Sample 1

Sample Faculty Development Plan

Scholarship

My primary scholarship contribution is to establish an underwater (UW) acoustics research group at BYU. This group consists of two complementary parts focusing on computational and experimental research. The computational group specializes in applying machine and deep learning algorithms to UW acoustics problems and evaluating parameter sensitivity of ocean acoustics propagation models. The experimental group will construct an underwater acoustics measurement tank, provide a validation testbed for the computational work, and explore other aspects related to UW acoustic propagation.

The choice to pursue UW acoustics is a practical one. First, I have experience with UW computational research from my graduate and post-doctoral research. My colleagues from this time have supported my re-entry into this field both with collaborations, participation in workshops, and help in obtaining external funding. Second, UW acoustics is a field with plentiful post-graduate opportunities for students in ocean acoustics graduate programs, national laboratories, and naval research centers. The students will gain skills in computation or experimentation, signal processing, and data analysis that will prepare them for these opportunities.

I strive to do excellent scholarship because I desire to be a good mentor and provide great opportunities for the students. Personally, I enjoy doing research and continually learning new things, but my passion is to share the adventure of research with students. I wholeheartedly support Pres. Worthen's quest for inspiring learning and feel mentored research provides an ideal setting for inspiring learning to occur. To provide students with high-quality opportunities in research, I will vigorously pursue external funding to make sure my research directions are sound and that I can support graduate students, who in turn will help mentor the undergraduates. I will strive to have each diligent student present their research at a national meeting and to publish at least a proceedings papers on their research. I will also encourage my students to network with other professionals in the field and to develop skills necessary to succeed.

Computational underwater acoustics

Computational UW is my main area of expertise. This work is moving forward on multiple fronts: evaluation of parameter sensitivity of UW acoustics propagation models, using machine learning for source localization and environmental classification, and comparisons with traditional inverse approaches to these problems. These inter-related research areas will position my group to contribute to computational UW acoustics research.

1. Evaluate the sloppiness of underwater acoustics propagation models

Most underwater acoustics research depends on forward models for UW acoustic propagation. These models incorporate well understood physics that depend on different parameterizations of the ocean. Questions loom as to the appropriate parameterization when using the forward models in optimization algorithms to characterize a sound source or ocean environment. Additional questions revolve around selecting the type of input data that has sufficient information content to obtain reliable estimates of the parameters. The uncertainty associated with these estimates must also be established.

I am interested in performing a systematic investigation to address the questions regarding appropriate parameterization, data type selection, and uncertainty estimation. This is part of a

project I have funded from the Office of Naval Research and I have asked Mark Transtrum to collaborate with me on this project. Several methodologies will be employed, including the Fisher information and Bayesian probability distribution, which both tie directly to my post-graduate work in this area. The first model to be studied is called ORCA, which is a range-independent model based on the normal modes of the ocean waveguide. Subsequently, the range-dependent model, PE-RAM, which is used in naval applications, will be investigated. This work will result in significant basic research advances in understanding how model parameterization and input data type affect results of optimizations for source environmental parameters.

2. Apply Machine and deep learning to underwater acoustics

Modern machine and deep learning (ML) are just beginning to be applied in UW acoustics. While many are skeptical of what they view as a black box approach to inverse problems, powerful ML algorithms have been developed that have great potential for revolutionizing the manner in which acoustical data is used to assess the ocean environment and find and characterize acoustic sources of interest. My group wants to discover robust ways in which ML algorithms can be used to train reliable networks for simultaneous source and ocean environment characterization.

We recently completed a Phase I SBIR in which a concrete foundation for this research was established. Several algorithms have been investigated simultaneously for two primary types of input data. Support vector machines, random forests, a feedforward neural network, and a convolutional neural network have been applied to synthetic, pressure time series for explosive sources. The convolutional neural network has also been tested using synthetic, complex spectrograms from moving surface ship as input. The one graduate and several undergraduate students working with me on this have all made significant progress.

Application of ML algorithms in ocean acoustics is a natural place for my research group to contribute. First, few papers have been written in this area, so the opportunity exists to publish and contribute significantly to this new field of research. Second, many students want experience with ML and by participating in this research will be prepared for the future opportunities in graduate school and the careers.

To evaluate the effectiveness of the ML algorithms, my group needs to 1) be fluent in traditional inversion techniques and 2) have access to measured data. Both of these efforts will rely on collaboration with colleagues in the UW acoustics community. Specifically, we need to write and maintain several traditional algorithms, including beamforming, matched-field processing, and Bayesian optimizations, for comparison. A strong collaboration with [redacted] (Knobles Scientific and Analysis, LLC) and [redacted] (University of Delaware), will provide my group access to data measured in the ocean. These data will provide the crucial testing for the ML algorithms. In addition, the UW acoustic measurement tank, described below, will provide data for implementation and testing of the ML algorithms.

Resources:

The UW acoustics computational research groups is supported by the new physics department cluster. A portion of my start-up funds ($50k) went to developing the new cluster. The department CSR, [redacted], and his students have done a great job getting the cluster running and providing a platform that supports virtual machines. The computational UW acoustics, Linux-based, virtual machine (called Neptune) and is a great resource for running the machine learning algorithms and UW acoustics propagation models. I used additional startup fund to purchase a GPU for Neptune and will likely purchase two more GPUs to allow multiple students to run large jobs simultaneously. In addition, the new, Window-based, virtual machine [redacted] has been created, which is where I generate the synthetic training data with MATLAB.

I am extremely grateful for the students who are helping me begin the computational UW research group. In particular, [redacted], as my first graduate student, has worked hard to build a strong foundation for this work.

Challenges:

The largest challenge in establishing my UW acoustic computation group is that prior to May 2018, I had not worked in this area of acoustics for 12 years. Thus, significant work is required to remember what I once knew and catch up on the literature and new advances in the field. In addition, I have to learn about machine and deep learning, such that I can understand and then implement state-of-the-art algorithms.

Short-term goals

1. Investigate sloppiness of the range-dependent model, ORCA
    - Use Fisher information matrix for optimal experimental design
    - Investigate the information content of environmental parameterization for different types of input data: transmission loss, waveforms, spectrogram, and arrays
2. Apply machine and deep learning algorithms to pressure time series and spectrograms.
    - Feedforward neural net, convolutional neural networks, support vector machines, and random forest using time series on a single receiver.
    - Develop capacity to generate synthetic training data
    - Expand networks to learn from vertical and horizontal line arrays
    - Apply trained networks to measured data.

Milestones

Summer 2018:

1. Submit SBIR Phase I proposal for machine learning for environmental assessment

Fall 2018:

1. ASA talk and POMA on Fisher Information for transmission loss

Spring 2019:

1. ASA talk and POMA on FNN for SUS waveforms with [redacted]
2. ASA talk and POMA on CNN using SUS waveforms (synthetic, four seabeds, 20 SSPs) with [redacted]
3. Submit white papers for 6.1 Basic research funding to ONR: Ocean Acoustics (June)

Summer 2019:

1. JASA article about CNN with noise applied to measured IVAR data with [redacted] and [redacted]

Fall 2019:

1. ASA talk and JASA paper on CNNs applied to the IVAR data ([redacted])
2. ASA talk on CNN with noise on waveforms ([redacted])
3. ASA talk on CNN and JASA paper for spectrograms ([redacted])
4. ASA talk and POMA or JASA article on SVM and RF ([redacted])
5. ASA talk and POMA or JASA article on learned dictionary for SSP ([redacted])
6. ASA talk on CNN for VLA or HLA ([redacted])
7. Submit white paper for 6.1 Basic research funding to ONR: Undersea Signal Processing

Winter 2020:

1. ASA talk and JASA paper on what CNN is learning
2. JASA paper on CNN for VLA or HLA ([redacted])

Spring 2020:

1. ASA talk and JASA paper on CNN+LSTM ([redacted])
2. etc...

Experimental Underwater Acoustics

My experimental underwater acoustics group will support the computational work by providing a testbed in which the ML algorithms can be validated. Progress on developing and testing ML algorithms for predicting source location, trajectory, and source strength and ocean environmental parameters will be enhanced by quantifying how they perform in a real measurement environment. Methods for refining ML algorithms with *in situ* acoustic sensing will be evaluated and a plan for implementation on naval platforms will be developed.

The heart of this group will be the underwater acoustics measurement tank being constructed in the Hydroacoustics lab, U117 ESC. This laboratory tank will provide a testbed to evaluate the robustness of ML algorithms in the face of environmental variability. The tank dimensions will be approximately 2.5 m long, 1 m wide, and 1 m deep. Ultrasonic sources and receivers will be positioned by robotic arms to allow for source motion and synthetic aperture arrays. An advanced filtration system will provide flexibility in modifying the tank environment.

The tank will be used to test the impact of environmental variability on the ML algorithms. For example, various sediments and 3d printed surfaces can be placed on the bottom of the tank. Sound speed variations in the water will be created in the tank using multiple approaches including a salinity-based approach and a random-faced acoustics lens. These features will facilitate a detailed investigation of errors caused by a mismatch between the data used to train ML algorithms and those likely to be found when the system is deployed. This approach will improve understanding of the generalization errors due to training ML algorithms on synthetic data. Ways to modify the training data to reduce generalization errors will be developed: methods for incorporating environmental variability into synthetic training datasets will be gained, and the best practices for adding *in situ* acoustic sensing will be identified.

Resources

The construction of the UW acoustic measurement tank is a costly endeavor. The generous start-up funds supplied by the Department and the College will be supplemented with a DURIP grant from the Office of Naval research that is currently being processed. These funds will allow for the construction of the tank, the purchase and integration of two robotic arms, the filtration system, a data acquisition system, and multiple ultrasonic transponders and hydrophones. The funds will also allow me to employ a LabView specialist to integrate the motion and the data acquisition systems.

The department has provided several additional resources, for which I am grateful. To help me in this endeavor, a portion of [redacted] time has been allocated for this project. He has a wealth of practical knowledge about laboratory systems that will help ensure that wise decisions are made. [redacted] has agreed to consult with me on this project since his dissertation work involved measurements in an UW acoustics measurement tank and he has ideas for future experiments in the tank. In addition, [redacted] is allowing me to use his Acoustic Field Recorder LabView software as a beginning platform for making acoustical measurements. Finally, I am grateful that [redacted] is going to be the first graduate student to work on the tank and be involved in the construction, validation, and first experiments.

Challenges

The experimental side of the research is very challenging for me. I have never made acoustical measurements underwater or at ultrasonic frequencies. I want to make wise decisions when purchasing expensive equipment but feel hampered by my lack of experience. I will rely on the experience of [redacted] and a study of literature about similar tanks to help make these decisions. I need to find someone to help develop the Lab-view software for my measurement

chain. On top of these concern, I am sure there are many unknown difficulties that will be encountered.

Short-term goals

1. Purchase needed equipment
2. Assemble the UW measurement tank, the robotic positioning arms, the filtration system, and the data acquisition system.
3. Calibrate positioning system
4. Integrate motion and data acquisition
5. Make initial measurements for comparison with machine learning

Milestones

Summer 2018:

1. Draft a complete plan for the tank including bids for equipment
2. Submit DURIP proposal for extra funds for tank

Fall 2018:

1. Observe measurements in the Great Salt Lake

Winter 2019:

1. Submit white paper to Task Force Ocean for graduate student funding for using tank as ML validation testbed (not granted)
2. Identify first undergrad students ([redacted]) and graduate student ([redacted]).
3. Purchase first hydrophones, power amp, preamp. Practice using AFR with current data acquisition system

Spring/Summer 2019:

1. Submit planning letters to ONR Ocean Acoustics basic research (May)
2. Get quotes and order tank and other equipment.
3. Set up tank and DAQ

Fall 2019:

1. Calibrate and validate measurement and positioning techniques
2. Take measurements to evaluate generalization errors for a CNN algorithm

Winter 2020:

1. ASA talk on using tank to test CNN ([redacted])

Teaching

My teaching philosophy dovetails nicely with Pres.Worthen's desire for inspiring learning. I thoroughly enjoy getting to know the students, helping them learn, and sharing in their moments of discovery. I am grateful to be teaching at BYU where I can interweave teaching with my love of the Savior and dependence on His mercy and the guidance of the Holy Ghost. I see each student as a child of God with great potential and strive to help each one feel that the Lord loves and is mindful of them as an individual. I set high expectations and work to ensure the students have the resources needed to achieve them. I try to encourage them and help them see the benefits of struggling to learn. I am grateful for the opportunity to be a teacher at BYU.

Classes

My classes provide the opportunity to interact with a large number of students. I strive to design courses that encourage curiosity and promote active learning. Class discussions are preferable to lectures and pre-class engagement with the material significantly improves the learning environment. High expectations are set at the beginning of the course and complemented by reminders that the students have chosen to be here to learn and strategies to

help them succeed. I strive to find ways to share my testimony with them and create an atmosphere for inspiring learning to occur.

I have three classes for the coming 2018-2019 school year: Physics 167, which I have taught more than a dozen times; Physics 416, which I have taught three times; and Physics 330, which will be a new prep. I have already spent a significant amount of time developing Physics 167 and 416, but have a few additional ideas for improvement, listed below.

Mentoring

The undergraduate and graduate students in my research group are important to me, and I want to be a good mentor for each one. I strive to set high expectations with a goal that each diligent student will present at a national meeting and co-author a paper, usually a proceedings paper for undergrads. I try to encourage independent thinking and allow students room to explore ideas. For low-performing students, I need to help them find their strengths and allow them to be done with research early and take a C on the senior thesis, so that I can focus more attention on those who wish to excel.

Strategies for improvement

I will strive to continue to become a better teacher and mentor. I have a goal to read one book on teaching, learning, mentoring and leadership each year and participate in department group discussions on these topics. During Winter 2019, I participated in discussions of the book "Leadership and Self-Deception," which provided several insights into ways I can be a more effective mentor. Spring/Summer 2019, I am joining other faculty in reading and discussing the book "Lift."

I have planned one concrete thing to do this year to improve each of my courses. For Physics 167, I will incorporate into Learning Suite grading rubrics for the two writing assignments, with help of the Center for Teaching and Learning. For Physics 416, I will familiarize myself more with the GE requirements and, in response to student feedback last semester, modify the last assignment in the class to be more useful. As I will be teaching Physics 330 for the first time, Fall 2019, I will use the current materials. In the future, however, I would like to investigate how decision-based learning could be employed to improve this course. The advantages of decision-based learning are currently being evaluated by the Center for Teaching and Learning.

Citizenship

Citizenship includes both collaborating with colleagues and providing service to the department, university, and professional community.

Enhancing Collaborations

Scientific research is generally more efficacious when pursued in collaboration. At BYU, in addition to collaborations with my students, I am currently collaborating with [redacted] on exploring the underwater acoustics propagation models. I recently had a phone call with [redacted], an incoming faculty member, about the possibility of collaborating on a computational side to his research. I am starting a writing group with three faculty who have just completed their first year at BYU: [redacted] (physics), [redacted] (School of Technology), and [redacted] (Chemistry). I also invited [redacted] (Electrical and Computer Engineering) to join us when she returns from her fellowship at the Air Force Research Laboratories in August. The plan is for us to meet weekly and briefly share our writing goals for the coming week. We will then discuss writing strategies and/or provide comments on a general section of one person's writing, such as a motivation or broader impacts

section. [redacted] and [redacted] are both the only women faculty members in their respective departments, so I am hopeful this group will provide them with a safe space to discuss any concerns and to receive encouragement.

Collaborations within the larger scientific community are also important. I am currently collaborating with [redacted] (at KSA, LLC) and [redacted] (at The University of Delaware) on the computational underwater acoustics. We are working on a three-year grant from the Office of Naval Research that will combine all the aspects of the work described above, including the work of [redacted]. I am submitting white papers to ONR that will strengthen these collaborations and start a new collaboration with YT Lin (at Woods Hole Oceanographic Institute). I am also working with [redacted] (at George Mason University), [redacted] (at Darmouth University), and [redacted] (University of Rhode Island) on a white paper for designing and implementing curriculum that will improve navy-relevant skills. I thorough enjoy these collaborations and need to be careful to not get involved in too many, especially those that are not related to my core areas in underwater acoustics.

Department

I currently have only one official assignment for the department. I am the chair of the Alumni relations committee. In the past, this committee has provided a homecoming dinner for alumni, but not much else. I am investigating ways to better connect with the alumni, including an improved alumni webpage and better use of the department's Facebook group.

For several years, I have been a *de facto* leader of an unofficial Women in Physics and Astronomy group. Not wanting to detract from the Society of Physics Student activities, my efforts have thus far been primarily confined to an end-of-semester brunch for the women students twice a year. Fall 2017, however, we (myself and the other women faculty) carried out a larger event. Fall 2018, the college did an activity, which we did not want to compete with. As time goes on, we will decide what is beneficial for the students.

With regards to building collegiality in the department (a required topic from the faculty development spring seminar), I will try to participate in regular discussions with other faculty about ways to improve teaching, mentoring, productivity, and leadership. Winter 2018, I participated in discussions about the book "Leadership and Self-deception." At the end of the four discussions, those of us who attended, particularly those who are new faculty members, brainstormed some other topics that it would be nice to discuss. I was going to propose weekly summer meetings to discuss them, but [redacted] asked me to postpone those discussions because he and [redacted] wanted to read and discuss the book "Lift." I have been reading that book and participating as the summer schedule allows. Fall semester I will likely initiate group discussions on the other topics of interest to new and not-so-new faculty. Such meeting can do much to foster awareness of what others in the department have done, provide a forum to constructively discuss challenges, and overall increase understanding.

University

I am not assigned to any university committee but offered service at the Annual University Conference, Fall 2018. I led a breakout session on inclusion and diversity at the college meeting, which was deemed "the least confrontational on that topic" the attendees had ever attended. The next day, I was invited to the BYU Computer Science Department retreat to discuss concerns of women students and how to handle them. We had a wonderful hour-long discussion, and I think everyone left with a concrete idea of something they could do to improve the atmosphere of their classes and provide encouragement to all their students.

Professional

I have significant opportunities to serve in the Acoustical Society of America. I am currently the Women in Acoustics Committee Chair and a member of the Public Relations Committee. I am an associate editor for the Journal of the Acoustical Society of America Express Letters in the category of Noise.

In addition, I serve the larger professional community by reviewing several journal articles each year. I will look for opportunities to also become a reviewer for grants.

Sample 2

SAMPLE

Faculty Development Plan

Department of Physics and Astronomy

Overview: As outlined by the Faculty Center and University Rank & Status Policy document, the faculty development plan serves as a roadmap for a new faculty member's progress in the areas of teaching, scholarship and citizenship. I discuss these three areas in detail below.

I. Teaching

Self-Assessment: Thanks to the substantial teaching experience I gained before accepting my current position, I feel well prepared to fulfill my teaching duties at BYU. I believe that one of my most important strengths as a teacher is the ability to feel and communicate my authentic desire for the well-being of the students, fueling a commitment on my part to help them find success in my class and in their lives more generally. From the student evaluations I have received at BYU and elsewhere, the students notice and appreciate this about me. In the coming years, I would like to improve my effectiveness in both introductory-level and upper-level by using appropriate evidence-based teaching strategies. I feel there is much I learn about such strategies to develop my capacities as a teacher further.

Goals and Plans:

A. Study and implement evidence-based teaching strategies by consulting online resources (physport.org, compadre.org, etc), physics education research literature, and the many excellent teachers in our own department. I will implement these strategies incrementally so as not to risk interfering too much with my current teaching style, which students have evaluated to be quite effective already.
B. Find ways to achieve the "spiritually strengthening" aim of a BYU education in my own courses in a way that feels natural and comfortable to me and the students. I will work on this by pondering and praying, consulting with other faculty members about their approaches, and discussing with students when appropriate.
C. Make a more conscious effort to help students recognize the importance of physics in their everyday lives and their chosen career paths. I will do this by first learning more about my students and their ambitions and then finding ways to connect the subject matter to their interests/ambitions. I will also consider creating assignments for my courses that help them explore these connections in greater detail.
D. Avoid the tendency to become cynical toward my teaching responsibilities or consider them to be distractions from my "more important" work of research. I will do this by developing meaningful relationships with as many as my students as possible and ensuring that they know I care about them as individuals and sincerely desire their well-being. I hope that some of my most important teaching happens outside of my lectures.

Relationship to Department/University Goals: I feel that these goals reflect and contribute to BYU's emphasis on providing a top-rate education bathed in the light of the Gospel. They demonstrate my commitment to continually improving as a teacher, and the engagement with PER (physics education research) and active learning techniques is consistent in many ways with recent changes to the church curriculum.

Resources Needed: The most important resources for achieving my teaching goals will be the willingness of colleagues in the department to share their thoughts and experiences with me. I have already found that this is the case within the department. Other resources such as course management software, iClickers, and demonstrations are also readily available for me.

Progress: My first semester of teaching Physics 106 went well, and I was gratified to see that I received strong student evaluations. I implemented the active learning techniques I was familiar with, including iClicker questions and think-pair-share activities. I made several connections to the Gospel and to the anticipated careers of my students (mostly medical and dental careers) throughout the semester. I was genuinely committed to my students the whole semester long and have been grateful that several students have kept in touch with me since the semester ended. I believe I am on a good trajectory with my teaching.

II. Scholarship

Self-Assessment: I have demonstrated my ability to engage in productive scholarship through my successful experiences in graduate school and my postdoc. In my opinion, my publication record up to this point is acceptable, and I believe that my current trajectory will allow me to meet or exceed department expectations for publications. I have been encouraged by a number of recent invitations to speak at conferences and workshops, suggesting that my scholarship is being recognized in my field. The main selling point of my research is the unique combination of experimental techniques that I bring together in a cohesive fashion to study the structure and magnetism of complex materials: pair distribution function analysis of x-ray and neutron total scattering to probe local atomic correlations, muon spin spectroscopy to determine bulk magnetic properties, and magnetic pair distribution function analysis to investigate local magnetic correlations on atomic length scales, effectively bridging the other two methods. Together, these techniques form a powerful suite of experimental tools that can be applied to a variety of material systems. One aspect of my research that I believe will require special attention and care on my part is to avoid getting pulled in so many different directions that I do not make any substantial contributions to any specific field. This is a particular risk for me for two reasons: I am naturally interested in a variety of topics, and my research techniques are flexible enough to be applied to many different types of materials. I consider these to be strengths, but they can become weaknesses if my contributions are too diluted across too many different fields as a result. I also want to improve my time management to ensure that I continue to make progress on my research even during time periods when I am heavily involved in teaching.

Goals and Plans:

A. Maintain my typical publication pace of 2-3 papers per year as the main "enabling" author and another 2-3 papers as a contributing coauthor in respected outlets such as *Physical Review*. I will accomplish this by finishing leftover projects from my postdoc and PhD years and starting new projects, including some in collaboration with BYU faculty. I will also block out specific times in my calendar to write so that I make steady progress, even during semesters with a heavy teaching load.
B. Be an effective and supportive mentor to 3-5 undergraduates and 1-2 graduate students at any given time. I will ensure my effectiveness by holding regular meetings both individually and as a group, providing them enough guidance to make progress while

allowing them to learn and explore on their own, helping them publish the results of their research as peer-reviewed articles, and doing all that I can to help them reach their post-graduation goals. I will also foster a spirit of friendship and camaraderie within my group by planning occasional social activities.

C. Finish setting up my crystal growth laboratory, with the help of John Ellsworth.
D. Bring in major research funding to support my activities. I plan to apply for the NSF early career award and/or a Department of Energy core program grant in 2019, the DOE early career award in 2020, the Research Corporation Cottrell Scholarship in 2021, and others as opportunities and collaborations arise.

Relationship to Department/University Goals: These goals support the mission of BYU to provide intellectually stimulating opportunities for students and generate meaningful research that will improve the world. They are also consistent with the department and college expectations for scholarship.

Resources Needed: Quality students and sufficient funding are the main resources I need to accomplish these goals. I have found an abundance of high-quality undergraduate students eager to work with faculty members on research, so that has not been a problem. I am hopeful that I will also be able to attract good graduate students in the coming years. The college and department have already provided me with a start-up funding package which will be sufficient to support me through 2020, and I hope to have external funding beyond that. If I have not yet received any major awards by 2021, then I hope to obtain interim funding from the college through FAST grants. To run a lean yet productive operation, I need roughly $20,000 per year to fund our experiments at national and international user facilities.

Progress: I am on track to reach my publications goals. I am currently working with 5 undergraduates in the department and 2 additional undergraduates in different departments within the college. I have received a verbal commitment from one graduate student applicant who has been accepted to the graduate program. My crystal growth lab has been outfitted with an argon glove box and multiple furnaces for crystal growth, leaving the vacuum sealing station as the main component still to be constructed. I have several ideas for research grants and I have started three new collaborations with BYU faculty, including [redacted] (magnetic nanoparticles), [redacted] (symmetry mode analysis of pair distribution function data), and [redacted] (chemical engineering; molten salts for nuclear reactors). I have had productive phone conversations with program officers at the Department of Energy to discuss potential research proposals. Overall, I feel that I have a good start on my scholarship activities.

III. Citizenship

Self-Assessment: My citizenship accomplishments up to this point are significantly fewer in number and smaller in scope than my teaching and research accomplishments. Nevertheless, I feel that in time, I can prove to be a valuable citizen in the department, college, university, and my research community. I have a cooperative and friendly disposition, which I hope will make me a good committee member, and I am diligent in carrying out my assignments quickly and well. My aim in the next few years is to excel in whatever committee assignments I receive from the department chair and to serve in some official capacity in one of my professional societies.

Goals and Plans:

A. Make meaningful contributions to the Graduate Committee. I will do this by carrying out assignments received by the committee chair ([redacted]), proactively considering ways to improve the experience of our graduate students and attract promising applicants, and getting to know the graduate students in the department individually.
B. Accept other committee assignments from the department chair.
C. Serve in some official capacity for one of the professional societies of which I am currently a member (American Physical Association, Neutron Scattering Society of America, American Crystallographic Association, and International Society for Muon Spectroscopy). I will solicit such opportunities directly. Based on feedback from my department chair, I will consider this goal to be helpful but not necessary for success in the 3rd- and 6th-year reviews, while recognizing that this type of activity will be vital for eventual promotion to full professor.
D. Provide valuable service to my discipline by regularly refereeing papers and proposals.

Relationship to Department/University Goals: Goals A and B are in direct fulfillment of departmental needs and contribute to the success of the university as a whole. Goals C and D will bring BYU and our department recognition and respect within the research community.

Resources Needed: If some of my activities on the Graduate Committee or some other department committee will require funding to be successful, I will approach the department to find a solution. Other than that, no particular resources should be required.

Progress: I have been a contributing member of the Graduate Committee since September 2018. My contributions include conducting recruiting efforts at regional universities in conjunction with giving invited colloquium presentations, revamping the promotional slides used to advertise the graduate program, and speaking up regularly during committee meetings. I have submitted an application for a service position within the American Crystallographic Association and the Neutron Scattering Society of America, although I have not yet heard back about the results. I referee on average one paper per month and I review 10-20 beamtime proposals for Oak Ridge National Laboratory twice a year. While I expect my citizenship contributions to grow with time, I feel I am already making useful contributions.