NSF Funding Opportunities and Strategies

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MPS
Astronomical Sciences
Chemistry
Materials Research
Mathematical Sciences
Physics

NATIONAL SCIENCE FOUNDATION

Chemistry

Centers for Chemical Innovation

Chemical Catalysis (Sept. submission)

Chemical Measurement and Imaging (Oct. submission)

Chemical Structure, Dynamics, and Mechanisms (Sept.)

Chemical Synthesis (Sept.)

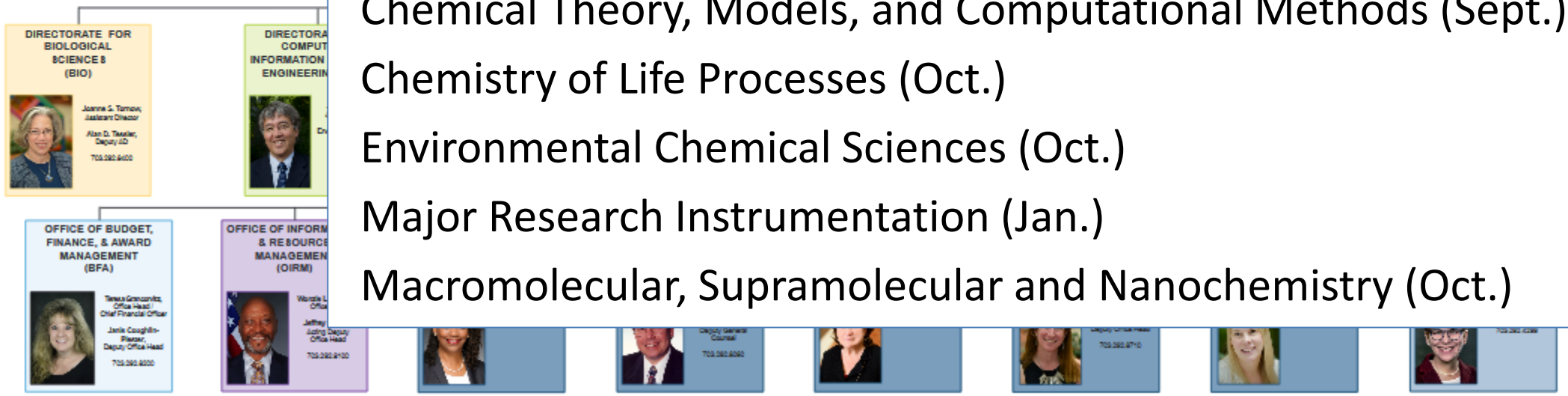
Chemical Theory, Models, and Computational Methods (Sept.)

Chemistry of Life Processes (Oct.)

Environmental Chemical Sciences (Oct.)

Major Research Instrumentation (Jan.)

Macromolecular, Supramolecular and Nanochemistry (Oct.)



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Alexandria, Virginia 22314
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May 2019

DIVISION OF MATERIALS RESEARCH - DMR

Topical Materials Research Programs (TMRPs)

Biomaterials
Ceramics
Electronic & Photonic Materials
Metals and Metallic Nanostructures
Polymers

Condensed Matter & Materials Theory
Condensed Matter Physics
Solid State and Materials Chemistry

Cross-Cutting Activities

Diversity

International

Education

Centers & Teams

Materials Research Science & Engineering Centers **(MRSEC)**

Partnerships in Research & Education in Materials **(PREM)**

Designing Materials to Revolutionize & Engineer our Future **(DMREF)**

National Facilities & Instrumentation Program

Cornell High Energy Synchrotron Source (CHESS)

National High Magnetic Field Laboratory (NHMFL)

Center for High Resolution Neutron Scattering (CHRNS)

National Nanotechnology Coordination Network (NNCI)

Materials Innovation Platforms **(MIP)**

DMR Solicitations for "Unsolicited" Proposals for TMRP

Biomaterials (BMAT)
Electronic & Photonic Materials (EPM)
Metals and Metallic Nanostructures (MMN)
Polymers (POL)
Condensed Matter Physics (CMP)
Solid State and Materials Chemistry (SSMC)

Division of Materials Research: Topical Materials Research Programs (DMR-TMRP)

PROGRAM SOLICITATION
NSF 17-580

REPLACES DOCUMENT(S):
PD 03-1710, PD 03-1773, PD 03-1775, PD 06-7623, PD 09-1771, PD 10-1762

Submission Deadline: Nov 1

Ceramics (CER)

PROGRAM SOLICITATION
NSF 19-515

REPLACES DOCUMENT(S):
NSF 16-597, PD 15-774

Condensed Matter and Materials Theory (CMMT)

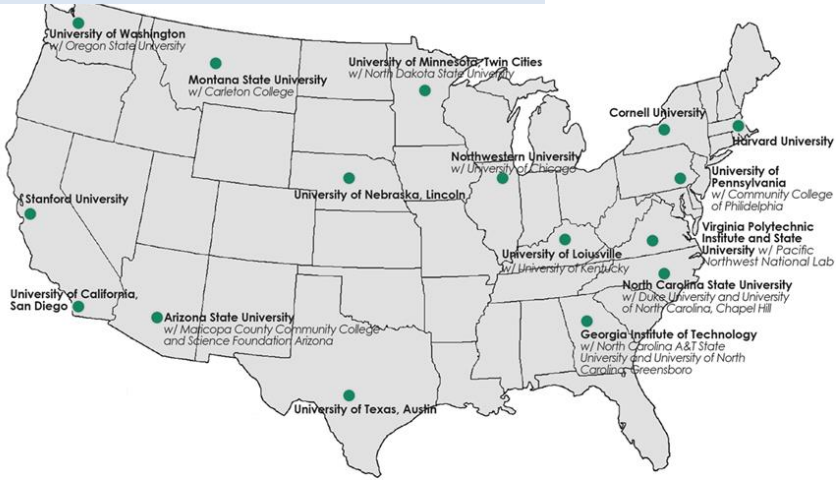
PROGRAM SOLICITATION
NSF 18-500

REPLACES DOCUMENT(S):
NSF 16-596

Open Window – No Deadlines

National Facilities & Instrumentation

Cornell High Energy Synchrotron Source (Cornell, Ithaca)



National Nanotechnology Coordinated Infrastructure http://nnci.net/about-nnci

Center for High Resolution Neutron Scattering (NIST, MD)

National High Magnetic Field Facility (Florida)

Materials Innovation Platforms (MIP)

MIP Concept: Combine a focused research effort in an interactive feedback loop together with a mid-scale user facility open to the community in order to accelerate advancement of a materials research topic of national importance.

2D Crystal Consortium
NSF Materials Innovation Platform
PennState
www.mip.psu.edu

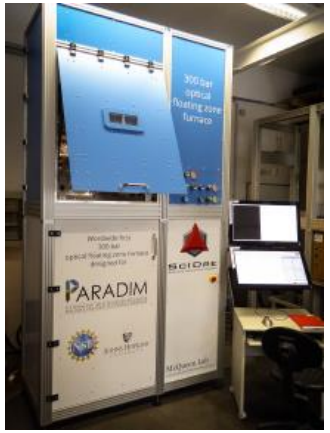
Focus: 2-dimensional chalcogenide materials for future electronics
e.g., Can theory model growth kinetics and guide materials synthesis?

PARADIM
www.paradim.org

Focus: interfacial materials, combining oxides & 2D materials, for valleytronics & spintronics
e.g., Can we design and create new interfacial materials by "breaking" Gibbs' & Pauling's rules?

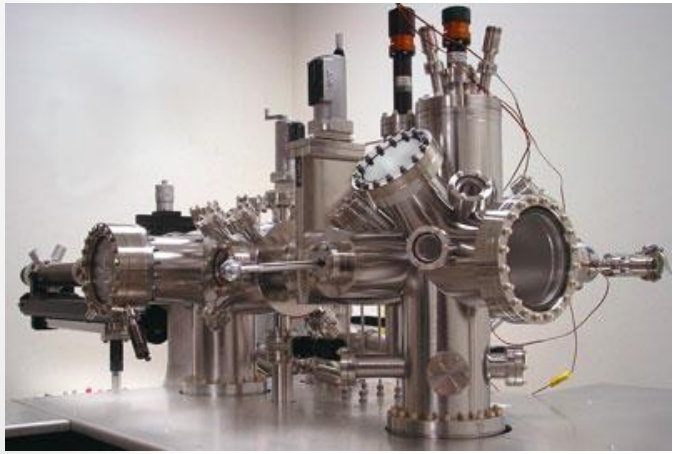
Current Status:

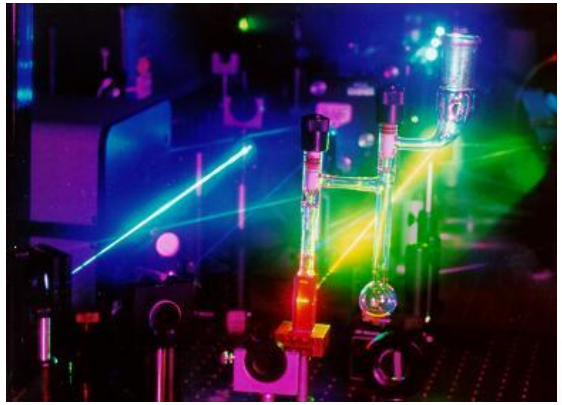
- Accept user proposals; some samples delivered to users already
- World's first 300-atm floating-zone furnace at Paradim-JHU
- Integrated MBE, CVD, ARPES & STM/AFM later in 2017
- Access to computational, TEM & other capabilities
- Webinars and summer schools



Instrumentation

- Major Research Instrumentation (MRI)
- Divisional instrumentation programs
- Research grants





Major Instrumentation Program (MRI)
NSF – 18-513

Next Deadline: January 2021 (check solicitation)

Submission limit - Three (3) per organization (up to 2 below $1M, at most 1 over $1M)

Awards - up to $4M for development or acquisition proposals

Cost-sharing at the level of 30% of the ***total project cost*** is required for Ph.D.-granting institutions and non-degree-granting organizations. ***Cost-sharing is not required for non-Ph.D. granting institutions.***

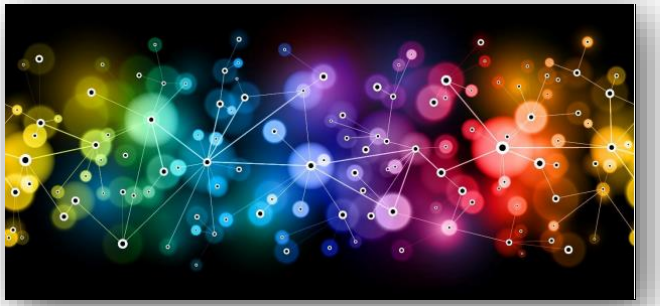
Merit Review - At the time of submission, PI's are asked to identify an NSF division(s) to review proposal. NSF reserves the right to place proposals in the appropriate division(s) for review.

National Science Foundation's 10 Big Ideas

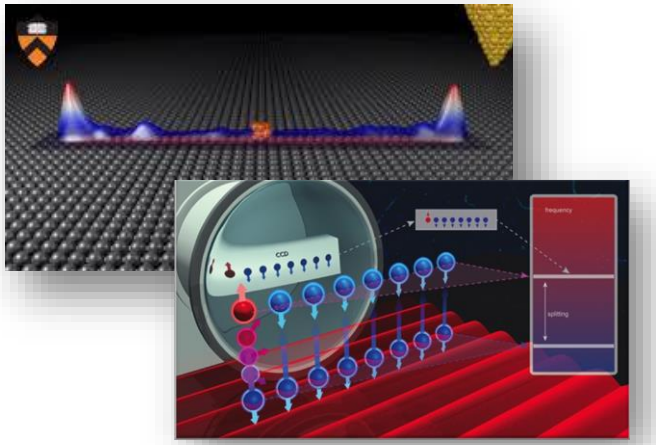
Understanding the Rules of Life

Harnessing the Data Revolution

Growing Convergence Research



Quantum Leap



Mid-scale Research Infrastructure

- Future of Work
- Navigating the New Arctic
- Windows on the Universe
- NSF INCLUDES
- NSF 2026

Where CHE & DMR Fit

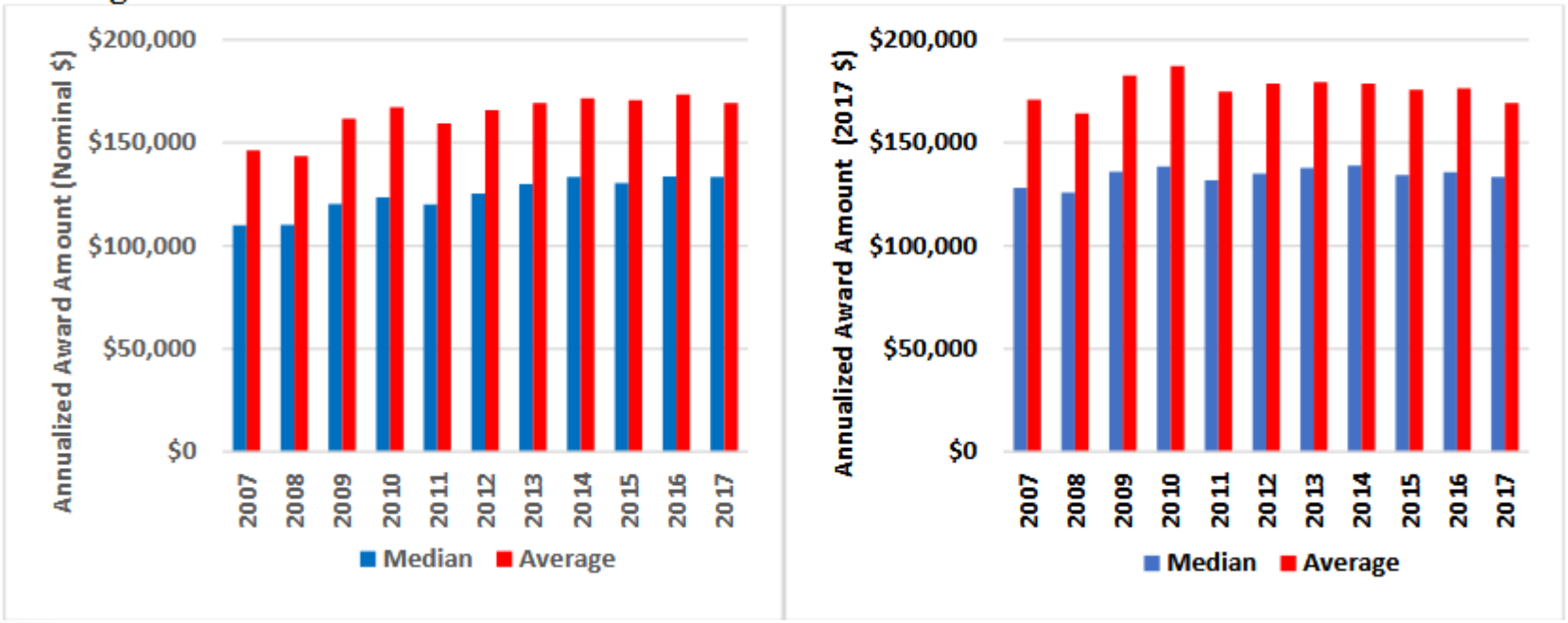
Report on the NSF's Merit Review Process: FY 2017

https://www.nsf.gov/nsb/publications/2018/nsb201915.pdf

Table 1. Research Proposals, Awards and Funding Rates

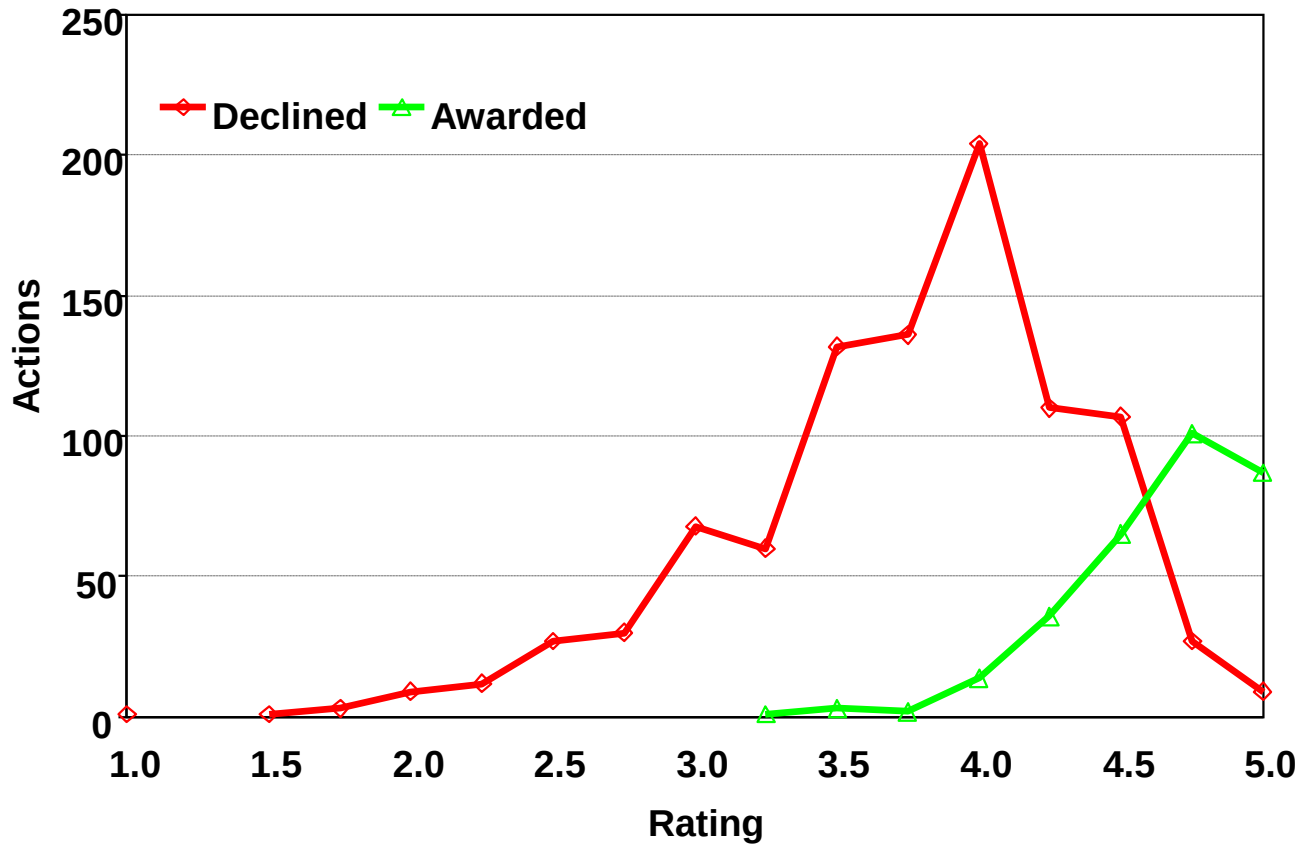
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Proposals	33,705	33,643	35,609	42,225	41,840	38,490	39,249	38,885	40,869	41,034	40,678
Awards	7,415	6,999	10,011	8,639	7,759	8,061	7,652	7,926	8,993	8,782	8,553
Funding Rate	22%	21%	28%[11]	20%	19%	21%	19%	20%	22%	21%	21%

Figure 1. Annualized Award Amounts for Research Grants in Nominal and Real Dollars



Results of Merit Review (CHE)

E = 5
V = 4
G = 3
F = 2
P = 1



Presubmission

- **Consult the NSF website (www.nsf.gov) and Guide to Programs to locate a suitable program home for your project: https://www.nsf.gov/funding/browse_all_funding.jsp**

- **Make use of "Search Awards" to locate abstracts of proposals with comparable objectives: /awardsearch/**

- **Pay att unities**

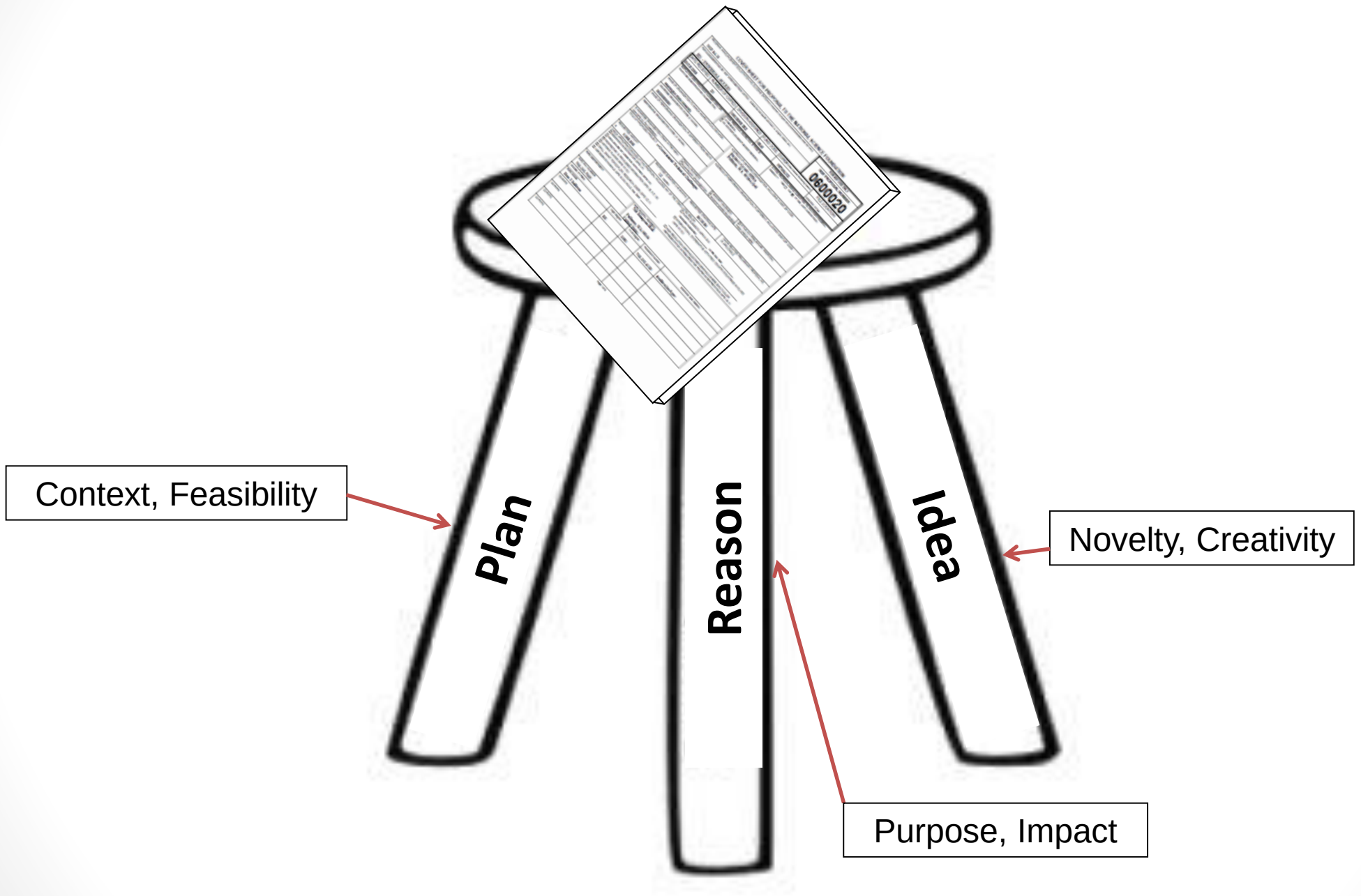
- **Contac f your project is ap**

- **Follow instructions! https://www.nsf.gov/publications/pub_summ.jsp?ods_key=papp**

Roughly half of all proposals received by the NSF Chemistry Division last year had to be returned for repair because they failed to follow new instructions. Repair may not be an option this year!

NSF/NSB Merit Review Criteria

- **Intellectual Merit:** The **Intellectual Merit** criterion encompasses the potential to advance knowledge
- **Broader Impacts:** The **Broader Impacts** criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes


Context, Feasibility
Plan
Reason
Idea
Novelty, Creativity
Purpose, Impact

Words you Do (and Don't) Want to Find in Your Reviews

Good	Bad	Ugly
Creative	Incremental	Non-Compliant
Well-Planned	Difficult to follow	Overlooks related work
Exciting	Narrow	Disease focused
Potentially Transformative	Missing Details	
Important	Diffuse	
Contingency for Pitfalls	"Fishing Expedition"	
Evaluation plan	Pedestrian	
Integrated	Sloppy	
Compelling		
High Risk/High Reward		
Challenging		

Try to read reviews objectively

- It can be helpful to enlist a colleague who will "tell it like it is"
- Analyze your reviews as if they were someone else's
- Make a list of "to do" items that emerge from the reviews
- If you think a reviewer misunderstood you, try to make your point more clearly

What's Special About CAREER?

- NEW Solicitation (NSF 20-525)
- Due July 27, 2020
- 5-Year Award (Minimum $400K, except BIO, ENG, OPP)
- Education Plan (Integrated with research!)
- Department Head Letter
- 3 Tries
- PCASE eligibility

NSF Graduate Research Fellowships

NSF 19-590

Five Year Awards – $138,000

- Three years of financial support
  - $34,000 Stipend per year
  - $12,000 Educational allowance to institution
- Professional Development Opportunities:
  - GROW International Research
  - GRIP Internships
- Career-Life Balance Initiative (family leave)
- FASED Individuals with Disabilities
- Supercomputer access: XSEDE

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