

# Obtaining Funding

# Where does funding come from?

- Federal Agencies
  - NSF, NASA, DOE, NIH, USDA, DOD, others
  - Federal funding agencies each have their own organizational structures
- Private Foundations and Organizations
  - ACS Petroleum Research Fund, many others
  - Some open to all, others invitation only
- Industry

# Know the Organization of a Funding Agency before You Apply

- Funding agencies have an organizational structure
  - NSF: Directorates, Divisions, Programs
  - NASA: Divisions, Programs (+ROSES)
  - DOE: Offices (multiple levels), Divisions, Programs
- All organizations generally have programs run by ***program managers***: This is the level where most funding decisions are made

# Program Managers

- Program Managers are the gatekeepers to obtaining funding
  - Sometimes provide guidance to potential applicants about appropriateness of research topic
    - Some program managers are really helpful
    - Others are bad communicators and do not reply to email or phone calls
  - Manages the review process
  - Make all final funding decisions, although some are subject to higher-level approval

# Proposal Process (From your end!)

- Identify program
- Submit proposal, following all *guidelines*
- Program determines if proposal follows the rules
- If so, proposal then sent out to review
  - 3 to 6 reviewers are common
- Program then convenes a review panel, which rates competitiveness of proposals
- Program managers use the panel results to make funding decisions
- Decision notices are then sent out

# Length of Proposal Process

- Proposal review take between 4 and 18 months at major funding agencies
- NSF: Typically 6 months
  - Decisions can be held up if program seeks to piece together funding from multiple sources
- NASA: Typically 6-9 months, sometimes 12+
- DOE: Highly variable, typically 6 to 9 months

# Nature of Peer Review (Revisited)

- Proposal reviews are some of the harshest comments you will ever receive
- Comments fall into 3 categories:
  - **Valid:** Learn from these, fix before you consider resubmitting
  - **Wrong, but useful:** Reviewer misunderstood part of proposal; you must explain better
  - **A\*\*hole:** Review comment with no basis in reality; ignore these

# Advantages and Disadvantages of Being Junior

- Negatives:
  - Uncertainty in your ability to handle multiple projects
  - Derogatory comments of naivety or youth
  - Lack of established reputation
- Positives:
  - Evaluated on a curve
  - Early career programs



# What to Do if You Do Not Get Funded

- Proposal success rates are typically <20%
  - Some programs hit 30%, some <3%
- Odds are many of your proposals will get declined
- You then decide whether to resubmit
  - Was the proposal generally well-received?
  - Can the comments be addressed?
  - Are there any fundamental flaws in your ideas?
- Often getting funded takes 2-3 tries (so 2-3 years)

# Formatting Strategies

- Make your proposal highly organized: Break into multiple sections with clear headings
- My general approach:
  - Motivation
  - Objectives
  - Background
  - Preliminary Data
  - Hypotheses
  - Proposed Research
  - Project Timeline
  - Project Management
  - Expected Results

# NSF Broader Impacts

- NSF also wants PIs to address broader impacts: Improving education, increasing participation of underrepresented groups, enhancing infrastructure, societal benefits
  - This is often hard for scientists!
- NSF proposals need clear sections addressing the Broader Impacts that will result from the project
  - Must be sincere!

# Strategies for Successful Proposals

- Clearly identify a problem to address
- Be confident but not overconfident
- Include projects that are certain to work and others that are riskier
- Know the literature and what has been done before
- Include preliminary results
- Write well

# Things to Avoid

- Trashing other researchers
- Proposing to do something that has already been done or is only an incremental advance
- Including an unrealistic amount of work
- Asking for too much money
- Continuing your graduate projects
- Overselling your work or its potential impact
- Conveying uncertainty in your approach
- Poor quality figures, disorganized text