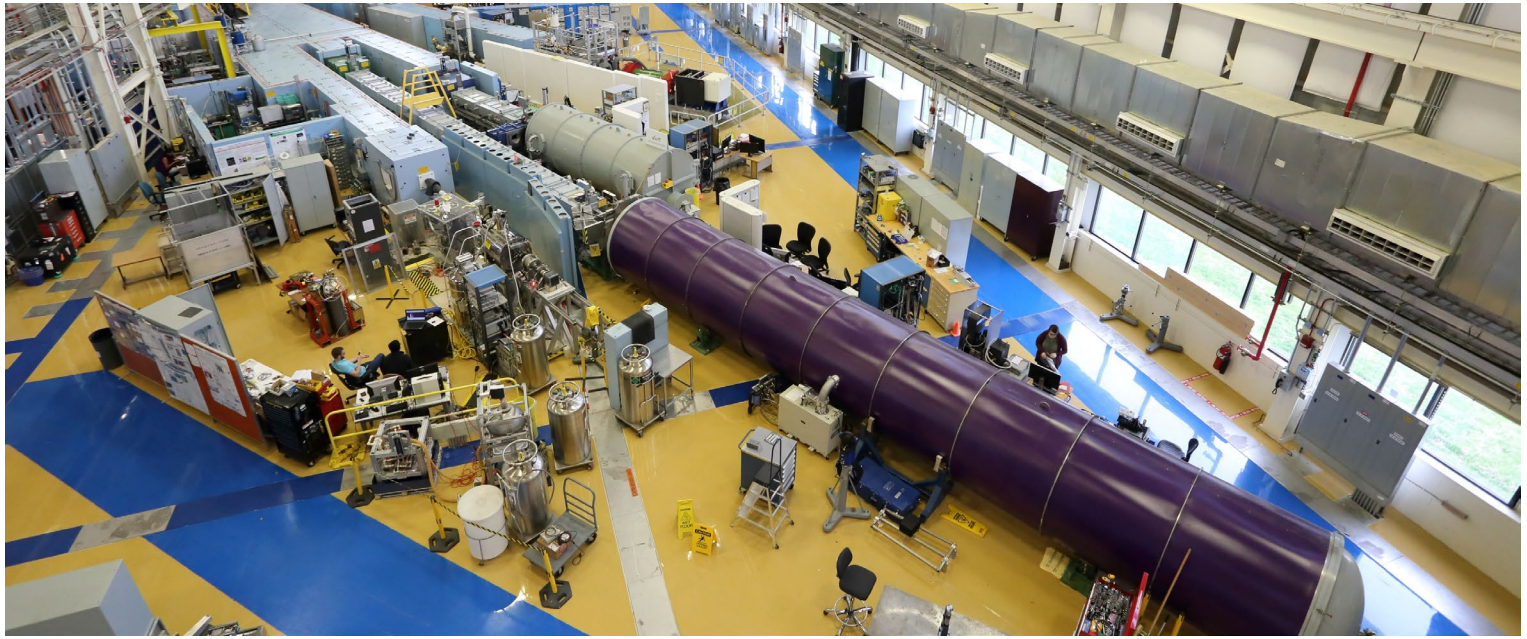


New Proposal: this is a proposal for instrument time submitted when a call is announced. The proposals will be reviewed by scientific and technical reviewers, as well as by the Beam Time Allocation Committee (BTAC).

Quick Access Proposal: a proposal submitted asking for access to the instruments in the near future for measurements that *cannot* be delayed. It will be reviewed by the BTAC and held to a much higher standard than regular proposals.

Beamtime request: this is not a proposal; it is a request. It is NIST internal time for NIST research programs. Under certain conditions (like feasibility time), external users can coordinate time with an instrument scientist.

Proprietary research agreement: this is not a proposal; talk to Ron Jones



Questions