Lessons Learned from 10,000 Proposal Reviews: Top Reviewer Criticisms and How to Avoid Them

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Thank you

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Research
Competitiveness Program
Online
Event
Series 2020

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About AAAS

American Association for the Advancement of Science

- World's largest general scientific membership society
- Founded in 1848
- Publisher of six international journals including *Science*
- More than 250 affiliated societies serving >10,000,000 people
- AAAS Research Competitiveness Program has worked for 20 years to build capacity for research communities

https://promo.aaas.org/science/join/

Announcements

A PDF of this presentation will be available—an e-mail will be sent to everyone registered.

An on-demand recording will be made publicly available for free—the link will be sent to everyone registered

Please send questions via the Q&A box. Questions are only visible to us. We will read them and answer them anonymously.

Data Sources

Charles E. Dunlap, Ph.D.
Program Director

Design and leadership of the International Funding Agency Symposium with the NSF

Design and implementation of S&T grant competitions, oversight and training of funding organizations, and experience as a reviewer and principle investigator.

Data Sources

AAAS

Research Competitiveness Program (RCP)

Building STEM Ecosystems

Explore the programs
aaas.org/rcp

PDF overview
bit.ly/aaas-rcp

Review of thousands of proposals annually

Strategic assessment and data-driven evaluation of more than $1 billion in S&T programs

Short courses for students, faculty, and administrators

Top Ten Reviewer Criticism: 1

Criticism: Proposal not relevant to the funding agency's priorities and requirements

Solutions: Explain in writing, in the proposal, how the project fully meets the requirements and priorities of the competition. Some successful proposals include a section titled "Funding Priorities."

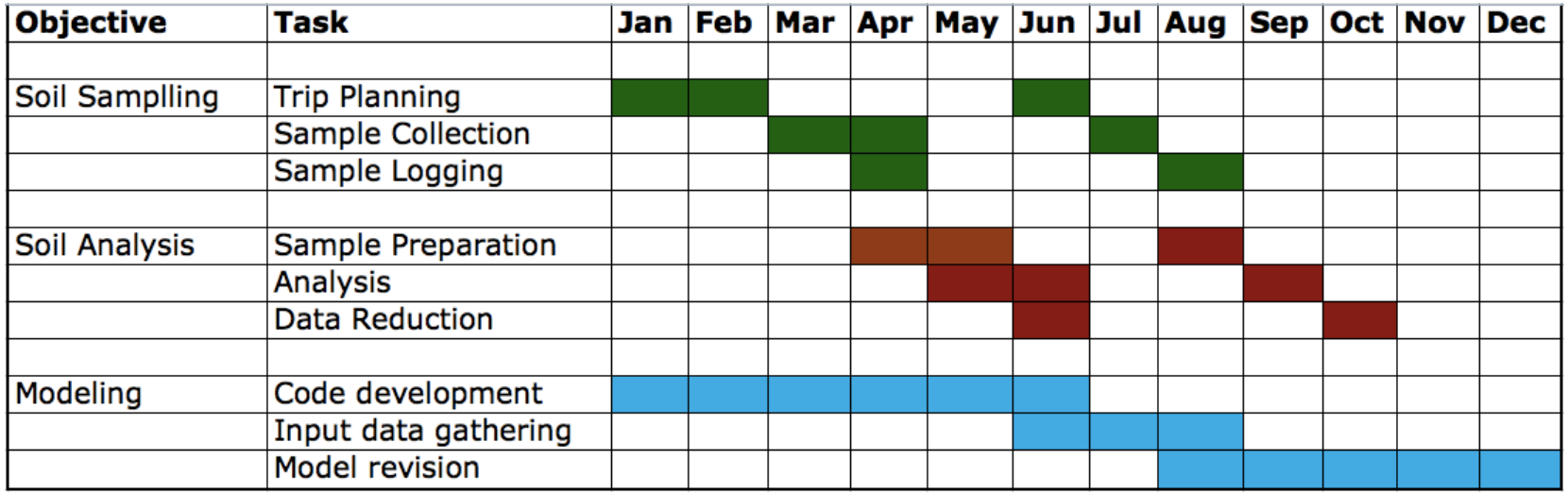
Don't make the reviewer hunt for critical information.

Top Ten Reviewer Criticisms

Top Ten Reviewer Criticism: 2

Criticism: Proposed work cannot be completed in the time allowed

Solutions: Provide a visual timeline (Gantt chart) showing all key steps and the time required for each step.



Objective	Task	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Soil Samplling	Trip Planning												
	Sample Collection												
	Sample Logging												
Soil Analysis	Sample Preparation												
	Analysis												
	Data Reduction												
Modeling	Code development												
	Input data gathering												
	Model revision												

The Importance of Timelines

"It is clear that technical resources for this project are adequate. The plans to manage and coordinate the project should have been more thorough. I expected a clear timeline for all proposed activities."

Discuss Backup Options

Top Ten Reviewer Criticisms: 3

Criticism: **Proposed work does not contribute to important questions in the field of research**

Solutions: **Use the Introduction and Background sections to cite recent publications and illustrate how the project addresses gaps in knowledge or tests an important hypothesis.**

5. Xu J, Zhang JZ, Xiang Y. Molecular Dynamics Simulation and Computational Two-dimensional Infrared Spectroscopic Study of Model Amyloid ss-peptide Oligomers. J Phys Chem A. 2013

Use the Introduction Strategically

"The use of copper in human industry is widespread [1, 2] and is increasing (Figure 1). Although it is a micronutrient, copper is toxic to phytoplankton at low concentrations above natural levels [3-5], and has therefore been the attention of federal policy to regulate its release into the environment as well as scientific research to understand its movement within the environment [6-8]. Yet, many US rivers, lakes, and estuaries exceed the EPA's water quality criteria for copper concentration [9], and there are presently no direct methods of measuring copper source, transport, and fate [10-11]."

Start with the Big Picture

Top Ten Reviewer Criticism: 4

Criticism: The methodology is not clearly explained, is missing key details, is out of date.

Solutions: Publish your methods and cite your method publications. Cite the methods of others and explain any modifications you will make. Explain every detail relevant to obtaining publishable data. Explain statistical methods where relevant (especially in biosciences). If you use an older method, compare it to the current approach; explain why you chose it.

Top Ten Reviewer Criticism: 5

Criticism: Proposed work cannot be carried out with the funding requested

Solutions: Match budget carefully to research plan. Always include a budget narrative (not just the budget table). Show guaranteed sources of outside support (obtain commitments of cost-sharing in writing).

INDIVIDUAL FINANCIAL SUPPORT				Support Requested	Support from Other Sources
Name	Daily Rate (US$11.36 max)	Number of Days per Month (22 max.)	Number of Months (Max. 10 Months)	--------	--------
TOTAL INDIVIDUAL FINANCIAL SUPPORT					

Example Budget Table

	A	B	C	D	E	F	G	H	I	J	K
1	(Exampled NSF Budget)										
2	**SUMMARY**									**Year 1**	
3	**PROPOSAL BUDGET**						**FOR NSF USE ONLY**				
4	ORGANIZATION						PROPOSAL NO.			DURATION (MONTHS)	
6	University of Tennessee									PROPOSED	
8	PRINCIPAL INVESTIGATOR/PROJECT DIRECTOR						AWARD NO.				
9	Dr. Jane Smith										
10	A. SENIOR PERSONNEL: PI/PD, Co-PI'S, Faculty and Other Senior Associates							NSF-Funded			Funds
11	(List each separately with title, A.7. show number in brackets)							Person-months			Requested By
12							Appointment	CAL	ACAD	SUMR	Proposer
13	1. Jane Smith			Salary:	$	82,017	9			1	$ 9,113
14	2. Bob Jones			Salary:	$	70,101	9			1	$ 7,789
15	3.			Salary:	$	-					
16	4.			Salary:	$	-					
17	5.			Salary:	$	-					
18	6. ( ) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)										
19	7. ( ) TOTAL SENIOR PERSONNEL (1-6)									2	
20	B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)										
21	1. (1) POST DOCTORAL ASSOCIATES			Salary:	$	45,000	12	12			$ 45,000
22	2. ( ) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)										
23	3. (1) GRADUATE STUDENTS										$ 20,000
24	4. (1) UNDERGRADUATE STUDENTS										$ 3,000
25	5. ( ) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)										
26	6. ( ) OTHER										
27	TOTAL SALARIES AND WAGES (A+B)										$ 84,902
28	C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)										$ 26,097
29	TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A+B+C)										$ 110,999
30	D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000)										

Budget Development Resources

Office of Sponsored Projects (Contracts and Grants Office)

NIH
https://grants.nih.gov/grants/how-to-apply-application-guide/format-and-write/develop-your-budget.htm

NSF (Univ. of Tennessee example)
https://osp.utk.edu/wp-content/uploads/sites/49/2013/06/NSF_Budget_Sample.xls

Top Ten Reviewer Criticism: 6

Criticism: The team is well qualified but missing expertise required for parts of the project

Solutions: Make sure team CVs illustrate qualifications for all project elements. Add collaborators with needed qualifications. Show preliminary data to illustrate ability to achieve goals. Publish previous results in international peer-reviewed journals to establish qualifications.

Letters of Support

"The application does not demonstrate that the investigators have direct experience with sequencing. They propose to work with the consultant to gain experience; however, the letter of support does not clearly address this. Further, the role of Professor XX is unclear and is not specified in his letter of support."

Letters of Support

A practical suggestion

- **YOU should write a draft of the letter for your collaborator.**
- **(As a collaborator on several grants I welcome this help)**

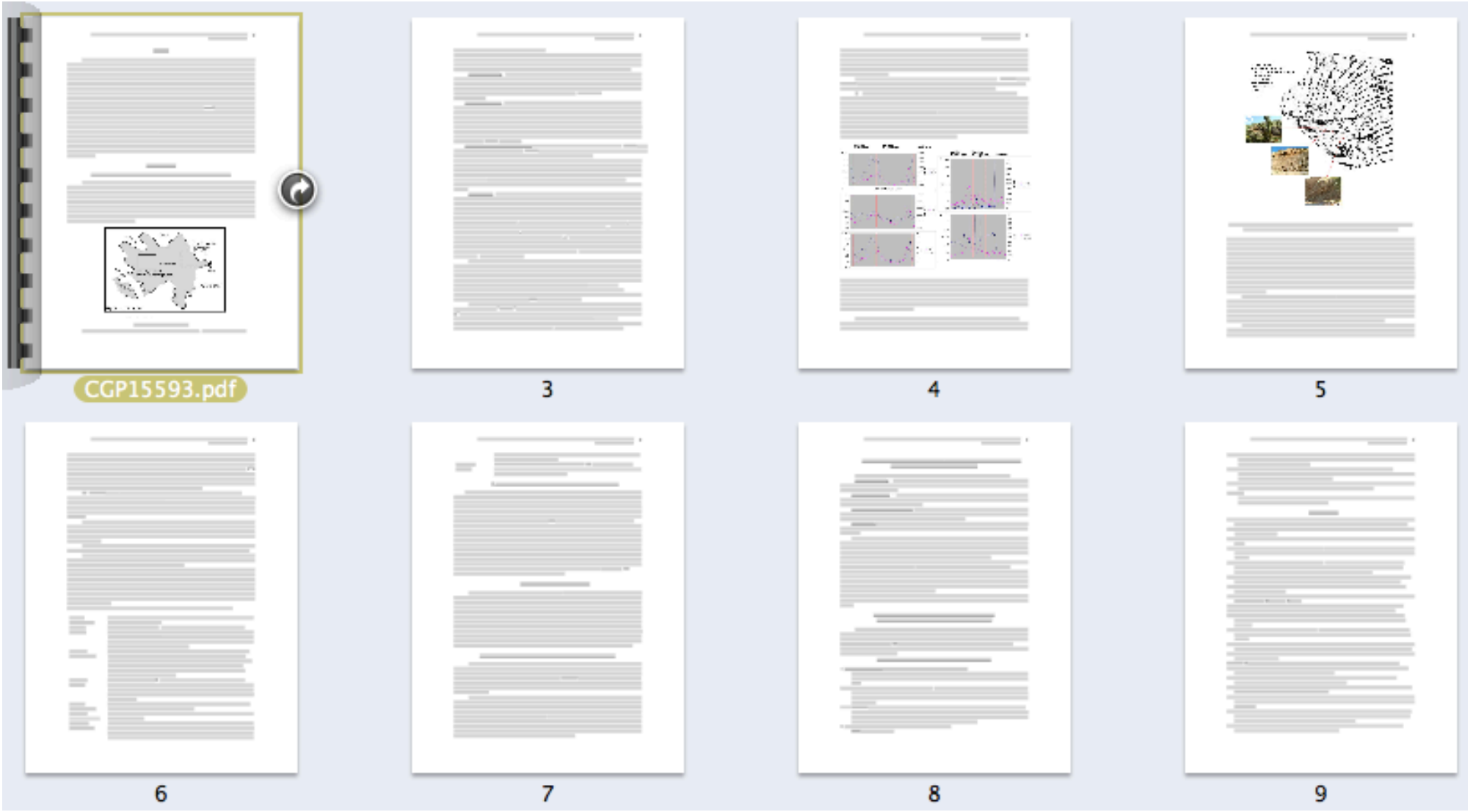
"One of the consultant's letters refers to Dr. XX as the PI of the proposal, rather than Dr. YY. This leads one to question how involved and engaged the consultant will be."

Top Ten Reviewer Criticism: 7

Criticism: Panelist is frustrated looking for key information; panelist misreads or misunderstands the proposal

Solutions: Provide clear section headings and format the proposal consistently. Break the proposal into smaller sections and subsections and use descriptive headings. Repeat key points in the proposal narrative so they are not lost. Use tables and figures to illustrate important concepts. Reviewers are busy; they need your help (and it helps you).

Review the Overall Structure



Top Ten Reviewer Criticisms: 8

Criticism: The outcomes described are not all discussed in the research plan. Research plan does not describe how some goals will be met.

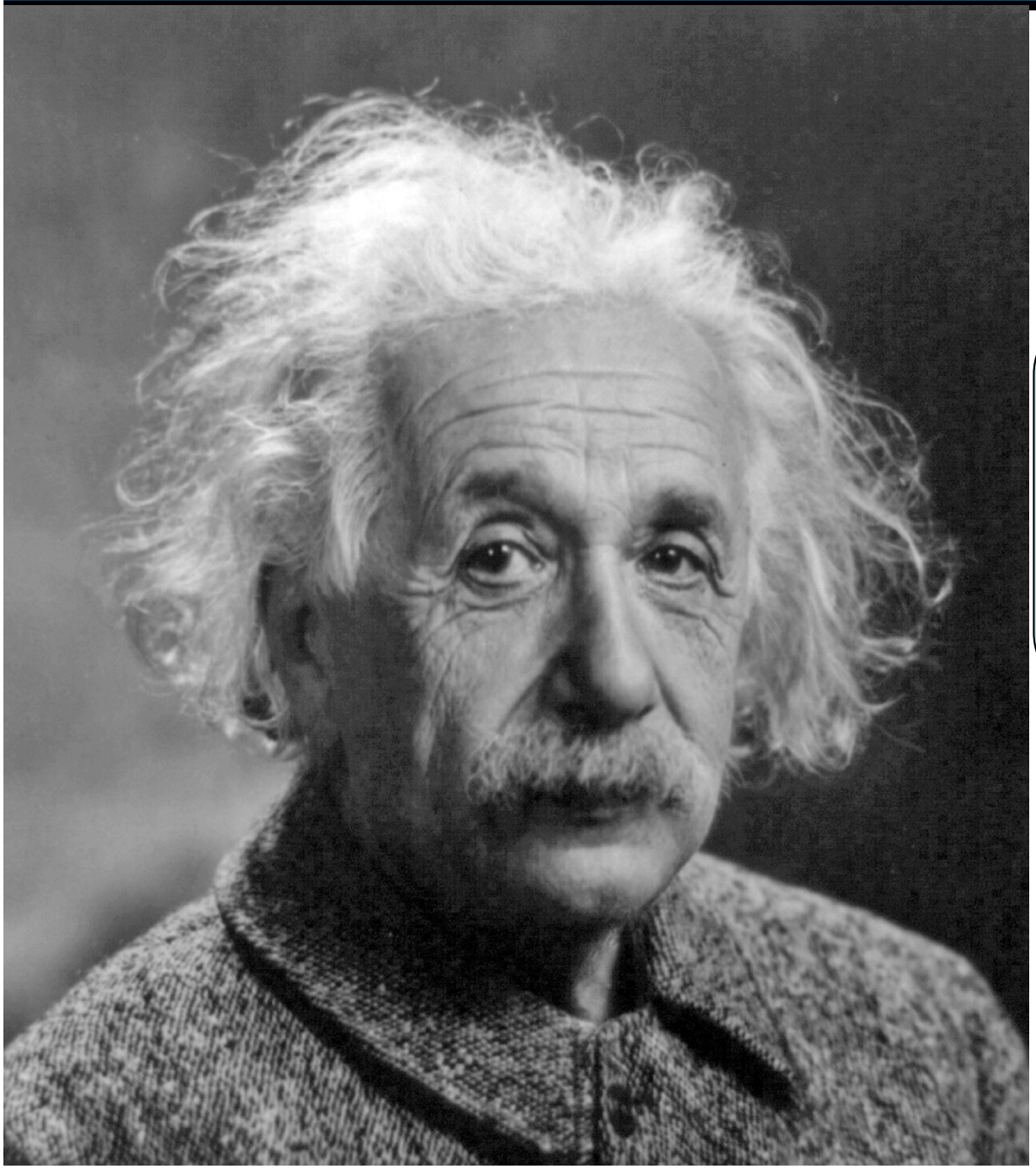
Solutions: Carefully read the proposal draft: if a goal is not discussed in the research plan, revise the research plan or delete the goal. Sometimes you'll need to reduce the scope of the project to fit the time and budget available. Use the conclusion of the proposal to describe other goals for future funding.

Top Ten Reviewer Criticism: 9

Criticism: Proposal is poorly written, full of errors that indicate careless editing. Low quality of writing suggest that PI may not be successful publishing results.

Solutions: Have other good writers read the draft. We can't always catch our mistakes easily. Develop the draft in advance; don't look at it for a week; read it again very carefully with "fresh eyes." Be very detailed in polishing spelling, grammar, and appearance. We are always practicing to improve our writing.

Explain Clearly for the Non-Expert



"If you can't explain it simply you don't understand it well enough"
—sort of Albert Einstein

For further discussion of scientists expressing similar sentiments see

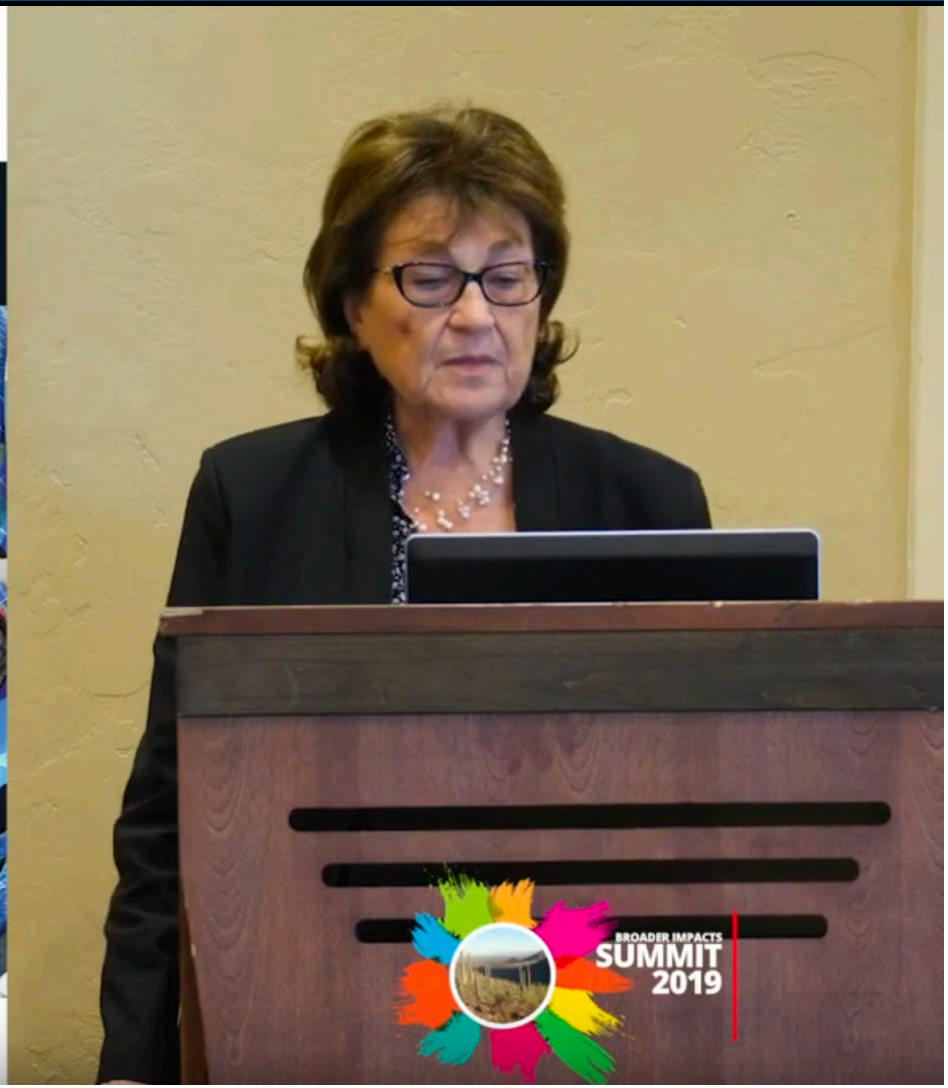
https://skeptics.stackexchange.com/questions/8742/did-einstein-say-if-you-cant-explain-it-simply-you-dont-understand-it-well-en

Top Ten Reviewer Criticism: 10

Criticism: Proposal is reasonable, well written, and makes a scientific contribution but it is not interesting or exciting work. It is not competitive.

Solutions: Be sure to illustrate the broad importance of your work. What is the impact? Are there important applications possible? Discuss the plausible benefits in the Introduction and in the Conclusion of the proposal. Some successful proposals include a separate page on "Projected Impacts."

NSF Broader Impacts



Youtube: bit.ly/broaderimpacts19

PDF of slide set: bit.ly/2M3yuAj

Some Proposals Can't Be Saved!

"The PIs assume that an earthquake will occur in the time that they're taking measurements."

AAAS

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