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
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
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
Writing grant proposals

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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
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
Writing grant proposals

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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?
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
Read colleague’s funded proposals

Activity: Example proposals
• Read the first page of some sample proposals
• Rank them
• Share how you determined your ranking
Writing grant proposals

• 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
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
Writing grant proposals

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- Participate in a writing group
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
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
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
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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