

New Laser Scientists Conference

October 23-24, 2014

Sponsored by the American Physical Society Division of Laser Science

Tucson Ballroom G, JW Marriott Hotel, Tucson, AZ

Additional Program Information

Daniel Gauthier and Jason Jones, Conference Co-Organizers

The 2014 New Laser Scientist Conference was attended by 17 laser scientists over two days. The program consisted of a mix of oral presentations where attendees presented a proposal idea, participated in a mock proposal review, participated in discussions related to funding, work/life balance, starting up a group, and informal discussions over meals and breaks. Some details of the conference are given below, including the program and some follow up comments assessing the Conference. Funding for the Conference was provided entirely by the Division of Laser Science and the approximate cost was \$4,973 (see budget near the end of this report). The OSA staff helped arrange everything with the hotel.



2014 New Laser Science attendees in the sunny, hot, dry Tucson desert.

The Conference started at 1:30 PM on Thursday, October 23, 2014 and ended at 3 PM on Friday, October 24. It was held in the same facility as the FiO/DLS meeting in the Tucson Ballroom G. Coffee breaks, dinner Thursday night, and breakfast and lunch Friday were provided (funds to cover the event are provided by the Division of Laser Science). There was no registration fee and attendees did not need to submit any forms to register for the meeting. Attendees had to cover your transportation and hotel.

The purpose of the meeting was for the attendees to network with other new laser scientists and to interact with senior laser scientists to obtain ideas for funding, ramping up a research group, work-life balance, etc. In the early days of this meeting, program officers from funding agencies attended. However, their travel is severely curtailed by the government, although we found out that there were some program officers attending FiO/DLS and that more effort should be put into inviting them to attend in 2016 now that we know that their travel is not so restricted. To give attendees some exposure to the funding process, Prof. Mark Neifeld of the University of Arizona gave a brief presentation about obtaining funding from DARPA. Mark spent four years at DARPA as a program manager in the Defense Sciences Office (DSO) and recently returned to his faculty position at the U of A. He shared some of his insights and was available for informal conversations after his presentation.

A panel discussion was convened on Thursday where Prof. Jones and Gauthier discussed issues of starting up their careers and then they took questions from the group.

There was ample time over coffee breaks and meals to network.

To gain exposure to funding from the National Science Foundation, all attendees were asked to:

- 1) Prepare a one-page NSF-style Project Summary - the abstract page for a proposal. This can be for a proposal you have under review or a proposal you are thinking of preparing. The summary should match the current guidelines in the NSF Grant Proposal Guide

http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg

Download the PDF file and see page 25 of the PDF document for the instructions for the Project Summary page. See especially Section III.a on the Merit Review Criterion, starting on PDF page 61 of the guide.

A Project Summary of a successful recent proposal by Prof. Gauthier that was funded by the AMOP Division in 2012 was distributed to the attendees. Note that the requirements for the Project Summary have changed somewhat since 2012, so attendees were warned to look carefully at the current guidelines.

2) All attendees were asked to send Prof. Gauthier the one-page Project Summary **no later than Friday, October 17**. He collated these and distribute to all participants.

3) All attendees gave a **15-minute** oral presentation that was an "elevator pitch" for their proposed project. This created an opportunity to briefly describe the work, explain how it fits in the mission of the NSF, and why it is worthy of funding. There was 5 minutes of questions on each presentation. The schedule for the presentations is appended to this document.

4) The attendees were assigned to small teams for a group discussion on Friday afternoon after all of the presentations. They were each assigned a Project Summary from another participant to present to each group, where the group assigned a rating and a ranking within the group for the proposal. The groups then reported out on their ratings to the rest of the participants. This gave the attendees some idea of how the proposal evaluation process takes place and gave some useful feedback on their ideas.

Thoughts for the 2016 Meeting

1. Make sure that all invitations go out a minimum of one month before the FiO/DLS housing deadline.
2. Approach program managers at the same time to see who might be attended FiO/DLS to see whether they can participate in the NLS meeting.
3. Try to reduce overlap with the FiO/DLS meeting by having NLS meeting run Thursday evening and all day Friday.
4. Continue the mock review panel.
5. Invite other senior laser scientists to sit on the discussion panel, also well before the housing deadline.
6. Directly approach some companies for defraying the cost of the meals or breaks (do not try to go through the OSA fund raising group).

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Thursday, October 23rd

1:30 – 1:40	Welcome and Introduction
1:40 – 2:00	Waseem Bakr, Princeton, Physics <i>Quantum simulation of the Hubbard model with attractive atomic Fermi gases</i>
2:00 – 2:20	Vanessa Huxter, U Arizona, Chemistry and Biochemistry <i>From the Individual to the Ensemble: Revealing Hidden Dynamics and Interactions in Systems Organized on the Nanoscale</i>
2:20 – 3:30	Panel discussion: <i>Perspectives on being a laser scientist</i> Jason Jones, Daniel Gauthier, and others
3:30 – 3:50	Coffee Break
3:50 – 4:30	Prof. Mark Neifeld, U of Arizona <i>Perspectives on funding from the DoD through the eyes of a former DARPA program manager</i>
4:30 - 4:50	Jeffery Moses, Cornell, Applied and Engineering Physics <i>A 10-fs hyperspectral stroboscope for ultrafast biological spectroscopy</i>
4:50 – 5:10	Wei Xiong, UCSD, Chemistry <i>Investigating time dependent molecular conformation and electron transfer dynamics at the organic/inorganic interfaces</i>
5:10 – 5:30	Arthur Mills, U British Columbia, Physics <i>State-selective Femtosecond Time-resolved ARPES of Quantum Materials</i>
5:30 – 5:50	Tom Allison, Stony Brook, Physics and Chemistry <i>Cavity Enhanced Ultrafast Transient Absorption Spectroscopy</i>
5:50 - 6:10	Tongcang Li, Purdue, Physics and Electrical and Computer Engineering <i>Quantum spin-optomechanics of levitated nanodiamonds</i>
6:10 - 6:30	Matt Graham, Oregon State <i>Finding graphene a bandgap; new light harvesting pathways in 2D conductive materials</i>
7:00 – 9:00	Dinner (Signature Grill, JW Marriott Hotel)

Friday, October 24th

7:45 – 8:30	Breakfast (in the conference room - Ballroom G)
8:30 – 8:50	Khanh Kieu, U Arizona, College of Optics <i>High Power Widely Tunable Fiber Lasers based on Optical Parametric Interaction</i>
8:50 – 9:10	Eugeniy E. Mikhailov, William and Mary, Physics <i>Enhancing sensitivity of gravitational wave antennas, such as LIGO, via light-atom interaction</i>
9:10 – 9:30	Susan Clark, Sandia <i>Optically - Controlled, Electrically - Gated Quantum Dots for Quantum Information</i>
9:30 – 9:50	Zhimin Shi, U South Florida, Physics <i>Efficient Real-Time Quantum Metrology Methods for High-Dimensional Quantum Systems</i>
9:50 – 10:10	Coffee Break
10:10 – 10:30	Bruce Gadway, UIUC, Physics <i>Harnessing Noise for the Control of Many-Body Dynamics</i>
10:30 – 10:50	Maiken Mikkelsen, Duke, Electrical Engineering <i>Tunable plasmonic nanoantennas for active control of spontaneous emission rates</i>
10:50 – 11:10	Susanta K. Sarkar, Colorado School of Mines, Physics <i>Background-free imaging with fluorescent nanodiamonds</i>
11:10 – 12:30	Lyuba Kuznetsova, San Diego State, Physics <i>Designing nano-layered metamaterials with hyperbolic dispersion</i>
12:00 – 1:00	Lunch - box lunches in the meeting room
1:00 – 1:20	Jiangfeng Zhou, U South Florida, Physics <i>Nonlinear metamaterials</i>
1:20 – 2:05	Small group discussion/evaluation of proposal abstracts
2:05 – 2:45	Report of group evaluation of proposal abstracts
2:45 – 3:00	Closing remarks

PI Name	Project Title	Reviewer
Tom Allison	<i>Cavity Enhanced Ultrafast Transient Absorption Spectroscopy</i>	Eugeniy Mikhailov
Waseem Bakr	<i>Quantum simulation of the Hubbard model with attractive atomic Fermi gases</i>	Bruce Gadway
Susan Clark	<i>Optically - Controlled, Electrically - Gated Quantum Dots for Quantum Information</i>	Matt Graham
Bruce Gadway	<i>Harnessing Noise for the Control of Many-Body Dynamics</i>	Tom Allison
Matt Graham	<i>Finding graphene a bandgap; new light harvesting pathways in 2D conductive materials</i>	Susan Clark
Vanessa Huxter	<i>From the Individual to the Ensemble: Revealing Hidden Dynamics and Interactions in Systems Organized on the Nanoscale</i>	Lyuba Kuznetsova
Khanh Kieu	<i>High Power Widely Tunable Fiber Lasers based on Optical Parametric Interaction</i>	Jeffery Moses
Lyuba Kuznetsova	<i>Designing nano-layered metamaterials with hyperbolic dispersion</i>	Vanessa Huxter
Tongcang Li	<i>Quantum spin-optomechanics of levitated nanodiamonds</i>	Jiangfeng Zhou
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Jiangfeng Zhou	<i>Nonlinear metamaterials</i>	Tongcang Li

Review Group 1	Review Group 2	Review Group 3
Tom Allison	Bruce Gadway	Susan Clark
Waseem Bakr	Eugeniy Mikhailov	Khanh Kieu
Matt Graham	Maiken Mikkelsen	Tongcang Li
Lyuba Kuznetsova	Jeffery Moses	Zhimin Shi
Susanta Sarkar	Arthur Mills	Wei Xiong
Jiangfeng Zhou	Vanessa Huxter	

Budget

EVENTS	ACTUAL
COFFE BREAKS 10/23 & 10/24	\$ 643.41
CONTINENTAL BREAKFAST 10/24	\$ 785.50
DINNER	\$ 1,769.38
LUNCH ON 10/24	\$ 1,013.37
AUDIO VISUAL	\$ 761.37
TOTALS	\$ 4,973.03

Comments from attendees after the Conference

Thanks again for hosting this terrific meeting. Sorry if this reply gets to you a little late, but here is some feedback on the meeting, which on the whole I found to be very helpful and informative.

Q: What was the best aspect of the meeting?

A: The best aspect of the meeting was getting to meet all the talented young researchers in laser science (as well as the talented veterans leading the meeting). Of perhaps more immediate relevance than just meeting all of these nice and interesting people who I'll share a field with for the next number of years, being exposed to the breadth of research topics funded in the NSF AMO Physics category was particularly enlightening. This experience will definitely inform my future attempts at justifying the merits of my own research program, in the context of many worthwhile efforts being funded.

Q: What should be changed for the next meeting?

A: So, of course, getting to meet with a current funding agent in an intimate setting like the NLSC would be a great opportunity, but given current circumstances, this seems untenable for meetings in the near future. It would be interesting to know the percentage NLSC participants that actually attended the FiO/LS conference, as some flexibility in the meeting's location may increase the likelihood of meeting with current program officers (ignoring historical ties to the FiO/LS conference, DLS support, etc.)

Q: How do you think this meeting will impact your career development?

A: I think that my main takeaway was the need to broaden the vision of my research statement, or at least tailor my message to a broader audience and justify the impact of my research program in a broader context. This seems to be the primary challenge in transitioning from grad school/postdoc-ing to a PI position, which one encounters time and time again.

Q: What are your thoughts on the presentation/discussion on funding from DARPA by Prof. Neifeld?

A: Prof. Neifeld gave an informative and candid presentation of the funding opportunities through DARPA, and on the value of making early contact with program managers and opening up a line for future dialog.

Q: What are your thoughts on the discussion on Being a Laser Scientist by Prof. Jones and Gauthier?

A: It's always great to get feedback from someone who has gone through the tenure process, especially an experimentalist in the field of optics/atomic physics, on advice for early career management. I especially appreciated your advice on having at least one major accomplishment that you should be recognized for in your field by the time your tenure clock winds down. Given the time it takes to build up a research program in some subfields, one needs to avoid the temptation of starting multiple research projects in unison.

Q: What are your thoughts on the effectiveness of the mock NSF proposal review, summary writing, and elevator pitch?

A: I thought that this portion of the program was extremely effective, even if (especially if) somewhat humbling. Every researcher is of course terribly interested in all the minor aspects of their subfield of physics. The challenge in obtaining support from a field of extremely talented researchers is not just to be the best equipped to address some interesting and difficult question, but to justify the broader impact of your research goals in general.

By the way, I really enjoyed the meeting and found it very instructive. Thanks very much for the time you devoted to it!

>What was the best aspect of the meeting?

I think meeting with my peer group was the best aspect of the meeting. In addition, thoughts on funding from former DARPA manager and Prof. Jones and Gauthier were very valuable.

Thank you very much for organizing such a great event!

>What should be changed for the next meeting?

I would make it less overlapping in time with FiO conference. Unfortunately, I have to miss a few talks from my session. It would probably be ideal to have it next day after the FiO or any other major optics conference (e.g., CLEO).

>What are your thoughts on the presentation/discussion on funding from DARPA by Prof. Neifeld?

It was useful to hear "insight view".

>What are your thoughts on the discussion on Being a Laser Scientist by Prof. Jones and Gauthier?

I really enjoyed the "cement and bricks" comparison J

>What are your thoughts on the effectiveness of the mock NSF proposal review, summary writing, and elevator pitch?

It was very helpful to hear the feedback on my research program.

What was the best aspect of the meeting?

Opportunity to meet peer group. For many of us, this was our first "national invited talk" as a PI . That opportunity alone is good reason to continue the meeting.

What should be changed for the next meeting?

I think the talk should be (b) ~30% elevator pitch (c) ~introducing your new lab on a national stage ; great way to start potential collaborations.

How do you think this meeting will impact your career development?

- I will be less disappointed in myself, when my next grant gets denied.

What are your thoughts on the presentation/discussion on funding from DARPA by Prof. Neifeld?

- OK. Really needed "a non-NSF grant" presentation, rather than one so DARPA specific.

What are your thoughts on the discussion on Being a Laser Scientist by Prof. Jones and Gauthier?

Very good overall

What are your thoughts on the effectiveness of the mock NSF proposal review, summary writing, and elevator pitch?

- I liked the summary writing idea. Suggest modifying pitch as above. 15 min allowed for people to get too technical for our broad audience.

What was the best aspect of the meeting?

A: The meeting is very focused to help young faculty with proposal writing, and it contains both experience sharing and a simulated environment of selling ideas and panel discussion. Since all the participants are within a very well-defined discipline, the meeting is much more focused and targeted than any proposal writing meetings held by any university.

What should be changed for the next meeting?

A: I like every aspects of this meeting. If possible, I wish the meeting could arrange more project managers from various funding agency to participate without violating the federal regulations.

How do you think this meeting will impact your career development?

A: It will positively impact my career development as it serves as a beacon to guide me towards to right direction. It also provided me an opportunity to meet potential collaborators, which is also an crucial part of my future career.

What are your thoughts on the presentation/discussion on funding from DARPA by Prof. Neifeld?

A: The discussion is very organized and well prepared. It provides a lot of helpful information. I wish the discussion can be longer with more details on how young faculty can get involved or be connected to DARPA projects.

What are your thoughts on the discussion on Being a Laser Scientist by Prof. Jones and Gauthier?

A: The discussion is very informative. The two professors shared a greatly amount of personal experience, which we could not learned else where. Many things happens to many people under similar scenario, so such panel discussion is very valuable.

What are your thoughts on the effectiveness of the mock NSF proposal review, summary writing, and elevator pitch?

A: This is my favorite part as we are provided with an opportunity to get some first-hand feedback on our research ideas and proposal strategy. It also give us some hint how the proposal are evaluated, which would significantly improve our writing skills as well.

Any other comments or suggestions?

A: As the project managers are not allowed to attend this meeting using federal funds, the meeting did not attract as many professionals from the funding agencies as compared to some previous meetings. However, it was noted that many project managers were present at the conference. Therefore, it would be extremely helpful if APS could provide one extra night stay for those project managers who are already attending FiO so they could share their thoughts in this meeting. The participants may not mind to make a small contribution registration fee to cover such cost if such arrangement of the funding agencies can be made.

What was the best aspect of the meeting?

I think the new section of group evaluations of others' work made this workshop very unique. It was also very informative to see how a group evaluates a proposal - which turned out to be very different from how I thought the proposal would be evaluated by a single reader. I think it is worth keeping. I also thought it was very important that you warned us that feedback would probably not feel great and that we weren't allowed to argue.

I also liked meeting my peers in the field and hearing about their biggest problems. It's always nice to find a new like-minded group of people to talk to!

What should be changed for the next meeting?

I think the talks could be shortened to 10 minutes with 5 minutes for questions after. I would also be interested in views from other funding agencies (if you can get them).

What are your thoughts on the presentation/discussion on funding from DARPA by Prof. Neifeld?

It was good to be reminded that agencies have their agendas, which are not just to hand out money to basic research, but rather find people to help them solve their problems. It also made me reconsider the fact that all research should be very clear about what problem it is trying to solve and why that problem is important.

What are your thoughts on the effectiveness of the mock NSF proposal review, summary writing, and elevator pitch?

... Having had to write the proposal, give the talk, and evaluate the proposals was a very effective technique for making the lesson of proposal writing memorable and tailored for each person. It is easy to be told a list of dos and don'ts, but experiencing proposal writing and getting more detailed feedback on a real attempt makes it obvious which pitfalls we each fall into.

Thank you very much for inviting me at the conference. The New Laser Scientist Conference is one of the best conferences that I have ever attended, and I have attended 4 Gordon conferences and other very selective small conferences.

In about 24 hrs, this conference taught me all aspects of NSF grant, informed me about an insider's view of DARPA grant, and got me connected to a very likely collaborator in future. This is one of the best programs that should be continued in future.

What was the best aspect of the meeting?

Very well organized with real helpful agenda that involved writing an actual NSF style project summary, 15 min pitch talk for the proposal, mock panel reviews, and informal interactions.

What should be changed for the next meeting?

Nothing.

How do you think this meeting will impact your career development?

One criticism that I got about my proposal summary was that there is no distinction from advisor's work and the mock panel sent it to the bottom of the list. This surprised me because I may be one of the very few new PIs whose research has absolutely no relation with any previous advisor's research. This opened my eyes and will change the way I write my grants.

What are your thoughts on the presentation/discussion on funding from DARPA by Prof. Neifeld?

It could not be better. He should be invited again.

What are your thoughts on the discussion on Being a Laser Scientist by Prof. Jones and Gauthier?

Dan should take part in the next meeting.

What are your thoughts on the effectiveness of the mock NSF proposal review, summary writing, and elevator pitch?

It must be continued. This was the best part if I must choose one.

What was the best aspect of the meeting?

Mock review, realizing how hard it is to judge others quickly and underlining the importance of writing clearly and convincing (anticipating reviewer's questions and making sure to answer them in the proposal).

What should be changed for the next meeting?

Would be nice with more work-life balance and also balancing work (but maybe I missed this the first day). Could shorten the elevator pitches to 10 min to allow for other activities.

Tricky with the overlap with the FiO conference. I would prefer it starting after the conference ends and going all day Friday.

How do you think this meeting will impact your career development?

Help with writing proposals.

What are your thoughts on the presentation/discussion on funding from DARPA by Prof. Neifeld?

Sorry I had to miss it. Appreciated the slides was sent out and helpful

What are your thoughts on the discussion on Being a Laser Scientist by Prof. Jones and Gauthier?

Sorry I had to miss it.

What are your thoughts on the effectiveness of the mock NSF proposal review, summary writing, and elevator pitch?

Good, as addressed above.

Thank you so much to organize the meeting. I found it helpful for me, as a new faculty.

What was the best aspect of the meeting?

meeting other young laser scientists. Practice on the elevator pitch and panel discussion

What should be changed for the next meeting?

The form of the elevator pitch is a little bit vague, as someone talked about pure proposed research, and some other people just present their previous work in the context of proposed work.....

How do you think this meeting will impact your career development?

High

What are your thoughts on the presentation/discussion on funding from DARPA by Prof. Neifeld?

Useful and a personal interaction would be even better

What are your thoughts on the discussion on Being a Laser Scientist by Prof. Jones and Gauthier?

very useful and I am grateful that you guys share your experience with us

What are your thoughts on the effectiveness of the mock NSF proposal review, summary writing, and elevator pitch?

the only thing I found it is weird is that the review is based on the elevator pitch, which is different from how a real proposal is reviewed, but I guess it definitely help us to form an elevator pitch for the PM.

Any other comments or suggestions?

an early notice of the conference would be better, so that it is easier to arrange flight and hotel.

Thank you for organizing this fantastic conference!

It was really great meeting with other colleagues at the early stage of out career.

I learned a lot from the mini panel review.

This review process allowed us to look at our proposals from a different perspective.

Some hidden strengths and weaknesses of our proposals became clear, which will certainly help our future proposals.