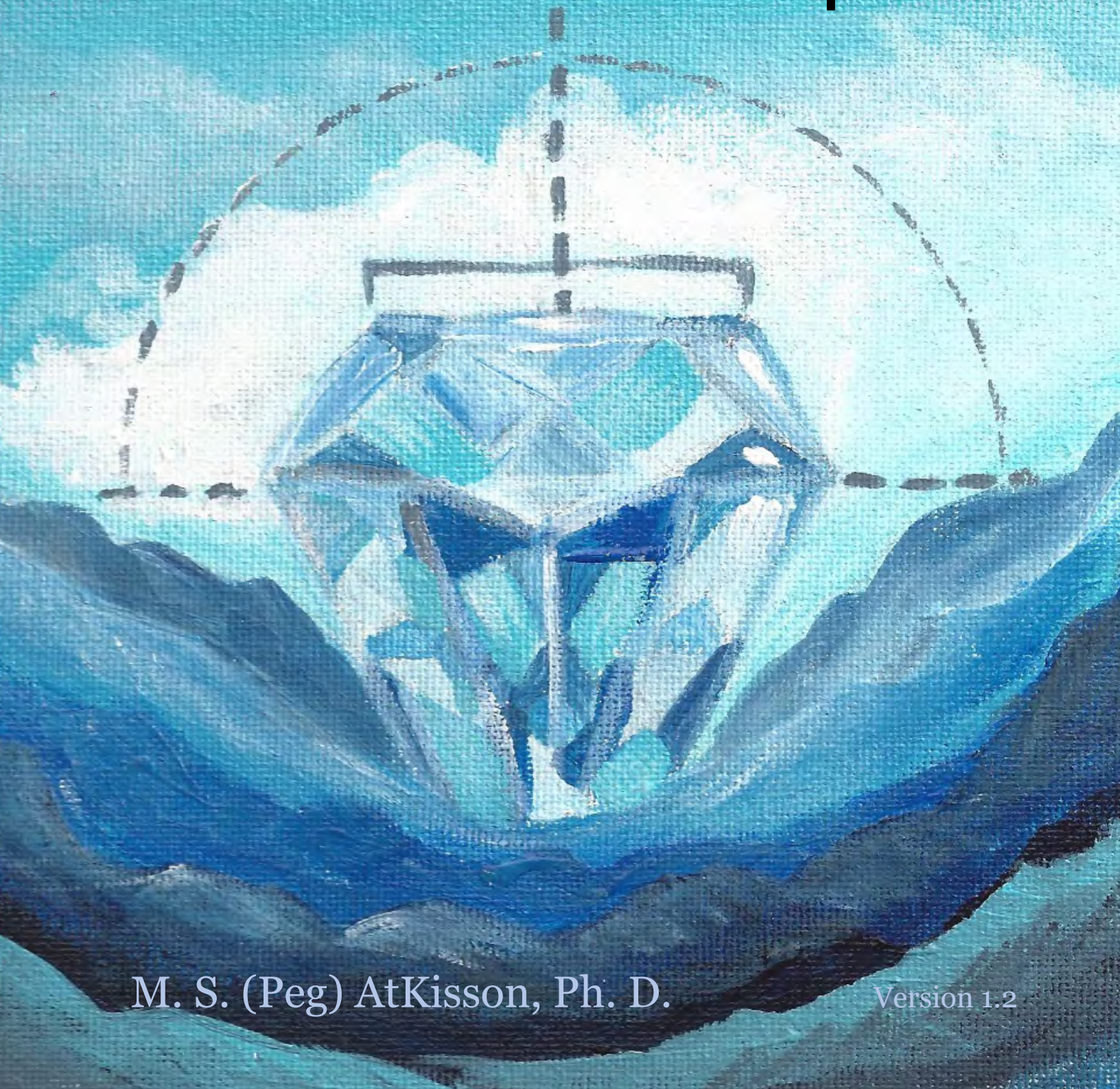


# Handbook for Planning and Writing Successful Grant Proposals



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Version 1.2



Minor updates for NSF Biosketch, corrections 10/19/2020  
Minor updates for NIH Biosketch, 4/9/2021

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# Introduction

In NASA's 2017 Guidebook for Proposers, it states:

“Experience has consistently shown that the characteristics of successful proposals are that they are technically meritorious, logical, complete, convincing, easily read, affordable, and responsive to the advertised NASA program...”<sup>1</sup>

In one sentence, they define what you need for good grant-writing skills, regardless of the proposal type or target funding agency. To unpack the sentence in the opposite direction, a successful proposal must:

- Be responsive to the priorities of the potential funder

This is first and foremost.

- Have a budget within the funding range of the potential funder, and one that matches the proposed activities

The grant and your activities can be described as a box bounded by money and time. Does your proposed project fit in the box of available funds and duration of the grant?

- Be written and organized so that the information is easy to read and easy to find

Grantsmanship is often defined as the packaging and presentation of the idea.

- Present a clear argument, based on facts

Grant proposals are sales documents, but you are selling a solid idea with a firm foundation.

- Include all required parts of the proposal

Follow the directions. Follow the directions. Find more directions and follow those.

- Show demonstrable logic between what has been done, what needs to be done, and how you plan to provide solutions

You may know you have a logical foundation, but you have to show those connections to the reviewers in a clear way. Show your thought process.

- Demonstrate that the approach(es) proposed have a sound technical basis and address an important problem

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<sup>1</sup> <https://www.hq.nasa.gov/office/procurement/nraguidebook/proposer2017.pdf>

The best way to show that you have a sound technical basis is to describe it well enough and to show proof of feasibility. It doesn't matter how good your research plan is, however, if you don't solve the first bullet: the problem must be seen as important to your potential funder.

All the concepts interrelate.<sup>2</sup>

The writing and organization of a grant proposal should reflect the logic of the project. In the chapters to follow, we will pull apart the components of a grant proposal and talk about the purpose of each part of the proposal, what you need to accomplish in that component, and very concrete tips for how to accomplish it. You will find

- suggested rubrics for specific paragraphs within the proposal
- outlines for key areas
- suggested approaches to wording
- links to other material

There is no one way to write a successful proposal, but my goal in this book is to provide you with some concrete skills and approaches to find the way that works for you.

There are many good books on writing grant proposals. I hope this one adds to your toolbox.



NOTES:

Where URLs are included as footnotes, please note that working copies move. It's often best to just search the document title to find an active link.

This is the first edition. Any suggestions on what works and what doesn't are welcome (even spotting remaining typographical errors) to [peg@atq.consulting](mailto:peg@atq.consulting).

**Federal requirements can change!** Please always check the current instructions from your sponsor. From the alpha version to now (8/25/2019), NIH and NSF both changed some major elements of the proposal.

NOTE from 10/17/2020. This **version, 1.1**, is updated for minor corrections and to account for the changes in the NSF biosketch.

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<sup>2</sup> See also the Heilmeier Catechism on proposals and projects. <https://www.darpa.mil/work-with-us/heilmeier-catechism> "What are you trying to do? Articulate your objectives using absolutely no jargon. How is it done today, and what are the limits of current practice? What is new in your approach and why do you think it will be successful? Who cares? If you are successful, what difference will it make? What are the risks? How much will it cost? How long will it take? What are the mid-term and final "exams" to check for success?"

# Acknowledgements

I owe quite a bit to the implicit knowledge on grant proposals and sound logic imparted to me by my dissertation advisor, Dr. Kathleen Dunlap.

I owe Peggy Newell, JD, MBA, the best boss I ever had, for the opportunity to practice, practice, practice for eight years as a grant writer and research developer for Tufts University.

I owe Drs. Stephen Russell and David Morrison for mentoring and eight years of the opportunity to hone my skills in dissection of other people's proposals to a broad array of funders. It was one hell of a post-doc.

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I owe many people on Twitter, too many to name you all, but most particularly @drugmonkeyblog.

I owe Dr. Joel White for support, believing in me, and telling me to quit my job, even if I had to hear it >10X to act. You're a great captain, great dad, and great partner, not necessarily in that order.

My thanks are owed to these folks, and to so many others. I had quite a bit of luck, support, and sponsorship. I hope to have honored that faith in me, or at least not embarrassed you all.

# Grant Proposal Outlines

Generic proposal outline	NSF proposal outline	NIH proposal outline
<p><b>OVERVIEW</b> ~1 page</p> <p><b>IMPACT OF THE WORK</b></p> <p><b>BACKGROUND</b></p> <p><b>PRELIMINARY WORK</b></p> <p><b>PROJECT PLAN</b></p> <p><b>Aim/Objective 1</b></p> <ul style="list-style-type: none"> <li>• <i>Rationale</i></li> <li>• <i>Specific activities</i></li> <li>• <i>Expected outcomes</i></li> <li>• <i>Potential problems and alternative approaches</i></li> </ul> <p><b>Aim/Objective 2</b></p> <ul style="list-style-type: none"> <li>• <i>Rationale</i></li> <li>• <i>Specific activities</i></li> <li>• <i>Expected outcomes</i></li> <li>• <i>Potential problems and alternative approaches</i></li> </ul> <p><b>TIMETABLE</b></p> <p><b>SUMMARY AND FUTURE DIRECTIONS</b></p>	<p><b>OVERVIEW</b> ~1 page</p> <p><b>Significance*</b></p> <p><b>Results from Prior NSF Support</b></p> <p><b>BACKGROUND</b></p> <ul style="list-style-type: none"> <li>• Include <b>Relationship to Other Work in Progress</b> and <b>Relationship to the PI's Longer-term Goals</b></li> </ul> <p><b>PRELIMINARY WORK</b></p> <p><b>RESEARCH PLAN</b></p> <p><b>Aim/Objective 1</b></p> <ul style="list-style-type: none"> <li>• <i>Rationale</i></li> <li>• <i>Specific activities</i></li> <li>• <i>Expected outcomes</i></li> <li>• <i>Potential problems and alternative approaches</i></li> </ul> <p><b>Aim/Objective 2</b></p> <ul style="list-style-type: none"> <li>• <i>Rationale</i></li> <li>• <i>Specific activities</i></li> <li>• <i>Expected outcomes</i></li> <li>• <i>Potential problems and alternative approaches</i></li> </ul> <p><b>TIMETABLE</b></p> <p><b>BROADER IMPACTS*</b></p> <p><b>SUMMARY AND FUTURE DIRECTIONS</b></p> <p>The Significance section can serve for Broader Impacts. For CAREER proposals, a longer Broader Impacts at the end can be used to integrate impacts of proposed research and education activities.</p>	<p><b>SPECIFIC AIMS</b> 1 page</p> <p><b>RESEARCH STRATEGY</b></p> <p><b>SIGNIFICANCE</b></p> <ul style="list-style-type: none"> <li>• Include <b>Rigor of the prior work</b></li> <li>• Include <b>Impact of the work</b></li> </ul> <p><b>INNOVATION</b></p> <p><b>APPROACH</b></p> <p><b>Aim 1</b></p> <ul style="list-style-type: none"> <li>• <i>Rationale</i></li> <li>• <i>Specific activities</i></li> <li>• <i>Expected outcomes</i></li> <li>• <i>Potential problems and alternative approaches</i></li> </ul> <p><b>Aim 2</b></p> <ul style="list-style-type: none"> <li>• <i>Rationale</i></li> <li>• <i>Specific activities</i></li> <li>• <i>Expected outcomes</i></li> <li>• <i>Potential problems and alternative approaches</i></li> </ul> <p><b>Timetable</b></p> <p><b>Summary and Future Directions</b></p>

USDA proposal outline	DOE proposal outline	NEH fellowship outline
<p><b>INTRODUCTION</b></p> <p><b>OVERVIEW</b> ~1 page</p> <p><b>BACKGROUND</b></p> <p><b>PRELIMINARY DATA</b></p> <p><b>RATIONALE AND SIGNIFICANCE</b></p> <p><b>RESEARCH PLAN</b></p> <p><b>OBJECTIVE 1</b></p> <ul style="list-style-type: none"> <li>• <i>Rationale</i></li> <li>• <i>Specific activities</i></li> <li>• <i>Expected outcomes</i></li> <li>• <i>Potential problems and alternative approaches*</i></li> </ul> <p><b>OBJECTIVE 2</b></p> <ul style="list-style-type: none"> <li>• <i>Rationale</i></li> <li>• <i>Specific activities</i></li> <li>• <i>Expected outcomes</i></li> <li>• <i>Potential problems and alternative approaches</i></li> </ul> <p><b>OBJECTIVE 3</b></p> <ul style="list-style-type: none"> <li>• <i>Rationale</i></li> <li>• <i>Specific activities</i></li> <li>• <i>Expected outcomes</i></li> <li>• <i>Potential problems and alternative approaches</i></li> </ul> <p><b>Timetable</b></p> <p><b>Summary and Future Directions</b></p> <p>*Suggested language instead of “Pitfalls and Limitations”. Remember also many USDA proposals require a 2-page Logic Model.</p>	<p><b>OVERVIEW</b> ~1 page</p> <p><b>RATIONALE AND SIGNIFICANCE</b></p> <p><b>BACKGROUND</b></p> <p><b>PRELIMINARY DATA</b></p> <p><b>RESEARCH PLAN</b></p> <p><b>OBJECTIVE 1</b></p> <ul style="list-style-type: none"> <li>• <i>Justification and Feasibility*</i></li> <li>• <i>Specific activities</i></li> <li>• <i>Expected outcomes</i></li> <li>• <i>Potential problems and alternative approaches</i></li> </ul> <p><b>OBJECTIVE 2</b></p> <ul style="list-style-type: none"> <li>• <i>Justification and Feasibility*</i></li> <li>• <i>Specific activities</i></li> <li>• <i>Expected outcomes</i></li> <li>• <i>Potential problems and alternative approaches</i></li> </ul> <p><b>OBJECTIVE 3</b></p> <ul style="list-style-type: none"> <li>• <i>Justification and Feasibility</i></li> <li>• <i>Specific activities</i></li> <li>• <i>Expected outcomes</i></li> <li>• <i>Potential problems and alternative approaches</i></li> </ul> <p><b>Timetable</b></p> <p><b>Summary and Future Directions</b></p> <p>*Supporting data go in Preliminary Data. Feasibility data go in Justification and Feasibility (see Chapter 8).</p>	<p><i>Outline is by paragraph</i></p> <p>Create a research space, using outline for Paragraph 1 of the Overview (see <a href="#">Chapter 4</a> and <a href="#">Chapter 5</a>)</p> <p>Provide your long-term goals, objective and research question. Establish why you are the right person to do this work. Use outline for paragraph 2 of the Overview (see <a href="#">Chapter 4</a> and <a href="#">Chapter 5</a>)</p> <p>State the significance of the work using model for second paragraph of Significance (see <a href="#">Chapter 6</a>)</p> <p>Describe the process you will use to carry out the work. (For a book completion proposal, give the chapters and discuss what remains to be done, whether research or writing.)</p> <p>End with a statement on the expected deliverables and dissemination plan. State the impact.</p>

All of these outlines can vary depending upon the specific funding opportunity. Always read the instructions and use the outline you can derive from the funding opportunity announcement (see Chapter 1).