

CUPM - Panel Discussion

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Finding Problems

- Within own research program or area
 - Find subproblems or special cases within your own research program.
 - Initial cases, special examples, counter-examples, relaxing conditions.
 - Attending specialized conferences in research area, talking with current graduate students in research area.
 - Reading recent doctoral dissertations of students in research area.
- Contact research advisors for current undergraduate research programs, e.g. NSF REUs, MSRI-UP, etc...
- Consider other areas of interest that are easily accessible to undergraduates: recreational mathematics, combinatorics, graph theory, experimental/computational mathematics.
- Explore some recently published advanced undergraduate textbooks in areas of interest / articles in undergraduate journals.

Logistics of a Year Long Undergraduate Research Program

- Establish regular contact hours to work with students, roughly 2 - 3 hours per week.
- Schedule a time and meeting place for students to work together beyond time with professor, roughly 4 - 6 hours per week.
- Undergraduates appreciate a big picture of the long term goals of the research project. For example, for my project with the students, I mentioned that our overall goal is to find ways of constructing Blahs. To get there, we would need to first define a Blah, look at a dissertation that did precisely this for Blehs, and take these ideas and apply them to our scenario.
- In general, they will need a series of short term goals, e.g. reading articles, chapters in a textbook, compute by hand small examples, work on the case $n = 3$, and so on.
- It helps to have external motivation: a stipend, a trip to a national conference to present poster or give a talk, a publication in a peer-reviewed journal, credit hours.
- It helps to have materials, supplies, tools: access to computers or a laptop loaded with necessary programs, books, notepads, textbooks, articles, an occasional pizza, lunch, or an outing.