

**FY2018 JSA Initiatives Fund Proposal Summary Sheet**

**Proposal title**

Support for the 2018 Gordon Research conference on Photonuclear Reactions.

**Project Start Date** (month/year)

**Project End Date** (month/year) August 2018



New proposal



Renewal

**Total funds requested** \$4500

Total leveraged support / matching funds. Details of funds must be included in budget proposal. **\$39500**

**To be completed by JSA: Total funds awarded \$4,500**

**Principal Investigator (PI)**

Julie Roche

Institutional affiliation  
Mailing address  
Email / phone #

Ohio University  
Edwards Accelerator, 1 Ohio University  
Athens OH 45701-2979  
rochej@ohio.edu  
740-593-1982

Co-PI (if more than 1, add pages with information)

Nicole d'Hose and Huey-Wen Lin

Institutional affiliation  
Mailing address  
Email / phone #

See attached

**Check one category:** If PI is a Lab employee, your identification of the appropriate Associate Director below represents the acknowledgement of that AD with your submittal of proposal. No signature required.



Lab employee: Identify Associate Director (email / phone)



Lab user: Identify University affiliation email / phone)oint appointee identif University and ab division association email / phone)

Ohio University, rochej@ohio.edu, 740-5931982



Other: Identify Institutional affiliation (email / phone)

**proposal Attach file with**

(1) . xecutive summary and technical proposal

(2) Synopsis of scientific, educational, technical, and/or business merits, and alignment with and significance to Lab's current program

(3) Proposed evaluation plan to measure success. If this is a request for renewal of funds, assessment of prior year performance

. our proposal may include letters of endorsement and other supporting information (maximum of 12 pages including this summary sheet and budget sheet)

## Budget Proposal

**Proposal Title** Support for the 2018 Gordon Research conference on Photonuclear Reactions.

**Principal Investigator (PI)** Julie Roche

**Total funds requested** \$4500

**To be completed by JSA: Total funds awarded** **\$4,500**

	Item Description		Amount
<b>Equipment.</b> Lab users submitting proposals that include equipment to be used at the Lab must review with the appropriate Lab Associate Director. The provision of the name of the AD below represents the AD's acknowledgement. <b>No signature required.</b>			
	Associate Director: _____		
	_____		
	_____		
	Subtotal Equipment		0
<b>Travel Support.</b> Provide break-out of estimates for registration fees, lodging and transportation, catering, and facility charges (room rentals, AV equipment; etc.)			
	Partial Registration fees for 9 students (each \$500)		
	_____		
	_____		
	_____		
	Subtotal Travel		4500
<b>Supplies</b>			
	_____		
	_____		
	Subtotal Supplies		0
<b>Consultants/Subcontracts</b>			
	_____		
	_____		
	Subtotal Consultants/Subcontracts		0
<b>Other Expenses.</b> Examples include stipends and honoraria, prizes, awards.			
	_____		
	_____		
	Subtotal Other Expenses		0
	<b>Total Budget Proposal</b>		<b>4500</b>

**Budget Justification:** Include narrative to explain need for each line item in the budget, showing breakdown of calculations used to arrive at the amount in each line of the budget. Note that the JSA Initiatives Fund Program does not support salaries and salary-related expenses, or indirect expenses.

**Leveraged Support/Matching Funds information.** Identify the source, type and amount of dollar funds from each institution. Include **separately** estimated value of in-kind support. Your identification of the authorized representative who has committed institutional support for your proposal represents the acknowledgement of that individual. If support or funds are provided by the Lab, identify the associate director (or equivalent) as the authorized representative. Information may be included on separate page.

# Support for the 2018 Gordon Research conference on Photonuclear Reactions.

## Executive summary

Funds are requested to assist travel of young scientists to the Gordon Research Conference on *Photonuclear Reactions: From quarks to nuclei* to be held at the Holderness School in Holderness, NH, on August 5 - 10, 2018 (of which the PI is the Chair, and the Co-PI are vice-chairs). The young scientists supported will be graduate students and postdoc members of the Jefferson Lab community. Participation of women and minorities will be encouraged.

## Synopsis

The Photonuclear Reactions Gordon Research Conference (GRC) has a special place for the JLab community. It is focused on the physics program at Jefferson Lab and at related facilities worldwide. For many young JLab scientists, it is the first international meeting that they attend. The Gordon format, with shared meals and no after lunch sessions, promotes interactions between participants which in turn strengthen the JLab user community. The poster session and poster prize also are prime opportunities for young scientists to present and discuss their work, as well as obtaining recognition from the community. As a result of the special format, many of us have found this meeting to play a very significant role in our careers. We are requesting funds in order to support JLab's young scientists registration or travel to the conference.

## Narrative

The Gordon Research Conference (GRC) provide international forums for the presentation and discussion of cutting-edge research and has been view as the world's premier scientific meetings. There are about 900 GRC meetings a year, most of them focus on Chemistry and Biology, fields in which they enjoy great prestige. GRC meetings follow a specific format and receive seed funding, organizational and local support from the GRC organization. The Gordon Research Conference (GRC) on Photonuclear Reactions has been held every two years for over 5 decades. The meeting has played an important role in the nuclear physics community in several ways:

- The meeting has a unique format that encourages interaction between the participants. The shared meals and afternoons without sessions both allow and encourage interaction between the scientists attending. Those of us who have attended meetings electronically and in person know that electronic attendance discourages communication, rather than encouraging it. Much of the impact from a meeting comes from the interaction with other participants between sessions.

- The meeting is often the first major international meeting for young US-based scientists in the community. Thus it often provides them their first detailed knowledge of scientific programs at other labs worldwide that are similar to, though often differently focused than, the JLab scientific program.
- The meeting provides a broad view of the JLab and related physics programs. Most (international) workshops are more narrowly focused than the Gordon Photonuclear Conference. In contrast, American Physical Society Meetings are typically overflowing with a much wider program of multiple parallel sessions from nearly all aspects of subatomic physics, but much of the meetings consist or short very specialized talks that are often hard to learn from; the parallel session format also makes it difficult to attend sessions and interact extensively with anyone other than existing close colleagues. The Gordon Research Conference format stands precisely in the middle, offering young scientists a program overviewing the forefront of nuclear physics, and a wide, diverse, and interested audience for their talks and posters. To illustrate the broad coverage of the meeting, the broad attendance, and the influence of JLab physics and physicists on the meeting, we present the 2016 Photonuclear Reactions program at the end of this narrative. The 2018 program at this time is being developed. However, we anticipate that the main topics will be similar to the ones of the 2016 edition, with focus in the most recent updates and highlights in the field of hadronic and nuclear physics. They will be selected with the collaboration of a large scientific advisory committee, formed by outstanding physicists from both the American and European scientific community.
- The Gordon Research Conference policy that material presented cannot be quoted allows for a more free and open discussion than at other meetings.

We believe that the meeting has played an important role in driving forward theoretical and experimental work on electromagnetic reactions in nuclear physics by providing a forum for the presentation of new ideas and timely results. The Photonuclear Reactions GRC also typically has a large percentage of young scientists among its participants, who often forge bonds with others they will work with throughout much of their careers. Young scientists often are much focused on the details of their own work, and not broadly knowledgeable about the field as a whole. The wider overview of their field offered by the Gordon Conference has been a timely eye-opener for many. Finally, about 30% of participants are coming from overseas; among them in 2016, 13 young scientists travelled to the GRC for their first international conference. While none received JSA support, they got plenty of exposure to JLab physics in an atmosphere that favor accessibility. For all these reasons, we believe the Photonuclear Reaction Conference is particularly important to young members of the JLab community.

Despite the importance of the Gordon Photonuclear Conference in our view, we feel that the continued existence of this meeting is potentially threatened. This comes from the convergence of two trends:

- The GRC organization has been pushing for the number of participants at each of its meetings to be increased from roughly 100 in 2010 to now a lower limit of 120. In 2016, the Gordon Photonuclear reactions conference was attended by 124 persons but those participants did not review the conference as well as usual. As a result, the conference was placed in probation by the GRC organization. One reason was that the number of speakers had increased while the duration of the conference itself was kept within the rigid prescription of the GRC organization. As a result, both listeners and speakers felt rushed. We were advised to reduce the number of speakers and schedule more time for discussion after each talk. While we plan to do so, this could potentially decrease the number of speakers and in turn of attendees.
- The federal financial support for science in general and nuclear physics in particular is likely to see a significant decrease in the next two years. Thus, the ability of research groups to send people to Photonuclear Reactions will be more limited than in the past. Such a situation is likely to disfavor going to meetings as a non-speaking participant, a role that is very important at the Gordon conference.

The competing pull and push of these trends can be alleviated by supporting the registration of non-speaking participants. In that sense, the continued support of JSA used toward the registration of young scientists is essential.

It would be a terrible pity for our community to lose the unique conference format fostered by the GRC organization. Indeed the positive comments from the ongoing Gordon Research Conference evaluations clearly show that the conference has been successful in achieving its goals. In past years, participants wrote “This is always a great opportunity to see new unpublished data and hear new ideas.” Others mentioned the “great networking opportunities”, and called the conference “very stimulating, even inspiring”. The Photonuclear Reactions GRC is a great venue for the interaction of young scientists with senior researchers. One wrote “The quality of the speakers was beyond doubt, stellar. As a first-time attendee and postdoc researcher, I was surprised at the friendly atmosphere and discussions of “leading edge” research. I can honestly say “best conference ever”. Beyond my expectations. I look forward to attending again.” Others wrote “The interactions between younger and more experienced researchers were fantastic!” and “very educational discussions that will be very helpful for my future career.” Many participants recognize the “friendly, informal atmosphere” and the large number of graduate students present. Thus, we believe that the Gordon Photonuclear Reactions Conference is a meeting that is particularly deserving of JSA Initiatives Fund support.

## 2016 Photonuclear Reactions program

### Sunday Evening: **Photonuclear Physics in the Spotlight**

Discussion Leader: K. Hafidi (Argonne National Laboratory, USA)

- G. Greene (U. of Tennessee, USA) "Weak Interaction Studies with Cold Neutrons"
- D. Tapia Takaki (U. of Kansas, USA) "The Most Energetic Photon Source Ever Built"
- K. Hicks (Ohio U., USA) "Pentaquarks and Other Exotics from LHCb to Jlab"
- B. Jacak (LBNL, USA) "Quark-Gluon Matter: Big and Small"

### Monday morning: **Hadron Spectrum and QCD**

Discussion Leader: M. Shepherd (Indiana University, USA)

- R. Briceno (Jefferson Laboratory, USA) "Hadron Spectrum from Lattice QCD"
- G. Eichmann (U. of Giessen, Germany) "Baryon Spectroscopy in the Dyson-Schwinger Approach"
- L. Tiator (U. of Mainz, Germany) "News on MAID"
- A. Filippi (INFN, Italy) "Hadron Spectroscopy at CLAS in Conjunction with JPAC"
- J. Hartmann (U. of Bonn, Germany) "Recent Developments in Baryon Spectroscopy"
- J. Stevens (JLab) "Meson and Baryon Spectroscopy in Photonuclear Reactions at GlueX"

### Monday Evening: **Nucleon Spin Structure**

Discussion Leader: S. Kuhn (Old Dominion U., USA)

- Z.-E. Meziani (Temple U., USA) "Double Spin Asymmetries at Jlab"
- K. Kurek (National Centre for Nuclear Research, Poland) "Polarized Gluons and More from COMPASS"
- R. Fatemi (U. of Kentucky, USA) "Sea Quark and Gluon Polarization from RHIC"
- N. Sato (Jefferson Laboratory) "New Developments in Polarized PDFs and Beyond"

### Tuesday Morning: **Long Range Hadron Structure**

Discussion Leader: B. Krusche (U. of Basel, Switzerland)

- G. Colangelo (U. of Bern, Switzerland) "Pion Transition FF and Light-Light Scattering"
- M. Mihovilovic (J. Gutenberg U. of Mainz, Germany / Jozef Stefan Institute, Slovenia) "New Form Factor Measurements at A1-MAMI"
- J. Friedrich (T.U. of Munich, Germany) "Measurement of the Charged-Pion Polarizability at COMPASS"
- K. Griffioen (College of William and Mary, USA) "Are Electron Scattering Data Consistent with a Small Proton Radius?"
- C. Collicott (George Washington U.) "The Nucleon Polarizability Program at A2-MAMI"
- E. Long (U. of New Hampshire) "g<sub>2p</sub> at Low Q<sup>2</sup> and VVCS Generalized Polarizabilities"

### Tuesday Evening: **New Theory Developments in QCD and Hadron Structure**

Discussion Leader: J. Qiu (Brookhaven National Laboratory, USA)

- B. Xiao (Central China Normal U., China) "Small-x Physics and Electron-Ion Colliders"
- D. Neill (MIT, USA) "TMD Factorization"
- P. Nadolsky (Southern Methodist U., USA) "PDFs for Hadronic Structure Studies"

- H-W Lin (Michigan State U., USA) "Nucleon Structure from Lattice QCD"

### Wednesday Morning: **Parton Structure of Nucleons and Nuclei**

Discussion Leader: A. Bacchetta (U. of Pavia, Italy)

- T. Rogers (Old Dominion U., USA) "Phenomenology of TMDs and Their Evolution"
- K. Allada (MIT, USA) "Semi-Inclusive DIS at JLab and Beyond"
- C. Aidala (U. of Michigan, USA) "SeaQuest: Probing Protons and Nuclei with Dileptons"
- N. D'Hose (CERN, Switzerland) "Exclusive Reactions at High Momentum Transfer: An Experimental Point of View"
- G. Karyan (DESY, Germany) "Fragmentation Function Measurements: Present and Future"
- W. Brooks (U.T. Federico Santa María, Chile) "Partons in and Through the Nuclear Medium"

### Wednesday Evening: **Standard Model and New Physics with Photon-Induced and Electroweak Processes**

Discussion Leader: Susan Gardner (U. of Kentucky, USA)

- K. Kumar (Stony Brook U., USA) "BSM Physics with Electron Scattering Experiments from JLab to the EIC"
- R. Parenduyan (U. of New Hampshire, USA) "Dark Matter Searches at HPS"
- B. Filippone (Caltech, USA) "Electric Dipole Moment Experiments"
- T. Bhattacharya (LANL) "Lattice QCD, the Neutron EDM, and New Physics Constraints"

### Thursday Morning: **Few and Many Nucleon Systems**

Discussion Leader: Sonia Bacca (TRIUMF, Canada)

- F. Hagelstein (J. Gutenberg-U. Mainz, Germany) "Exciting Proton in Muonic Hydrogen" **(GRADUATE STUDENT POSTER PRIZE WINNER)**
- A.I Schmidt (MIT, USA) "The Olympus Experiment" **(GRADUATE STUDENT POSTER PRIZE WINNER)**
- K. Paschke (U. of Virginia) "Neutron Skin Experiments"
- G. Hagen (Oak Ridge National Laboratory) "Neutron Skin Theory"
- T. Neff (GSI Helmholtz Centre for Heavy Ion Research, Germany) "Short Range Correlations in Nuclear Theory Calculations"
- O. Hen (MIT, USA) "Surprises and Perspectives in Nuclear Short Range Correlation Experiments"

### Thursday Evening: **Hadronic and Nuclear Physics at Future Facilities**

Discussion Leader: Frank Ewald Maas (GSI Helmholtz Centre for Heavy Ion Research, Germany)

- S. Baunack (Johannes Gutenberg U. of Mainz, Germany) "Low-Energy Accelerators for High Precision Measurements"
- R. Lednicky (Joint Institute for Nuclear Research, Russia) "The NICA Project"
- T. Hemmick (Stony Brook U) "Hadronic and Nuclear Physics at the Electron-Ion Collider"

### **Budget Justification:**

We request \$4,500 to aid in the transport and registration costs of participants to the meeting. This should be enough to provide “matching” funds to 9 graduate students or postdocs. The registration fees for the conference is not yet completely confirmed but it is expected to be \$900/participant. This fees includes lodging and boarding for 5 days as well as registration fees or \$180 per days. The goal of the support is to encourage young scientists to attend the meeting. Our experience since 2012 is that for most of the potential attendees, funding at the level of \$500/person was enough to make going to the conference inexpensive enough that the advisors / employers of the young scientists were willing to cover the remaining expenses.

### **Leveraged Support/ Matching Funds Information:**

When renewing the conference, the GRC organization provided us with \$27,000. In order to replicate the level of support given to the 2016 participants, we are hoping to raise about \$17,000 from other sources. So far we were able to secure support from Bob McKeown (\$4,500, matching this request), Ohio University (\$6,000) and Michigan State University (\$2,000).

### **Proposed evaluation plan to measure success:**

Every participants to any GRC is asked to fill an evaluation survey during the Thursday evening session. Evaluation criteria are “science, discussion, management, atmosphere and suitability”. The size and diverse make-up of the participants pool are also considered. The GRC organization uses a comprehensive analysis of these surveys to decide on the renewal of the conference series. The result of the analysis as well as the renewal decision is communicated to the present and future chairpersons. The overall renewal of the conference by GRC is the ultimate measure of success.

## **Co-PI information**

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FY2016 JSA Initiatives Fund Program

# Support for the 2016 Gordon Research Conference on Photonuclear Reactions – *Report* –

*Dr. Alberto Accardi, PI*

*Dr. Julie Roche, co-PI*



Photonuclear Reactions  
Gordon Research Conference  
August 7-12, 2016  
Holderness School, Holderness, NH  
Chair: Alberto Accardi  
Vice Chairs: Julie Roche & Barbara Pasquini

# **Support for the 2016 Gordon Research Conference on Photonuclear Reactions**

**Holderness School, Holderness, NH**  
**August 7–11, 2016**

## **Introduction**

Gordon Research Conferences are recognized as world premier scientific meetings. The Photonuclear Gordon Research Conference has been held biennially since 1959. Beyond providing a preeminent meeting place for discussing the study of hadronic and nuclear physics with electromagnetic probes, it also exposes the participants to physics beyond these confines. Because of its specific format, this conference also provides excellent networking opportunities for younger scientists. Thanks to the fund provided by JSA and the matching funds from JLab, 19 young scientist working on JLab physics received support to defray their registration cost, and enjoyed a very successful conference.

## **Conference overview**

For over 75 years, Gordon Research Conferences (GRCs) have been recognized as the world's premier scientific conferences, where leading investigators from around the globe discuss their latest work and future challenges in a uniquely informal and interactive format. Participation from students and junior researchers is particularly encouraged.

The Photonuclear Reactions GRC is a forum for the presentation and discussion of the most recent and exciting results in a wide range of subatomic physics topics. Since 1959, this GRC has been a preeminent meeting for the discussion of new ideas and results, even at the preliminary stage, providing ample and unique opportunities for young scientists and leading researchers to interact in the most scientifically stimulating environment. Senior researchers and younger colleagues are housed on campus at the Holderness School, and can meet in an informal, yet rigorous atmosphere. Having left ample time for discussions, and having “discussion leaders” to organize these, the scientific exchanges have been engaging and rewarding. Formal discussions have been complemented by many private exchanges during the afternoon free time, both on campus and off.

The conference was structured around invited morning and evening talks, and a late afternoon poster session. The afternoons are left on purpose free to promote discussions, exchange of new ideas, and connections among colleagues, while enjoying the many outdoor activities offered by the area. Topics for the 2016 conference were: Hadron spectrum and QCD; Long range hadron structure; Nucleon spin structure; Parton structure of nucleons and nuclei; Few and many nucleon systems; Standard model and new physics with photon-induced and electroweak processes; Neutrino Physics; New results in QCD theory; Future facilities and directions. The plenary program consisted of nine sessions on: Highlights in Photonuclear Physics, Hadron spectrum and QCD; Long range hadron structure; Nucleon spin structure; Parton structure of nucleons and nuclei; Few and many nucleon systems; Standard model and new physics with photon-induced and electroweak processes; Neutrino Physics; New results in QCD theory; Future facilities and directions.

## Outcome

The conference has been by many metrics a success. It was attended by 124 participants, one of the highest turnouts in recent years, and received very positive evaluations, both in the official survey and in many private communications. About 30% of the participants listed country of origin outside the United States. We also had a good participation by female scientists, who comprised about 25% of both speakers and attendees.

The meeting was attended by 73 graduate students and postdocs, who have been the backbone of a successful poster session, and contributed to a lively atmosphere during the plenary sessions. We were pleased to see that the conference attracted both students from the US (many of whom have been supported through this JSA grant) and from Europe (a graduate student from Korea, who was accepted and eager to come, could not however participate due to VISA problems). In total, 54 participants presented posters most of them being young scientists. Thirteen young scientists traveled to the Photonuclear Reactions GRC for their first international meeting, though none of them received JSA/JLab funding, they got plenty of exposure to the JLab physics and community.

## Leveraged support and matching resources

The total budget for the conference was \$40,000 with \$26,000 provided by the Gordon Research Conference organization, \$8,500 by a combination of JSA and JLab support, plus smaller contribution from Ohio U., Stony Brook U., MIT and Nature. In that sense the JLab and JSA funds represented a substantial part of our budget and were instrumental reaching the target attendance of 110 persons.

## Use of JSA funds

The awarded JSA funds, totaling \$4250, were entirely spent to support participation of young scientist from the Jefferson Lab users community. In detail, we awarded registration discounts to the following 10 graduate students (9 more were supported through JLab matching support):

<b>Name</b>	<b>Institution</b>	<b>Role</b>	<b>Amount</b>
Bane Jason	U. of Tennessee	poster presenter	\$500
Biswas Debaditya	Hampton U.	poster presenter	\$450
Chetry, Taya	Ohio U.	poster presenter	\$450
Craycraft, Kayla	U. of Tennessee at Kno	poster presenter	\$500
Dlamini Mongi	Ohio U.	poster presenter	\$450
Gautam, Thir Narayan	Hampton U.	poster presenter	\$450
Gleason, Colin	U. of South Carolina	poster presenter	\$450
Guerrero, Juan	Hampton U.	poster presenter	\$100
Hague, Tyler	Kent U.	poster presenter	\$450
Kamel, Mahmoud	Florida International U.	poster presenter	\$450
<b>Total awarded JSA support</b>			<b>\$4,250</b>