

2021 Physics and Astronomy SEA Change Annual Report

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Introduction

This public report serves as a summary of the activities that the Physics and Astronomy (P/A) SEA Change pilot engaged in during 2021. Activities include what the Physics and Astronomy SEA Change Committee (PASCC) did as well as what the pilot departments have been doing. Meeting notes, monthly updates, the previous annual report, and project manager Dr. Alexis Knaub's personal records and observations have provided information for this report.

The P/A SEA Change is in an important point. Aspects of the program are being implemented, others are being developed, and long or longer-term sustainability is in the forefront of the PASCC's work. Reflecting on the 2021 achievements and activities, along with considering what still needs to be done and how improve current operations, will support the outcomes of this pilot but also how this work impacts equity, diversity, and inclusion (EDI) in physics and astronomy departments.

One important matter to note is that P/A SEA Change activities for 2021 have been during the continuing COVID-19 pandemic. This context is important to keep in mind for future readings, as the pandemic is ever-changing the course of our lives and has caused considerable stress and fear for many people. In the education context, many departments are facing financial austerity. The rapid changes in the pandemic have caused rapid changes and/or stress for faculty, students, and staff regarding in-person operations at universities and colleges. While we have made quite a bit of progress in 2021, this major factor likely has slowed down our progress. Thus, this report captures the PASCC activities during a troubling time.

Physics and Astronomy SEA Change Committee (PASCC) Activities

Committee Membership

Beth Cunningham (AAPT), Chair for the PASCC

Alexis Knaub (AAPT), Project Manager for the Physics and Astronomy SEA Change Pilot

American Association of Physics Teachers (AAPT)

Robert Hilborn, AAPT
David Marasco, Foothill College

American Astronomical Society (AAS)

Kim Coble, San. Fran. State Univ. [Thru June 2021]
Stella Kafka, AAVSO then Am. Meteorological Soc.
Karen Masters [Began September 2021]

American Institute of Physics (AIP)

Rachel Ivie, AIP [Began April 2021]
Taharee Jackson, AIP [Thru April 2021]
Arlene Modeste Knowles, AIP

American Physical Society (APS)

Monica Plisch, APS

American Vacuum Society (AVS)

Talat Rahman, Univ. Central Fl.

Council on Undergraduate Research (CUR)- Physics and Astronomy

Carol Hood, Cal. State Univ.- San Bernardino

National Society of Black Physicists (NSBP)

Stephon Alexander, Brown Univ.
Stephen Roberson, Parson Corp. [Began June 2021]

National Society of Hispanic Physicists (NSHP)

Juan Burciaga, Colorado College

Optica (formerly OSA)

Marcia Lesky, OSA

Society of Physics Students (SPS)

Brad Conrad, SPS
Steve Mackwell, AIP [Thru April 2021]
Jim Borgardt, Juniata College [Began May 2021]

Professional Societies Signed onto Charter

The charter was developed to articulate how the Physics and Astronomy SEA Change project would operate including committee structure, voting means, and other project practices. Most professional societies in the PASCC have signed the charter.

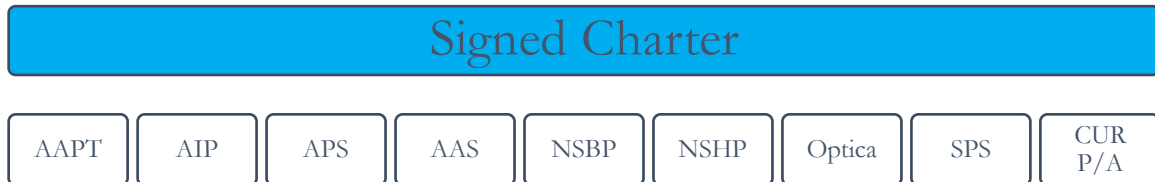


Figure 1: A depiction of the 9 societies that have signed onto the P/A SEA Change charter

Consensus Model

As mentioned in the 2021 report, a PASCC member was concerned about the consensus model and wished to discuss how the PASCC operated in terms of consensus. Knaub investigated various consensus models the PASCC might use. The PASCC decided to use the guidebook from a non-profit

called Seeds of Change. This is noted as footnote in the charter: Consensus decisions will be made using the **Seeds of Change** consensus decision making model.

Proposals are considered by the PASCC. Members have a week to mark their vote or ask for more time. Once the deadline has passed, unless there is a block or a request for more time, the proposed actions can go through. If a professional society blocks the representative works with a subset of the PASCC to resolve the concerns that led to a block. The proposal is then revised and brought back to the PASCC to undergo the consensus process again.

Monthly Meetings

The entire committee has met once a month for 1.5 hours each month. Like 2020, the PASCC discussed the progress of the pilot and the development of the program.

Many of these meetings included proposals from the subcommittees, which are discussed below. The monthly meetings serve as an opportunity for PASCC members to provide feedback or come to consensus regarding plans and policies that the subcommittees have developed. The subcommittees lead those discussions to answer questions as needed.

Subcommittees

The PASCC has continued to implement a subcommittee structure that began in 2020. In 2021, there were three subcommittees. PASCC members volunteer to serve on the subcommittees. They are encouraged to propose new subcommittees as needs arise. The project manager, Knaub, manages the subcommittees. She organizes the activities, tracks progress, and works on tasks as appropriate.

Application and Awards Subcommittee

Members: Juan Burciaga, Brad Conrad, Rachel Ivie, and Bob Hilborn

This subcommittee created and proposed plans regarding the application and the awarding processes to ensure that the application and awards processes were fair to many types of departments. This includes proposing departments for the second pilot cohort and designing the review panels and reviewer selection process.

Implementation Subcommittee

Members: Juan Burciaga, Brad Conrad, Bob Hilborn, and Carol Hood

This subcommittee created plans for ensuring that the awarded departments work on their 5-year action plans. These plans were designed to support the awarded departments to be accountable, while keeping in mind the constraints and challenges that can occur when implementing plan. The implementation structures were also designed with the PASCC's resources in mind.

Sustainability Subcommittee

Members: Brad Conrad, Bob Hilborn, Stella Kafka, Arlene Modeste Knowles, and Monica Plisch

This subcommittee just begun this year. They are tasked with ensuring that the P/A SEA Change is sustainability across many facets it might take to run an entire program. This past year, they were

mostly concerned with financial sustainability. The recommend finding an organization that can serve as the grant development center for longer or long-term funding.

Supporting Each Professional Societies' EDI Work

Cunningham has secured funding for a project for EDI projects under the AIP Federation and determining how they can best communicate and work together. This issue was evident last year when regarding P/A SEA Change. Physics and astronomy stakeholders may not know which of the numerous EDI projects and programs in the physics and astronomy professional societies are best suited for their departments. This can be confusing and frustrating. We anticipate that this emergent work will better support P/A SEA Change, as well as other EDI programs and projects.

Staffing

Knaub continues to work as the only employee for P/A SEA Change. She is half-time. She runs the social media, organizes the webinars, interfaces with AAAS SEA Change regularly, works with the PASCC, and supports the pilot departments. She has created some onboarding materials for new PASCC members as well as well monthly updates that support the PASCC in knowing what is happening. Updated documents also include public updates that are to be distributed.

Pilot Cohorts

P/A SEA Change pilot departments are the first departments to pilot in the entire SEA Change program. There is considerable interest in how P/A is doing, from AAAS, physics and astronomy departments, and other STEMM disciplines. This is an exciting and important time.

The pandemic continues to impact departments. This includes faculty bandwidth issues with ever-changing Covid-19 policies on campuses and in broader society and departmental constraints including departments under threat of being closed and having fewer resources available.

Cohorts 1 and 2

The cohorts and the department types in a figure at the end of this section. Due to confidentiality, we cannot share the names of the departments.

The departments in Cohort 1 are making progress, with two anticipating that they will submit application by the end of 2022 or the beginning of 2022. The challenges that the department are facing are like challenges in other change work: faculty/staff bandwidth and time. P/A SEA Change hosts optional meetups with Cohort 1 regularly to discuss their progress and to support the departments learning from one another.

Recruitment for pilot cohort 2 began late fall 2021. The second cohort will further test the viability of a full P/A SEA Change program and serve as role models for other departments; if departments do not see similar departments participating, it can inadvertently suggest that it is not for them. For cohort 2, we primarily sought departments west of the Mississippi. We are additionally working to include the following: an astronomy-only department, a department that is at one of the AAAS SEA Change Institutional awardees, and an HBCU. At the time of this report, three departments have been onboarded and another 3-4 will be onboarded later this spring.

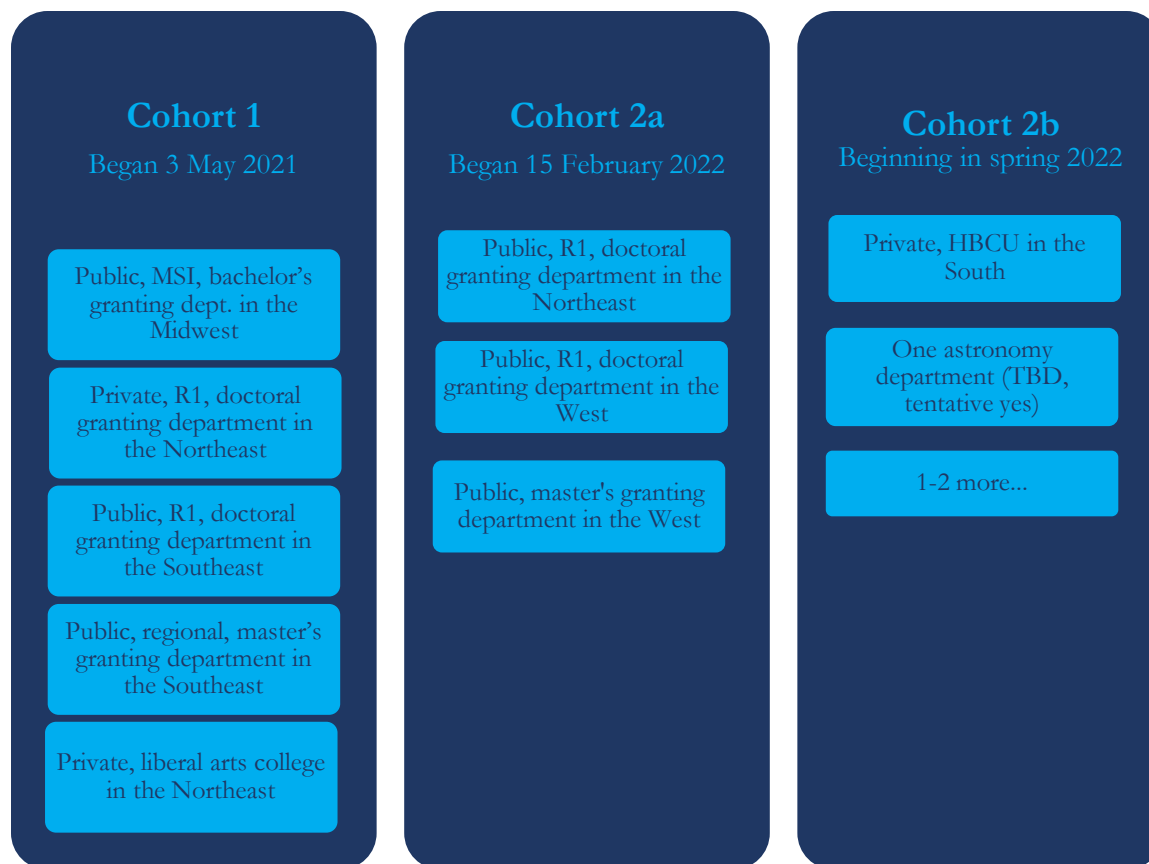


Figure 2a: A depiction of the cohorts and departments within the cohorts

Work with AAAS

The PASCC continues to work closely and collaboratively with AAAS SEA Change staff (Erin Conn, Shirley Malcom, and Beth Ruedi). Knaub routinely meets with Ruedi to discuss the progress of P/A SEA Change as well as to ask for feedback on the P/A SEA Change policies and practices. Many of these are documents (e.g., the reviewer application form) that are modified to suit the P/A SEA Change needs. Knaub also provides feedback to AAAS regarding any areas of confusion regarding the departmental awards program or specifically, P/A SEA Change; one such example is there is a misconception that departments must be AAAS Institutional members to participate in the pilot. AAAS and P/A SEA Change work together to resolve this kind of misconception or issues.

Online Engagement for the Broader Community

Many of the programmatic efforts from 2020 continued through 2021. Much of the goals are to increase visibility of P/A SEA and to spread the word about promising practices for EDI. The strategy is to make as much free and open as possible to benefit as many as possible.

Webinar Series

The webinar series initially began as a means of getting the word out about the P/A SEA Change brand. This series is curated to feature promising EDI practices that departments might adopt if they

are having challenges in an area. The practices have some research or evaluation that suggests that these are indeed promising practices. Knaub strives to cover promising practices for a variety of populations as well as a diversity of efforts or change needed to implement (e.g., an entire program overhaul is different from changing class practices). These are free to anyone if they register.

The 2021 webinars were:

- February. **Culturally Relevant Pedagogy in Postsecondary Education**. Presenter: Clausell Mathis (University of Washington)
- March. **Closer to Fair: Mathematics & Social Justice (with lessons for Physics)**. Presenter: David Kung (Saint Mary's College of Maryland).
- April. **EP3 Guide and DEI**. Presenters: Willie Rockward (Morgan State) and Sam McKagan (McKagan Enterprises).
- May. **Community Ambassadors - An Approach to Enhance Equity in STEM**. Presenters: Dr. Regina Barber DeGraaff (Western Washington University), Dr. Thanh Le (Western Washington University), and Dr. Leticia Romo (Chaffey College)
- June. TYC: **Cal-Bridge: A Multi-Institutional Partnership Engaging Underrepresented Students in STEM**. Presenters: Carol Hood, California State University, San Bernardino; Arturo Hernandez, El Camino College, MESA Director South Physics & Astronomy Steering Committee; Cal-Bridge Mary Usufzy, CSU Fullerton MS Student and Cal-Bridge Alumni; and Chelsea Adelman, UC Irvine PhD student and Cal-Bridge Alumni
- September. **2021 SEA Change Updates**. Presenters: Alexis Knaub and Beth Cunningham.
- November. **The Alma Project: Cultivating Cultural Capitals in Physics & Astronomy Thru Reflective Journaling**. Presenters: Ana Maria Barrera (San Francisco State University), Bahar Amin(San Francisco State University), & Kim Coble (San Francisco State University) Collaborators: Amal Egeh, Jomar Lopes, Khanh Tran, Rachel Xie
- December. **Covid's Impact on Progression Into and Through Graduate Study**. Presenters: Janet Gao, Research and Program Associate (Council of Graduate Schools); Craig Ogilvie, Dean of the Graduate School and Associate Vice-President of Research (Montana State University); and Suzanne Ortega, President (Council of Graduate Schools).

Social Media and Web Presence

The [website](#) has been created. It provides static information, such as the committee members and the charter. P/A SEA Change has presence on [Twitter](#) and [Facebook](#). The Facebook page largely is another means of advertising P/A SEA Change or promoting others' work that is relevant to physics and astronomy EDI efforts. Twitter has a bit more engagement with others. Both are fairly quiet, but do have some following.

Lastly, Knaub participates in a variety of web communities. She participates in the AAAS Port of Call, various APS Engage platform, AAPT Communities, and the TEAM-UP Slack workspace.

Dissemination

We have done some level of dissemination. As the pilot has no results, this is mostly presenting information to advertise the project.

- *Publications*. There were no publications this year. Knaub hopes to write a manuscript featuring case studies of institutional awardees. She collected these data last year.

- *Presentations.* At the AAPT SM21, David Marasco (Foothill College) curated a session on SEA Change. Shirley Malcom, Cunningham, and Knaub presented. In September 2021, AAAS invited Knaub to speak on the progress of the P/A SEA Change at the Disciplinary Society Convening. Knaub has given two invited talks at virtual events that delved into EDI and physics: Penn State for individuals in discipline-based education research (DBER) and the AAPT Chicagoland-area section and APS Prairie Section meeting in November 2021.
 - Knaub was invited to participate in three career talks/panels: a career panel for the APS National Mentoring Community (NMC) Conference in February 2021; the University of Georgia's SPS group in fall 2021, as part of the APS Career Mentoring Fellows program; and a career panel at Florida International University, for a DBER group. Although P/A SEA Change was not the reason she was invited, it was still discussed.
- *Informal gatherings.* Knaub hosted a P/A SEA Change discussion in the AAPT DEI Resource room at the virtual Winter Meeting 2021. These are informal spaces where individuals can stop by to ask questions.
- *Committee Meetings.* Knaub and Cunningham provides brief updates at the open AAPT Committee meetings. No formal information has been collected, but it appears that various PASCC members do inform their society's leadership. In December 2021, Brad Conrad invited Knaub and Cunningham to discuss P/A SEA Change at the AIP Committee on Education. This Committee consists of representatives from the member societies in the Federation. The conversation went well.
- *Monthly updates.* All PASCC members receive monthly updates. One is for internal use only and is to keep PASCC members informed. The other update is for public distribution. Knaub has seen some of the professional societies tweet the updates, and she also shares them on the P/A SEA Change Twitter, P/A SEA Change Facebook Page, and on the AAAS Port of Call.

Summary and Future Items to Consider

The PASCC has moved P/A SEA Change along even further than it had been in 2020. There is one pilot cohort working on the self-assessment, and there are departments signing up for a second pilot cohort. The plans devised by the subcommittees are creating the program. Because P/A SEA Change is the first discipline to pilot the department or disciplinary awards, the impact is likely to go beyond just physics and astronomy. This project has progressed because of the willingness of the PASCC to create the program without a great deal of guidance.

In 2022, P/A SEA Change will continue many of these activities. The PASCC will hopefully test the procedures and policies devised for application review and awarding departments. There will be more concentrated effort to achieve at least longer-term financial sustainability. These all will likely need to be adjusted throughout the process.

The PASCC has risen to the occasion to overcome many issues in the past year and has truly made progress. These recommendations are important and not trivial to resolve, but necessary to consider if P&A SEA Change is to be sustainable.