LGBT Climate in Physics

BUILDING AN INCLUSIVE COMMUNITY

AMERICAN PHYSICAL SOCIETY

March 2016

LGBT Climate in Physics: Building an Inclusive Community

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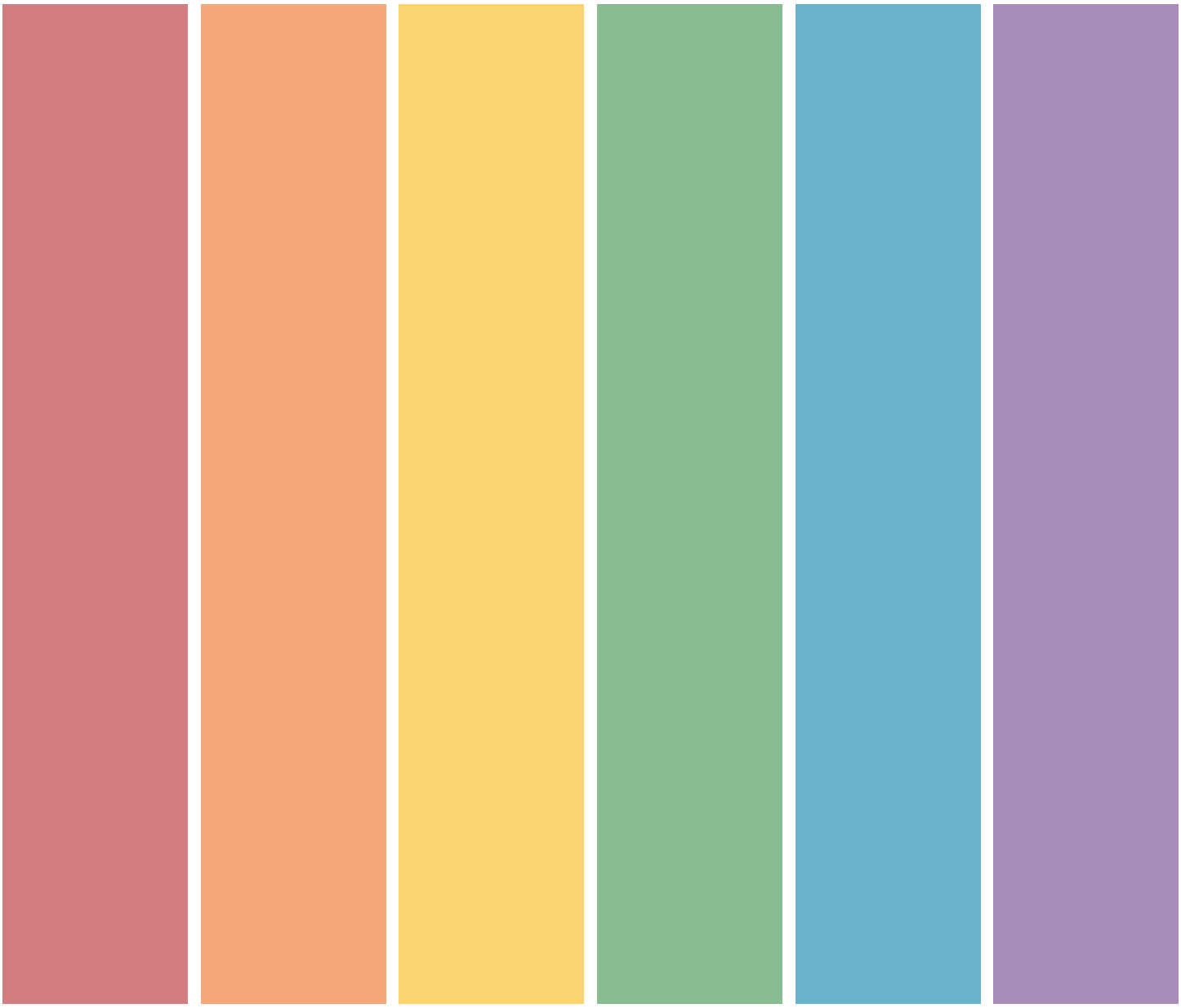

AMERICAN PHYSICAL SOCIETY
MARCH 2016

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Acknowledgments

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Executive Summary

PHOTO CREDIT: SALIL KISHOR BEDKIHAL

We offer six recommendations that the committee identified as the most critical steps APS could take to ensure that LGBT individuals pursuing physics can enter a level playing field.

In response to our charge, the Ad-Hoc Committee on LGBT Issues (C-LGBT) reviewed the status of LGBT physicists to assess the barriers to full inclusion within the physics community. Input was obtained through focus groups held at APS meetings, a detailed climate survey, and a set of in-depth interviews with individuals who self-identify as LGBT. Committee members also reviewed aspects of law and policy that were deemed relevant, and drew on their own experiences and observations in building a community of support of LGBT physicists. Here we briefly summarize the findings and recommendations. These recommendations naturally fit with the broader goals of promoting participation within the physics enterprise by a diverse membership and ensuring equal opportunity. These are goals clearly expressed in the mission statement of APS, as well as its policy on equal professional opportunity.

Summary of Findings

1 LGBT physicists have faced uneven protection and support from legislation and policies.

LGBT physicists in the U.S. face uneven legal protections with regard to employment, and some LGBT individuals are at risk for getting fired on this basis. At the time of this printing some US states are considering legislation that would criminalize the use of appropriate restrooms by trans individuals. Anti-LGBT legislation in other countries criminalizes homosexuality (e.g., India) or makes it illegal to publicly discuss homosexuality (e.g., Russia).

With regard to campus or workplace policies, 50% of climate survey respondents rated policies as "highly supportive" or "supportive," while 30% characterized policies as "uneven," "lacking" or "discriminatory." Only 40% of transgender respondents rated workplace policies as "highly supportive" or "supportive," with 49% rating these policies as "uneven," "lacking," or "discriminatory."

2 The overall climate experienced by LGBT physicists was highly variable.

About 15% of LGBT men, 25% of LGBT women, 30% of gender-nonconforming individuals characterized the overall climate of their department or division as "uncomfortable" or "very uncomfortable." Also, 30% of trans individual regardless of gender identity characterized the overall climate of their department or division as "uncomfortable" or "very uncomfortable."

About half of climate survey respondents were "out" to all or most of their co-workers, while the other half were out to only some, few or none of their co-workers. The degree of "outness" was strongly correlated with comfort level within their department or division.

3 In many physics environments, social norms established expectations of closeted behavior.

Over 40% of climate survey respondents agreed with the statement, "Employees are expected to not act too gay," and about 45% disagreed with the statement, "Coworkers are as likely to ask nice, interested questions about same-sex relationships as they are about heterosexual relationships."

4 Isolation was a common theme for many LGBT physicists.

Many LGBT physicists lack supportive professional networks, mentoring relationships, and LGBT role models that can help with navigating physics careers, particularly the frequent career transitions common for young physicists. This isolation arises due to the small percentage of individuals who identify as LGBT and their lack of visibility.

5 A significant fraction of LGBT physicists have experienced or observed exclusionary behavior.

More than 20% of climate survey respondents reported experiencing exclusionary behavior in the past year, while about 40% reported observing exclusionary behavior due to gender, gender expression, gender identity, sexual orientation, or sexual identity. These numbers were significantly higher (49% and 60% respectively) for trans respondents.

Reports of exclusionary behavior included sexual harassment, verbal harassment, homophobic comments, purposeful misidentification of gender, exclusion from study groups and social activities, LGBT stereotyping, and expectations of incompetence.

6 LGBT physicists with additional marginalized identities faced greater levels of discrimination.

Women experienced exclusionary behavior at three times the rate of men.

Open-ended and interview responses revealed particular challenges for LGBT persons who were also people of color.

7 Transgender and gender-nonconforming physicists encountered the most hostile environments.

Transgender and gender-nonconforming physicists reported the highest levels of exclusionary behavior, adverse climate, and unsupportive policies.

Transgender and gender-nonconforming physicists face specific challenges, which can include lack of health benefits, lack of access to safe bathrooms, inappropriate use of pronouns, and a profound lack of respect and awareness from others.

8 Many LGBT physicists were at risk for leaving their workplace or school.

Over one-third of climate survey respondents considered leaving their workplace or school in the past year.

Reporting adverse climate or observing exclusionary behavior in one's workplace or school correlated strongly with considering leaving.

9 LGBT physicists reported trouble identifying allies to help mitigate isolation, exclusion, or marginalization.

LGBT physicists reported difficulty identifying allies. Visible allies, where they existed, proactively created safe and welcoming environments, spoke out against exclusionary behavior, and offered informed and supportive mentoring to LGBT physicists. This ameliorated academic and professional climate issues.

Summary of Recommendations

1 Ensure a safe and welcoming environment at APS meetings.

APS should establish written best practices for APS meetings that support inclusion and attend to issues particular to LGBT physicists. These practices should be disseminated to conference organizing committees and meetings staff.

APS should implement the APS Code of Conduct with thorough and careful regard to informing members and responding to reports of infractions.

2 Address the need to systematically accommodate name changes in publication records.

APS should work to improve electronic journal records and publication procedures so that transgender physicists who change their names will have their full publication records visible and, at the same time, will not be outed by their publication record. This issue is also of significance to those who experience a name change due to changing marital status or other reasons.

3 Develop advocacy efforts that support LGBT equity and inclusion.

APS should issue a statement on the inclusion and fair treatment of LGBT people in physics that supports workplace non-discrimination policies and legislation, among other actions.

APS should update existing APS policies and statements to be inclusive of LGBT physicists.

APS should advocate in the international physics community for the inclusion and fair treatment of LGBT people.

APS should lobby federal funding agencies to include LGBT demographics in STEM education and workforce surveys and to acknowledge a pressing need to address climate issues for LGBT people in STEM fields.

4 Promote LGBT-inclusive practices in academia, national labs, and industry.

APS should publicize, disseminate, and encourage the use of the Best Practices Guide developed by lgbt+physicists.

APS should develop a training program on inclusive workplace and mentorship practices for physicists in academia, national labs, and industry that incorporates the needs of LGBT physicists and aims at the recruiting of active allies.

APS should provide physics departments and national labs with feedback on LGBT inclusion as part of the climate site visit program organized by CSWP and COM.

5 Implement LGBT-inclusive mentoring programs.

APS should establish written best practices for mentoring programs that are inclusive of LGBT physicists, disseminate these to program leaders, and discuss their implementation.

APS should create a professional network of LGBT mentors and mentees. In addition, APS should sponsor LGBT networking events that support the development of mentoring relationships.

6 Support the establishment of a Forum on Diversity and Inclusion.

APS should support the establishment of a new APS Forum that works toward a more inclusive, diverse, and equitable society for all physicists, including those who identify as LGBT, women, racial and ethnic minorities, persons with disabilities, and others.

Glossary

PHOTO CREDIT: KARL SLIFER

We note that some of the terminology used for describing sexual and gender minorities has been evolving, and for this purpose we provide a glossary for the reader.

There has been a recent trend to use the acronym GSM, short for Gender and Sexual Minorities, as an inclusive way to refer to persons who self-identify as lesbian, gay, bisexual, transgender, queer, questioning, intersex, as well as other sexual and gender minorities. This terminology obviates the need to list each sub-category and in so doing, risks omitting some in the process. However, because the charge to the committee used the acronym LGBT for this purpose, we will retain this terminology throughout the report, taking it in its most inclusive sense to mean the same as GSM herein.

Ally *(n.)*

Someone who works to ensure equal rights and opportunities for people from a marginalized community, although they do not identify as a member of this community.

Bisexual *(adj.)*

Sexual orientation characterized by emotional, romantic, and/or sexual attraction to multiple genders.

Cisgender (or Cis) *(adj.)*

The opposite of transgender or trans, this term refers to a person whose gender identity agrees with the sex they were assigned at birth. For example, someone who was assigned female at birth and identifies as a woman is considered to be cisgender.

Climate *(n.)*

The overall level of inclusion and respect for persons in a professional environment. This may be comprised of colleagues' attitudes, behaviors, and standards.

Exclusionary Behavior *(n.)*

An act that shuns, ignores, or harasses a person.

Gay *(adj.)*

Term referring to a person who is emotionally, romantically, and/or sexually attracted to people of the same gender.

Gender *(n.)*

Gender refers to the roles, behaviors, activities, and attributes that a society considers normative for men and women. It is distinct from sex, which is a category assigned at birth based on physical characteristics.

Gender Identity *(n.)*

An internal sense of self as male, female, or a blend of both or neither. A person's gender identity may differ from their sex assigned at birth.

Gender Minority *(n.)*

An individual whose gender is not as widely represented as others in society. For example, a trans woman is a gender minority.

Gender Neutral Restroom *(n.)*

A restroom that people of any gender or gender identity may use and have their individual privacy respected. This could be implemented either as a single stall or multi-stall restroom.

Gender-Nonconforming *(adj.)*

An umbrella term for gender identities outside the gender binary (i.e., outside of the categories of men and women). "Non-binary" and "genderqueer" are common synonyms.

GSM *(adj.)*

Shorthand for Gender and Sexual Minorities, refers to persons who self-identify as lesbian, gay, bisexual, transgender, queer, questioning, intersex, as well as other sexual and gender minorities.

Heterosexual *(adj.)*

Sexual orientation characterized by emotional, romantic, and/or sexual attraction to individuals of another gender.

Homosexual *(adj.)*

Sexual orientation characterized by emotional, romantic, and/or sexual attraction to individuals of the same gender. Because of the pathologizing clinical history of this word, use of the adjective "gay" is preferred.

Intersex *(adj.)*

A general term used for a variety of conditions in which a person is born with a reproductive or sexual anatomy that does not seem to fit the typical definitions of female or male.

Lesbian *(n./adj.)*

Term referring to a woman who is emotionally, romantically and/or sexually attracted to other women.

LGBT *(adj.)*

Shorthand for Lesbian, Gay, Bisexual and Transgender. For the purpose of this report, LGBT will be taken to refer to persons who self-identify as lesbian, gay, bisexual, transgender, queer, questioning, intersex, as well as other sexual and gender minorities.

Out (of the Closet) *(adj.)*

Openly identifying oneself as LGBT. Someone may be "out" to some people, but not to others (e.g., out at school but not to family members, or vice versa). The decision to come out is highly personal.

Out *(v.)*

The act of revealing, perhaps publicly, the LGBT identity of someone who is not out of the closet, typically without the person's approval. Outing an individual can be harmful or even dangerous to that person.

Preferred Pronoun *(n.)*

The pronoun or set of pronouns that an individual would like others to use when talking to or about that individual. If you are unsure, simply ask in private, "What are your preferred pronouns?"

Queer *(adj.)*

A former term of abuse that has been reclaimed by some members of the LGBT community as an identity that may be used in place of, or in conjunction with, other identities from the LGBT spectrum. Like all reclaimed words, it should be used with caution by persons outside of the community.

Questioning *(adj.)*

An individual who is not yet certain of their sexual orientation or gender identity. Questioning is considered to be a legitimate identity in itself, and those who identify as such should not be coerced to "make up their minds."

Sex *(n.)*

A category, such as male, female, or intersex, assigned at birth based on physical characteristics.

Sexual Minority *(n.)*

Persons whose sexual orientation is not as widely represented as others. For example, gay men are a sexual minority.

Sexual Orientation *(n.)*

A person's sexual identity regarding the gender or genders to which they are romantically or sexually attracted.

Transgender (or Trans or Trans*) *(adj.)*

Term referring to a person whose gender identity differs from the sex they were assigned at birth. For example, a trans woman is someone who was assigned male at birth but whose gender identity is female.

Introduction

PHOTO CREDIT: GREG DOHLER

The committee was charged with reporting on the issues faced by LGBT physicists. For the purpose of this report, LGBT refers to persons who self-identify as lesbian, gay, bisexual, transgender, queer, questioning, intersex, as well as other sexual and gender minorities.

In 2014 the Executive Officer of the American Physical Society (APS), Kate Kirby, created an Ad-Hoc Committee on LGBT Issues (C-LGBT), responding to a formal request from the lgbt+physicists organization[3] for representation within APS. The full charge to the committee was as follows:

The committee (C-LGBT) will advise the APS on the current status of LGBT issues in physics, provide recommendations for greater inclusion, and engage physicists in laying the foundation for a more inclusive physics community. More specifically, the committee will investigate LGBT representation in physics, assess the educational and professional climate in physics, recommend changes in policies and practices that impact LGBT physicists, and address other issues that affect inclusion.

Beyond a response to the APS charge, this report represents the culmination of a process that began at the grass roots level in 2010 with the formation of an independent self-organized group; lgbt+physicists. At the 2012 APS March Meeting in Boston, the lgbt+physicists group organized the first LGBT-focused session in the history of APS on "Gender and Sexual Diversity Issues in Physics."[4] A survey of the participants at this session identified a number of pressing concerns for LGBT physicists.[5] These included a highly variable workplace and school climate that could range from accepting to hostile or even exclusionary. It also revealed a scarcity of visible role models and allies. Among the issues participants noted at the 2012 APS session was a general lack of awareness within the physics community of the issues faced by LGBT physicists. This could be partially attributed to a lack of data on the subject. We have sought to address this last concern by undertaking the significant data gathering effort described herein. Our data bear out the initial impressions of the 2012 APS session participants, and also allow us to make a more nuanced assessment of the aspects of our community that present barriers to LGBT physicists. Out-quotes from our climate survey and follow-up interviews are included throughout the text to illustrate the main points and motivate the recommendations.

In the report that follows, we outline six specific and actionable recommendations for the APS that would represent significant steps forward in enhancing the inclusivity of the physics community regarding its LGBT members. In presenting these recommendations, we want to emphasize that LGBT physicists are a remarkably diverse collection of individuals with great capacity to contribute to the physics enterprise. We are people of every nationality, ethnicity, race, creed, and religion. We exist throughout the U.S. and around the world. We represent people of many genders, and some who eschew gender entirely. It is this diversity of experiences that provides our strength. It also makes it challenging to ascribe one unifying set of needs and a simple prescription for their fulfillment. Further, no current census exists of LGBT individuals working in physics, and undertaking such an effort was beyond the capacity of the committee. However, the breadth of diversity clearly evident within our climate survey data places our recommendations squarely in the context of other efforts by APS to ensure physics is broadly inclusive and supportive of all physicists, including those who have been historically marginalized.

Michael Falk
Chair, C-LGBT

Background & Findings

PHOTO CREDIT: GENEVIÈVE DU PAUL

A persistent concern from the focus groups and participant surveys performed by lgbt+physicists at APS Meetings over the last several years was frustration with the lack of definitive research about LGBT physicists and their experiences.

Currently, there is no knowledge of the number of LGBT people in physics or whether LGBT people are underrepresented in the field. While such a study was not possible to complete within the time available to C-LGBT, our committee worked with the APS Membership department to include a relevant question in the recent membership survey. An equally pertinent question is: "What are the experiences of LGBT people in the field of physics?" A number of surveys have been performed in career settings and in academia[6,7,8,9] to assess climate experiences and persistence toward their degree or in their profession for LGBT individuals; but C-LGBT found no such prior published work specific to the physics community.[10]

Given the lack of available research, C-LGBT undertook three major data gathering efforts to inform the report. The first was a climate survey conducted in 2015 to assess the experiences of LGBT self-identified individuals of the professional climate and their persistence within physics. Second, several interviews probed the experiences of selected climate survey respondents in greater depth. The third was a review of the input gathered from a series of focus groups that were conducted at APS March and April Meetings in 2014 and 2015. The information gathered formed the basis for the nine major findings of the committee, as detailed in this report.

Information gathered via climate survey

C-LGBT implemented a climate survey based on the methodology of previously conducted studies.[11] We supplemented prior approaches by including trans-specific questions. Open-ended responses were also solicited to obtain a deeper understanding of the particular experiences of LGBT physicists. The full climate survey can be found in Appendix I at the end of this report. The survey was distributed from May 11, 2015 through June 5, 2015 online through snowball sampling. Identified participants were asked to send the survey out to persons they believed should take the survey. The survey was also sent out to the lgbt+physicists listserv of LGBT physicists and allies, to APS members through various communications channels, and distributed through other LGBT STEM social media sites and physics listservs. We estimate that the survey was directly emailed to approximately 1000 individuals. In all, 324 usable responses were received.

The demographics of survey respondents reflected a broad cross-section of the LGBT physics community. Most identified as physicists (299, 92%), and half (161, 50%) were members of the APS. The majority of survey participants reported working or studying in academia (272, 84%). Fewer participants were working in government (19, 6%) and industry (16, 5%). Respondents were graduate students (126, 39%), undergraduate students (62, 19%), faculty members (42, 13%), postdocs (29, 9%), and research scientists (17, 5%). The respondents primarily worked in the USA (254, 78%), and most were citizens of the USA (239, 74%).

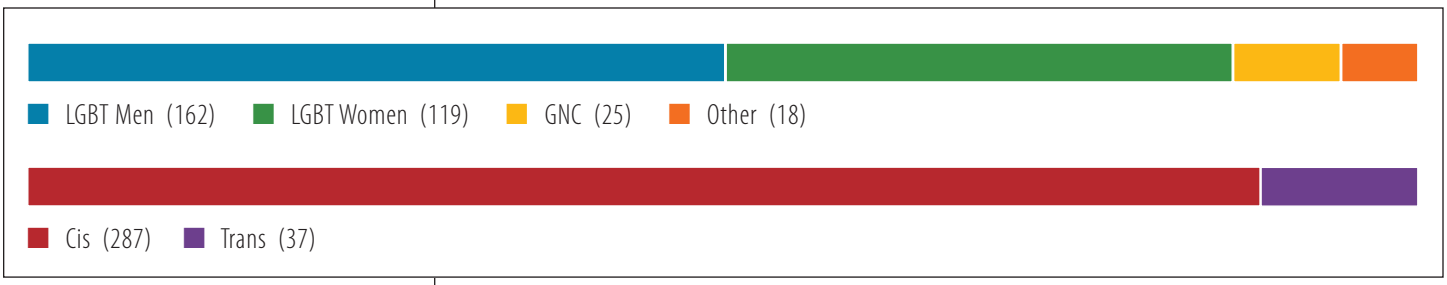


FIG 1. Respondents by gender, where GNC is gender-nonconforming, and by trans/cis status. Cis respondents include all those who did not identify as trans.

As shown in Figure 1, half of climate survey participants identified as men (162, 50%). Women comprised over one-third of respondents (119, 37%), and a smaller number (25, 8%) identified as gender-nonconforming. A separate question asked participants if they were transgender (37, 11%) or intersex (2, 1%). In describing their sexual orientation, participants could select multiple categories. Most identified as gay (116, 36%), bisexual (86, 27%), queer (63, 19%), lesbian (45, 14%), and heterosexual (46, 14%). Participants also saw a number of other categories as relevant, including pansexual (26, 8%), asexual (15, 5%), man loving man (10, 3%), questioning (8, 2%), woman loving woman (6, 2%), and other (15, 5%). When

describing their race and ethnicity, participants had the option to select from multiple categories. Most participants identified as white (267, 82%). Respondents also identified as Asian (19)(6%), Latino (16, 5%), Asian-American (11, 3%), South Asian (7, 2%), Native American (6, 2%), and African American (6, 2%). Other race and ethnicity categories had 5 or fewer respondents.

Information gathered via interviews

Following the climate survey, five interviews were conducted with survey participants who indicated a willingness to be interviewed. The interviewees were all students, and included voices from women, gender-nonconforming, and transgender people; as well as some who identify with underrepresented racial groups. Individuals with these identities were chosen because the survey data indicated such individuals face the most significant barriers to inclusion. Quotes from these interviews and the open-ended survey responses are shared as out-quotes throughout the report to provide context for the quantitative data and the recommendations.

Information gathered from focus groups

The lgbt+physicists group held a roundtable discussion on mentoring and issues facing LGBT physicists at the APS March and April Meetings in 2014 and 2015. At each of these sessions, up to 50 participants from all career stages discussed their needs and experiences in a small-group format. Organizers and APS staff made summaries of the views expressed and these are integrated into the text of the findings.

Information gathered via APS membership survey

A single demographic question was added to the APS membership survey in 2015 that was sent to a random sample of 30% of APS members on October 13, 2015. A total of 2,596 responses were received for a response rate of 22.1%. Of the respondents, 2.5% identified as LGBT while 14% of respondents preferred not to provide this information. This makes it difficult to gauge the fraction of LGBT individuals amongst the APS membership. One interesting aspect of the survey was the ability to correlate LGBT identity with nationality and age. US respondents were approximately twice as likely (3.4%) as non-US respondents (1.6%) to identify as LGBT. Furthermore, respondents in the 18-25 age range were significantly more likely (16.3%) to identify as LGBT and less likely (6%) to choose not to provide this kind of information. This indicated to the committee that the issue of LGBT identity may presently be both more salient and less taboo to physics students in undergraduate and graduate physics programs than it is to professional and academic physicists. Also notable was the presence within the written comments of a small but significant number of (21) strongly negative responses to the existence of this question on the survey. These generally fell into two main categories: denying the relevance of the question or objecting to the question as offensive.

The large discrepancy in openly identifying as LGBT based on age could be due to a leaky pipeline effect that takes place during late graduate and post-doc years, a generational divide where younger people are more comfortable openly identifying as LGBT, or as a result of the AIDS crisis. We recommend further studies that explore this drastic drop-off.

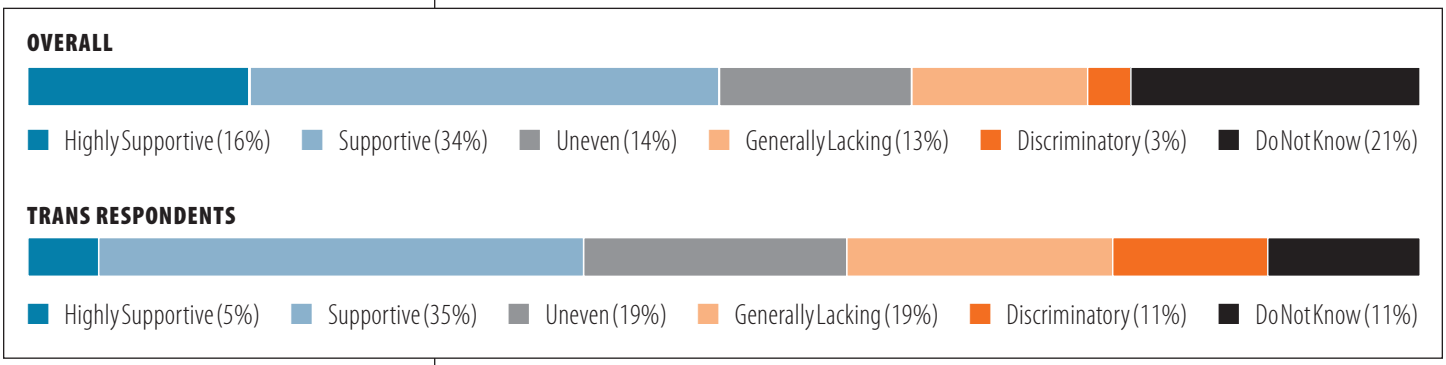
1 LGBT physicists have faced uneven protection and support from legislation and policies.

"When I first came here the policy that I was informed of [for] using bathrooms was that I had to match my driver's license, which was stressful to start. And it wasn't until after the first semester when over Christmas break I came across the, let's see, EEOC statements about Title IX and Title VII where basically they said that discrimination on the basis of gender identity or presentation is sex discrimination and therefore banned. I was like boom, okay, great."

LGBT physicists in the U.S. face uneven legal protections with regard to employment, and some LGBT individuals are at risk of being fired on this basis. Anti-LGBT legislation in other countries criminalizes homosexuality or makes it illegal to publicly discuss homosexuality. Recent examples include laws prohibiting "LGBT propaganda" in Russia and Section 377, which banned homosexuality in India. At the time of this printing some US states are considering legislation that would criminalize the use of appropriate restrooms by trans individuals.

As shown in Figure 2, with regard to campus or workplace policies: 50% of climate survey respondents rated policies as "highly supportive" or "supportive," while 30% characterized policies as "uneven," "lacking" or "discriminatory." For transgender participants, nearly half (49%) found policies "uneven," "lacking" or "discriminatory." During roundtable discussions at APS meetings, policy issues for trans people included lacking adequate health care that covers trans-related needs, and access to bathrooms based on the person's identity. Partner issues, including visa and immigration status, were identified as significant challenges. We note that our climate survey closed three weeks before the Supreme Court of the U.S. issued a ruling in favor of marriage equality in Obergefell v. Hodges.[12] National, institutional, and company policies in many instances have not yet caught up to this recent decision.

FIG 2. Perception of policies in campus or workplace for all climate survey respondents as well as for the subset of respondents who identify as trans.



2 The overall climate experienced by LGBT physicists was highly variable.

"My workplace environment is very hetero male, and I identify as an effeminate genderqueer. Generally, my coworkers are accepting, but I do not feel comfortable talking about or disclosing my gender or sexual identity at work."

Overall climate

When asked about the workplace climate, the level of comfort varies markedly with gender, as shown in Figure 3. About 15% of LGBT men, 25% of LGBT women, 30% of gender-nonconforming individuals characterized the overall climate of their department or division as "uncomfortable" or "very uncomfortable." As discussed below in finding 7 and illustrated in Figure 7, 30% of trans individuals, regardless of gender identity, also characterized the overall climate of their department or division as "uncomfortable" or "very uncomfortable." Moreover, gender-nonconforming individuals rated the climate beyond their department or division significantly less favorably than their department or division, with 40% reporting their campus/company/organization to be "uncomfortable" or "very uncomfortable."

FIG 3. Departmental/Divisional climate for participants by gender where GNC is gender-nonconforming. GNC respondents were more likely to rate their campus/company/organization as "uncomfortable" or "very uncomfortable."

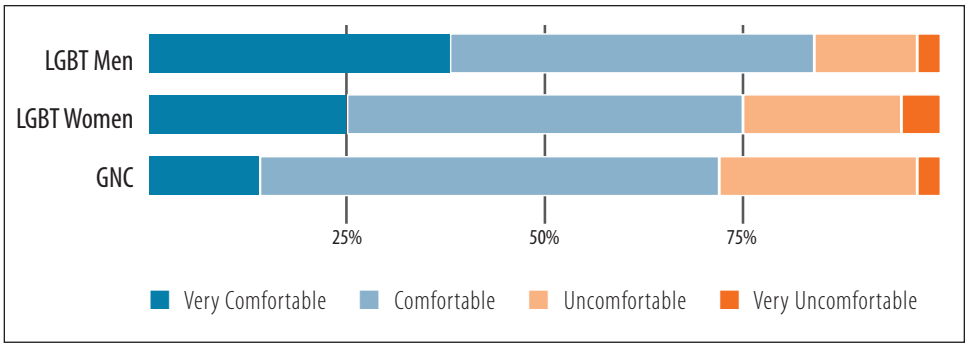
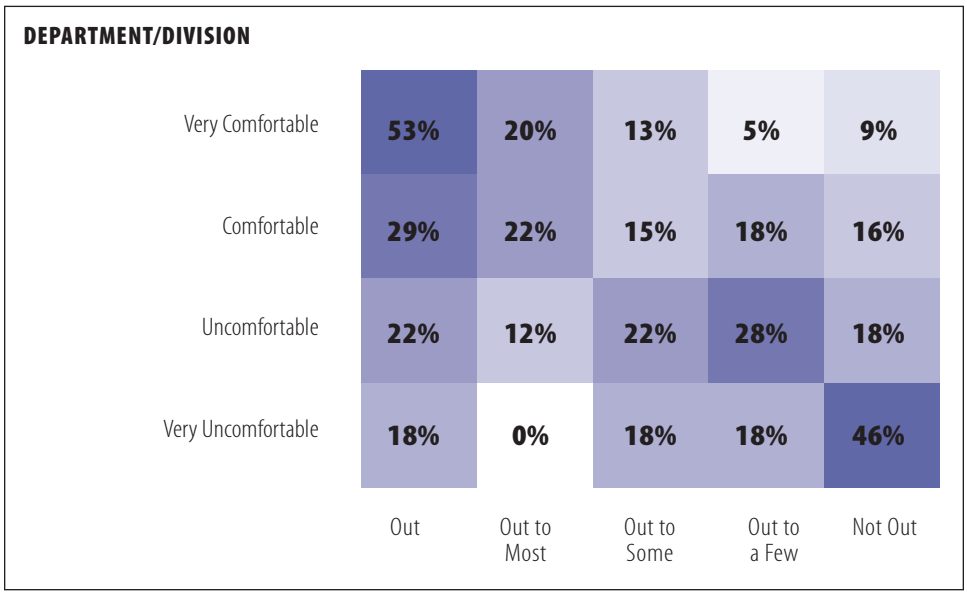


FIG 4. Correlations between experience of climate (vertical) and outness (horizontal).



Degree of "outness"

About half of climate survey respondents were "out" to all or most of their co-workers, while the other half were out to only some, few or none of their co-workers. As might be expected, the degree of outness was strongly correlated with comfort level within their department or division, as illustrated in Figure 4. About 70% of those who feel very comfortable are likely to be out to all or most colleagues, and approximately 70% of those who feel very uncomfortable are likely to be out to few or no colleagues.

Many of the climate survey respondents reported not being out in their departments because of fear of negative impacts on their work experiences:

> "In the last lab I worked with, I was afraid to even mention that I might be gay. They were all very traditional sort of people."

> "Because I am in the closet about my identity, and I pass just fine as a result, I am actually quite comfortable in these areas. What people don't know can't hurt me!"

> "I don't know of any other 'out' physics grad students. I know that a lot of them are very conservative. And I feel like they respect me right now. But I don't know that they would respect me if I came out to them."

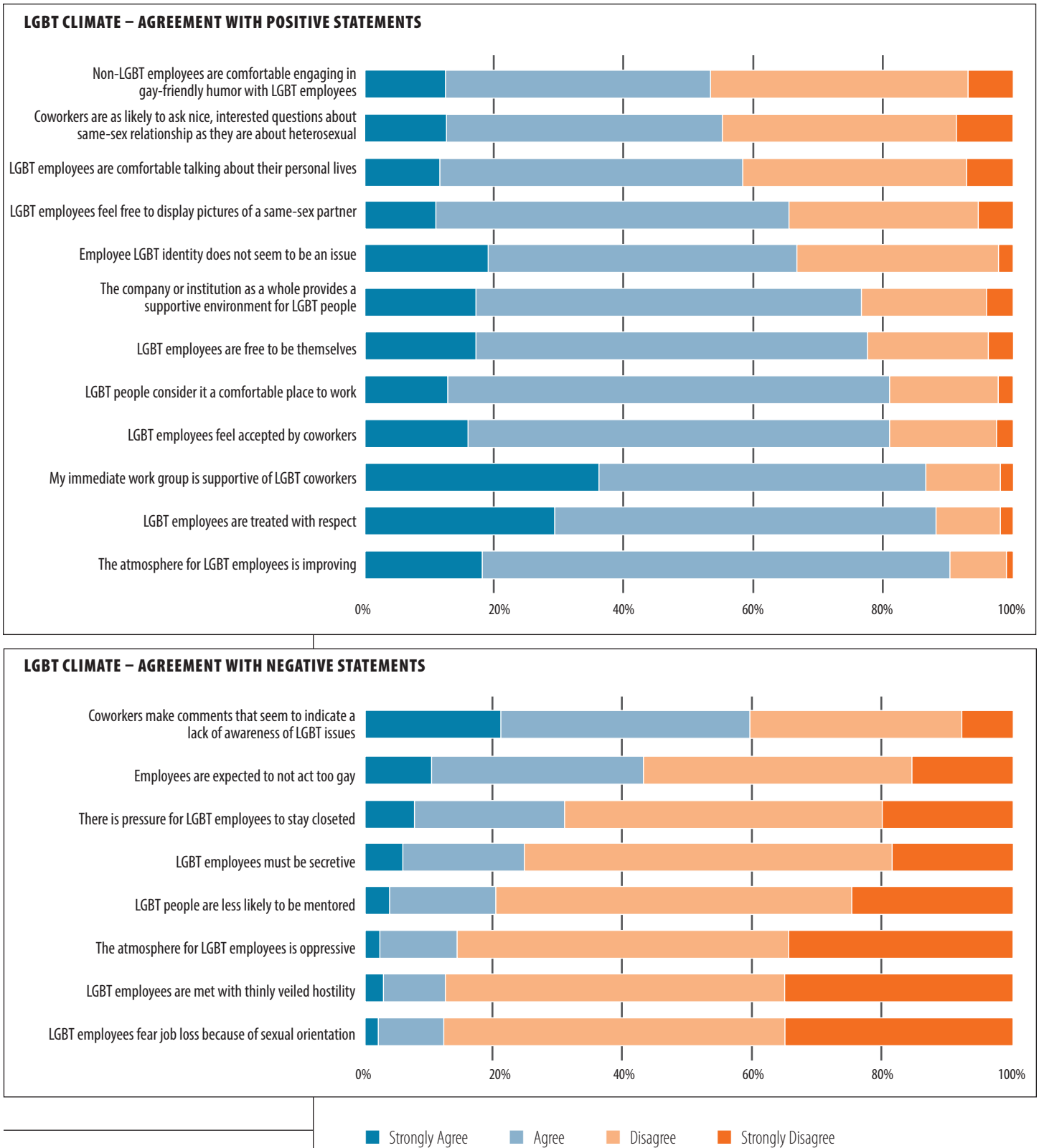


FIG 5. Responses to LGBT-specific climate statements adopted from a previously validated study.[6] The top chart rank orders positive statements regarding LGBT climate from lowest level of agreement to highest level of agreement. The bottom chart orders negative statements regarding LGBT climate from highest level of agreement to lowest level of agreement.

3 In many physics environments, social norms established expectations of closeted behavior.

"It's 'don't ask , don't tell,' [which leads to a] hard time networking because [my] mostly male colleagues [are] uncomfortable to invite [a] gay couple for outings etc. It's a subtle form of discrimination. Inability to network makes it difficult to join group grant proposals."

A detailed assessment of climate was made through 20 LGBT-specific climate questions that were derived from previous studies. The responses from these are shown in Figure 5. From this information, we can infer that many physics environments, while they may not be overtly discriminatory, are heterosexist and cissexist. This strongly signals a discomfort with outward expression of sexual and gender difference. Over 40% of climate survey respondents agreed that "Employees are expected to not act too gay," and about 45% disagreed with the statement, "Coworkers are as likely to ask nice, interested questions about same-sex relationships as they are about heterosexual relationships."

4 Isolation was a common theme for many LGBT physicists.

"...half the time people's biases are because they don't know somebody that they're judging, right? So when people are in front of them and they're just normal people and they're doing great things and they make some huge research - you know, it's pairing the person who put out the paper that everybody loves with the idea that they are also a gay person or they're a trans person."

Lack of visibility

A key challenge identified in focus groups for mentoring LGBT people was the issue of visibility. Because it is frequently not possible to determine LGBT identities from a person's appearance, it is much more difficult to establish supportive professional networks and mentoring relationships that can help with navigating physics careers as LGBT individuals. Even supportive mentors may not know to offer relevant mentoring if they are unaware of a person's LGBT status. The most commonly reported statement for new members joining the lgbt+physicists group relates to isolation: many did not know any other LGBT people in the field. Further, a need was raised for LGBT role models willing to speak about their experiences, as well as stories of successful LGBT physicists. Lack of visible role models can cause LGBT individuals to question the basic opportunity for success. One participant at a forum for LGBT physicists held during an APS meeting commented that they felt empowered from the discussion to see that LGBT people "can become professors." The fact that LGBT people may exist in physics while remaining invisible distinguishes LGBT issues from those of other types of underrepresented groups in physics; including racial and ethnic minorities or women.

Small numbers

A related issue discussed in focus groups is the relatively small fraction of the general population that identifies as LGBT, which in itself poses challenges to building supportive relationships and networks. For example, even if LGBT people are represented proportionally in the physics community (which remains an unanswered question), for statistical reasons some departments might not contain a person who identifies as such. The problem is amplified for subsets of this population, such as trans individuals, that contain relatively small numbers of people. The ability to connect with someone within the same institution or even a neighboring institution varies dramatically depending on institutional and geographical contexts.

"I am not really out at work because I don't feel comfortable outing myself in the environment. There are no other out LGBT+ individuals in my department."

Career transitions

Frequent career transitions for young physicists, which typically involve moving to a new institution, can introduce additional challenges to establishing supportive relationships and networks; both within their career and within the external community. Postdocs were identified as a particularly vulnerable group, because these roles are quite short in duration and at a key transitional stage of the career pipeline. Additionally, recent data from the APS Membership Survey shows a sharp drop-off of physicists who openly identify as LGBT within typical post-doc age, from 16% aged 18-25 to 2% aged 36-45. They report experiencing a lack of community having moved to a new institution from graduate school. One participant noted that he was out to students but not to his "'old school' advisor." Others spoke of having difficulty with their advisors and described that the experience of being a postdoc could be "lonely." Although this experience may be common to many postdocs, those who participated in focus groups perceived that needing to re-establish support structures and social networks as a LGBT person presented higher barriers.

5 A significant fraction of LGBT physicists have experienced or observed exclusionary behavior.

In the past year, 22% of climate survey respondents reported experiencing and 39% reported observing exclusionary behavior due to gender, gender expression, gender identity, sexual orientation, and/or sexual identity. Figure 6 shows that the incidence of observing and experiencing exclusionary behavior is higher for LGBT women and gender-nonconforming physicists than for LGBT male physicists. It was also higher for trans respondents than for cis LGB respondents.

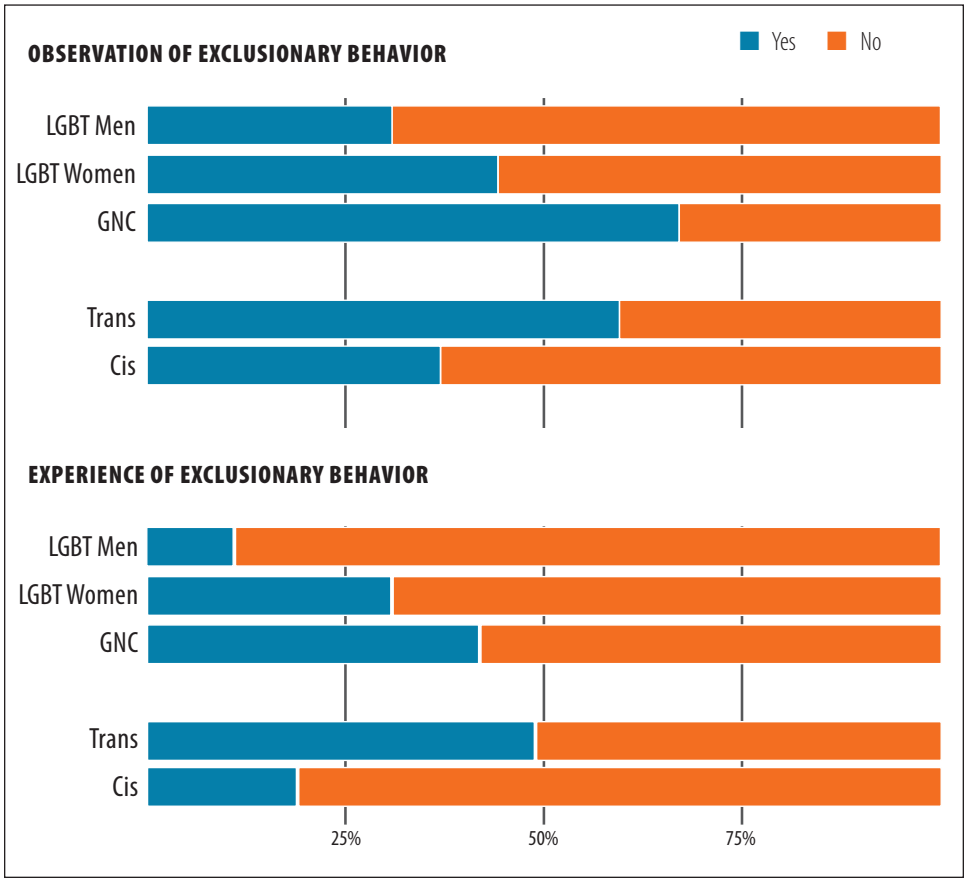


FIG 6. Observation and experience of exclusionary behavior broken down by gender and separately by trans or cis identity. Cis respondents include all those who did not identify as trans.

6 LGBT physicists with additional marginalized identities faced greater levels of discrimination.

"It was mostly just exclusionary discrimination. I don't know if it was based on my gender or my sexual orientation. But I was very out [as an undergraduate]. So it could have been either or both. I know that all of the other students, literally all of them, studied together and did their homework together and all of that. And I tried to participate in these things and was often, you know, given the run around on the times, and I just stopped trying after a while and stopped interacting with them socially."

LGBT physicists who have additional marginalized identities faced greater levels of discrimination. Additionally, some noted that it was difficult for them to distinguish the aspect of their identity to which colleagues were reacting when subjecting them to exclusionary behaviors. Women climate survey respondents experienced exclusionary behavior at *three times* the rate of men. Also, people who identify as LGBT and carry other marginalized identities reported experiencing these issues differently. For example, LGBT people of color often report feeling fully at home neither within majority-white LGBT support groups nor within majority-cis/straight organizations that serve the needs of people of color. Interview data and open-ended responses on the survey explored these issues further, as described in the following sections.

Experiences of LGBT women

In the open-ended responses, climate survey participants cited physical and verbal sexual harassment experienced by women. For example:

> "Things I have personally experienced within my physics department: Sexual harassment, sexist jokes directed at me (e.g. being told that I would not be using experimental apparatus in a lab except for personal grooming), sexist assumptions directed at me (e.g. being told that I only received the position due to my gender), sexualization and tokenization of my orientation (e.g. male physicists showing pictures of conventionally attractive females to me, because they think that 'lesbians are hot')... The examples within the entirety of my campus are too numerous to list."

> "[I was] Touched inappropriately by another graduate student I did not know in my office ... When [I] emailed him to ask that he does not come to my office or contact me again, he again showed up at my office."

The interviews also revealed gender-based issues. One participant believed that, from her own experience, more substantial barriers arose due to gender than sexual orientation:

> "I'd rather be a gay man than a straight woman any day. So I think that like gender seems to play a much bigger role than orientation at least in what I've experienced."

Other participants reported experiencing discrimination that may have been due to both gender and sexual orientation:

> "I have not felt safe to talk openly about my sexuality. The sexism is rampant. I get less respect than others, it's hard to know if it is my gender or being a lesbian. Other women are not treated with the respect they deserve."

Some participants reported discouragement in bringing up experiences of exclusionary behavior:

> "I was sexually harassed for multiple years within my physics department. Despite repeated attempts on my part to discuss the matter with other students, faculty, and the department head,

I was consistently shut down, told that I was overreacting, or misinterpreting the other student who was consistently given the benefit of the doubt in contrast."

> "I think that people are discouraged from making a fuss. So I've witnessed people explicitly say things like, 'Oh I mean this is a big problem, but I'm not going to bring it up because it'll be over in six months.'"

Participants also reported other experiences of sexism and exclusionary behavior. For example, one participant felt supported by her advisor who was sending her to be trained in experimental techniques that require physical strength. But other graduate students in the lab questioned why she was allowed to do these trainings because the male students could do the work:

> "And he like sends me to training on very experimental techniques that require strength. And I get comments from my fellow grad students about why are you... 'I mean, why are you learning those things? We know how to do those things. You and the other girl can just go do the detail work and we can do the heavy stuff.' And... Also, our post doc has been trying to take credit for some of my work. I always e-mail my advisor and don't CC him. So it hasn't been working. But he's been trying."

This participant noted that the postdoc who was trying to take credit for her work also made inappropriate complaints about the participant's clothing to their advisor.

Experiences of LGBT persons of color

Statistically significant quantitative differences in the experiences of persons of color and white physicists who were LGBT were not evident in the climate survey data, most likely due to limited sample size. However, the open-ended responses in the climate survey and an interview with a queer black woman indicate that racial issues were a deterrent for some participants.

One response suggested that the participant was perceived poorly due to minority status, in part because this attribute was more visible:

> "I think I grappled more with the race element than I do with the sexuality because the deal is – is that that's what they see first. I can't actually closet my race because I'm – evidently I'm brown – my hair looks different, so it's just there. That said, I think there's already a prejudgment there on the basis of how high my aptitude is, just in general. It doesn't necessarily have to be specific to physics but anything that requires some level of critical thinking is always kind of under examination or assumed to be mediocre or subpar."

Other respondents reported that they have heard both homophobic and racist comments from their colleagues:

> "It is my impression that faculty are intolerant and silent bystanders towards LGBTQ students. Upon hearing comments made by faculty I know there are negative attitudes and stereotypes towards LGBTQ people and people of color."

In the interviews, one participant who identified as African American acknowledged barriers in her family to coming out as they intersected with race:

> "... I'm not necessarily saying ... that all people who are Caucasian happen to have more ease in terms of coming out, but I can definitely say ... they seem to have a little bit more ease of access in terms of being able to have conversations like that with the people in their family or the people amongst their friends, whereas with me that's not necessarily the case."

This participant struggled with asking for help when she needed it because of the risk of perceived inferiority due to her race:

> "...I know I grapple with that a lot because when it comes to asking questions or completely having no idea about how to start a problem it becomes injurious to me in terms of being able to progress through a course because professors may have made the stereotype that I already came in with this low level of aptitude ...So in terms of bringing on the queer aspect to that, it is, it's kind of really difficult to deal with both at the same time. ... I think in the long run it has definitely been very difficult for me to have confidence in my abilities. And I can for sure tell you that my grades have suffered because of that."

She now works in industry and her experiences have deterred her from pursuing a PhD.

7 Transgender and gender-nonconforming physicists encountered the most hostile environments

"At my university, coworkers made snide/hostile remarks about my wardrobe such as 'Why do you paint your nails? You're a boy. Boys don't do that.'"

Transgender and gender-nonconforming physicists reported the highest levels of exclusionary behavior, adverse climate, and unsupportive policies. Figure 6 clearly indicates higher levels of experienced and observed exclusionary behavior amongst trans and gender non-conforming respondents. Trans respondents reported lower levels of comfort than cis respondents as shown in Figure 7. Cis respondents are those who did not identify as trans, and mostly identify as gay, lesbian, bisexual, or queer. Furthermore, as shown previously in Figure 2, trans respondents were 5.5 times more likely to describe policies as "discriminatory" than cis respondents. They are also 3.6 times less likely to describe them as "highly supportive." Trans respondents, like gender-nonconforming respondents, exhibited a lower level of comfort in their campus/company/organization.

There were 5 trans-specific questions on workplace climate that were asked of the 37 respondents who identified as trans. These are shown in detail in Figure 8. 40% of trans respondents disagreed that "My co-workers use my preferred pronouns." Only half of trans participants agreed that "My health benefits cover trans related needs."

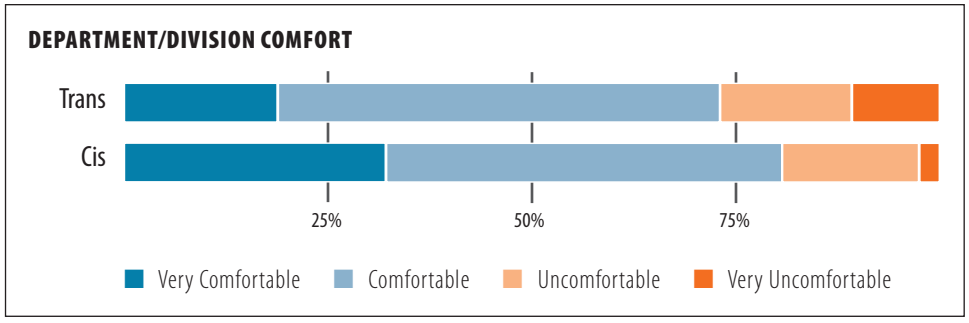


FIG 7. Climate for trans and cis respondents. Cis respondents include all those who did not identify as trans; it should be emphasized that most of these cis individuals identify as gay, lesbian, bisexual or queer.

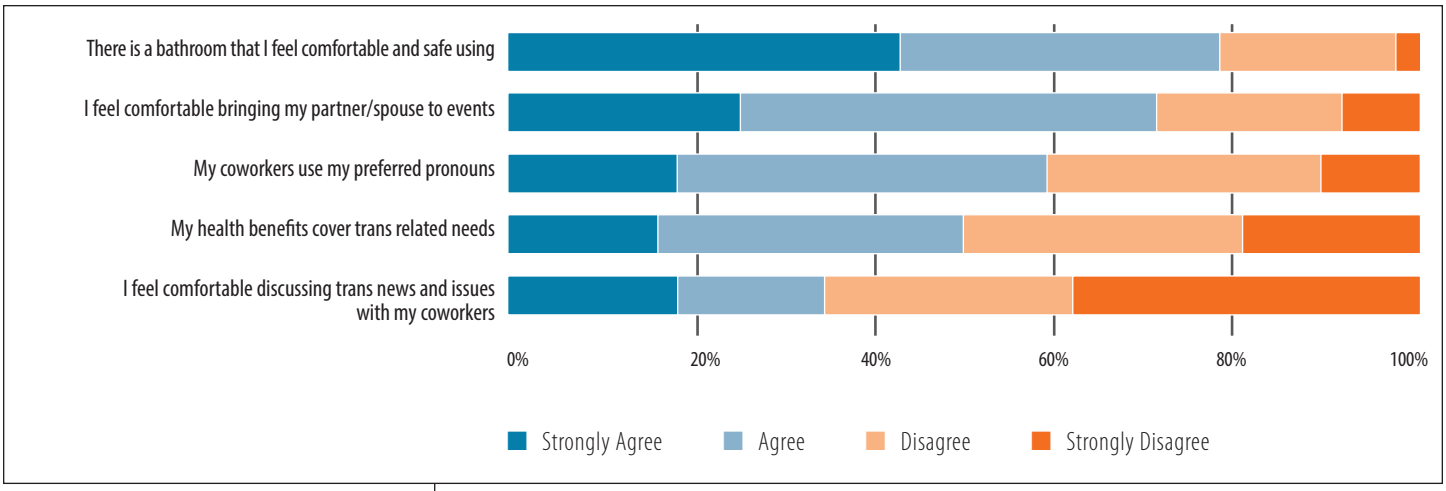


FIG 8. Trans-specific climate questions arranged from highest to lowest degree of agreement. These questions were only asked of the respondents who identified as trans.

Experiences of transgender people

Many trans respondents reported particular difficulties with being trans on-campus and in their department. Some of the struggles derived from larger cultural and policy issues at their institution:

> "Most prominently, an ordinance that would be (somewhat) protecting me ... was repealed by people who think trans women are predators and men. This included very hateful campaigns on their part, ones in which my old landlord even participated. Some of this was on campus. There are also evangelical Christian men who protest LGBT people's existence on campus and nearby with hateful signs. There are transphobic gay men in the on campus LGBT groups who make things worse. And the school insurance has exclusions against trans people getting care. These exclusions are archaic, hateful, and not financially necessary given how few AMAB (assigned male at birth) people even undergo sex reassignment surgery, hormone treatments, facial hair removal (to name the ones I either have done or want)."

Multiple participants struggled with peers in their departments and workplaces that routinely misidentify their gender by refusing to use correct gender pronouns even when requested to do so. Instances of misgendering have been related to intense distress as reported by trans people reaching out for mental health support when experiencing suicidal episodes.[15]

> "Misogynistic comments (both benevolent and outright) from those who perceive me as female. Open mockery of the concept of gender identity & associated terms at social events."

> "I had to testify at length at an appeals hearing brought by a fellow departmental faculty member who was appealing the disciplinary action taken against him. He had refused or was unable to use the correct pronouns when referring to me even though my transition had been 5-6 year prior to the last instance of his use of the wrong pronouns."

> "I deal with not having my choice of pronoun respected every day. Sometimes these situations affect me deeply on an emotional level, and affect my ability to work for several hours."

Other participants in the climate survey reported being mocked and harassed publicly:

> “Being mocked and openly laughed at by a group of colleagues in a corridor of my department as a result of my gender expression.”

> “I was harassed by a professor while going into the bathroom like the first week that I was on campus.”

The interview participants who identify as trans also faced significant barriers in their education. One person’s barriers came from institutional issues, while another came from hostility and ignorance in their own department. For one student, she struggled when she entered graduate school because the university could not match her gender on paperwork after it was erroneously labeled with the gender assigned to her at birth. As a graduate student coming into her program she spent significant time and mental energy dealing with multiple offices to remedy the situation. Eventually, she had to get the Title IX representative involved because the human resources department refused to act on the matter.

Safety was also a very prominent concern for this participant. Before she even came to the program, she asked her future advisor about safety:

> “And so part of me talking with my advisor and asking him if the school would be a safe and welcoming place was asking if the group would be safe and welcoming and him having a conversation with them about me coming. And everyone was fine with it. But it meant that everyone who was there knows more or less”

For one trans respondent, establishing a safe educational environment included a proactive discussion with her potential advisor so that he would specifically communicate her arrival to the research group. Safety also required finding a bathroom she could use without fear of confrontation or legal action. The policies that she was told were in place discriminated against her using appropriate bathrooms. She then had to seek out the actual policies in order to protect herself.

Another trans participant had problems integrating into their first non-physics department:

> “...there’s a lot of gender - pushing for gender roles to be conformed to and they would not respect where I was coming from or respect my pronouns or that kind of thing. So there were issues just in the department. They kind of make it clear that they’re looking for people that fit their - a female should be a flirty individual that’s going to kind of cater to older males in the industry...”

8 Many LGBT physicists were at risk for leaving their workplace or school.

"... And the outlook for me in terms of getting a PhD ... is really contingent upon whether or not I have the right type of support system around me to be able to facilitate my success."

Over a third of participants (36%) reported considering leaving their institutions in the year prior to taking the climate survey. This was seen to correlate strongly with uncomfortable workplace climate and/or the *observation* of exclusionary behavior. Succinctly stated, the climate is sufficiently unwelcoming in some physics workplaces and schools to drive LGBT physicists to leave. This finding is consistent with the National Transgender Discrimination Survey, which found that 15% of trans people at some point leave school due to discrimination or harassment.[17]

9 LGBT physicists reported trouble identifying allies to help mitigate isolation, exclusion or marginalization.

"I don't think that LGBT support is visible. I don't think it's absent, but I don't think it's visible in physics."

In the interviews and the focus groups, the visibility of allies was an important topic. Because of the visibility issue for allies, LGBT people may not be aware that supportive mentors exist or that mentoring is potentially available on LGBT issues. Further, many participants in focus groups shared the feeling that it is difficult to broach the topic of LGBT issues and come out to people they would consider mentors, since there is often such a strong barrier between research or academic discussions and personal matters. Having an appropriate space in the organization to discuss these issues was identified as valuable. Some participants felt most comfortable opening up to possible mentors who share any kind of experience outside the norm; for example, someone in any kind of minority group in physics. It can help to have shared reference points and concerns like casual discussion of relationships and family life with colleagues. For instance, straight women will not have the same experiences as gay men, but they may share the experience that the topic is uncomfortable to discuss with professional colleagues.

Many focus group participants highlighted the importance of institutional supports like SafeZone, a program typically hosted by campus LGBT groups or centers. SafeZone participants receive a sticker that they can display in their working space to indicate support for LGBT people and knowledge of LGBT issues. The sticker serves to increase the visibility of LGBT persons and allies. Participants discussed the SafeZone programs found in their institutions and felt that programs with a training component were more successful. The need for such programs to specifically teach allies mentoring strategies for LGBT people was noted. One interview participant described the impact of finding a visible ally and how this was important to her academically:

> "I've identified two professors at [University] who are okay working with queer, LGBTQ people and one of them was actually my thesis advisor. And the reason I was able to identify him was because he had a little rainbow sticker on his window. And I would kind of see some of these, I don't want to call them Easter eggs, in different places and I don't necessarily know that he's queer himself. I think his children may be or something like that, and that was kind of a cue for me to be a little more comfortable around him in terms of just talking about my family life or just opening up in general although being queer was never a topic of conversation. I was able to kind of receive whatever critique it was that he was giving me in terms of workstyle or homework sets whatever without having the stigma of being stereotyped for being queer or making him feeling uncomfortable because I might present something that may be queer or whatever."

Recommendations

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Based on the findings, C-LGBT developed six broad recommendations along with specific actions that describe ways the APS can increase inclusion and support for LGBT physicists within the broader physics community.

The main themes of the committee's recommendations are to engage all physicists in the day-to-day work of treating each other with dignity, to acknowledge the challenges that LGBT people still face in a world that can be hostile to difference, and to break through the silence and violence that has too often characterized LGBT marginalization. At its best, physics is a welcoming, safe, and open community that draws contributions from a diverse range of dedicated scientists; including those who identify as LGBT. The ultimate aim of these recommendations is for all physics-related workplaces and educational institutions to live up to this aspiration.

1 Ensure a safe and welcoming environment at APS meetings.

APS should ... **establish written best practices for APS meetings that support inclusion and attend to issues particular to LGBT physicists for dissemination to conference organizing committees and meetings staff.**

Many of the recommended practices for meetings described below mirror those in the guide co-authored by the lgbt+physicists group and the AAS Working Group on LGBTIQ Equality, which is directed toward academic departments.

Promote use of inclusive language

"[A] trans co-worker is constantly misnamed and misgendered in physics department by senior colleagues."

The APS should encourage presenters and session chairs to use inclusive language. For instance, always use the name and pronoun of a person's choosing. Chairs may approach presenters in private, asking "How would you prefer to be addressed?" before introducing their talks. Use gender-neutral phrasing whenever possible, avoiding heterosexual assumptions about partners in professional conversation, and use words like "chair" instead of "chairman." In addition, create an APS policy for meetings that addresses harassing and harmful language, and aligns with the APS Code of Conduct.

"I will say I have heard disparaging remarks ... made by other professors about gay people and I think that was the one thing that kind of let me know these individuals are not good to be able to work around."

We emphasize here that there are some members of the transgender community who eschew traditional gender pronouns, preferring to be referred to by "they" as a singular gender neutral pronoun. There have been objections to this based on the erroneous claim that this usage is grammatically incorrect. However, the usage of "they" as a singular gender-neutral third person pronoun is actually a correct usage with an established history. This particular concern has been noted recently in an update to the Washington Post Style Guide and other mainstream media.

Create safe spaces

"At both my current and previous institution, my peers have consistently left me out of social events and frequently talked about me behind my back with disrespectful language relating to my gender identity/ expression."

Over the past five years, the American Physical Society (APS) has begun to accommodate and create safe spaces for LGBT physicists at both the March and April Meetings. Since 2010, lgbt+physicists, a grassroots group devoted to developing resources and fostering networking, has held an official event at both of these annual meetings with support from APS. In 2012, this event took the form of an invited session co-sponsored by COM and CSWP at the March Meeting. This included talks and a panel discussion about the experiences and needs of LGBT academic professionals. LGBT physicists have also found support at APS meetings through the APS Education & Diversity booth. This space has acted as a hub for LGBT physicists at APS meetings, assisting with dissemination of flyers and information for events, handing out badge stickers for LGBT physicists and allies to show support, and providing information about resources at the meeting.

The APS should continue to offer opportunities for LGBT attendees to form safe social spaces during the March and April Meetings, and support diversity events and sessions that address LGBT issues in physics. Based on the success of LGBT networking events and sessions at the March Meeting and April Meeting, APS should also consider supporting these types of events at other meetings.

"A professor harassed me about bathroom usage."

Provide adequate restroom facilities

APS has also begun to offer accommodations at meetings concerning safe restroom facilities for LGBT (and particularly transgender and gender-nonconforming) physicists. At the March Meeting, gender neutral restroom facilities have been available in the convention center for the past two years, and over the same time period at the April Meeting, gender neutral restrooms have been available whenever possible. These facilities have acted both as a practical necessity for attendees who feel uncomfortable or unsafe in gendered restrooms, as well as a visible sign of support for LGBT attendees. It has also sparked wider discussions about the need to provide resources for LGBT individuals in professional scientific spaces.

APS should make gender-neutral restroom facilities available at all APS meetings, conveniently located and clearly indicated in a note in the meeting bulletin or bulletin maps. If no gender-neutral restrooms exist in the conference space, one solution is to temporarily designate one or more gendered restroom(s) as gender-neutral for the duration of the meeting, with clear signage. If a bathroom is to be converted in a location adjacent to another gendered bathroom, both bathrooms should be converted to avoid the implicit creation of "single-gender plus trans" bathrooms, which single out trans individuals. Any gendered bathrooms converted to gender neutral ones, especially previously-male-bathrooms, should have sanitary trashcans available in all stalls similar to those in women's restrooms. If gender-neutral restrooms do exist or if they are created for the conference, it is important that they are conveniently located and accessible. It may be necessary to add clarifying signage or designate additional restrooms as gender-neutral. APS should request that convention center staff avoid "correcting" attendees' use of any restroom, whether gendered or gender-neutral. Gender-neutral restrooms should be located near the hub of meeting activity to avoid creating unnecessary barriers for those who feel most comfortable using them, and want to participate in the scientific meeting to the greatest extent possible.

APS should ... implement the Code of Conduct with thorough and careful regard to informing members and responding to reports of infractions.

"[Producing] some really well defined harassment policies at conferences also for both women and LGBT people would be really good."

APS has a responsibility to ensure that all meeting attendees are treated with respect and experience a safe environment in order to benefit from free exchange of scientific ideas as well as networking and professional opportunities. Following other scientific societies, APS recently drafted a Code of Conduct. APS will require all participants to agree to follow the Code of Conduct as part of registering for national conferences. This represents an important step toward creating a space where all voices can contribute to the advancement of physics. This Code of Conduct should not merely exist as an isolated policy at registration; rather, it should be integrated throughout the meeting.

Inform members of the Code

In addition to requiring that all attendees, exhibitors, and APS staff agree to the Code of Conduct before attending an APS meeting, APS should also ensure that respectful and ethical behavior is maintained throughout the duration of the event. In the spirit of the AAS Code of Conduct,[16] it should be incumbent on the leadership of the APS to inform members of the Code of Conduct. Perhaps this can be achieved by recording a short video to be played throughout the meeting

venue and on the webpage. This will help to convey the appropriate gravity of the Code of Conduct.

Establish clear procedures for reporting infractions

In order for the Code of Conduct to be effective, the process of reporting infractions should be clear to participants and easy to perform. Information on the Code of Conduct and reporting infractions should be included in meeting apps, websites, and other program materials as appropriate. All APS staff attending meetings should be trained as potential initial contacts to respond sensitively to members. The APS staff attending meetings should also be trained to not challenge the validity or severity of any claim. APS staff should then see to it that the participant is connected as soon as possible with designated staff members who are more specifically trained to address the alleged infractions.

Respond to infractions using clear and fair protocols

APS should establish protocols regarding the handling of infractions of the Code of Conduct. A process should be established to formally document all reports to the APS. Further, the Code of Conduct should be enforceable. We encourage APS to clarify the procedures it will follow to establish the veracity of alleged infractions, as well as actions it is prepared to take if an infraction is verified to have occurred. For transparency, it is important that a designated group of individuals is charged with investigating alleged infractions and determining an appropriate response.

2 Address the need to systematically accommodate name changes in publication records.

APS should ... **work to improve electronic journal records and publication procedures so that transgender physicists who change their names will have their full publication records visible and, at the same time, will not be outed by their publication record. This issue is also of significance to those who experience a name change due to changing marital status or other reasons.**

Publication records are extremely important for advancing careers in physics. Transgender physicists who transition later in their careers are currently faced with two poor options when listing their publications on a C.V. or elsewhere: (1) include publications under a differently gendered name that reveals their transgender status and risk discrimination, or (2) leave out publications under a differently gendered name and risk appearing less accomplished.

Currently, name changes are typically handled by linking current and past names in journal and other database records, making all articles written by the author easy to find. This approach does not work well for transgender physicists since it forces their gender history into the public domain, potentially affecting their careers. This serious issue has been raised repeatedly at LGBT roundtable discussions, at APS meetings, and by members of lgbt+physicists.

"Despite repeated requests for appropriate pronouns, the same people continue to misgender me and try to have me fit particular gender stereotypes."

Another issue is that even in the case of someone who is completely out as transgender, a name mismatch could still be potentially awkward or distracting during a job interview. It is also quite possible that someone relying on a search engine to check a job applicant's publication history could overlook a portion of

their record. We note that these last two considerations could also be problematic for individuals who have experienced name changes through marriage and divorce, an issue which has been discussed within CSWP.

The rapidly growing predominance of electronic journals and databases presents an opportunity to develop an electronic solution. A unique identifier could be assigned to each author, rather than identifying authors by their name. A variable labeled 'present name' could then be assigned and displayed on all of the author's papers, which could be changed when needed. The author should be given a choice as to whether a previous name would appear in publicly searchable databases, or their present name exclusively. Enacting such a solution would require cooperation from journal editors, technical staff, database managers, and other stakeholders. As a professional society and a leading international publisher, APS is uniquely positioned to marshal such coordinated action.

3 Develop advocacy efforts that support LGBT equity and inclusion.

APS should ... issue a statement on the inclusion and fair treatment of LGBT people in physics that supports workplace non-discrimination policies and legislation, among other actions.

"One of my undergraduate mentees was beaten by his roommate because of his sexual orientation. He has endured lasting physical and emotional injury that will likely persist for years to come."

It would be a meaningful signal of APS's commitment to LGBT inclusion if the professional society were to issue a statement that asserts LGBT physicists deserve to work in a safe and supportive environment; free from prejudice and discrimination. Currently, there is no federal law that protects employees against being fired for identifying or being perceived as LGBT, and fewer than half of US states have such protections. This limits professional opportunities available to LGBT physicists, particularly within academia, where willingness to relocate for professional reasons can be critical to a physicist's career trajectory. In order to promote equity, APS should support efforts towards ending discrimination in the workplace, such as the Equality Act, which would prohibit discrimination on the basis of sex, gender identity, and sexual orientation.

APS should ... update existing APS policies and statements to be inclusive of LGBT physicists.

APS has made a number of statements that have positively impacted the lives of physicists. Below are specific recommendations for making existing statements more inclusive of LGBT physicists.

Update language in existing statements

The language of the following statements should be updated to include sexual orientation, gender identity, and gender expression to unambiguously state that all LGBT physicists deserve fair and equal treatment, and protection from discrimination.

- Protection Against Discrimination
- Policy On Equal Professional Opportunity
- Displays in the Workplace of Graphic Material Depicting Demeaning Images of Women
- K-12 Education Statement

"In the campus in general, and in my lab/office I feel comfortable. I have had no issues with anybody and they have all been accepting. In my department I have been mocked and been the victim of general transphobic attitude."

With respect to the last of these statements, it should be acknowledged that K-12 schools are unsafe for the majority of LGBT students. A recent study found that 85% of LGBT students reported harassment and 30% skipped at least one day of school in the prior month because they felt unsafe or uncomfortable. The situation is particularly harsh for transgender students, nearly all of whom have faced harassment and two-thirds of whom feel unsafe at school. The majority of LGBT students have also experienced discriminatory school policies and practices. LGBT students who experienced discrimination and were victims of harassment had lower GPAs and were less likely to apply for college. APS should specifically include LGBT students alongside other underrepresented groups, and promote an educational environment that is free from harassment and discrimination for all LGBT students.

APS should ... advocate in the international physics community for the inclusion and fair treatment of LGBT people.

Around the world, human rights violations against LGBT individuals are common. In some countries, these violations are supported by the legal system. Such human rights violations deny physicists the opportunity to work in a safe and supportive environment in those countries. APS should advocate for LGBT equity for physicists at home and abroad. As a start, APS has statements on The International Nature of Physics and International Cooperation and Scientific Contact with Countries Accused of Abrogating Human Rights. Sentences should be added to these statements making it explicit that APS deplores human rights violations against LGBT populations in any country and encourages APS members to support LGBT physicists suffering from violations of their basic human rights.

APS should ... lobby federal funding agencies to include LGBT demographics in STEM education and workforce surveys and to acknowledge a pressing need to address climate issues for LGBT people in STEM fields.

Advocate for the study of LGBT representation in STEM

Currently, there is little data regarding LGBT individuals in STEM fields. Basic questions with significant implications, such as whether LGBT individuals are underrepresented in STEM, remain unanswered. Federal agencies such as the National Science Foundation regularly conduct national studies on STEM education and the STEM workforce which have provided a wealth of information with regard to gender, race and ethnicity, and persons with disabilities. However, these surveys do not include LGBT demographic questions. In order to better document, understand, and address the needs of LGBT physicists, APS should lobby federal agencies to include LGBT demographics in national STEM education and workforce studies. APS should also include LGBT demographic questions in its own surveys of members, as the American Astronomical Society has done, and as was done by APS in 2015.

It is important that demographic questions ask for sexual and gender identity respectfully and accurately.[28] For example, many surveys that attempt to include transgender participants require choosing one of three options: male, female, or transgender. Since most transgender people identify as male or female, this type of question is inadequate. Surveys that include transgender demographics should do so with a separate "yes/no" question that asks if the participant is transgender, or by allowing more than one selection on questions about gender where transgender

"Comments made by faculty members regarding another student's transgender status discouraged me from publicly revealing my sexual orientation and speaking out."

is one of the options. Survey questions on LGBT demographics should be vetted by representatives of the LGBT community and also by researchers with relevant expertise, as LGBT status is a sensitive question for most individuals.

Advocate for federal agencies to promote LGBT inclusion in broader impacts

Federal funding agencies value efforts to promote women and racial or ethnic minorities in STEM fields as addressing the "broader impacts" review criterion used to evaluate proposals. Similar efforts relevant to LGBT individuals in STEM fields are typically not included. Given the evidence regarding climate issues and exclusionary behavior faced by LGBT individuals in physics, as well as science and engineering on a broader scale,[7,9,10,11,29,30,31,32,33] APS should lobby funding agencies to promote LGBT inclusion and mitigate discrimination. APS should value such efforts as addressing the broader impacts review criterion.

4 Promote LGBT-inclusive practices in academia, national labs, and industry.

APS should ... **publicize, disseminate, and encourage the use of the Best Practices Guide developed by lgbt+physicists.**

"Our departmental/division climate seeks to be inclusive, but doesn't really know how."

The data collected by C-LGBT provides clear evidence of climate issues for LGBT physicists, indicating that the current practices of many physics institutions systematically exclude LGBT individuals. The lgbt+physicists have developed and refined a *Best Practices Guide*[18] with specific recommended actions that physics departments can take to improve the climate for LGBT individuals. Many recommended actions in the *Best Practices Guide* can be implemented with little effort or expense. APS should promote this resource to physics departments and encourage its use. To facilitate the use of the *Best Practices Guide* in trainings, collections of slides should be made available.

APS should ... **develop a training program on inclusive workplace and mentorship practices for physicists in academia, national labs, and industry that incorporates the needs of LGBT physicists and aims at the recruiting of active allies.**

"Physicists need to kind of take it down a notch and pull more of the human element because no matter what answers you search for by using a laser, doing all different types of experiments with detectors, you still have people doing these things and you have to remember if you want them to work at their best you have to be able to treat people right, you have to make a climate that's hospitable."

Building LGBT-inclusive physics communities depends on recruiting, training, and sustaining active allies. Active allies seek out information to educate themselves about these issues and create open and inclusive communities. They do this by serving as local resources, by acting as advocates, and by recognizing and countering factors that marginalize vulnerable members of the community. APS can take a number of steps to foster active allies and provide information on LGBT inclusion.

APS should provide resources and training to aid in the professional development of active physicist allies whose efforts will ultimately result in the physics community adopting more inclusive practices. Such a training program could be offered through the APS webinar series, at the annual APS meeting, at the New Faculty Workshop, or at the Physics Department Chairs' Meeting. The LGBT-specific aspects of such training could be based in part on existing initiatives such as SafeZone programs, CampusPride webinars, and the QUILL training at Michigan State University. A compilation of such resources has been collected by the committee and published on the APS website to accompany this report.

"A gay student was openly mocked by a professor in front of the class, most of whom laughed in agreement."

The resources provided by APS can form the basis for recruitment, training of new allies, and discussions between allies. Presenting and talking about issues faced by LGBT individuals, along with other marginalized groups, will normalize how physicists talk about these issues. To achieve this, it is necessary to create an open environment in which allies can ask genuine questions about unfamiliar terminology or handling difficult situations.

APS should ... **provide physics departments and national labs with feedback on LGBT inclusion as part of the site visit program organized by CSWP and COM.**

"I have witnessed hostile commentary made about LGBTQ people as being unnatural during an SPS campus chapter meeting. It made other students feel uncomfortable."

The site visit program,[34] organized by CSWP and COM, is one of the few ways in which physics departments can receive independent, confidential, and actionable feedback on climate issues as assessed by their peers. Currently, this program does not explicitly include assessment of climate for LGBT physicists. Such information would be useful for departments in considering a holistic view of the climate experienced by their students, faculty, and staff. The findings in this report show that improving LGBT climate is relevant for retention of faculty and staff, as well as the success of students. Further, some women and racial or ethnic minority physicists identify as LGBT. The climate site visit program should be updated by promoting the option to assess climate for LGBT physicists and the addition of a representative from the LGBT physics community to the site visit team.

5 Implement LGBT-inclusive mentoring programs.

APS should ... **establish written best practices for mentoring programs to be inclusive of LGBT physicists, disseminate these to program leaders, and discuss their implementation.**

"There is this idea that scientists don't think that they have prejudice because they are rational, but they definitely do and it comes out in ways that they probably don't even realize that they're expressing. But they are expressing them and it hurts. It's not good for the people who are experiencing it."

As a professional society, the APS is a natural facilitator of mentoring activities at the national level. APS already has several programs with significant mentoring components and should ensure that these are explicitly LGBT-inclusive. At minimum, all APS-affiliated mentors should be required to undergo the training recommended in Recommendation 4 of this report, so as to be aware of LGBT identities and resources. In addition, programs should incorporate the inclusive practices detailed within the lgbt+physicists *Best Practices Guide*[18]. This effort should include making explicit the incorporation of LGBT identified women, including trans women, and LGBT-identified under-represented minority individuals in efforts designed to advance those groups. Having mentoring programs incorporate activities that specifically address strategies for creating a physics climate inclusive of LGBT identities would produce not only a diverse physics workforce, but one whose members are prepared to support each other as active allies.

APS should ... **create a professional network of LGBT mentors and mentees. In addition APS should sponsor LGBT networking events that support the development of mentoring relationships.**

Mentoring is invaluable to junior physicists in order to transition to new roles and succeed in each career stage. Mentees frequently need multiple mentors to address separate components of their career goals. LGBT physicists may need mentoring to help them navigate challenges specific to their own identities. To foster success

"There needs to be some network or support system or something where students may be able to reach out, or there might be resources that those individuals have come [across]"

of LGBT individuals in physics, we recommend the creation of a professional network of LGBT mentors and mentees in partnership with national organizations that support LGBT scientists in the U.S., such as the National Organization of Gay and Lesbian Scientific and Technical Professionals[35] (NOGLSTP) and Out in Science, Technology, Engineering and Mathematics[36] (oSTEM). A strong relationship with these organizations should be established by a mutual presence at each other's meetings. Such a program would assist in matching mentees with potential mentors, and could build on the OutList initiated by the lgbt+physicists,[37] Furthermore, APS should use current and future mentoring projects as a particular point at which to establish connections between participating mentees and this LGBT physicists mentoring network. In addition, APS should sponsor LGBT-specific mentoring activities, such as formal sessions and networking events, during which LGBT individuals are visible. These activities could also include professional development on career navigation issues specific to LGBT individuals.

6 Support the establishment of a Forum on Diversity and Inclusion.

APS should ... **support the establishment of a new APS Forum that works to build a more inclusive, diverse and equitable society for all physicists, including those who identify as LGBT, women, racial or ethnic minorities, persons with disabilities and others.**

"My students tend not to believe I'm competent to teach Maths when they see me, because I'm a woman and a minority."

Implementing these C-LGBT recommendations will take time, and the issues faced by LGBT physicists are not short-term issues. Once the ad hoc committee has submitted its report, there will still be a need for an ongoing structure within APS to help implement its recommendations and to give those engaged in the work official standing within the Society. C-LGBT examined two possible structures, either a standing committee or a forum, and unanimously endorsed the idea of creating a forum. A forum is inherently a more flexible structure than a committee and directly engages the broader APS membership. In addition, a forum affords new opportunities for addressing issues of equity, diversity, and inclusion quite broadly within the Society. Since a minimum of 200 APS members are required to create a forum, this structure needs to have a broader membership basis than LGBT physicists and allies. We therefore propose creating a Forum on Diversity and Inclusion, broadly construed. Conversations with the Committee on Minorities and Committee on the Status of Women in Physics have confirmed their strong interest in working together to create this new membership unit. Not only would such a Forum allow for a broader engagement of APS members on diversity, equity, and inclusion; it would also allow for addressing issues of intersectionality (i.e., individuals with two or more marginalized identities). In addition, as new constituencies come forward with concerns, the Forum on Diversity and Inclusion would offer a home for addressing these issues in a timely fashion.

Structure of the Forum on Diversity and Inclusion

The executive committee of the Forum on Diversity and Inclusion should consist of a Chair line, a Secretary, a Treasurer, a number of Representatives, and a number of Members at Large. In order to meet the needs of a diverse group of physicists, the leadership structure should include representation focused on the needs of particular populations. Initially, these positions would include a member of the Committee on the Status of Women in Physics (CSWP) serving as a

"The physics department in my school has rampant transmisogyny. It's gotten somewhat better, but initially I was told that I was crazy for wearing skirts, that it was too confusing that I sometimes present as I did before transitioning, and that it was offensive for me to have false breasts."

Representative for Inclusion of Women, a member of the Committee on Minorities (COM) serving as a Representative for Inclusion of Racial and Ethnic Minorities, a Representative for Inclusion of LGBT Physicists, and a Representative for Inclusion of Persons with Disabilities.

The structure should be flexible enough that new representatives can be added as needs arise. The structure should also ensure that a single group does not dominate the work of the Forum, so that key issues are not forgotten. The executive committee can convene subcommittees to focus on particular issues or programs that are either identity- or issue-focused. Regular communication among the members of the executive committee will help ensure that issues based on the intersections of multiple identities are productively and proactively addressed. The members of CSWP and COM will help to ensure good communication with these two standing committees, so that the work of the Forum is coordinated with the work of the committees and efforts are not duplicated or working at cross-purposes.

Mission and Activities of the Forum on Diversity and Inclusion

The mission of the APS Forum on Diversity and Inclusion will be to educate, empower, and engage a diverse community, including students and professionals at universities, at national labs, and in industry. Specifically, the Forum will identify, advocate for, and address the needs of women, underrepresented minorities, LGBT people, persons with disabilities, and members of other marginalized groups within physics. It will aim to fulfill these needs through mentorship connections, networking opportunities, strategic collaborations, and professional/leadership development. It will also advise the APS leadership on issues affecting diverse cohorts of physicists. The Forum on Diversity and Inclusion will build a thriving community of people committed to issues of diversity and inclusion, including those in marginalized groups and their allies.

Like any APS Forum, the Forum on Diversity and Inclusion will support its mission through promoting the accomplishments of its community. In this regard, it will nominate APS Fellows, raise funds to sponsor prizes and/or awards, sponsor sessions at APS meetings, and publish a newsletter. The APS Forum on Diversity and Inclusion will also take actions to promote diversity and inclusion within the APS and the broader physics community. It will gather information about the status of marginalized groups within the physics community through surveys, focus groups, and community roundtables. It will formulate recommendations arising from that information and work collaboratively with other APS units and staff to support the adoption and implementation of inclusive best practices. The Forum on Diversity and Inclusion will also seek to collaborate with external organizations supporting diversity in STEM such as lgbt+physicists, oSTEM, NOGLSTP, the National Society of Black Physicists, the National Society of Hispanic Physicists, and the American Indian Science and Engineering Society.

Conclusions

PHOTO CREDIT: MIHA MIHOVILOVIC

Most LGBT physicists today face a significantly more open environment than they would have a generation ago. We find it particularly heartening that 90% of climate survey respondents perceive that the atmosphere for LGBT people in physics is improving.

On average, policies and practices in physics are shifting in the direction of greater inclusion in step with the broader legal and cultural landscape. At the same time, it is clear that not all corners of the physics enterprise are adapting to fully accept LGBT physicists on these scientists' own terms. Those LGBT physicists who study and work in these more hostile environments face situations that range from disadvantaging, to exclusionary, or even debilitating to their physical and mental well-being.

Our investigations indicate that the negative effects are greatest where LGBT identity runs counter to societal prejudices that reinforce the primacy of fixed binary gender roles and hierarchies of privilege based on gender and race. The price paid by LGBT physicists in hostile environments is high. They are more likely to be subjected to exclusionary behavior, or fear its consequences due to their observations of the consequences suffered by others. Our data makes clear that many leave physics for this reason.

In our report we have outlined particular steps that the APS can take to foster an environment of inclusion that embraces LGBT physicists. As with many diversity efforts, we expect that these inclusive practices are likely to take root most readily in the universities, laboratories, and industries that already highly value diversity in its broadest sense. Any APS effort will only be successful to the extent that it reaches the corners of physics where LGBT people, facing routine hostility, report high degrees of discomfort, are least likely to be out, and are most isolated from allies. Empowering physicists at these institutions to advocate for themselves and their colleagues is a significant challenge, but one that APS is uniquely suited to address as one of the preeminent physics organizations in the world; bound together by the common pursuit of truth and understanding.

APPENDIX A | APS LGBT Physics Survey

CONSENT

The data collected in this survey will be used to better understand how the physics community can better support LGBT+ persons. All data will be reported anonymously and email addresses of participants will never be released.

Do you consent to take this survey? ❑ Yes ❑ No

CLIMATE

Climate is defined as the "current attitudes, behaviors, and standards held by faculty, staff, and students concerning access for, inclusion of, and level of respect for individual and group needs, abilities and potential."

Overall how comfortable are you with the climate in the following areas?

❑ Very Comfortable ❑ Comfortable ❑ Neither Comfortable nor Uncomfortable ❑ Uncomfortable ❑ Very Uncomfortable

Campus/Company/Laboratory

Department/Division

Classroom/Workplace

Please elaborate on your responses to experiences of climate.

Have you ever seriously considered leaving your campus/company/laboratory?

❑ Yes ❑ No Why did you consider leaving and why did you decide to stay?

Within the past year, have you personally experienced any exclusionary (e.g., shunned, ignored), intimidating, offensive and/or hostile conduct (harassing behavior) that has interfered with your ability to work or learn on your campus or workplace because of your gender, gender identity, gender expression, sexual orientation, or sexual identity?

❑ Yes ❑ No Please elaborate on your experience of exclusionary behavior.

Within the past year, have you observed or personally been made aware of any conduct directed toward a person or group of people on campus that you believe has created an exclusionary (e.g., shunned, ignored), intimidating, offensive and/or or hostile (harassing) working or learning environment because of their gender, gender identity, gender expression, sexual orientation, or sexual identity?

❑ Yes ❑ No Please elaborate on your observations

How do you find the policies in place at your campus, company or laboratory with respect to hiring, benefits and institutional practices relevant to LGBT+ persons?

❑ Highly Supportive ❑ Supportive ❑ Uneven ❑ Generally Lacking ❑ Discriminatory Please Explain

WORKPLACE CLIMATE

Using this scale, please respond to each statement with respect to your experience within your workplace or department

❑ Strongly Agree ❑ Agree ❑ Neither Agree nor Disagree ❑ Disagree ❑ Strongly Disagree

Lesbian, gay, bisexual, and transgendered (LGBT employees are treated with respect.

LGBT employees must be secretive.

Coworkers are as likely to ask nice, interested questions about a same-sex relationship as they are about a heterosexual relationship.

LGBT people consider it a comfortable place to work.

Non-LGBT employees are comfortable engaging in gay-friendly humor with LGBT employees (for example, kidding them about a date).

The atmosphere for LGBT employees is oppressive.

LGBT employees feel accepted by coworkers.

Coworkers make comments that seem to indicate a lack of awareness of LGBT issues.

Employees are expected to not act "too gay."

LGBT employees fear job loss because of sexual orientation.

My immediate work group is supportive of LGBT coworkers.

LGBT employees are comfortable talking about their personal lives with coworkers.

There is pressure for LGBT employees to stay closeted (to conceal their sexual orientation or gender identity/expression).

LGBT employees are met with thinly veiled hostility (for example, scornful looks or icy tone of voice).

The company or institution as a whole provides a supportive environment for LGBT people.

The atmosphere for LGBT employees is improving

There is a bathroom that I feel comfortable and safe using

My health benefits cover trans related needs

My co-workers use my preferred pronouns

I feel comfortable bringing my partner/spouse to events

I feel comfortable discussing trans news and issues with my co-workers

DEMOGRAPHICS

How out about yourself as an LGBT+ person or ally are you to your:

❏ Out ❏ Out to most ❏ Out to some ❏ Out to a few ❏ Not out

Friends

Immediate Family

Extended Family

Coworkers

What is your current gender identity? ❏ Man ❏ Woman ❏ Gender Non-Conforming ❏ Other:

Are you transgender? ❏ Yes ❏ No

Are you intersex? ❏ Yes ❏ No

What best describes your sexual orientation?

❏ Asexual ❏ Bisexual ❏ Gay ❏ Heterosexual ❏ Lesbian ❏ Man loving man ❏ Pansexual ❏ Queer
❏ Questioning ❏ Woman loving woman ❏ Other:

Are you a US citizen? ❏ Yes ❏ No

What is your race/ethnicity?

❏ African ❏ African American ❏ Alaskan Native ❏ Asian ❏ Asian American ❏ Southeast Asian ❏ South Asian
❏ Caribbean/West Indian ❏ Caucasian/White ❏ Latino(a)/Hispanic ❏ Latin American ❏ Middle Eastern
❏ Native American Indian ❏ Pacific Islander/Hawaiian Native ❏ Other:

What is your primary status on campus or in your work place?

❏ Undergraduate Student ❏ Graduate Student ❏ Post Doctoral Researcher ❏ Faculty ❏ Staff ❏ Administrator
❏ Research Scientist ❏ Technician ❏ Engineer ❏ Project Manager

What is your current status as an undergraduate student?

❏ First year student ❏ Second year student ❏ Third year student ❏ Fourth year student ❏ Other:

What is your current status as a graduate student?

❏ Masters student ❏ PhD student ❏ Other:

What is your current status as a faculty member?

❏ Instructor ❏ Adjunct ❏ Assistant Professor ❏ Associate Professor ❏ Professor ❏ Visiting Professor ❏ Other:

Would you be willing to participate in an interview?

❏ Yes ❏ No If so, please provide your email address.

PERSONAL DEMOGRAPHICS

We would like to ask some basic demographic questions. Understanding the demographics of the APS membership will enable the Society to provide better services to members. As a reminder, your responses are anonymous and will remain completely confidential.

1. **What is your ethnicity/race**? *(Check all that apply.)*:

Ethnicity

❒ Hispanic
❒ Non-Hispanic

Race

❒ Asian or Asian-American
❒ Black or African-American
❒ Native American (American Indian or Alaska Native)
❒ Native Hawaiian or other Pacific Islander
❒ White
❒ Prefer not to specify
❒ Other *(please specify)* _____

2. **Do you identify as:** *(Check all that apply.)*

❒ Man
❒ Woman
❒ Prefer not to specify
❒ Other *(please specify)* _____

3. **Do you identify as:** *(Check all that apply.)*

❒ Heterosexual or straight
❒ Gay
❒ Bisexual
❒ Lesbian
❒ Transgender
❒ Queer or fluid
❒ Prefer not to specify
❒ Other *(please specify)* _____

LGBT support groups and advocacy in physics and astronomy

lgbt+physicists

An advocacy group for people in physics who are considered sexual minorities and/or gender minorities. The group formed following informal discussions on LGBT issues in physics that were held at the 2009-2011 APS March and April Meetings, and later nominated members for the APS ad-hoc committee on LGBT issues, C-LGBT. Their website hosts an OutList, with names of physics professionals who choose to publicly identify themselves as LGBT physicists or allies, as well as media resources and a blog. The group was founded by Elena Long.

Committee for Sexual Orientation and Gender Minorities in Astronomy

SGMA is a committee of the American Astronomical Society (AAS) that works to promote equality for sexual-orientation and gender minorities within the Astronomy profession, including those identifying as lesbian, gay, bisexual, transgender, intersex, questioning or queer, or asexual. SGMA aims to eliminate hiring and workplace discrimination on the basis of sexual orientation and gender identity or expression, and to create a professional climate that respects and values diversity. SGMA was originally established as the Working Group on LGBTIQ Equality (WGLE) in January 2012.

Supporting LGBT+ Physicists & Astronomers: Best Practices Guide for Academic Departments

This document, primarily directed at department chairs, is intended to serve as a guide for creating an inclusive department environment that is free from harassment and discrimination against LGBT physicists and astronomers. The guide includes both short-term and long-term department-level suggestions, as well as several recommendations for university-level policies intended to guide conversations with institution administrators. Policies that can be implemented rapidly are flagged with stars. The Best Practices Guide was developed in collaboration between lgbt+physicists and SGMA (formerly WGLE).

LGBT CERN

LGBT CERN aims to facilitate the integration of LGBT individuals within the CERN community and to create a work environment based on mutual respect and inclusiveness without discrimination on the basis of sexual orientation or gender identity. The group also organizes social and cultural events for LGBT physicists working at CERN and is recognized by the CERN Diversity Office.

IGenSpectrum

A student group at UC Berkeley dedicated to improving the visibility and professional preparation of LGBT physicists. Founded in 2014, IGenSpectrum has already hosted a visiting colloquium speaker in a discussion of the challenges facing LGBT scientists, a summer research supplement program for undergraduates, and many social events.

LGBTIQ and Allies Astro Outlist

A list of "out" lesbian, gay, bisexual, transgender, intersex, queer (LGBTIQ), and ally astronomers; along with affiliations and contact info.

LGBT support in the wider science and tech community

NOGLSTP

The National Organization of Gay and Lesbian Scientists and Technical Professionals (NOGLSTP) is a membership-based professional society that educates and advocates for lesbian, gay, bisexual, transgender, and queer students and professionals in science, technology, engineering, and mathematics. NOGLSTP educates on LGBT issues in science and technical workplaces while fostering mentoring and networking among its members. NOGLSTP is a 501(c)(3) organization.

oSTEM

Out in Science, Technology, Engineering, and Mathematics (oSTEM) is a national society dedicated to educating and fostering leadership for LGBTQA communities in the STEM fields. Following an IBM-sponsored focus group at the Human Rights Campaign headquarters in Washington D.C. in October 2005, students on several campuses founded groups focused on LGBT issues in STEM fields. These groups eventually converged to form oSTEM, which is also a 501(c)(3) organization.

Other diversity organizations in physics and astronomy

Conferences for Undergraduate Women in Physics (CUWiP)	This APS conference series supports and encourages undergraduate women pursuing a professional career in physics. A typical conference program includes research talks by faculty, panel discussions about graduate school and careers in physics, and a student poster session. A member of lgbt+physicists hosted a roundtable discussion at a previous iteration of CUWiP focusing on issues facing LBTQ women.
Committee on Minorities (COM)	The APS Committee on Minorities (COM) is responsible for advising the Society on increasing the representation, retention, and professional development of underrepresented minority physicists. The committee implements programs, suggests studies, and provides oversight for activities that improve the participation of underrepresented minorities in physics. The committee also produces *The Gazette* newsletter in conjunction with CSWP.
Committee on the Status of Women in Physics	The APS Committee on the Status of Women in Physics (CSWP) is responsible for advising the Society on increasing the representation, retention, and professional development of women physicists. The committee implements programs, suggests studies, and provides oversight for activities that improve the participation of women in physics. The committee also produces *The Gazette* newsletter in conjunction with COM.
National Society of Black Physicists (NSBP)	Founded in 1977 at Morgan State University, the mission of the National Society of Black Physicists is to promote the professional well-being of African American physicists and physics students within the scientific community and society at large. The organization seeks to develop and support efforts to increase opportunities for African Americans in physics, and to increase their numbers and visibility of their scientific work.
National Society of Hispanic Physicists (NSHP)	The NSHP promotes the professional well-being and recognizes the accomplishments of Hispanic physicists within the scientific community of the United States and within society at large. The Society seeks to develop and support efforts to increase opportunities for Hispanics in physics and to increase the number of practicing Hispanic physicists, particularly by encouraging Hispanic students to enter a career in physics.

Select Academic Readings

Cech, E., Waidzunas, T. (2011)	*Navigating the Heteronormativity of Engineering: The experiences of lesbian, gay, and bisexual students*. Engineering Studies, 3(1), 1J24. http://doi.org/10.1080/19378629.2010.545065.
Patridge, E., Barthelemy, R., Rankin, S. (2014)	*Factors Impacting the Academic Climate for LGBQ STEM Faculty*, Journal of Women and Minorities in Science and Engineering, 20, 75 http://doi.org/10.1615/JWomenMinorScienEng.2014007429
Yoder, J. B., Mattheis, A. (2015)	*Queer in STEM: Workplace Experiences Reported in a National Survey of LGBTQA Individuals in Science, Technology, Engineering and Mathematics Careers*, Journal of Homosexuality 63, 1 http://www.tandfonline.com/doi/citedby/10.1080/00918369.2015.1078632

Select Media Resources

(for more detailed picture, see the lgbt+physicists media page)

APS Looks to Improve Climate for LGBT Physicists	*Physics Today*, March 2015. This article discussed the formation of the C-LGBT committee at the request of APS and the motivations for the committee's work.
LGBT Physicists: The Interviews	*Physics Today*, February 2015. Interviews with several out LGBT physicists.

Why Sally Ride's Sexuality Really Matters	*New Scientist*, July 2012. Lisa Grossman describes the need for LGBT role models in science in light of discovering that the late Astronaut Sally Ride's life partner was a woman.
On Becoming a Woman Astronomer	Astrobetter Blog Post, November 2015, and "WGLE Interview: Jessica Mink," SGMA Website, <date not listed>.

Social Media Resources

Out in Physics	The Facebook group of the lgbt+physicists group, a collection of physicists seeking to create a more welcoming environment in physics and related fields for people of diverse sexuality and gender.
LGBTIQ Physicists, Astrophysicists & Astronomers and Allies	A Facebook group with approximately 350 members (as of December 2015) that promotes discussion among lesbian, gay, bisexual, transgender, intersex, and questioning physicists, astrophysicists, astronomers and allies.
Committee on the Status of Women in Astronomy	The Facebook page of the American Astronomical Society's Committee on the Status of Women in Astronomy (CSWA), from which a working group on LGBT equality was formed that eventually became the Committee for Sexual-Orientation and Gender Minorities in Astronomy (SGMA) in the summer of 2015.
Equity & Inclusion in Physics & Astronomy	A closed Facebook group that addresses the structural and cultural marginalization of underrepresented minorities in the physics and astronomy communities and institutions.
NOGLSTP	The Facebook page for NOGLSTP.
oSTEM Incorporated	The Facebook page for oSTEM.

1 http://www.aps.org/about/mission/

2 http://www.aps.org/policy/statements/94_3.cfm

3 lgbt+physicists is an independent organization. More details can be found at their website: http://lgbtphysicists.org

4 A list of talks and abstracts in the session can be found here: http://meetings.aps.org/Meeting/MAR12/Session/J20

5 N. Ackerman, T. Atherton, W. Deconinck, M. Falk, S. Garmon, E. Henry, E. Long, Gender and Sexual Diversity Issues in Physics: The Audience Speaks, arXiv:1206.4112, June 19, 2012.

6 B. J. Liddle et al., "Construction and validation of the lesbian, gay, bisexual, and transgendered climate survey," Journal of Career Assessment 12, 33 (2004).

7 E. Patridge, R. S. Barthelemy, and S. Rankin, "Factors impacting the academic climate for LGBQ stem faculty," Journal of Women and Minorities in Science and Engineering 20, 75 (2014).

8 S. Rankin et al., "2010 state of higher education for lesbian, gay, bisexual & transgender people," (Q Research Institute for Higher Education, Charlotte, NC, 2010).

9 E. A. Cech and T. J. Waidzunas. "Navigating the Heteronormativity of Engineering: The Experiences of Lesbian, Gay, and Bisexual Students." Engineering Studies. (2011).

10 The APS Forum on Graduate Student Affairs did undertake a prior survey in 2011 that laid some of the groundwork for our effort. http://www.aps.org/units/fgsa/upload/FGSA-Climate-Survey.pdf

11 R.S. Barthelemy, et al., "Academic and career climate for LGBT physicists," in preparation.

12 Obergefell v. Hodges, 576 U.S. 14-556 (2015). http://www.supremecourt.gov/opinions/14pdf/14-556_3204.pdf

13 Pearson's chi-squared tests were used to determine significance. See Field (2009) for details. Field, A. (2009). Discovering statistics using SPSS (3rd ed.). Thousand Oaks, CA: Sage.

14 Testa, R.J., et al, Psychology of Sexual Orientation and Gender Diversity, Vol. 2, No. 1, 65-77 (2015).

15 Haas, A.P., Rodgers, P.L., Herman, J.L., "Suicide Attempts among Transgender and Gender Non-conforming Adults," American Foundation for Suicide Prevention, The Williams Institute, January 2014. http://williamsinstitute.law.ucla.edu/wp-content/uploads/AFSP-Williams-Suicide-Report-Final.pdf

16 In order to determine this correlation between the decisions to leave one's school or workplace and other factors measured in the survey, a principal component analysis was used to create an aggregate climate factor rating, and binary logistic regression was used to assess correlations. It was found that for each standard deviation below the mean of comfort reported by a participant they were 1.95 times more likely to consider leaving. Additionally, an individual who observed exclusionary behavior was 2.2 times more likely to consider leaving.

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