

A modest proposal for
getting funded in the
atmospheric and oceanic sciences
for graduate school and beyond

- ANKUR DESAI, AOS, DEPT SEMINAR



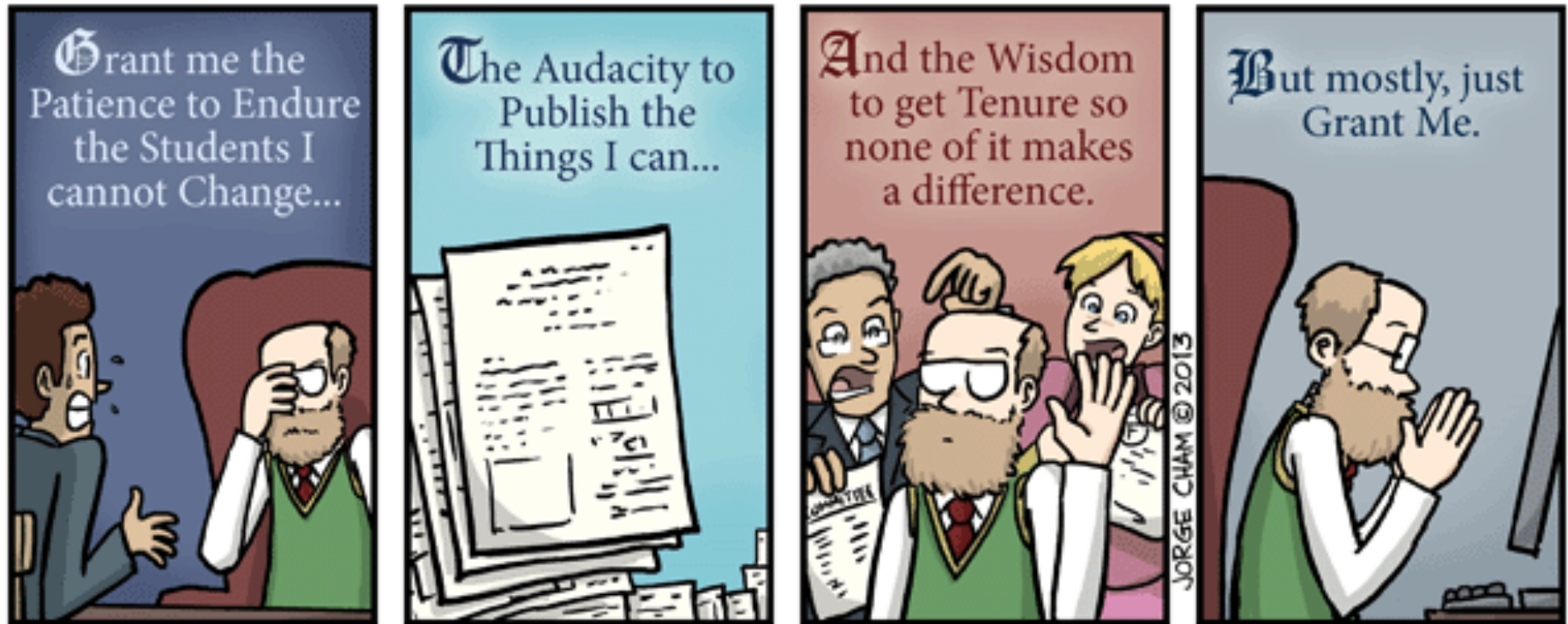
<https://thefablesoup.wordpress.com/2016/03/03/jonathan-swifts-use-of-irony-in-a-modest-proposal/>

M. DCC. XXIX.

Wikimedia

Science costs money

A Professor's Prayer



My Modest Proposal

- If you want to succeed as a scientist in our field, you need to be writing proposals frequently
 - Fundable, good ideas are built on the backs of lots of bad ideas



Proposal writing is improved primarily by frequent practice

Current:

- ▶ CCR-CPEP-17
- ▶ DOE-Ameriflux-13
- ▶ Hanson-Macrosys-GLEONRCN-16
- ▶ NASA-ROSES16-IndiaHyspiri-17
- ▶ NEON-StorageFlux-17
- ▶ NSF-Dietze-ABI-14
- ▶ NSF-EF-Mandifore-16
- ▶ NSF-LTER-13
- ▶ POC-Ceilometer-17
- ▶ UW-Gradschool-15
- ▶ UW2020-Stanley-15
- ▶ UW2020-Townsend-15

Pending:

- ▶ Deskmukh-Indonesia-17
- ▶ NOAA-GOESR-16

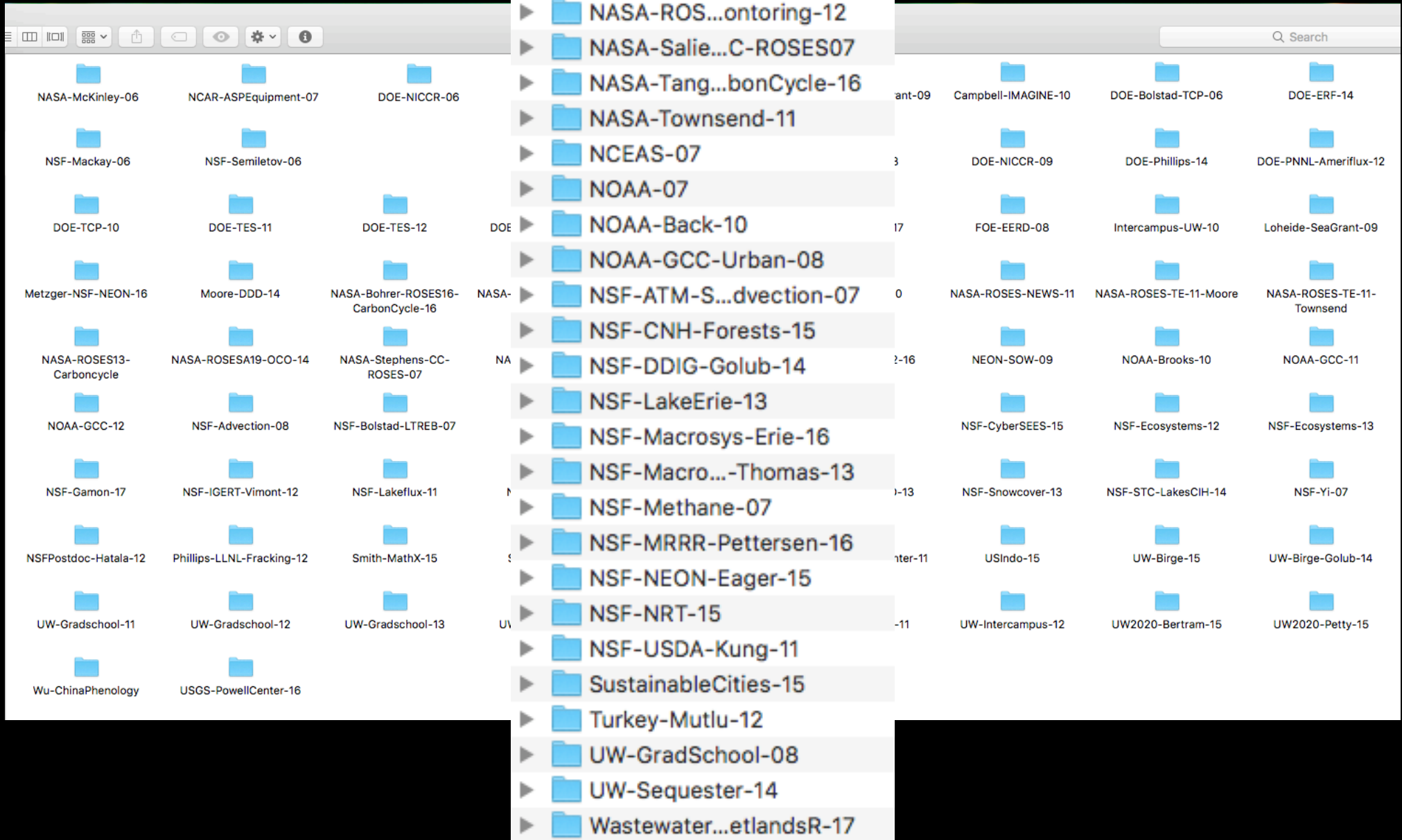
In prep:

- ▶ WRI-Groundwater-17
- ▶ NSF-CHEESEHEAD-19

Past:

- ▶ NSF-Snowcover-16
- ▶ NSF-Macrosys-12
- ▶ NSF-CAREER-08
- ▶ CampbellSci-IMAGINE-15
- ▶ NASA-DecadalSurvey-Whitepaper-Townsend-16
- ▶ NSF-Dietze-ABI-10
- ▶ Reed-NSF-Postdoc-14
- ▶ UW-CPEP-15
- ▶ Birge-Golub-13
- ▶ NEON-Bromley-15
- ▶ NEON-ERF-13
- ▶ NASA-TE-Serbin-13
- ▶ WSGC-DuBois-14
- ▶ NASA-ROSES11-HySPIRI-12
- ▶ NOAA-GCC-Stephens-08
- ▶ FOE-09
- ▶ Goetz-Dubois-12
- ▶ UW-CPEP-Exploratory-12
- ▶ Birge-12-Golub
- ▶ DOE-LLNL-Macfarlane-11
- ▶ Desai-USDA-ChEAS-09
- ▶ NICCR-07
- ▶ UW-CPEP-Pilot-11
- ▶ UW-GradSchool-10
- ▶ UW-GradSchool-09
- ▶ DOE-WindEnergy-09
- ▶ Sulman-BART-09
- ▶ DOE-Carey-Sylvania-00
- ▶ NSF-Mckinley-06
- ▶ NASA-Bolstad-upscaling-05
- ▶ UW-GradSchool-07
- ▶ NSF-Luo-RCN-08
- ▶ NEON-RFI-07

And getting used to... and failure!



Every \$\$ helps

- A. Independent funding source
- B. Practice in proposal writing
- C. Prestige

Fellowships and awards that provide stipend, travel, supplies, or other incidentals are worth going after!

Let's play Name That Jargon!



PI

- Principal Investigator
- Co-PI, Co-I, Senior personnel
- PDRA: Post-doctoral research associate

PM/PO/PD

- Program manager, officer, director

RFP

- Request For Proposals
- FOA: Funding Opportunity Announcement
- Solicitation
- Call for Proposals
- GPG: Grant Proposal Guide

GPG

- Grant Proposal Guide
- Handbook for Proposers
- NSF PAPPG:
https://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg

NOI

- Notice of Intent
- LOI: Letter of Intent
- Preproposal
- Stage 1 / Step 1 proposal

ROSES

- Research Opportunities in Space and Earth Sciences (NASA)

IDC

- InDirect Costs
- F&A: Facilities and Administrative Costs
- Overhead

COI

- Conflict of Interest
- Collaborators
- Identified on CV (curriculum vitae) or separate COI document and/or list of current and pending proposals

NSPIRES

- NASA Solicitation and Proposal Integrated Review and Evaluation System
- Fastlane
- Grants.gov / Research.gov
- NOAA Grants online
- Submission, reviewing, panels, award announcements, reporting

WISPER

- WISconsin Proposal Electronic Routing
- RSP: Research and Sponsored Programs
- Office of Sponsored Programs
- <https://www.rsp.wisc.edu/index.html>

EPSCoR

- Established Program to Stimulate Competitive Research (EPSCoR)

A. Independent Funding Sources

- NSF GFRP
- NIH Pre-doctoral training grants
- NOAA
- EPA STAR
- DOE SCGF and SCGSR
- NASA NESSF
- DOD SMART
- AMS
- AAAS
- SCAR (Antarctica), 3rd world travel
- UNESCO
- National Academy of Sciences NRC
- Private foundations: Hetz, Ford, MacArthur, McNair, HHMI
- Fulbright
- University fellowships: AOF
- Smaller awards: Grad school and AOS travel awards, WISELI speaker awards

Post-docs, too

- NSF AGS
- NSF IRFP (International)
- NOAA Climate and Global Change
- NCAR Advanced Study Program
- National Academy post-docs
- DOE ORISE
- Harvard Environmental Fellows Program
- Marie Curie (EU)
- Most national labs, many private universities, and a few foundations

What might they cover?

- Stipend, partial or full, 9 or 12 month
- Benefits
- Materials and Supplies
- Equipment
- Travel
- Tuition, partial or waiver (rules vary)

Let's look at several

- <https://www.nsfgrfp.org/>
- <https://www2.ametsoc.org/ams/index.cfm/information-for/students/ams-scholarships-and-fellowships/ams-graduate-fellowships/>
- <https://science.nasa.gov/researchers/sara/grant-stats/nasa-earth-and-space-science-fellowship-nessf-selections>
- <http://science.energy.gov/wdts/scgsr/>
- <https://spacegrant.carthage.edu/funding-programs/research/wsgc-fellowship/>

Campus resources

- <https://grad.wisc.edu/studentfunding/workshops/>
- Grad School Professional Development
- AOS staff: Sonja Johnson and Chelsea Dahmen
- Graduate chair
- Successful students

Things to watch out for

- Strict deadlines and fine print (read the RFP!)
- Page limits, margins, fonts (read the GPG!)
- Submission method (email, NSPIRES/Fastlane, paper, WISPER)
- Eligibility rules (citizenship status, career stage, minority or gender focus, research topics)
- Specific expectations (summer internships, post-graduation position, annual reports)
- Who gets paid and who pays taxes (direct to you or payroll through University)
- Tuition remission and health insurance details
 - UW allows fellows to count as in-state. Sometimes better to wait for dissertator status
- Funding rates (typically 10-15%, sometimes a lot higher, rarely a lot lower)
- Most fellowships provide less than typical length of degree. Have a plan for how to fund before/during/after. Have a back up plan.

B. Practice in Proposal Writing

- A career that involves scientific research will in some form or another involve forming, writing, managing, and/or reporting on funding

Proposal writing is the single most creative endeavor we do as scientists

Typical elements of a fellowship proposal

- Research plan or statement of work (2-5 pages)
 - Works cited may be incorporated or separate
- Personal/career statement (1-2 pages)
- Letters of recommendation or reference (1-3)
 - Letter from advisor or department chair or host institute.
Focus on academics who know you in research capacity
- Transcript (early career ones in particular) or CV (post-doc in particular)
- Budget (rare or pro-forma) and justification
- Forms (always)
- “Broader Impacts” (if agency requires it) (1-2 pages)

Getting started

- Find out what's been funded, ask for copies of successful ones from your program
- Talk to program managers if unsure about fit of an idea
- Competitive proposals are not written overnight
- Think of the reviewer! You might even get to read the reviews



Kevin R. Burgio @KRBurgio · 18h

Ppl think that NSF doesn't fund "risky" projects. Panels LIKE applications w/ intellectual risk but not ones with high feasibility risk 5/

1 6 24



Kevin R. Burgio @KRBurgio · 18h

The highest priority proposals are bold (aka innovative or iconoclastic) w/ low feasibility risk (i.e. will get an answer either way) 6/

2 6 29



Kevin R. Burgio @KRBurgio · 18h

Non-competitive proposals are both boring (i.e. not intellectually bold) and risky (e.g. unrealistic w/ fatally flawed methodology) 7/

1 4 14



Kevin R. Burgio @KRBurgio · 18h

Whenever in doubt, email the Program Manager. They will help you bc it's their job & good proposals make their job easier! 8/

A good research plan

- An early-hook (first paragraph!): Strong **motivation**
 - Why is this interesting? And what's been tried before? Therefore, what are you going to do?
- A novel idea: Interesting question, hypothesis or **objective**
 - Connect to specific goals of the RFP, accessible to any scientist
- A doable **approach**
 - What's your best idea so far? Specific, exciting but not overly ambitious set of tasks, clear connection of each activity to objectives and hypotheses, recognition of what to do if proposed approach fails. Avoid jargon and acronyms.
- Clear **deliverables**
 - Papers, conferences, websites, data, professional development
- Logical **management plan**
 - Qualified, expert **personnel**, well articulated **timeline**, sustainable **data management** and safety plans if needed
- Integrated **broader impacts**
 - How does the proposal help you as a developing scholar, advance the field at large, the agency and its mission, include participation by future students, enhance your community, and the general public/society? Is there a role for mentoring or broadening access of science?

Exercise

- Write a 3 sentence introductory abstract to a fellowship proposal in 3 minutes
- Share with partner
- Partner take turns reading out loud to each other
- Provide your gut feeling/feedback
- Rate: E/VG/G/F/P

C. Prestige

- All awards and fellowships count as “funding” in your CV
- NSF GFRP fellows in particular are highly sought after by every graduate program in the country
- Independent awards give you more control over direction of your thesis or post-doc research (though potentially with less access to other resources)
- Managing money for research is non-trivial and hard to learn except by doing it
- Learning to talk to program managers is a good skill. Go to town halls at conferences.
- In interviews you will be asked, “How will you fund your research? How will you manage a lab?” Easier to answer if you’ve already done it, or even tried to do it!

Big Points

- Fellowships are competitive, but have a lot to offer. Everything counts. Apply early and often
- Read RFP and pay attention to all rules and deadlines! Start early. Talk to the program. Use campus and AOS resources.
- Just going through the process, even if unsuccessful, is critical to your professional development as a scholar

Thanks!

