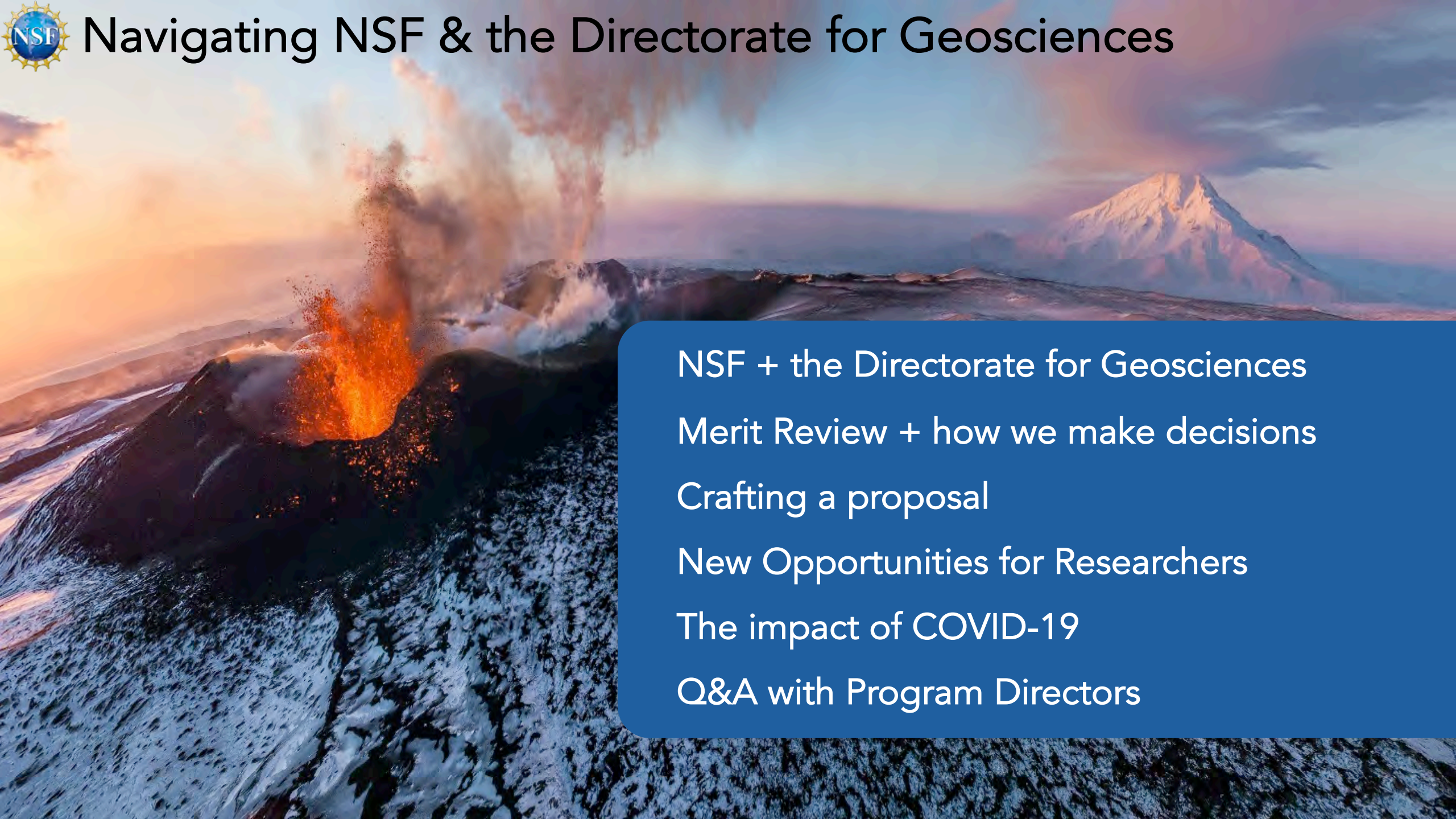
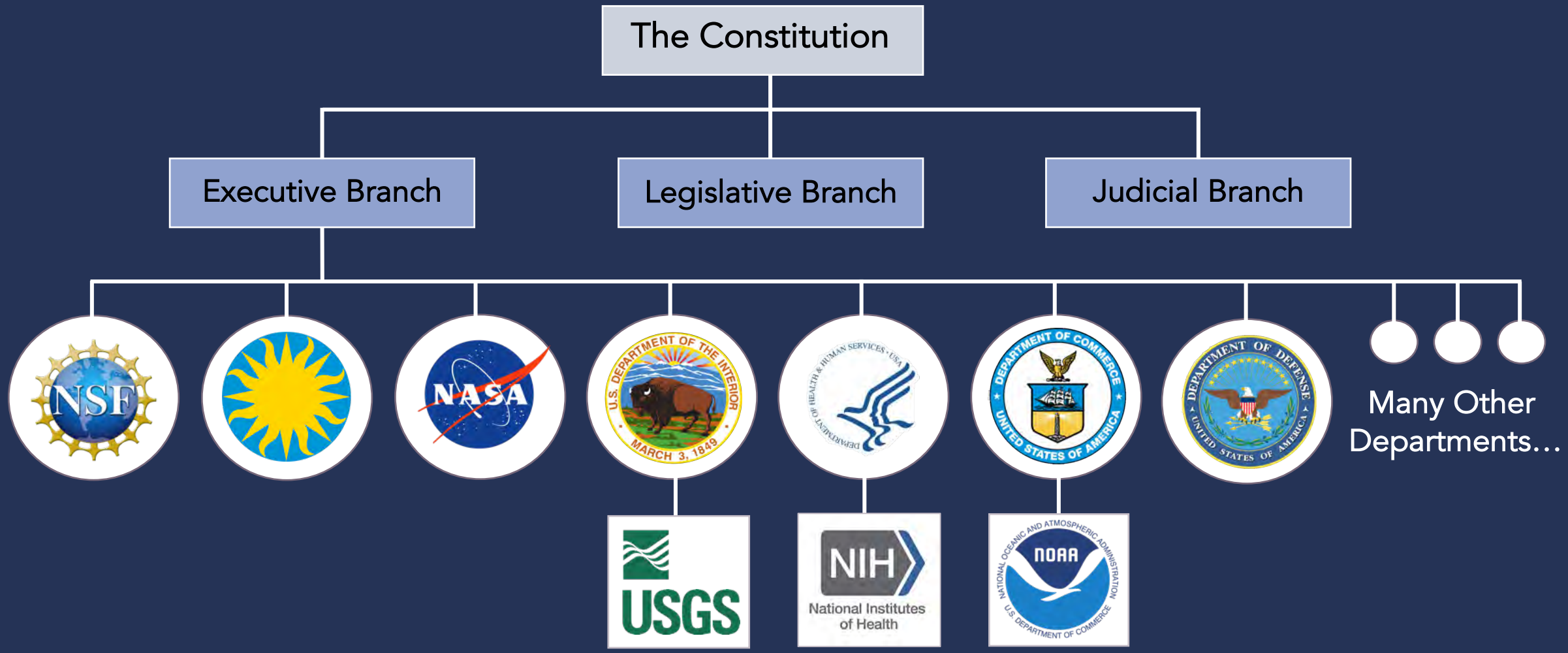
Navigating NSF & the Directorate for Geosciences



- NSF + the Directorate for Geosciences
- Merit Review + how we make decisions
- Crafting a proposal
- New Opportunities for Researchers
- The impact of COVID-19
- Q&A with Program Directors

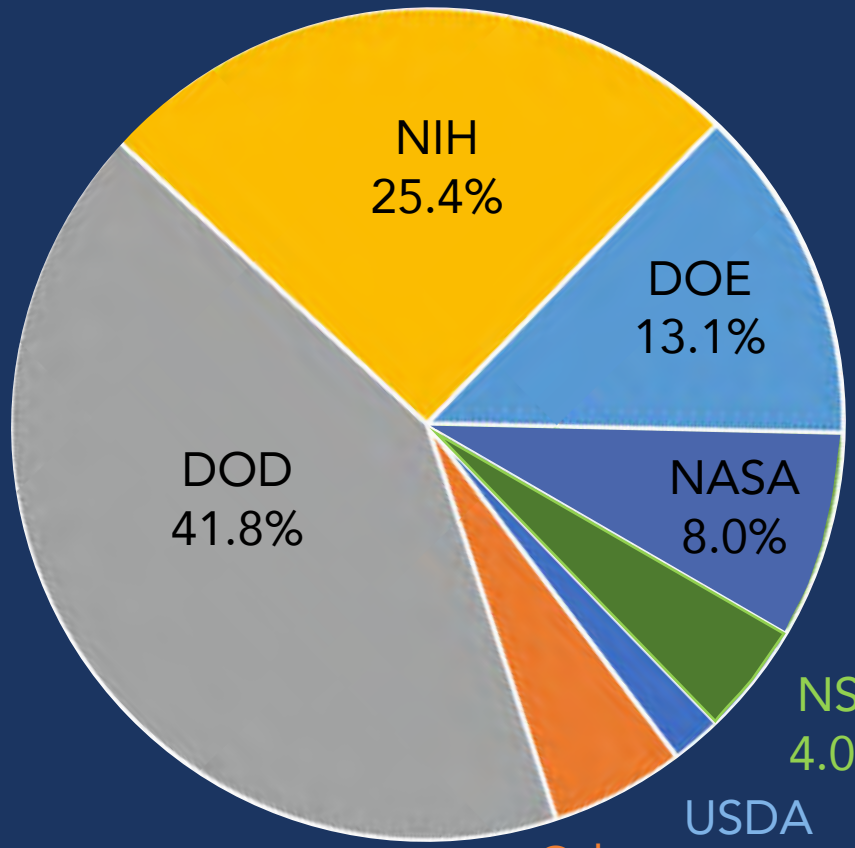
The Government of the United States

(way oversimplified)



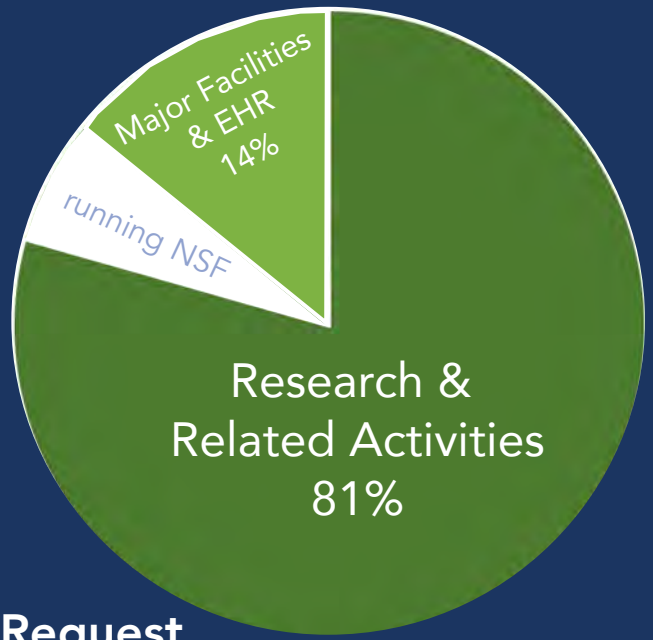
NSF is a very small agency…

…with a **big impact**, due to low overhead



Total R&D by Agency FY 2018

95% of our money goes out the door as grants



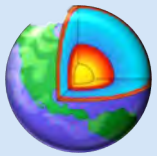
NSF Budget Request FY 2018

Source: AAAS, NSF Budget Office

NSF Structure

The Director, Office of Budget, Finance, & Award Management, Office of International Science & Engineering, etc.…

Directorate for **Engineering (ENG)**	Directorate for **Biological Sciences (BIO)**	Directorate for **Computer & Information Science & Engineering (CISE)**	Directorate for **Geosciences (GEO)**	Directorate for **Education & Human Resources (EHR)**	Directorate for **Mathematical & Physical Sciences (MPS)**	Directorate for **Social, Behavioral & Economic Sciences (SBE)**



Earth Sciences (EAR)

- Disciplinary Programs Section
- Integrated Activities Section

Ocean Sciences (OCE)

- Ocean Section
- Marine Geosciences Section
- Integrated Programs Section

Atmospheric and Geospace Sciences (AGS)

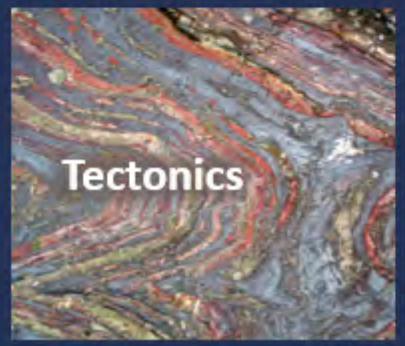
- Atmosphere Section
- Geospace Section
- NCAR/Facilities Section

Polar Programs (OPP)

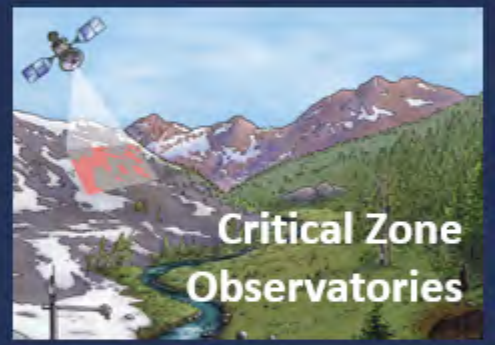
- Antarctic Research
- Arctic Research
- Antarctic Artists and Writers

The Division of Earth Sciences (EAR) for example

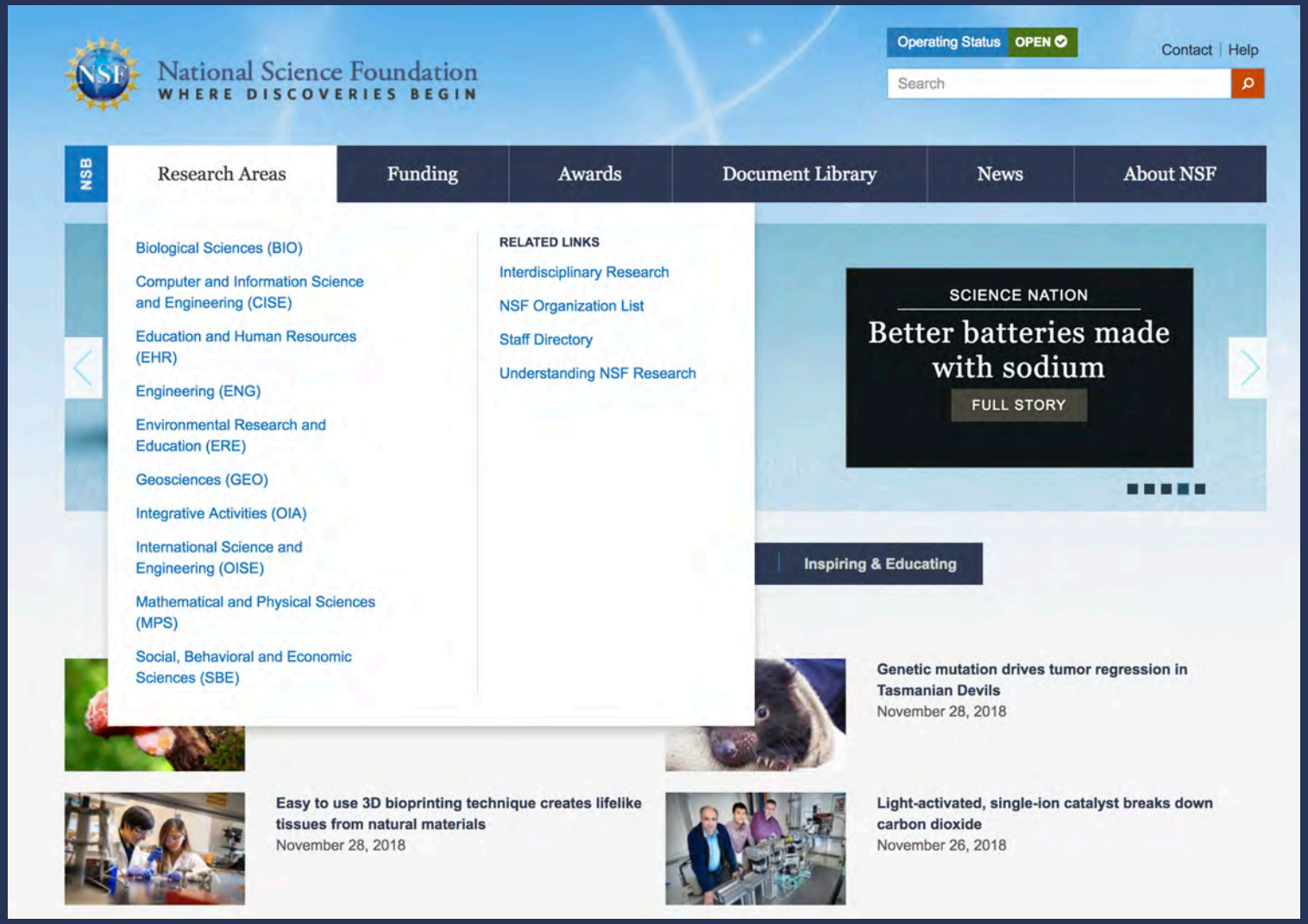
Disciplinary Programs Section



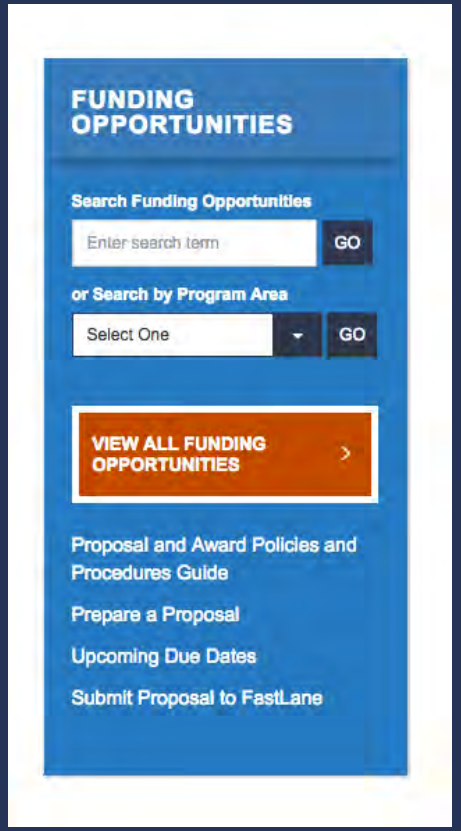
Integrated Activities Section



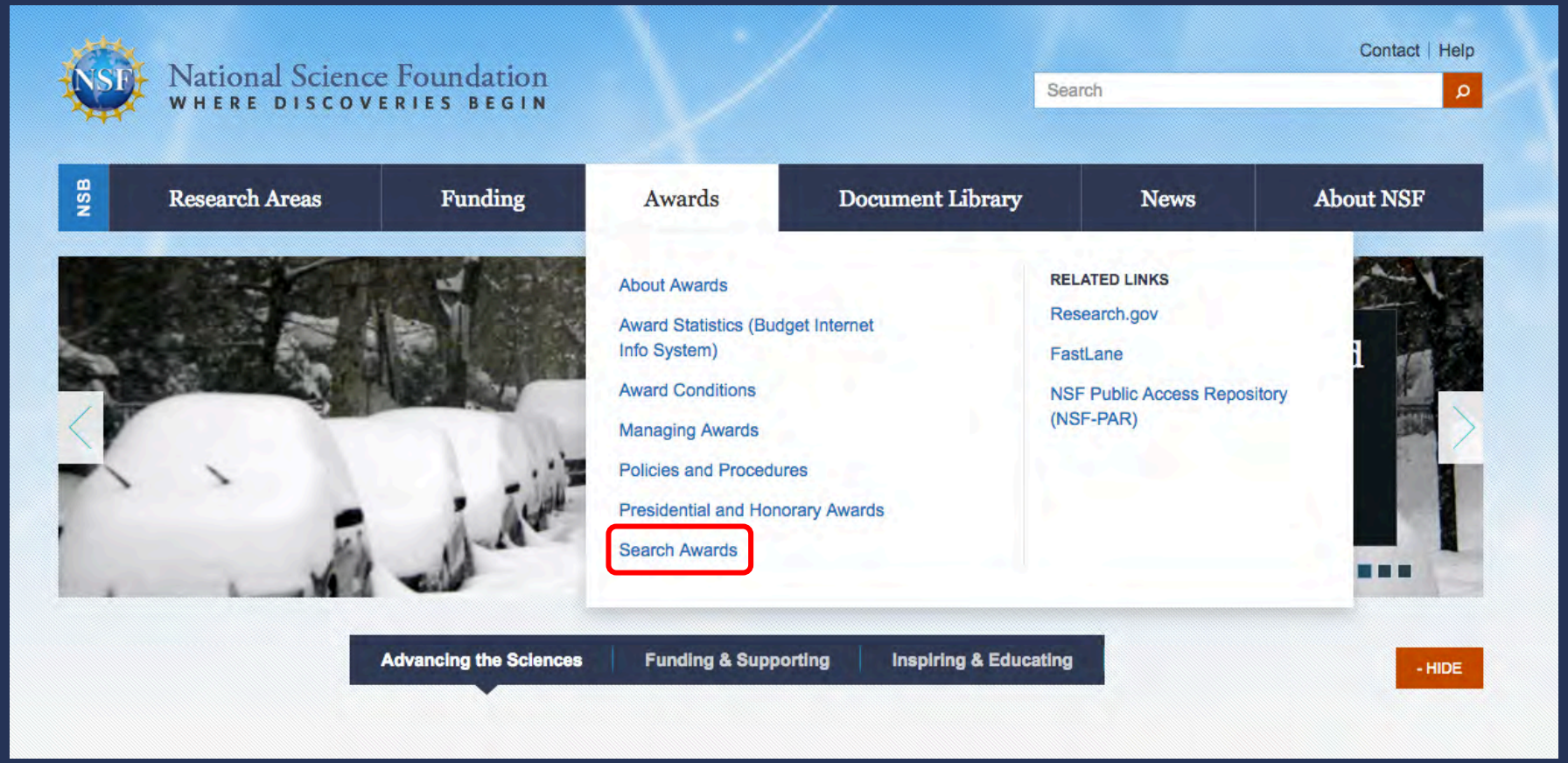
Search for funding opportunities



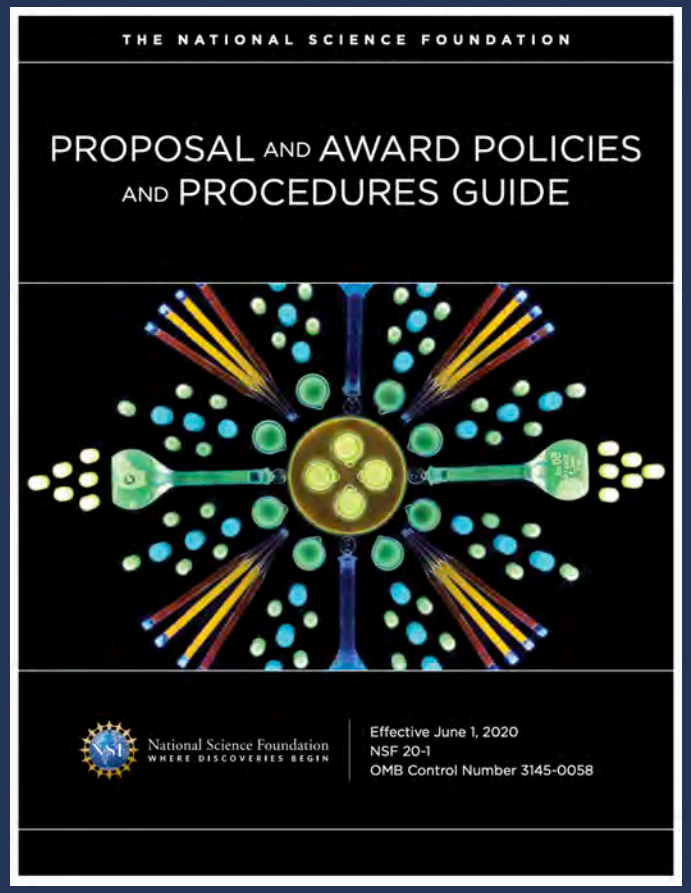
ww.nsf.gov



Where does your research fit?



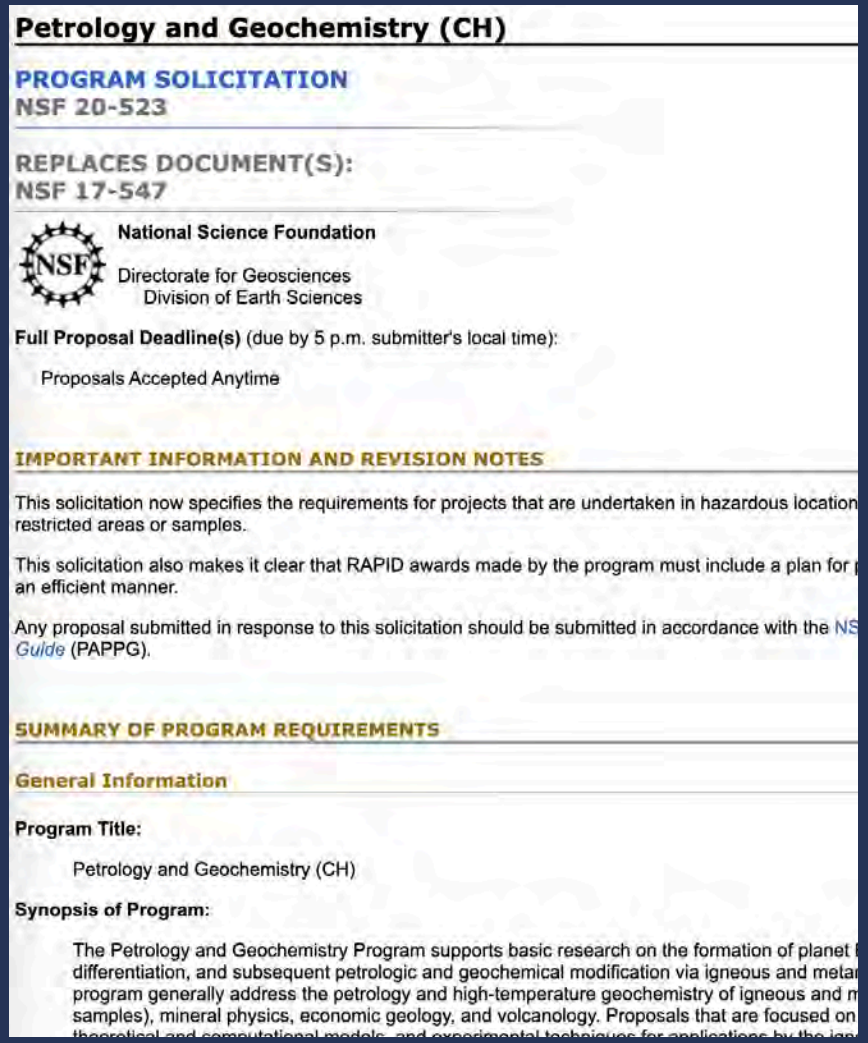
Essential Documents - PAPPG



- Provides guidance for preparation and submission of proposals to NSF
  - Who can submit proposals?
  - What is allowed in the budget?
  - Format + required documents
- Describes process – and criteria – by which proposals will be reviewed
- Outlines reasons why a proposal may be returned without review

NSF 20-1

Essential Documents - Solicitation



Petrology and Geochemistry (CH)

PROGRAM SOLICITATION
NSF 20-523

REPLACES DOCUMENT(S):
NSF 17-547

National Science Foundation

Directorate for Geosciences
Division of Earth Sciences

Full Proposal Deadline(s) (due by 5 p.m. submitter's local time):

Proposals Accepted Anytime

IMPORTANT INFORMATION AND REVISION NOTES

This solicitation now specifies the requirements for projects that are undertaken in hazardous location
restricted areas or samples.

This solicitation also makes it clear that RAPID awards made by the program must include a plan for
an efficient manner.

Any proposal submitted in response to this solicitation should be submitted in accordance with the NS
Guide (PAPPG).

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Petrology and Geochemistry (CH)

Synopsis of Program:

The Petrology and Geochemistry Program supports basic research on the formation of planet
differentiation, and subsequent petrologic and geochemical modification via igneous and meta
program generally address the petrology and high-temperature geochemistry of igneous and m
samples), mineral physics, economic geology, and volcanology. Proposals that are focused on

- Deadline / Target Date
- Synopsis (do you belong?)
- Program Directors (who to ask questions)
- Eligibility (are you/your institution allowed in this program?)
- Budget limitations
- Do you need a Pre-Proposal or Letter of Intent?
- How much money do they have, how many awards do they expect?

Types of Funding Opportunities

Program Descriptions	Program Announcements	Program Solicitations	Dear Colleague Letters
Proposals for a **Program Description** must follow the instructions in the PAPPG.	Proposals for a **Program Announcement** must follow the instructions in the PAPPG.	The instructions in the PAPPG apply unless otherwise stated in the solicitation, which take priority.	**DCLs** are notifications of opportunities or special competitions for supplements to existing NSF awards.

Parts of a Proposal

Cover Page

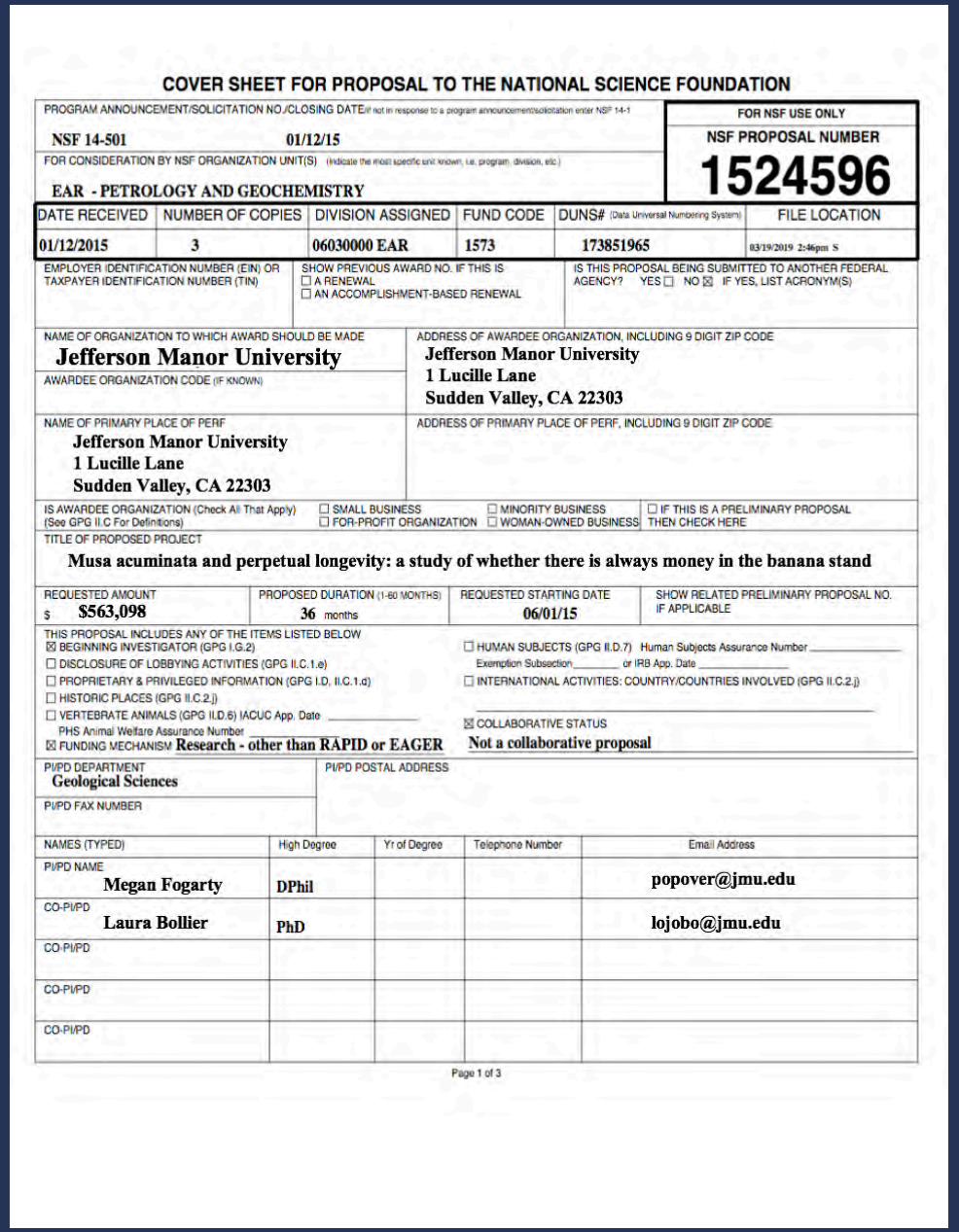
Project Summary – 1 page

Project Description – 15 pages*

Biosketch

Current & Pending Support

Budget



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FOR NSF USE ONLY
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☐ HISTORIC PLACES (GPG II.C.2.j)
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☒ COLLABORATIVE STATUS
Not a collaborative proposal

PI/PD DEPARTMENT
Geological Sciences

PI/PD POSTAL ADDRESS

PI/PD FAX NUMBER

NAMES (TYPED)	High Degree	Yr of Degree	Telephone Number	Email Address
PI/PD NAME Megan Fogarty	DPhil			popover@jmu.edu
CO-PI/PD Laura Bollier	PhD			lojobo@jmu.edu
CO-PI/PD				
CO-PI/PD				
CO-PI/PD				

Page 1 of 3

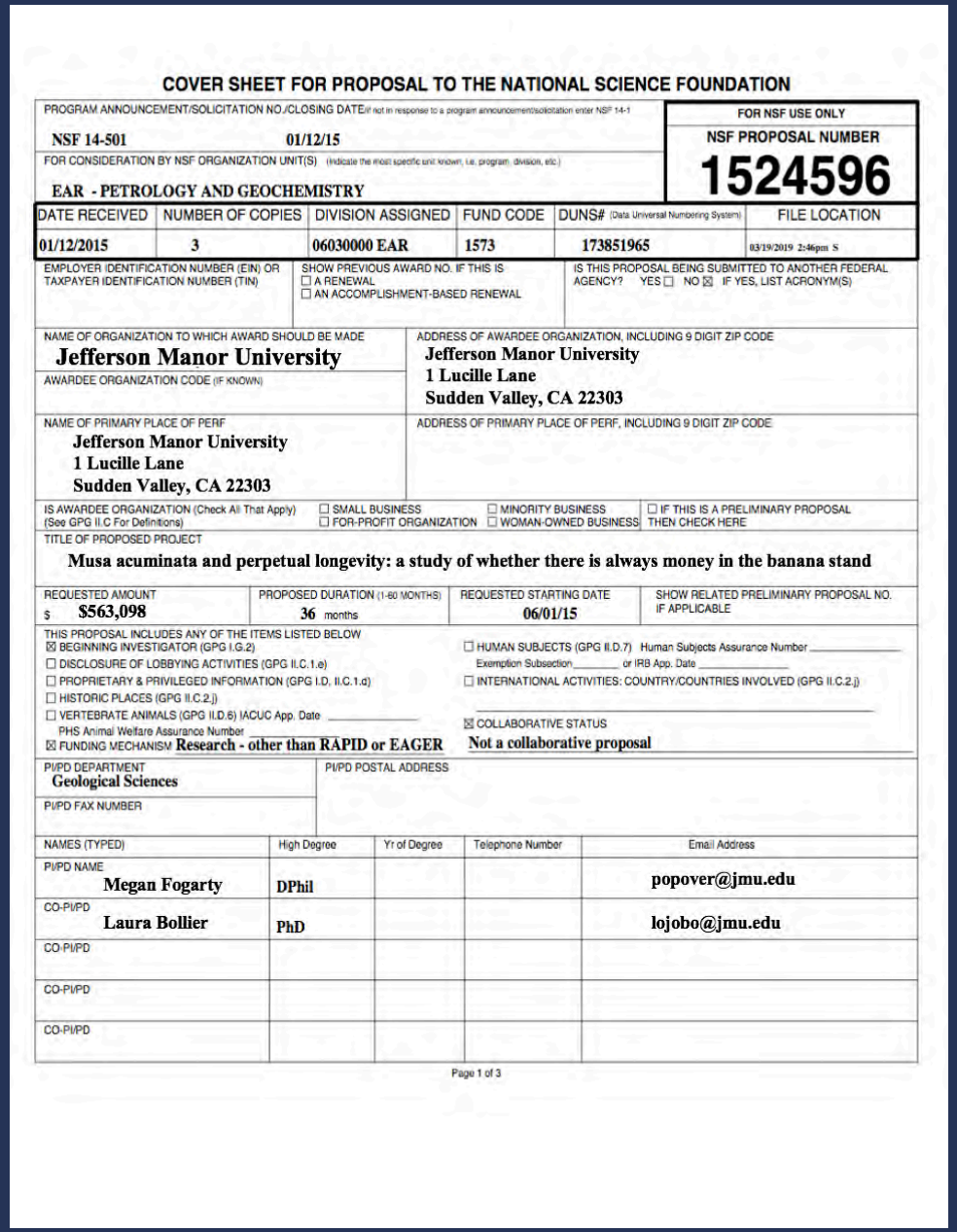
Parts of a Proposal

Letters of Collaboration

Data Management Plan

Facilities, Equipment, & Other Resources

Postdoctoral Mentoring Plan



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Page 1 of 3

Parts of a Proposal

Single Copy Documents are for "NSF Use Only" and are not provided to reviewers

- Authorization to deviate from proposal preparation requirements
- List of suggested reviewers to include or not to include
- Proprietary or privileged information
- Information about collaborators and other affiliations

Demographic Information

- PIs and reviewers are asked to self-report demographic information when submitting proposals or reviews. Submitting demographic information does not in any way affect how your proposal is reviewed or how we use your review.

- NSF strives for fairness throughout the merit review process. We use aggregate statistics on reviewer demographics to determine whether we are using a broad spectrum of reviewers.

- We know they're imperfect – they're designed by the federal Office of Management and Budget (OMB), not NSF. Comments about the demographic questions? jwade@nsf.gov

Merit Review Process

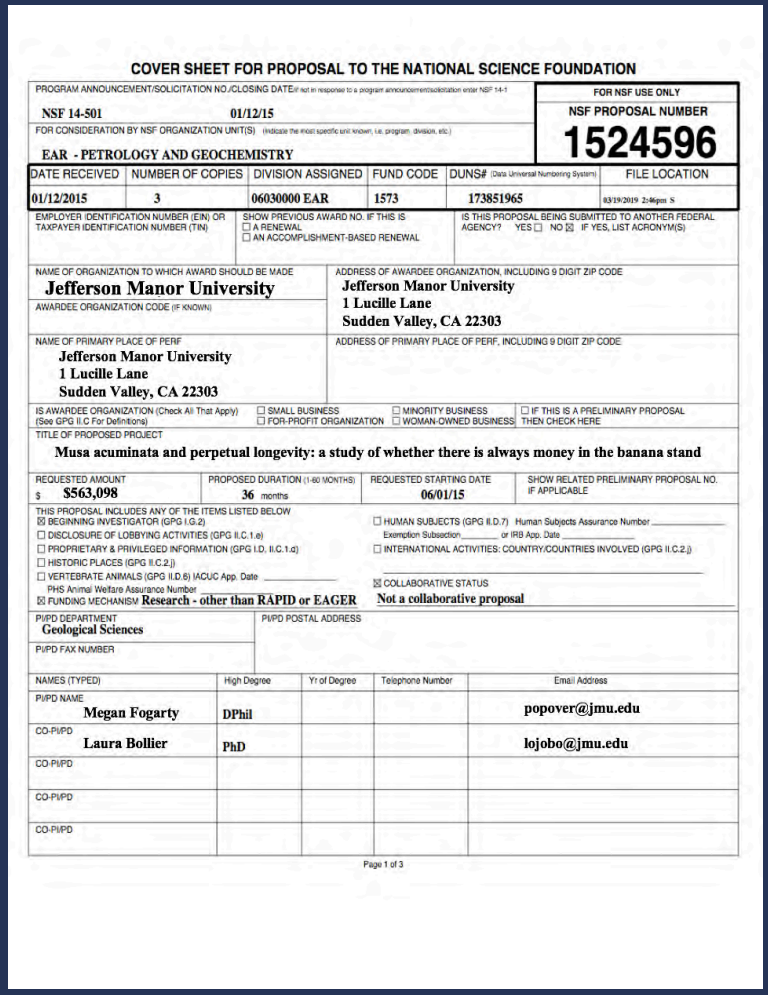
1. Deadline/Target Date/No Deadline

2. Ad hoc review and/or

3. Panel 

4. PD makes recommendation

Note that this varies across NSF, even within GEO!



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Page 1 of 3

Who are the reviewers?

NSF runs the gold standard of merit review.

For every proposal submitted, I have to ask 6-10 people to review it, and if I'm lucky, HALF will actually do it.

If we get 100 proposals in @ deadline, that's a minimum of 600 people I have to ask to review.

For one deadline.

In one program.

There are 13 programs in EAR alone.

How are proposals rated?

E	Excellent; It must be funded!!
V	Very good; Please fund it if there is enough money.
G	Good; Probably would be better with revision
F	Fair; Proposal is flawed in one of the five elements.
P	Poor; Fundamental rethinking is needed before resubmission

The content is WAY more important than the letter rating

Merit Review Criteria

- **Intellectual Merit (IM):**
  the potential to advance knowledge

- **Broader Impacts (BI):**
  the potential to benefit society

5 Review Elements

1. Will the work advance knowledge, and benefit society?
2. Is the work creative? even potentially transformative?
3. Does the work plan make sense? Will they know if they’re successful?
4. Is the team qualified to do what they propose?
5. Do they have the right lab, or know the right people?

Broader Impacts: Benefitting Society

Teaching, training, and learning (undergrads + grad students)	**Broaden participation of underrepresented groups**	**Build or enhance partnerships** (internationally, or with other agencies)
Broad dissemination to enhance scientific + technological understanding	**Enhance infrastructure** (labs, equipment, + work in developing countries)	**Local impacts** (policies @ state + local level)

Broader Impacts: Benefitting Society

Teaching + training

Broaden participation

Build or enhance partnerships

- It is better to do 1 or 2 well than to try covering them all
- Not every PI or institution is well suited for the same BI
- BI should be integrated and meaningful, not tacked on

Broad dissemination

Enhance infrastructure

Local impacts

Things to think about

- Does NSF fund your area of research?
  - Search Awards in the NSF website
  - Ask funded colleagues, mentors, advisors, past rotators
  - Email or meet with Program Directors

- Know your audience - Who will read your proposal?
  - Ad hoc reviewers are close experts in your field, whereas a panel will see your proposal in a broad context
  - Make sure at least one person reads your proposal before you submit it (not just your SRO!)

What if your project fits in 2+ programs?

Many projects are multidisciplinary (across EAR, GEO, or all of NSF)

We as PDs are committed to:

- trying our best to find the best home for any proposal submitted
- the inclusivity of all good ideas

One benefit of co-review, beyond sharing financially, is that the PI will benefit from feedback from a broad community

Talk to your program director!

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Project Summary – 1 page

Project Description – 15 pages*

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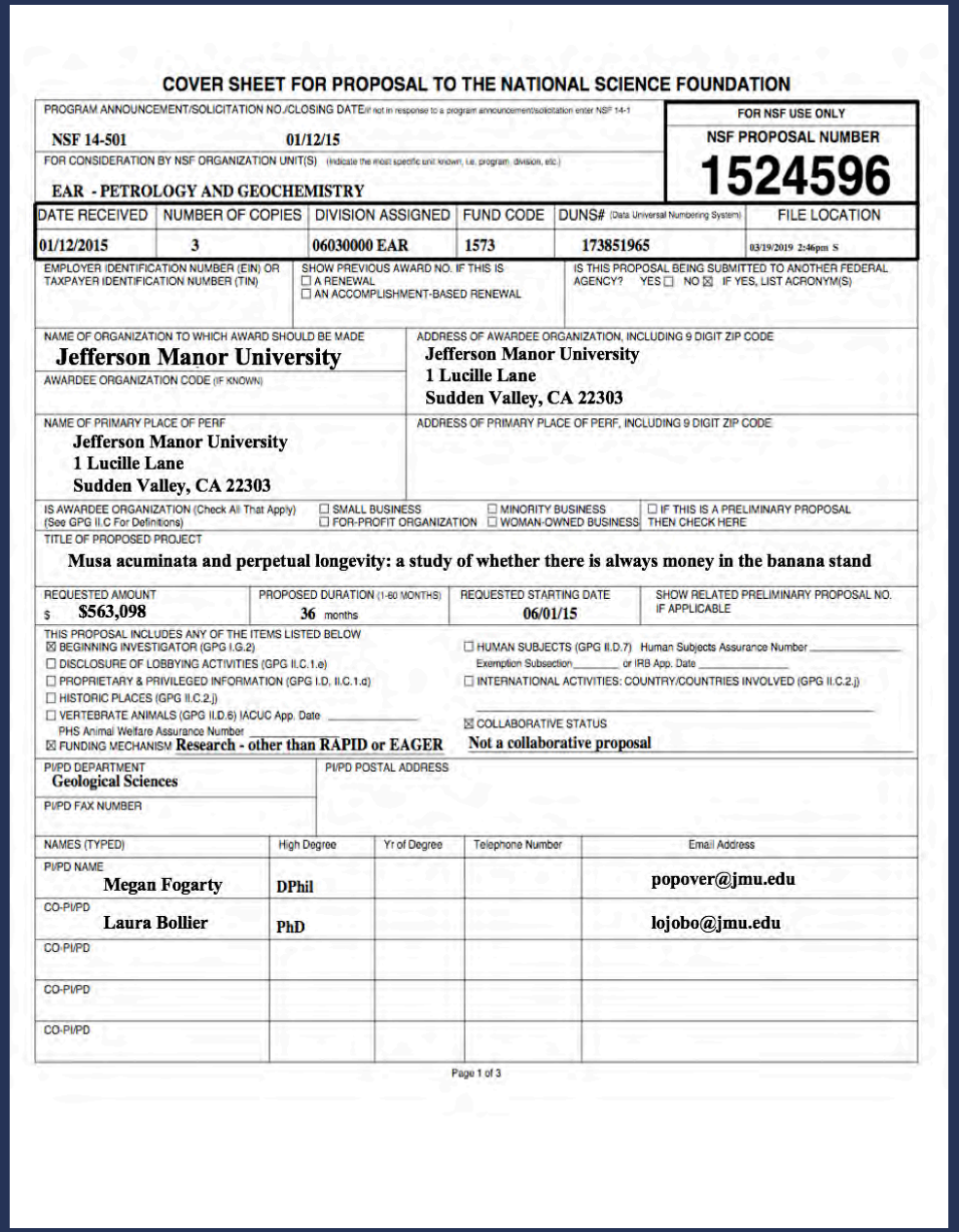

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Exemption Subsection or IRB App. Date
☐ INTERNATIONAL ACTIVITIES: COUNTRY/COUNTRIES INVOLVED (GPG II.C.2.j)
☒ COLLABORATIVE STATUS
Not a collaborative proposal

PI/PD DEPARTMENT
Geological Sciences

PI/PD POSTAL ADDRESS

PI/PD FAX NUMBER

NAMES (TYPED)	High Degree	Yr of Degree	Telephone Number	Email Address
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CO-PI/PD				
CO-PI/PD				

Page 1 of 3

Writing a Proposal is NOT like writing a Paper

A Paper is:	A Proposal is:
a scholarly pursuit: individual passion	aimed at sponsor goals: service attitude
past-oriented, work that has been done	future-oriented, work that should be done
theme-centered: theory and thesis	project-centered: objectives and activities
expository rhetoric: explaining to the reader	persuasive rhetoric: 'selling' the reader
impersonal tone, objective, dispassionate	personal tone, conveys excitement
few length constraints: verbosity rewarded	strict length constraints: brevity rewarded
specialized terminology: "insider jargon"	accessible language: easily understood

Porter (2007) The Journal of Research Administration; Volume XXXVIII, No.2: p. 37-43

A Compelling Introduction

- This is basically a statement of the Intellectual Merit. Catch the reader's attention immediately. State up front what you want to do, and why it's exciting and important
- Explain why previous studies have been insufficient to resolve the problem and how you can remedy the situation.
- Explain why your field site (or experiment or model) was chosen for the study.
- Lay out your specific **hypothesis** to be tested. Or, explain your compelling observation that is so new, you need to do the work to develop a hypothesis

Lay out a Clear Work Plan, Timeline, and Role for Each Participant

Work Plan A:

PIs Howe and Fogarty will go into the field with the graduate and undergraduate students in year 1 to collect samples, and will complete the proposed analyses by year 2.

Work Plan B:

PIs Howe and Fogarty, along with one graduate student and two undergraduates from each institution will go into the field in year 1. Graduate students will be responsible for mapping the region, and the undergraduates will learn tephra sampling skills. Upon return from the field, undergraduates will be involved in sample preparation including thin section billet cutting, and bulk major and trace element analyses. Each graduate student has a defined project [describe] focused on mineral-scale analyses.

Lay out a Clear Work Plan, Timeline, and Role for Each Participant

- draw out a timeline, with tasks
- explain how each analysis or model connects to your hypotheses
- clarify the specific role of each PI + student
- show that the work is feasible within your timeline

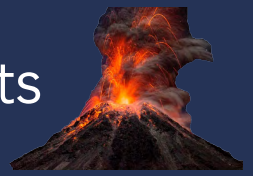
Work Plan B:

PIs Howe and Fogarty, along with one graduate student and two undergraduates from each institution will go into the field in year 1. Graduate students will be responsible for mapping the region, and the undergraduates will learn tephra sampling skills. Upon return from the field, undergraduates will be involved in sample preparation including thin section billet cutting, and bulk major and trace element analyses. Each graduate student has a defined project [describe] focused on mineral-scale analyses.

Build a Realistic Budget

- We know science costs money. Be accurate, be reasonable
- Find out what size grants are the norm for the program to which you are applying and get into that ball park
- Know what the funder will pay for and will not pay for…talk to your program manager (equipment? Travel? USGS collaborators?)
- Use the “Budget Justification” pages to explain your costs (so important that it’s now 5 pages)
- Ask for money to support your Broader Impacts

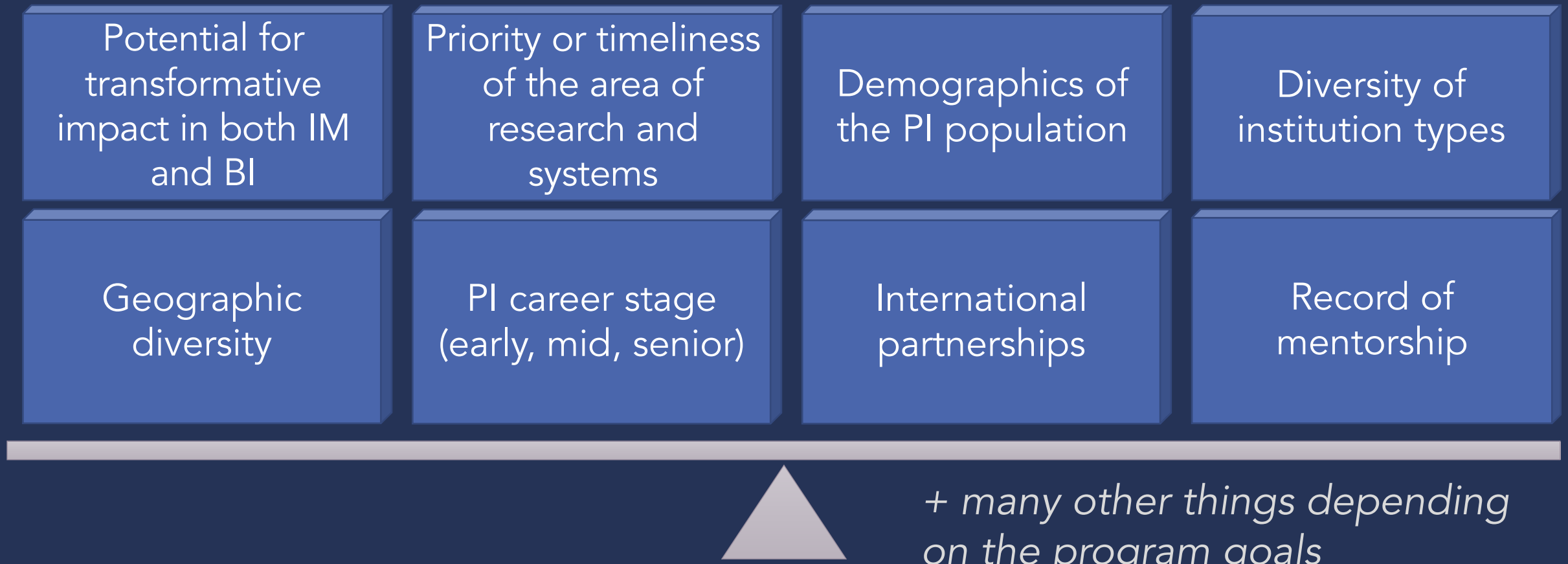
What If You're Declined?

- It happens to everyone, except those who don't submit
- Stay calm, and don't get discouraged. Breathe deeply and read the reviews more than once
- Identify common themes across different reviews (weaknesses AND strengths)
- Don't fixate on minutia + cranky comments 
- Ask a friend/colleague to read the reviews objectively

What If You’re Awarded?

- Celebrate! We’re so proud of you 
- Read the reviews and/or panel summary: they likely had some useful criticisms and advice
- Cite the award and NSF when you publish or present
- Read NSF’s guide for awardees (the PAPPG) + write your annual reports on time
- Develop a rapport with your Program Director + keep her updated
- Be a good mentor to the students and colleagues you support

Program Decision-Making & Portfolio Balance



+ many other things depending on the program goals

Opportunities for early- and mid-career researchers

The OCE postdoctoral fellowship program is coming back – DCL NSF 20-131 (soon NSF 21-538!)
Two Target Dates: March and November

- to support work within and across traditional disciplinary lines, develop partnerships, and avail themselves of unique resources, sites, and facilities.

EAR's postdoctoral fellowship continues – NSF 18-565.
September Target Date, currently focused on issues of scale (in time, space, whatever that means to you)

Mid-Career Advancement – NSF 21-516
February Target Date.

- the only cross-directorate NSF program specifically aimed at providing protected time and resources to established scientists and engineers targeted at the mid-career (Associate Professor rank or equivalent) stage *(so this is separate from CAREER, which is pre-tenure)*

- to enhance and advance your research program through synergistic and mutually beneficial partnerships, typically at an institution other than your home institution

- Partners from outside the PI's own sub-discipline or discipline are encouraged, but not required, to enhance interdisciplinary networking and convergence across science and engineering fields.

Opportunities across GEO and NSF

MSRI-1

Midscale Research Infrastructure-1 21-505

"any combination of facilities, equipment, instrumentation, or computational hardware or software, and the necessary human capital in support of the same"

January 27: pre-proposals due

- Design projects: $600k > $20M
- Implementation projects: $6M > $20M

Webinar is archived on the program page

ROA

Research Opportunity Awards 14-579

to enable faculty members at primarily undergrad institutions (PUIs) to pursue research as visiting scientists with NSF-supported investigators at other institutions

[part of the RUI/Research at Undergraduate Institutions solicitation]

GEOPAthS

Pathways into the Earth, Ocean, Polar, and Atmospheric & Geospace Sciences 20-516

Improving underg + grad STEM education.

NSF INCLUDES

Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science 20-569

Alliances with a goal of achieving systemic change

COVID-19's impact on science

Centralized NSF guidance and FAQs: nsf.gov/coronavirus

They keys are communication and flexibility on the part of researchers, institutions, and NSF staff

Katherine Bermudez and Sarah McGrath-Blaser
University of Florida

If you are currently funded by NSF and are impacted:

1: Communication PAPPG VII.D
- talk directly with Program Directors to report the impacts of the pandemic on your projects
- document impacts in annual reports and/or record them via "Interim" reports in Research.gov

2. No-cost extensions PAPPG VI.D.3.c
- these help you compensate for time lost due to closures and delays

3. Re-budgeting PAPPG X.A.3
- awardees have considerable flexibility to re-budget funds across budget categories. Consider this, especially if you proposed large travel budgets.

4. Supplemental requests PAPPG VI.E.4
- there are no new or separate funds for supplements
- only considered after the above options have been explored. Email your Program Director with a brief description of the need, the management steps that have been taken to mitigate the situation, and a strong justification for supplemental funding.

- see the new DCL expanding options for Career-Life Balance Supplements (NSF 21-021) for project support during time away from a project due to family leave or dependent care.

nsf.gov/coronavirus