

Writing mathematics and grant proposals

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Discussion: Why write a grant proposal?

- To get funding to do research
- To get funding to organize a conference or workshop
- To refine your research program
- To define specific research problems to work on
- To get feedback on your research
- To get people to know about your research

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Discussion: What are components of writing a successful grant proposal?

- Create a track record
- Collaborate with colleagues (internationally)
- Devise a better idea
- Read colleague's funded proposals
- Use tips for writing a good proposal
- Participate in a writing group

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Writing grant proposals

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Create a track record

- Be aware of what is being done in the field
- Find open problems to work on
- Collaborate with colleagues (internationally)
- Write a research plan
- Have scheduled times to do research
- Write and submit papers
- Share your papers
- Give talks on your work
- Document what you have done

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Collaborate with colleagues

Question: What can you do to accomplish this?

- Attend a workshop like this
- Make a weeklong visit to work intensely with a collaborator on a problem (instead of attending a conference)
- Have a collaborator visit you for a week to work intensely on a problem
- Schedule regular online virtual meetings with collaborators

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Some logistics for remote collaborations with colleagues

- Use Skype or Zoom
- 30-60 minutes weekly
- Disadvantages of meeting longer: interruptions, (e.g., phone calls), weak internet
- Make goals for the meetings – I will do this before our next meeting and then reporting on what you have done
- Use Overleaf to write research results in LaTeX

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Remark: research as a collection of small activities

Look at research as a collection of small activities grouped together such as

- look at concrete examples of a result
- explore a result computationally
- make a conjecture based on computer examples
- read through a proof
- summarize a proof
- try to generalize the main idea of a proof

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Devise a better idea

Activity: Derivative of area equals perimeter idea

- Apply this to a square
- Apply this to regular convex polygons (e.g., triangle, square, hexagon, regular n-gon)
- Apply this to nonregular convex polygons (e.g., non-square rectangle)

What are the differences between these problems?

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Devise a better idea

Characteristics of a good idea

- a problem that interests you (but maybe not others)
- applying a known approach that others may already be using to solve similar problems

Characteristics of a better idea

- a problem that interests you and others
- creating a new approach to solve problems

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Read colleague's funded proposals

Question: How can you get copies of good proposals?

- Volunteer to review grant proposals
- Contact someone you know who has received grants and ask if they would share the proposal with you
- Contact someone who has received a grant from the program you are applying for
- See if you can find examples online

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Read colleague's funded proposals

Activity: Example proposals

- Read the first page of some sample proposals
- Rank them
- Share how you determined your ranking

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Use tips for writing a good proposal

- Explain your idea to a colleague
- Create an outline that includes all the required sections
- Write a draft. Have a colleague read it and give feedback
- Rewrite
- Know your audience. Write so that your proposal plan is clear to the reader
- Have colleagues read your proposal and give feedback
- Write to convince the reviewers that your proposal needs to be funded
- Don't have typos or incoherent sentences in your proposal

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Participate in a writing group

Create a (virtual) writing group that has regular scheduled meetings during which people

- Exchange the documents they have written
- Each person reads a document
- Each person gives comments on what is good and suggestions on how to make improvements

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Participate in a writing group

Activity: Start a proposal

- Write an outline or draft of a proposal or research statement
- Pair up with a colleague
- Exchange what each of you have written
- Provide at least three components that are good
- Provide at least three components that could be improved

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Potential Funding Sources

International Mathematical Union (IMU): Commission for Developing Countries (CDC)

- African students can receive support through the GRAID program:

<https://www.mathunion.org/cdc/scholarshipsgraduate-scholarships/graduate-assistantships-developing-countries>

- Researchers in Africa can apply for support to come visit researchers in USA and Western Europe:

<https://www.mathunion.org/cdc/grantsresearch-travel-grants/imu-simons-african-fellowship-program>

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Potential Funding Sources

U.S. Fulbright Program

the Fulbright Visiting Scholar Program for foreign scholars aiming to conduct post-doctoral research in a US institution:

<https://exchanges.state.gov/non-us/program/fulbright-visiting-scholar-program>

U.S. National Science Foundation (NSF)

Partnerships for International Research and Education (PIRE), next round in 2020:

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505038

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Connecting with me

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IMO 2021 will be in Washington, D.C. and the MAA will be organizing the event.

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Questions?

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