Tips for Developing Successful Technical Proposals—Preliminary Planning

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• In order to create a competitive research proposal:
  • Proposal must first be well conceptualized
Goals for this session

Understand why it is important to know your funder

Review what an “RFP” is and why it is important

Become familiar with the contents of most Western RFPs

Discover how to use the RFP to plan your project

Learn the steps to planning your proposal

• State Goals
Answering five simple questions will help you focus your proposal

What is the objective of this project?  
*What hypothesis are you going to test?*

Why is it important?  
*What important questions will it answer, what important social problem will it solve, or what useful applications will it enable?*

What methods will you use?  

What resources are needed?  
*How much is it going to cost?*

What are the objectives of the funder?  
*How will your successful project further the goals of your sponsor?*

• Ask yourself five questions:
  
  • 1) What’s the objective?  
     • Is the project hypothesis driven – it MUST be hypothesis driven  
     • Many reviewers complain about “fishing expeditions”  
  
  • 2) Why is it important?  
     • Who will care, what is the utility?  
  
  • 3) How will it be accomplished, what methods?  
  
  • 4) What will it take to accomplish the task?  
     • The resources, the cost  
  
  • 5) How is this helping the funder?

• Write down the answers to these five questions. Think about them—write and rewrite your answers until they are clear, direct, and persuasive.
  
  • This exercise will help you to focus your thinking and to write a tighter proposal.

• Always use a journalistic writing style: who, what, when, why, how
Successful proposals start with careful PLANNING

Learn about current work in your field—how is your approach faster, better, cheaper?
  Read the literature—the Western literature
  Talk to other scientists
  Explore the Internet

Find out what organizations fund your type of research
  What is a prospective funder’s mission and objectives?
  Read its “annual report”
  Talk to a program officer

• Careful planning will pay off in the end
• How is your approach better, faster, cheaper?
• Identify the latest trends & advancements
• Who else is working in this area?
  • Look at acknowledgments on papers related to your work. Who is supporting it? Contact the PI.
  • When was the last time you spoke with them?
• What funding agencies are active in this area?
  • Identify the funder’s focus area
    • Read the annual report
    • Call or email the program staff
Rule #1

To create a successful proposal, you must understand the funder’s objectives

• State Rule #1
Find out all you can about the funder

Does it support research in your country
What kinds of research it supports
What its organizational goals are
How it awards grants
How to obtain copies of its RFPs*
How to contact its program officers

*RFPs are called different names by different funders—look for “program announcement” “program solicitation” “grants” “call for proposals” “funding opportunities”

•Find out about the funder
  •Do it work in your country?
  •What specific type of research do they fund?
  •What is its mission?
  •How does it awards grants
  •Ask for a copy of the RFP
  •Contact the program staff
Most organizations are required to prepare “annual reports” and make them available to the public

Annual reports detail what activities an organization engaged in (what kind of projects it supported) and how it spent its money

Many annual reports are available on the Internet

• Detailed information on funding agencies is
  • Widely available
  • Often on-line
  • In-depth
• Annual reports: a good window on funding agencies
Funders’ websites provide a great deal of useful information

Program announcements
Databases of funded projects
Types of research supported
Contact information for program officers

• Regularly check funders’ websites!
  • Sites updated with new information often
  • Old information available too
    • Archives
    • Databases and lists of past awards
      • Easy to identify someone in your area
  • Current activities are listed too
  • Programmatic information is available
  • Important contact information
  • Match-making, finding collaborators
  • Check the links!
    • Links to other related or similar organizations with other funding opportunities
Most funders provide a “mission statement”

The mission of the CRDF is to

- Support exceptional research projects that offer scientists and engineers alternatives to emigration and strengthen the scientific and technological infrastructure of their home countries
- Advance the transition of foreign weapons scientists to civilian work by funding collaborative non-weapons research and development projects
- Help move applied research to the marketplace and bring economic benefits both to the United States and the countries with which the CRDF works
- Strengthen research and education in universities abroad

A funder will support only those research projects that advance its mission

Design your project to meet those goals

• Easy to identify the intent behind a funders’ activities: its mission
• Mission often stated on the “Home” page of website
• Mission is the core of the organization
• CRDF’s mission
• We will not support a project outside of this mission
• It is an applicant’s obligation to match his project with the mission of the organization
• An application that easily explains how it advances the agency’s mission has a better likelihood of funding
Find out what kinds of projects have been funded in the past and who’s doing the work

Civilian Research and Development Fndtn
  http://www.crdf.org/Awards/awards.html

INTAS
  www.intas.be/catalog/CATA_TAB.htm

ISTC
  www.istc.ru/istc/website.nsf/fm/GBMeetings

Howard Hughes Medical Institute
  http://www.hhmi.org/grants/reports/Awards/main

U.S. National Institutes of Health (NIH)
  http://crisp.cit.nih.gov/

• Many agencies have lists of past awards
  • Organized in databases or archives

• Some awards listed can lead you to
  • Current literature
  • Prospective collaborators

• Briefly describe listed funding agencies
Example of an NSF award summary and project abstract

Award Abstract #0652874
Numerical studies of binary black hole dynamics and waveforms

**ABSTRACT**

The NSF's LIGO gravitational wave detectors are among a number of new and planned facilities all over the world which are designed to directly detect and measure gravitational waves. The observation of gravitational waves will open a new window on the universe by enabling us to study exotic phenomena such as black holes, supernovae, neutron stars, and gamma-ray bursts. The research in this project is aimed at developing the computer code needed to simulate the evolution of two black holes inspiraling and merging. The equations of gravitational wave evolution, binary black hole systems, inspiraling black holes, and merger of two black holes have already been studied in the literature. The work of this project is focused on refining the code to simulate the inspiraling and merging of two black holes. The code will be validated using analytical solutions and future simulations of known examples. The results of this research will be used to develop a physical understanding of the gravitational waves emitted during the inspiraling and merging of two black holes.

**Investigator(s):**
Wolfgang Tichy, wolfgang.tichy@physik.tu-berlin.de (Principal Investigator)
Pablo Marronetti (Co-Principal Investigator)

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- U.S. National Science Foundation database
- A very comprehensive database of awards
  - Funded under NSF
  - Dating back to 1972
- Free of charge
- Open to public
- In a separate presentation will describe how to search NSF database
The RFP establishes the rules for the proposal competition

Types of projects that will be considered
Who can submit a proposal
Maximum award amounts and duration
Deadlines for submitting proposals
Instructions for preparing a proposal
Evaluation criteria
Requirements of grantees

• RFP states rules of competition
  • Range of research projects
  • Eligibility
  • Award maximum amount and duration
  • Proposal deadlines
    • Beware that some agencies have varying deadlines for different types of proposals
  • Preparation instructions
    • Special requirements such as institutional clearance
  • Evaluation criteria
    • Including preferences or special considerations
      • Such as junior researchers or less-represented geographic areas
  • Requirements of grantees
    • In the case of an award
Rule #2

Follow the instructions in the RFP exactly—no deviations, no exceptions!

• State Rule #2
Pay particular attention to . . .

Eligibility requirements
Budgetary limits and matching funds
Signatures and certifications
Page limits
Formatting requirements
Deadlines
Required information

Failure to follow these rules will likely send your proposal straight to the funder’s “circular file”

• Beware of regulations of proposal submission
  • Eligibility
  • Budget limits and leveraging
  • Signatures
  • Institutional and government certifications
• Page limits
• Deadlines
• Required Information

• If you do not pay attention to these basic regulations
  • Your proposal may be rejected during screening even before it is submitted to competition

• Program staff often have 100’s of proposals to process
  • Do not have time to request corrected/complete proposals from applicants
“Eligibility” rules determine who may submit proposals

The type of organization
Foreign or domestic
For-profit or not-for-profit
Educational (at what level?)

Requirements for scientific personnel
Educational requirements
Citizenship
Security clearances

Limits on the number of proposals an organization may submit or the projects a scientist may be involved in

• Eligibility rules for each program and agency are different
• The rules determine who may apply
  • Type of organization
    • Foreign or domestic (e.g., U.S. National Science Foundation does not accept proposals for research to be done in foreign countries, U.S. National Institutes of Health does)
    • For-profit & Not-for-profit
    • Educational
    • Academy of Science
  • Requirements for personnel
    • Educational requirements
    • Different levels for numerous roles on project (PI vs. student)
    • Citizenship
    • Security Clearances
      • Especially for former weapons scientists
      • Especially for Proprietary Information and Technical Information
      • National Security issues
• Limits Number of Proposals
  • Submitted by individual
  • Submitted by organization
The RFP specifies monetary rules for the proposed project

- Maximum support ($$$) per year
- Maximum duration of a project
- Requirements for matching or “cost-sharing” funds that the proposer must commit to the project
- Limitations on how funds may be spent
- Auditing and reporting requirements
- Preparation instructions for a budget justification if required

- Many RFPs have very specific budget requirements and limitations
  - Maximum financial support
    - Per Year
    - Or over duration of entire project
  - Award maximum duration
  - Requirements for leveraged funds (contributions by the submitting organization)
    - Contributions from organizations
      - Often times for-profit organizations are required to contribute
  - Limits on how funds are spent
  - Auditing and reporting requirements
  - Budget preparation instructions
- Many budgets require budget narratives
- If any portion of budget is unclear, contact the program officers
- They will help you
The RFP specifies what categories of expenses will be allowed...

Salaries and wages
Equipment and supplies
Travel
Services, consultants, and subawards
Institutional overhead

• The RFP will describe
  • Categories of expenses that are allowed
• Specific information will be provided on the
• Maximum levels of funds
• Requirements of requesting funds within categories
  • Individual Financial Support
  • Materials and Services
  • Maximum travel time, travel stipend
  • Secondary Collaborators, Sub-contractors
  • Institutional Overhead
...and what costs are not allowed

Construction or remodeling of facilities
Payments to individuals who contribute no work to the project
Equipment or supplies not used directly in the supported research
Travel unrelated to the research

• The RFP will also describe
  • What expenses are NOT allowed
• Many scientific funding programs will not allow
  • Construction or remodeling
  • Payments to personnel that do not contribute to work
  • Equipment or supplies not directly related to work
  • Travel unrelated to the research
The RFP will include certain forms and certifications that must be completed and returned with the proposal

Cover page, must be filled out completely, often requires signatures by the investigator and institutional officials

Budget pages, must be filled out completely and accurately, sometimes requires signatures

Other certifications, e.g. protocols for use of human subjects, animals, radioactive sources

• Many RFPs will be advertised with
  • Application forms
  • List of required certifications
• Application forms used to collect information
  • In a standard way
• All required forms MUST be submitted, no question
• Forms may include
  • Cover page form
  • Budget form
  • Signature forms
  • Certification forms
  • For special issues such as
    • Use of human subjects
    • Use of animal subjects
    • Volatile or radioactive materials
The RFP will tell you mandatory parts of the proposal that must be submitted and whether additional supplementary information is allowed

- Project summary
- Project description
- References
- Biographical data on scientific personnel
- Budget and budget narrative
- Sources of other support
- Facilities and equipment to be employed in the project

- RFP will specify other parts of proposal
- Which may or may not require an accompanying form
  - They are no less important
  - And often make up the bulk of the proposal
- Mandatory components MAY include (not all RFPs the same)
  - Project summary
  - Project description
  - References and literature citations
  - Biographical data on scientific personnel
  - Budget and Budget narrative
  - Description of other sources of support
    - Including those that
      - Contribute to this project
      - Other un-related projects
  - Facilities and resources
- All of these components are required in order to allow the reviewers adequate information on your project
- If any portions are missing you will fail to convince reviewers why your project should be funded!
The RFP provides specific instructions about proposal format

Page limits
- For the entire proposal package
- For individual proposal components

Minimum font and margin sizes

Page numbering

Ordering of sections

Inclusion of figures, tables, graphs, refs

IMPORTANT NOTICE: No proposal may exceed 22 pages in length, including all forms. Any proposal exceeding 22 pages in length will be disqualified.

...from the RFP for the 2005 Targeted Research Competition of the Civilian Research and Development Foundation

• Specific information will be provided in the RFP on
  • Page limits
    • For entire proposal
    • For proposal components
  • Stylistic requirements
    • Font
    • Language
    • Margins, paper size
  • Page numbering
  • Ordering of sections
  • Inclusion of figures, tables, graphs, references

• See example from recent CRDF program announcement

• While these may seem like minor details
  • Ignoring them, may send the program officers and reviewers a message that you have not paid attention to the proposal requirement and
    • may result in a declined proposal
  • This information is provided in the RFP for you to follow it—not for it to be ignored!
The RFP specifies how the proposal is to be submitted

Electronically—by email or a web interface

By mail—how many copies?

Some RFPs may require a combination of submissions, e.g. the technical description is submitted electronically, but hard copies of the cover pages or budget page, with original signatures, must be mailed to the agency

• RFP will specify how a proposal is to be submitted
  • Electronically
    • By web
    • By email
  • By post mail
  • How many copies
• Some RFPs require a combination of submission procedures
  • And may apply to some rather than all
  • You may be required to submit both electronic and paper copies of the proposals
    • May require signatures on only some rather than all submissions
• Read carefully
The RFP specifies deadlines for receipt of proposals by the funding agency

Is there a “hard” deadline?

Is the deadline “submitted by” or “received by”?

Allow time to obtain
- Required signatures and authorizations
- Certifications
- Price quotations
- Letters of intent or collaboration
- Details of subcontracts

• The RFP will specify deadlines
  • How must you meet the deadline?
    • Is there a hard deadline
    • Only proposals received on a certain date
    • Proposals received no later than

• Allow yourself plenty of time to obtain
  • Signatures/authorizations
  • Certifications
  • Price Quotations from vendors
  • Letters of intent or collaboration from partners
  • Details of Secondary collaborators, sub-contractors
The RFP usually tells how proposals will be reviewed and what criteria will be used to make funding decisions.

Write your proposal with the review criteria in mind.

Include a brief section for each of the review criteria that directly states how your project meets that criterion.

Put your sections in the order the criteria are mentioned in the RFP, to make it easy for a reviewer to check them off.

The RFP will specify:

- How the proposals will be reviewed, including:
  - Phases of review
  - Review criteria
  - Selection criteria

Write your proposal, addressing directly these details:

- Write with the review criteria in mind:
  - TELL the reviewers how your proposal meets the review criteria

Make it easy on the reviewers:

- Do not leave them guessing
- Put your sections in order described in the RFP
The RFP usually describes how grants will be awarded and what will be required of grantees

Funds are usually awarded in increments

Grantees are usually required to submit progress reports and to inform the funder of problems affecting the work

Grantees are required to maintain adequate financial records and comply with budgetary rules

If you are unable or unwilling to comply with funder requirements, you should not submit a proposal

• The RFP will describe
  • How grants will be awarded and
  • What will be required of grantees
• Funds awarded in increments
• Funds awarded often by how much agency has available
• Some programs very competitive
• Grantees required to submit reports
  • Report on progress, accomplishments
  • Report any problems (technical or administrative)
• Grantees required to maintain financial records
  • According to western standards
• Applicants who are unwilling to comply with funder requirements
  • Should not submit a proposal
Use the RFP to plan your project and proposal

Structure your project so that it meets the funder’s objectives and review criteria

Make a checklist of all required information

Use the list of mandatory sections to organize your proposal and gather information

Arrange the sections of your proposal so that it corresponds to the order in the RFP; use the same section titles and numbering scheme

• Use the RFP as a guide for drafting your proposal
• Structure the proposal so that
  • It meets the review criteria
• Make a checklist
  • Sometimes a checklist is provided in RFP
Gather and organize background information

On the concept
   How does the project advance prior work?
   What new, important knowledge will be gained?

On the project
   How will the work be organized?
   What are the anticipated results?
   How can you best evaluate them?

On the resources needed
   Who will work on the project?
   What will you need to buy?
   How much will it cost?

• Organize the background information:
• On the concept (what is the larger picture? – what will the impact be?)
   • How does the project advance prior work in the field?
   • How will the results be new?
• On the project
   • How will the project be organized?
   • What are the anticipated results?
   • How can you best evaluate and validate the results?
• On the resources needed
   • Who will work on the project?
   • What will you need to buy?
   • How much will it cost?

Note on Expenses: You will not be able to pin down all the expenses until you work out the project details; thus the main financial data gathering takes place later. However, at this point you should sketch out the broad outlines of the budget to be sure:
1) Your budget will fall within the program guidelines.
2) Your costs are reasonable for the scope of work being proposed.
Ask for advice from people who can help you

From the program officer
Ask what kind of projects have been supported in the past or are of current interest
Describe your project and ask for suggestions
Request referrals to other investigators or prospective collaborators

From your colleagues
Ask them to read a first draft of the proposal and give you constructive criticism
Ask them to share copies of their successful proposals

• Do not go it alone!
• Ask for help and advice
• There are people who can help:
  • Program officers
    • Ask for lists of projects that have been funded in the past
    • Do they have examples of successful proposals?
    • Describe your project and ask if it fits the scope of the program
    • Request referral to collaborators or resources to help identify them
  • From your colleagues
    • Request an internal review of a proposal before it is submitted
    • Ask for them to share copies of successful proposals

Tip: Have someone not particularly familiar with your field read the proposal without taking notes. Then ask him or her to tell you—from memory—what the project will do, how it will do it, and why it is significant. If the answers are not clear and immediate, start rewriting.
Organize the task of writing

Make a list of what is needed
Background information and references
Figures, photographs, data sets
Price quotations on equipment
Authorizations and certifications
Letters from collaborators

Assemble a team and assign specific duties

Develop a firm schedule with real deadlines
Allow enough time to obtain needed signatures and authorizations
Allow enough time for colleagues to read a draft of your proposal and make suggestions
Allow enough time for revisions

• Stay organized:
  • Make a list
    • Background info references
    • Figures, photographs, data sets
    • Price quotations on equipment
    • Authorizations and certifications
    • Letters from collaborators
  • Assemble a research team
    • Assign specific duties
    • Rely on the help and feedback of your research team
  • Develop a firm schedule
    • Allow for plenty of time for signatures
    • Allow for internal review of your proposal
    • Allow for revisions
  • Do not submit at the last minute
Let’s review what we’ve learned...

- Why it is important to know your funder
- What an “RFP” is and why it is important
- The contents of most Western RFPs
- How to use the RFP to plan your project so that it is responsive to the funder’s mission
- How to use the RFP to structure your proposal so that it is complete and easy to review