Proposal Review Process

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Pre-panel Process

Initial Submission

Many programs now require the submission of pre-proposals, with invitations for full proposals

Initial Submission

The evaluation of pre-proposals and full proposals is similar

The primary distinction is that full proposals are evaluated by external reviewers *and* a panel, while pre-proposals are evaluated by a panel *only*

Panels and Reviewers

Panelists and proposal reviewers* are chosen by Program Directors

The role of panels and reviewers is advisory

* Program directors generally choose at least one of the reviewers that is recommended by an applicant and often more than one reviewer

Proposal Review

Merit Review Criteria

Projects are evaluated based on the merit of what is written *in the proposal*

Merit Review Criteria

Intellectual Merit:

Importance of the questions (potential impact on the field)

Feasibility (researchers must have the necessary expertise and institutional support to accomplish their aims)

Merit Review Criteria

Broader Impacts:

Broaden participation

Dissemination of results

Integration of research and education

Impact to society

Reviewer Scores

Reviewers rate proposals as

Excellent: Exceptional proposal in all respects (highest priority for invitation or award)

Very Good: High quality proposal in nearly all respects (should be invited or supported if at all possible)

Reviewer Scores

Reviewers rate proposals as

Good: A quality proposal, worthy of support, but may have some problems

Fair: Lacks one or more critical aspects and some key issues need to be addressed

Poor: Has serious deficiencies

Panel Reviews

Panelists review pre-proposals (full proposals) individually and as a group rank them into categories (which vary between Programs)

Panel Reviews

High Quality

- Innovative, creative, imaginative, novel
- Compelling Scientific Merit and Broader Impacts
- Cutting edge of scientific field
- Convincing and feasible approach

Medium Quality

- Somewhat innovative
- Solid Scientific Merit and Broader Impacts
- Strong case for feasibility

Low Quality

- Worthwhile qualities, but NOT compelling (incremental)
- Feasibility may be questionable
- Weak Broader Impacts

Not Competitive

- Lacks potential scientific impact
- Contains flaws in logic or approach
- Discourage future submission

Pre-proposal Panel

Primary Panelist Review

REVIEW:

What is the intellectual merit of the proposed activity?

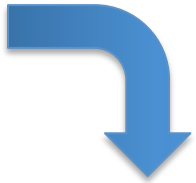
This is a very interesting proposal that aims to study the sensory and neural mechanisms involved in navigation of a nocturnal arthropod with unusual sensory and central neural structures that appear to facilitate their ability to navigate in darkness. The main question is very interesting and hypothesis clearly stated.

What are the broader impacts of the proposed activity?

The broader impacts are excellent, with not only student training but also outreach activities in 2 states.

Summary Statement

This is an excellent proposal that studies an unusual animal, making it easy to have meaningful broader impacts. The PIs collaborate to integrate outreach activities and training for students.



Summary Statement

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Secondary Panelist Review

REVIEW:

What is the intellectual merit of the proposed activity?

This was a captivating, well integrated pre-proposal that incorporates expertise from 3 participants to investigate the behavioral, sensory, and neural mechanisms involved in short and long-distance nocturnal navigation by whip spiders (amblypygids). The novelty of the proposal is in the selection of the study species, which apparently relies on olfaction to return to its diurnal resting sites in trees, a job that requires navigation in a complex, 3-dimensional space under the cover of darkness. Incorporation of both field and lab studies, as well as miniature tracking devices, add to the strength of the pre-proposal. The 3 PI's is each very well qualified to cover their part outlined in the proposal, which has a high probability of yielding novel and interesting results on an understudied but intriguing arthropod.

Although the study organism appears to be one of the rare arthropods that uses olfactory cues for nocturnal navigation, the assumption is that because the whip spiders lack compound eyes, they would be unable to navigate visually. Nevertheless, because many nocturnal insects use visual cues to navigate complex tropical forests while foraging at night, it seems prudent to at least rule out that ocelli are not used in navigation before proceeding with olfaction, even though pilot data suggest the latter modality is used. Visual ablation to address this question is proposed; some pilot data on results of such techniques would have strengthened the assumed novel aspects of this pre-proposal. I would have liked to see greater development of the actual proposed research (especially for objective III); the sketchiness of this section weakened the proposal. The introduction could have easily been shortened, providing the space for description of actually what would be done. How does ablation affect behavior of individuals in the field? How do you inactivate the mushroom body in a way that the arachnid can still function in the field?

What are the broader impacts of the proposed activity?

The PI's take advantage of an existing program at Bowling Green to promote STEM study by women and minorities. Hebets current outreach efforts will be developed in Ohio as well. More specifics of how STEM students would participate would be appreciated, especially given that much of this would be done in the tropics, which presents logistical and financial constraints when involving undergraduates. I was struck by the engaging writing style used in this pre-proposal, and think it might be indicative of the success of outreach publications and speaking engagements of one or more of the PI's.

Summary Statement

The proposed work would greatly expand our understanding of the use of olfaction in nocturnal navigation of a fascinating and understudied group of arachnids. The outlined research incorporates lab and field studies that integrate behavior and its underlying neurophysiology. Given the emphasis on olfaction, stronger evidence that visual cues are relatively unimportant would have strengthened the underlying rationale of the proposal, especially since arthropods are known to use relatively subtle visual cues effectively. Broader impacts are likely sufficient, but needed more development.

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Tertiary Panelist Review

REVIEW:

What is the intellectual merit of the proposed activity?

Very good. This very interesting proposal involves a previously undocumented sensory system (olfaction) mediating navigation in whip spiders, which exhibit a world-wide distribution. This work is significant, as it will yield new information about a highly specialized 'evolutionary extreme' group with regard to behavioral, structural and neural adaptations. Most studies of arthropod navigation have only considered species with visual abilities. This proposal was very well worded and interesting to read with compelling pilot data. The research team is highly qualified and brings together a powerful mix of specialties to this integrative project. Although amblypygids exhibit a worldwide distribution, it was still somewhat unclear how the information in this particular study will have a strong 'transformative impact' on how the discipline of arthropod navigation is conducted.

What are the broader impacts of the proposed activity?

Good. One research team member (Hebets) has an impressive list of high quality outreach, music and science education activities. It would make this proposal stronger had the investigators specified which programs would be continued with the current work and how other PIs would contribute. For example, how will these outreach activities be established in Ohio (have particular groups indicated an interest in participating?).

Summary Statement

I weighted each component above equally. I understand space constraints are an issue in pre-proposals, but I was somewhat disappointed at the brevity of Broader Impacts in the project description. Additional details would be helpful here, as described above. I also was interested in how, exactly, lectures are given to schools or other general venues (e.g. are any of these part of an established school curriculum that the PI helps with? part of a lecture series?).

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The Board

HIGH PRIORITY	MEDIUM PRIORITY		LOW PRIORITY		NOT COMPETETIVE
P0002323	P0005676	P0005432	P0006665	P0002038	P0005554
P0001243	P0005687	P0004321	P0007776	P0003047	P0005656
P0002343	P0008970	P0001324	P0008887	P0004958	P0006767
P0004565	P0005746	P0002435	P0009998	P0005867	P0007676
P0005676	P0002435	P0003546	P0000009	P0001200	P0008798
P0007898	P0005555	P0005768	P0003333	P0002300	P0004444
P0009098	P0006778	P0006879	P0002221	P0003498	P0000000
P0000978	P0008789	P0008076	P0003332	P0007777	
P0009867	P0009089	P0002222	P0004443	P0008787	
P0006534	P0007867	P0003333	P0005554	P0003521	
P0002417	P0005645	P0004334	P0006665	P0004521	
	P0003423	P0004554	P0007776	P0005672	
	P0001234	P0005665	P0008887	P0006781	
	P0002345	P0006776	P0009999	P0007890	
	P0003456	P0007887	P0001029	P0004488	
	P0004567	P0008998			
	P0005678	P0009009			
	P0006789	P0001111			
	P0007890	P0002221			
	P0000987	P0003332			
	P0009876	P0004443			
	P0008765	P0006543			
	P0007654				

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P0004565	P0005746	P0002435	P0009998	P0005867	P0007676
P0005676	P0002435	P0003546	P0000009	P0001200	P0008798
P0007898	P0005555	P0005768	P0003333	P0002300	P0004444
P0009098	P0006778	P0006879	P0002221	P0003498	P0000000
P0000978	P0008789	P0008076	P0003332	P0007777	
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	P0004567	P0008998			
	P0005678	P0009009			
	P0006789	P0001111			
	P0007890	P0002221			
	P0000987	P0003332			
	P0009876	P0004443			
	P0008765	P0006543			
	P0007654	P0006666			

Panel Summary

Intellectual Merit

Strengths:

This is a captivating proposal that uses olfaction studies of whip spiders that navigate at night and return to the same resting site during the day. **It is interesting because** not many arthropods have been shown to use this modality for this behavior. The proposal examines the sensory organs on forelegs and aims to relate them to the neuroanatomy of central structures. **This proposal was easy to read and well worded and the model is very interesting.**

Weaknesses:

It is **not clear that this would have broad impact on the field**, although it would add to the general ideas of navigation using an evolutionary extreme animal. One reviewer noted that the a proposal lacked an explicit hypothesis.

Panel Summary

Broader Impacts
Strengths:
The research would involve under-represented groups at the university level.

Weaknesses:
The public outreach, while **strong for one PI**, appeared to only extend the same programs to a second location.

Panel Summary

Rationale for Panel Recommendation:
The panel felt that this is an interesting proposal and that the broad impacts were good. However the panel felt that the **broader impacts were mostly due to the continuing work of one PI**. This is a **solid science proposal** that would be contributing to the field of insect navigation because it examines an understudied area.

The summary was read by/to the panel and the panel concurred that the summary accurately reflects the panel discussion.

Panel Recommendation: Medium Quality

Post Panel Process

Invitations (Awards)

Program directors use panel ranks and panelist reviews* to decide which pre-proposals to invite (for full proposals)

Panel ranks, panelist reviews and external reviews are used to determine which full proposals are recommended for an award

* Reviews are advisory documents for the NSF and they may or may not contain useful information for the applicant

Awards

Program Directors attempt to balance their portfolio (awards) to ensure that areas of scientific interest to the field are covered*

They also balance their portfolio based on the geographic location of institutions, institution type, the gender and race of investigators and the status of investigators

*Do you know the areas of interest to your Program Directors?

Awards

Program Directors are typically provided with a budget and they decide how to allocate funds (that is, Program Directors do not receive special funds to support CAREER, EAGER, RAPID, INSPIRE or DDIG proposals)

What Did the Program Director Decide?

Pre-proposal Decision

The project we discussed:

Appears **solid scientifically**

Has a **strong team** of researchers

Would likely have a **modest impact** on field

Has **underdeveloped Broader Impacts**

Decision: **DO NOT INVITE**

What Should You Do?

Suggestions

Examine the abstracts of funded proposals in Programs that cover your scientific area

Suggestions

Then, **contact your Program Director** and discuss your scientific ideas

Determine specific areas of interest to the Program* and how well your ideas fit (if interest seems low, discuss how you could modify your ideas to be of more interest to the Program)

* Are there gaps in the desired portfolio?

Suggestions

If your pre-proposal (full proposal) is not invited (recommended for an award) **study your panel summary and reviews** and **contact your Program Director** to discuss what happened at panel (panel summaries do not always fully reflect the tone of the discussion) and how you might revise your pre-proposal (full proposal) to be more competitive

Become a NSF Citizen!

Contact your Program Director (send your vitae) and offer to be a reviewer or serve on panel

Progress in science depends on participation by scientists like you!