

# Recommendations to the Physics Community on Justice, Equity, Diversity, and Inclusion

Physics Graduate Student Council and the Physics Working Group

July 14, 2020

The Physics Graduate Student Council (PGSC) and the Physics Working Group (PWG) are releasing recommendations in the spirit of the [Steps Towards Diversity and Inclusion](#) presented by the Society of Physics Students (SPS) on June 18th about what we as the MIT Department of Physics must do to uphold our [Physics Community Values](#) by furthering diversity, equity, and inclusion (DEI) in our community — and crucially, justice for our Black students and colleagues.

The tragic and violent deaths of George Floyd, Ahmaud Arbery, Breonna Taylor, and countless others have once again thrust systemic racism and its manifestation in the behaviors of individuals into the national spotlight. *Systemic racism* refers to structural, societal, and system-level dynamics, policies, and practices that disproportionately disadvantage and harm racial minorities. It is important to recognize that these fundamental failures across many elements of society are not the sole provenance of some other place, population, or time. Profound racial inequities and injustice have plagued MIT throughout its [159 years](#) of existence, not only at an institutional level, but also here in our own department.

Even though MIT has spent [decades](#) studying systemic racism on campus, only [mild progress](#) has been made toward implementing recommendations from faculty, staff, student and alumni groups. If we truly wish to uphold the values we claim to espouse, then now is the time to act. We as a community cannot wait another day and must work together to achieve lasting change.

We present twenty-nine recommendations grouped into six major categories for improving the experience of underrepresented physicists:

- Safety and Security
- Building the Pipeline
- Support and Inclusivity
- Community Involvement
- Education and Awareness
- Feedback and Accountability

This document consists of five pages of broad overview, followed by detailed descriptions of each recommendation. We present specific actionable items and provide links that provide a *first* step towards explaining the research and motivating our recommendations. We expect that conversations with the Department to develop comprehensive plans for change will entail discussion of the compelling body of literature behind each recommendation and the full range of potential actions.

To this end, underrepresented scientists and their allies have already done much of the difficult legwork in devising goals, collecting background information, and presenting well-researched proposals for improving the state of physics. National task forces, in particular the AIP National Task Force to Elevate African American Representation in Undergraduate Physics & Astronomy ([TEAM-UP](#)), have made

tremendous efforts to compile detailed resources and best practices guidelines for supporting Black physicists. We appreciate as well the objectives put forth recently by fellow students, including the [BSU/BGSA](#) petition, student government demands in other departments, documentation from campus advocacy and activist organizations like [GSC-DEI](#) and Grad Students for a Healthy MIT, and many others. We are grateful to the Divisions for their enlightening [#ShutDownStem](#) discussions and action plans, as well as to fellow physics graduate student organizations ([physREFS](#), [PVC representatives](#), [GWIP](#)) for lending expertise gained from their advocacy efforts. Most importantly, we thank our fellow students for sharing valuable ideas, suggestions, guidance, and insights from their lived experiences.

Due to the wide-ranging scope of existing literature, the full list of improvements we can make for our community is extensive. Many of our recommendations touch upon issues that can be resolved by simple action items. However, the most important recommendations are far more complicated and will require a coordinated effort to fully investigate, deliberate, and rectify. To provide some sense of priority, we mark in **bolded red font** the items on which we request that the Department take immediate action.

We recognize that our physics faculty and staff already do a great deal to support our Department, so we propose two major ideas to divide the labor. First, we discuss the potential appointment of a graduate student advocate, a department ombuds, and/or the hiring of an additional diversity staff member. Rather than reinvent the wheel, we ought to bring members into our community who are well-educated and dedicated to these areas and who can guide our community in best practices. Second, we recommend that the Department strive to engage all its members at every career level in DEI, outreach, and advocacy, and prevent placing the burden of this work on just a few. According to the Physics Values Statement,

*As members of our community, we uphold the principles of well-being, respect, inclusion, collaboration, and mentorship. We take an active responsibility in ensuring that everyone feels welcome and respected. We recognize that other people's life experiences are not our own, but are valid in and of themselves. Given this, we realize that our actions may impact others in unintended ways even as we strive to treat each other with respect. We understand that we will make mistakes. When we do, we will work to correct them and educate ourselves.*

It will require a significant and sustained effort from each and every MIT physicist, as well as the Physics Department as a collective entity, to embody these values in a meaningful way. The path forward will be easier if we can coordinate various cohorts within the Department and centralize what are at present many disparate initiatives and ideas. In addition, while any efforts devoted to DEI may seem like they are only taking time away from other work, we urge our community to think about the long term. Efforts to improve the experience and work conditions of all members of our Department will raise the quality of students and researchers we can attract into physics and MIT, and allow all of us to better contribute to teaching, research, our campus community, and the advancement of physics.

We are at a pivotal moment in history—a moment that requires us to pull together in solidarity and stand up for what is right. We look forward to working with the department to improve our climate, support our colleagues, and create an MIT physics community that embraces Black students, postdocs, and faculty and their pursuit of physics. Let us ensure that the next generation of physicists does better than our own.

# Overview of the Recommendations

In this section, we provide an overview of the graduate student recommendations to the physics community. We organize the recommendations in six major categories. Within each category, we do not order the recommendations based on importance but rather group them based on the logical flow of ideas. We realize that it may be impossible for the Department to act on all recommendations simultaneously, especially given the pandemic. To provide the Department with a sense of prioritization, we emphasize in **bold red font** those recommendations on which we hope the Department will act immediately. We hope that we as a community fulfill all of our recommendations in the long term.

## Safety and Security

At the forefront of our minds are the safety, security, and well-being of our Black colleagues. In line with Objective Two of the [BSU/BGSA recommendations](#), we strongly recommend reconsidering the nature of the MIT Police's presence in Physics Department spaces to protect the security and well-being of Black physicists at MIT. We also make suggestions aimed to decrease racial stereotyping and profiling among non-Black members of our community to further well-being and mental health.

### Recommendations

- #1 Minimize *armed* police presence in physics research and learning spaces**
- #2 Change language used by the Department in suspicious activity reports**

## Building the Pipeline

The significant and persistent lack of racial diversity in the field of physics, in our Department, and in each of our divisions is the result of systemic racism both at home at MIT and more broadly throughout our nation and its history. It is far past time that we step up and join the efforts disproportionately spearheaded by Black women activists toward rectifying this inexcusable status quo. Underrepresented groups in physics of course include racial minorities, women, LGBTQ+ physicists, and physicists marginalized in various other aspects of their identity. But, at this moment, we want the Department to take a particularly close look at Black physicists, who have been severely affected by the legacy of white supremacy inside physics and whose numbers have remained shockingly stagnant over the past ten years compared to other underrepresented groups in our Department.

### Recommendations - Faculty and staff level

- #3 Hire a physics staff member specifically devoted to DEI**
- #4 Examine hiring trends by division
- #5 Invite a diverse set of visitors and speakers

### Recommendations - Student level

- #6 Expand outreach to other universities**
- #7 Reform graduate admissions**
- #8 Hold a DEI-centered event at the admitted graduate student visit
- #9 Align physics majors with MIT undergraduate student body demographics
- #10 Build the graduate school pipeline coming from our own campus
- #11 Expand K-12 outreach efforts

## Support and Inclusivity

It is not only important to recruit talented underrepresented physicists to come to MIT, but also to support them so that they can succeed in their goals here. One way to achieve this with disproportionate impact is via mentoring, in both its formal and informal manifestations. Advising and support can be improved all around in the Physics Department, though we acknowledge with gratitude the important strides that have been made over the past few years. The hiring or appointment of additional staff focused on these issues may be particularly effective as well. We suggest the creation of guidebooks for students with insight into how to navigate our Department and academia as a whole, which would have particular benefit for current and prospective students from underrepresented backgrounds or colleges who may lack access to traditional networks. We also strongly recommend that the Department provide community-building, networking, and mentoring opportunities for underrepresented minority (URM) students, starting with the level of support the Department has provided women through GWIP, and eventually expand these efforts.

### Recommendations

- #12 Encourage multiple-mentor models and more involved advising**
- #13 Help all members of the Department be better mentors
- #14 Develop student handbooks
- #15 Realize a URM graduate student/postdoc organization
- #16 Create a dedicated lounge for URM students
- #17 Make our physical spaces more inclusive
- #18 Cover health insurance for incoming students during orientation and quals
- #19 Rename and reframe the written exam (not a request to alter structure or content)

## Creating an Ethos of Community Involvement

The burden of our collective responsibility to instigate and ensure change should not fall solely upon underrepresented physicists. Being underrepresented already places acute stress on these groups. It is crucial to get everyone, including and especially those who are not members of minoritized populations, on board to make the Department (and world) a more just and equitable place. We as a Department should collectively take a stand, declaring publicly and demonstrating through action that this matters to us as a community. As one of the top physics programs in the country, we should be setting an example, both for other programs and for all the physicists we train by mobilizing them to join in solidarity with minoritized students and scientists throughout the international academic community.

### Recommendations

- #20** **Build an ethos of community involvement and ensure non-marginalized members of the community share in DEI labor**
- #21 Compensate service work beyond the regular duties of one's position
- #22 Rework our definition of merit at all career stages

## **Education and Awareness**

To help everyone join in the effort, we need to build awareness of existing issues and provide resources for education. Orientation events and trainings when new community members first arrive should provide an on ramp for them to start learning and discussing about DEI issues, particularly if they have not had much exposure to such topics in the past. The Department should support further learning and growth by funding professional development and making available resources for self-education. Research groups, labs, and divisions should do their part by facilitating regular conversations about DEI to improve their own internal cultures.

### Recommendations

- #23** **Provide ongoing opportunities for education about DEI in physics**
- #24 Foster regular discussions about DEI
- #25 Expand resources on our website
- #26 Actively counteract harmful messaging in physics, like ageist stereotypes

## **Accountability and Feedback**

In this document, we lay out a framework for an ongoing collective effort to improve DEI in our community. We ask that the Department likewise create a framework by developing a long-term strategic DEI plan at the department and division levels. We should publicly post data, keep holding town halls (which we applaud the Department for hosting), and talk about representation in the Department at these open forums. June 10th was just a baseline first step to improvements we need, but this cannot be left as a single day effort and it cannot only be led by the current set of student leaders. We as a community need to hold ourselves accountable in the long term.

### Recommendations

- #27** **Create division-level committees, department and division action plans**
- #28 Publish data about representation publicly on our website
- #29 Appoint a department-level ombudsperson

# **Full Recommendations**

We present endorsements of ongoing initiatives as well as 29 additional Recommendations for the Physics Department to better embody its values of respect, well-being, inclusion, collaboration, and mentorship, with a particular focus on the experience of Black and other underrepresented graduate students.

# Endorsements

We begin by reiterating our immense gratitude to all those who came before us in devising and pushing for improvements to diversity, equity, and inclusion in physics, academia, and society. We especially thank the Divisions for their enlightening discussions on June 10 and applaud the changes they have started to institute, many of which we mirror and propound for broader implementation by all Divisions.

We strongly endorse the following sets of recommendations recently put forth by student organizations to address systemic anti-Black racism at MIT:

- The [Steps Toward Diversity and Inclusion](#) recommendations authored by the MIT Society of Physics Students (SPS)
- The [Support Black Lives at MIT 2020 Petition](#) authored by the MIT Black Students Union (BSU) and the Black Graduate Student Association (BGSA)

We commend the current collaborations between physics graduate students and Physics Department leadership to

- Hire a Graduate Student Advocate, an initiative spearheaded by physics graduate students
- Recruit at Historically Black Colleges and Universities (HBCUs), an initiative spearheaded by the Physics Working Group (PWG), a recently-formed physics graduate student organization

We applaud the ongoing efforts of the Physics Values Committee (PVC) to

- Compile resources and create a private feedback form on the [PVC website](#)
- Initiate a [Recommendations and Actions Process](#) within the PVC for the Department to collectively address longstanding systemic issues
- Partner with physics departments at other universities to improve equity through [APS-IDEA](#)

We strongly commend the actions that the MIT community has taken to support our international students amidst the recent ICE policy changes, including [MIT's strong legal response](#) and message of inclusion, as well as the [amicus brief](#) recently filed by the MIT Graduate Student Council.

# Safety and Security

## **Recommendation 1. (Immediate action requested)**

**That the Department minimize and find alternatives to police presence in our community's research, learning, and socializing spaces.**

The presence of armed police in campus research, social, and teaching spaces creates a hostile and dangerous workplace environment for racialized physicists, especially our Black colleagues. Police presence significantly and negatively impacts Black physicists' well-being and ability to carry out regular scientific activities (see [@BlackInTheIvory](#) on Twitter for anecdotal examples). It is unacceptable that we allow our colleagues to be placed into stressful and potentially deadly situations in our own department.

At the same time, we recognize that currently MIT Police carry out a number of essential roles that necessitate coming into Physics Department spaces. Police are often first responders to medical emergencies, which can be life-or-death situations. The popular conception of physics and MIT have made our Department a unique target of interest and in cases, obsession, among certain members of the general public; at times this has led to threatening behaviors and situations, particularly for our staff and faculty. The necessity of carrying out laboratory work at odd hours presents risks to women and gender minorities, and concerns of harassment, stalking, and violence, to the extent that the Department funds [taxi rides home](#) in the middle of the night. Many feel that patrols play an important role in mitigating risk for non-men in our department.

It is a fallacy, though, to view this as an either/or choice that places the Department in the position of barring police from department spaces to protect one vulnerable population or permitting police presence in order to protect another vulnerable population. In particular, it is crucial to find a solution that does not harm those at the intersection of such populations, e.g., Black women. Armed, uniformed police need not play the role of the go-to resource for such a wide swath of issues. We should consider who is best equipped to respond to each specific situation—someone trained in law enforcement, someone trained in medicine, someone trained as a mental health counselor, or an unarmed person with no specialized skills.

For example, community members often must call the MIT Police when they have locked themselves out of their office, particularly after hours. A Black student could understandably feel uncomfortable doing so, as any encounter with the police runs the risk of turning fatal, something that the rest of American society has only truly begun to grapple with over the past few months. A better option might be connecting locked-out members of the community with nearby custodial staff.

Another example is that of nighttime patrols. Unlike on the main campus, MIT's dormitories have unarmed watchmen patrol the building periodically overnight. These university employees often develop friendly relationships with many of the residents, and are viewed by students as people they can trust with their safety. As these "community safety patrols" are not dressed in police uniforms and do not carry

lethal weapons, they do not bring up historically entrenched (and ever-increasingly severe) anxieties regarding the relationship police have with Black and NBPOC (non-Black people of color) populations.

It would be of great benefit to the community if the Department works to minimize the presence of *armed and uniformed* MIT Police from Department spaces unless specifically requested, and to ensure that these police do not linger beyond the duration of that immediate need.

We recommend three concrete action items to the Department:

- That the Department as a body or Physics Council sign the [Support Black Lives at MIT petition](#) that calls for MIT to investigate how current police funding “could be reallocated to other measures that increase physical safety and emotional well-being at MIT or educational purposes aligned with the institute’s missions.”
- That the Department make a statement on behalf of students about our concerns and work with MIT and MIT Police to seek an intermediate option that allows vital tasks to be performed while minimizing harm to Black physicists.
- That the Department keep our community informed about police presence in our workplaces, including about the presence of regular patrols and any specific situations that may arise that are of interest to the general department population.

**Recommendation 2. (Immediate action requested)**

**That when reporting suspicious activity in a building, Department staff use language that does not invoke stereotypes and inadvertently cause harm to URM physicists.**

We recommend that the Department produce a set of best practice guidelines to be shared and discussed with staff and faculty who notify our community about suspicious activity in department spaces. In order to [reduce bias](#) in reporting concerning situations, emails to our community should emphasize suspicious *actions* as opposed to suspicious *people*. Emails should never focus on race or ethnicity. It would also be helpful were the Department to develop and disseminate a set of best practices for the cases of repeat offenders who have caused concern on multiple occasions over long time periods in department spaces.

We also highly recommend that the Department build awareness among its members of the negative effects that police presence can have on underrepresented minority members of our community. This may be weaved into the implementation of Recommendations 23-26.

# Building the Pipeline

Building the pipeline at the faculty and staff level

**Recommendation 3. (Immediate action requested)**

**That the Department hire a staff member specifically devoted to diversity, equity, and inclusion (DEI), as requested in the [BSU/BGSA petition](#).**

We are grateful that the current faculty and staff in our Department are kind and caring people, who have in the past (and who we are certain will in the future) make headway in improving our Department. Notwithstanding, the primary requirement for becoming a faculty member in our Department is a physics Ph.D., which historically has required no formal education in matters of justice, equity, diversity, and inclusion. Likewise, we have no staff member whose role specifically focuses on matters of climate, representation, and fostering inclusivity.

To facilitate faster and better progress on overcoming longstanding issues in our Department of nearly a thousand people, it would be helpful to hire someone whose full-time job is to specifically focus on improving DEI and who has experience in these areas through their formal education and prior employment. This person can bring valuable expertise to existing department committees and initiatives, assist the Department in regularly aligning its policies with the most recently developed best practices, and interface with students. This staff member can work and coordinate with school-level or other department DEI staff, the [ICEO](#), [OGE](#), and other relevant offices on campus.

We reiterate that a single person cannot fix our Department; it will take hard work from each and every single one of us to create lasting and meaningful change. The purpose of DEI-focused staff is to assist, expedite, and simplify that process.

**Recommendation 4. That the Department periodically examine trends in hiring by Division and implement corrective measures as necessary.**

The Department has seen significant improvement in recent years in the recruitment of physicists from underrepresented groups. However, hiring happens at the Division level, and not every Division has made uniform improvement across all measures of diversity, equity, and inclusion. For example, Astrophysics has not admitted a Black graduate student in at least a decade. ABC is the largest division in the Department encompassing many research areas, and yet it only has a single woman faculty member. Certain Divisions are reputed to have better climates than others for underrepresented physicists. The Department should research best practices for recruitment and hiring for each career level and ensure that they align with current policies, programs, and practices in each Division. Furthermore, we strongly

recommend that the Department and Division leadership look at their records together and share information and initiatives to help one another address disparities between Divisions.

For example, one of the [outcomes of the June 10 discussions in the CTP](#) is that in the postdoctoral hiring process, the CTP will now designate “a faculty member explicitly assigned to monitor equity/diversity issues, and at minimum ensure a second read of all files for candidates who are known to be URM.” We recommend that the other theory divisions follow suit, and further recommend that experimentalists consider what sorts of checks can be implemented to ensure equity in their postdoctoral hiring process, which tends to happen at the research group level. (See also Recommendation 22.) The Pappalardo Fellowship program is also an important pipeline for future physics faculty, and it is important to ensure that it is contributing to equity in our community. We recommend that the Department review its processes and procedures for awarding Pappalardo Fellowships in relation to current best practices.

**Recommendation 5. That the Divisions strive to invite a diverse group of visitors and speakers.**

We recommend that Divisions ensure that their seminar organizers are inviting diverse sets of speakers to give technical talks. To guarantee that both the host and the visitor create a welcoming climate for one another, the divisions should create a seminar Code of Conduct that emphasizes mutual respect, using welcoming and inclusive language, and includes a mechanism or designated role for reporting and shutting down perceived aggression. Seminar organizers should also actively ensure that speakers have adequate numbers of meetings scheduled with MIT researchers and get the most out of their visit.

We further recommend that the divisions also take more advantage of opportunities like the [MLK Visiting Professors and Scholars Program](#) to assist in inviting a diverse group of visitors to conduct and collaborate on their physics research at MIT. While the primary focus of hosting visiting scholars should always be their scientific contributions to our community, visiting underrepresented minority scholars can also function as role models that may otherwise be lacking in this department. ([TEAM-UP report](#), p. 12.)

## Building the pipeline at the student level

**Recommendation 6. (Immediate action requested)**

**That the Department expand outreach and recruiting efforts to college students outside of the MIT community.**

We recommend that the Department expand outreach and recruitment efforts in order to engage more underrepresented minority students with physics and with MIT. It is important to note that there is no need to reinvent the wheel; there are already a number of longstanding and extremely successful programs running on MIT’s campus and more broadly in the field of physics with which we as a Department could easily engage.

First, the Physics Department should urge its faculty to participate in MIT's primary pipeline program to recruit underrepresented minority and underserved students to our campus, the [MIT Summer Research Program](#) (MSRP). There are a number of ways in which our physicists can engage with MSRP. MSRP is always in need of additional faculty supervisors as well as graduate student reviewers for applications, especially in the field of physics. It would be of great benefit if high profile members of the department like Division and Department leadership, were to actively promote the program and raise its visibility. We emphasize that MSRP students are free to faculty. The Department should also encourage faculty to post more clear and accessible descriptions of the research that they do to the department webpage to assist potential applicants to our Department at all levels.

Second, the Department should encourage its faculty to participate in national programs to serve URM students such as the [APS National Mentoring Community](#), which matches underrepresented minority undergraduates with faculty mentors.

Third, the Department should institute a policy of sponsoring a booth and sending at least one faculty representative every year to each of the major minority-centered academic conferences, such as the [National Society of Black Physicists](#) annual conference. The Department should both maintain a list of relevant opportunities on its website, as well as actively publicize and promote upcoming events.

Fourth, the Department should build partnerships with [Historically Black Colleges and Universities](#) (HBCUs) graduating relatively high numbers of physics majors, an effort that is currently being spearheaded by the Physics Working Group in collaboration with Department leadership.

Fifth, the Department should create a fund that provides travel support for MIT community members giving talks at minority-centered conferences and institutions. (See also Recommendations 15 and 23.)

### **Recommendation 7. (Immediate action requested)**

**That the Department take immediate steps to reform graduate admissions. Specifically,**

7a) That the Department create oversight of equity in graduate applications by having an external body periodically evaluate equity in our admissions practices and by mandating that application readers undergo regular training or [professional development](#) regarding admissions practices.

7b) That the Department permanently remove the GRE and Physics GRE from the application. The PGRE [disadvantages minorities, does not significantly correlate to PhD completion](#), and is known in astronomy to [not correlate to first-author papers or postdoctoral prize fellowships](#). A large body of peer-reviewed scientific literature also highlights [failings of the General GRE](#); for example, in biomedical fields, there has been shown to be [no correlation](#) between GRE scores and first-author papers, grants, or fellowships. Physics departments at many of our peer institutions are [no longer requiring or no longer allowing GRE scores](#), even outside of this pandemic year.

7c) That the Department ensure serious consideration of all talented candidates, including those who did not attend top-ranked universities or who are not from research groups recognized by the committee. Faculty reading applications should be made aware that the colleges that students apply to and attend are tied to a variety of factors besides just personal achievement and potential, including but not limited to family background and academic resources. For example, an enormous number of students from underrepresented backgrounds do not even apply to the top-ranked colleges for which they are qualified. Nearly three-quarters of American undergraduate students attend public universities, only 15% of undergraduates attend college more than 500 miles from home, and a full 15% of undergraduates are accepted to but turn down their top-choice institution based on cost. [More details, see for example: the 2019 [American Freshman Survey](#), [20 Surprising Higher Education Facts](#), “[No Point in Applying](#)”]

7d) That the Department create an application assistance program for students from underrepresented backgrounds, [an initiative](#) being spearheaded across campus by Graduate Student Council (GSC-DEI’s) Department and Classroom Inclusion Subcommittee (some examples: [Biological Engineering](#), [Brain and Cognitive Sciences](#), [Chemistry](#), [EAPS](#)) . We remark that GSC-DEI has sought the guidance and approval of the [Office of the General Counsel](#) for its programs.

7e) That the Department clearly advertise [application fee waivers](#) on the Physics Department website’s [application home page](#) to ensure equity in admissions for students facing financial hardship.

7f) That the Department request that graduate applicants write an essay about how they will contribute to a more diverse, equitable, and inclusive physics community. This gives underrepresented and underserved applicants the space and the comfort to talk about their own personal background and experiences if they so choose, while forcing all other applicants to engage with longstanding issues in our field and write about their involvement in advocacy, mentoring, outreach, or other volunteer efforts, per the aims of Recommendation 20. Many of our peer institutions either require or allow a diversity statement, including the Berkeley and Stanford Physics Departments.

To start the conversation, we include here [a particularly interesting reading](#) about the role of diversity statements in the faculty hiring process, which may translate well to graduate students as well. If diversity, equity, and inclusivity are priorities for the Department, they should be explicitly recognized as considerations, in addition to research potential.

**Recommendation 8. That the Department host an event explicitly focused on Diversity, Equity, and Inclusion (DEI) at the admitted graduate student visit.**

At the admitted graduate student visit days, the only current DEI-related event is a breakfast hosted by GWIP held in parallel to a general breakfast for all students. We recommend that the Department hold a DEI-centered event scheduled for the entire admitted student group that highlights resources at MIT and in our Department available for students from *all* marginalized backgrounds. Presenting all [support resources](#) and [ways to get involved](#) at once to everyone minimizes the organizational burden for the Department to hold multiple informative events or for students to feel singled out if they are the only one

to whom certain information applies. Moreover, it is important to recognize that many students identify with multiple marginalized identities.

These events should be primarily run by faculty and staff, as are all other informational events during the visit. The burden should not fall on URM, women, LGBTQ+, and other marginalized students to educate the community about available resources, though these cohorts may choose to hold separate events to build community and camaraderie within a single cohort.

Additionally, we strongly recommend that summary documents about MIT's support and advocacy organizations should be included in print in the folder given to prospective students. To assist in recruitment, links to the Physics Values Committee's website [graduate student resource lists](#) should be linked clearly and publicly from the Physics Department's graduate admission webpages.

**Recommendation 9. That the Department increase representation of underrepresented physics undergraduates so that within five years, minority and women physics major demographics reflect the demographics of the undergraduate student body as a whole.**

The Department should strive to eliminate significant and persistent disparities between Course 8 major demographics and institute-wide undergraduate demographics. By applying to and enrolling at MIT, students have demonstrated a strong background and a strong interest in STEM fields. Moreover, all undergraduate students are extremely well-positioned to pursue a physics major: every freshman is expected to take a year of physics and a year of calculus upon arrival.

It is important to reach out to students and actively counteract implicit and explicit messages they have received growing up or during their time at MIT about who belongs in STEM and in particular in the hard sciences. The Department should start recruitment with freshmen and advertise the major in introductory physics courses, particularly making an extra effort to reach out to underrepresented students in large lecture courses in a non-intimidating and non-tokenizing way. Instructors should draw attention to the work of racial minority, women, and LGBTQ+ physicists in their lectures, particularly in early subjects.

We strongly emphasize that faculty should encourage every single student who indicates an interest in physics to take our classes and pursue our major - not just the first-years who start out in upper-level physics classes, not just the first-years in 8.012 and 8.022, not just the top performers in the introductory subjects, not just the advisees with the best grades, not just the students who do great research. Everyone belongs here.

We recommend that the Department speak with departments like Mechanical Engineering to learn how they [accomplished parity in gender representation](#) in the recent past. Undergraduate and graduate students would also be willing to provide input to faculty about how they might best interface with students. We also note [work done by our peer institutions](#) to make introductory physics courses more accessible for students with less preparation in math and physics than their peers.

**Recommendation 10. That the Department expand its efforts at the undergraduate level to build the academic pipeline and increase the pool of talented underrepresented applicants to MIT and other institutions' graduate physics programs.**

The Department should institute additional measures to support underrepresented physics majors on the road to graduate school. A great deal of [literature](#) exists about how this might be accomplished, and we recommend that the Physics Values Committee take Recommendations 9 and 10 on as longer-term projects.

As a first step, physics professors should *actively reach out* to underrepresented students in their classes, encourage their participation in physics, and inform them about research and other physics-related opportunities. Graduate Teaching Assistants can also play an important role in encouraging undergraduates and promoting equity. The Department should closely consider what kind of training it provides for TAs, instructors, and advisors (see also Recommendations 12-13) and how they can play an important role in the academic success and personal well-being of underrepresented students.

Second, we recommend that the Department strive to better connect the graduate and undergraduate student communities. The [GWIP-UWIP Mentoring Program](#) plays an important role in helping women progress through the physics program. The Department should create a parallel program for URM students and strongly consider providing graduate student mentors to all physics majors. Near-age physicist acquaintances and role models are an important way to help get young undergraduates excited about what a future in physics can look like, to elucidate the path to get through the physics major, to explain what graduate school entails, and to provide casual and informal guidance along the way. We note that there are also benefits for the mentors; research [ties volunteering to improved mental well-being](#).

Third, graduate students would be interested in working with the Department to host workshops relevant for our physics majors; for example, a workshop in the summer or fall to help write graduate school essays. The Department should also consider asking divisions to hold workshops or presentations about their research (or hold a department-wide event) to help introduce physics majors to the full breadth of opportunities available at MIT and to make them more comfortable with interacting with professors.

**Recommendation 11. That the Department expand outreach at the K-12 level to foster early interest in STEM and physics-related careers, particularly for URM and women students.**

We as a Department should play an active part in making sure the next generation of scientists, engineers, and mathematicians is more diverse than our own. It is important to recognize that early life influences can impact later career choices. We should work to actively break down stereotypes among children and teenagers about what kind of people do or do not go into science. To further these objectives, we recommend that the Department participate in and collaborate with local K-12 outreach programs. In addition, different divisions or groups of students may want to consider forming formal partnerships with specific schools. We note that MIT has a dedicated [K-12 Community Outreach Administrator](#) in its Office

of Government and Community Relations, who might be an excellent point of contact. We also commend the PVC's existing compilation of [outreach opportunities](#) on its website and suggest that the main department page include such material as well.

Furthermore, many of us receive emails on occasion from grade school students or other interested members of the community wanting to know more about physics. Presumably they found our individual or organization email addresses through our website; this indicates both the general community's desire to engage with our Department as well as the efficacy of our Department website in reaching a more public audience. Perhaps the Department would consider writing a page or set of webpages on its site with information specifically for young people and other members of the general public interested in physics. For example, such a page could include:

- A list of popular physics books appropriate appropriate for each age group,
- A list of biographies of physicists, including prominent URM, women, and LGBTQ+ scientists,
- Links to interesting websites about physics topics,
- More in-depth educational materials such as recommended textbooks,
- And any other resources that physicists may have found influential to their choice of career.

The Department could do a large service to both the public and prospective MIT physics students by providing an outline and overview of each of the major areas of physics. In our earlier years, many of us first heard about physics through the diverse selection of popular literature about astrophysics and string theory, as well as the numerous famous personalities associated with those areas. It might be enlightening to inform our website readers about fascinating areas that are less in the popular consciousness like condensed matter physics or biological/biomedical physics. We can do our part to broaden interest in our field by making it sound exciting and open to people with a diverse array of interests, and we can help people be able to see themselves in this type of career by writing in accessible language.

The Department could consider recruiting UROPs and/or graduate students interested in science writing to create these pages.

# Advising and Support

## **Recommendation 12. (Immediate action requested)**

**That the Department encourage multiple-mentor models. That the Department encourage more active academic advising and coaching.**

[Having multiple mentors](#) is important, especially for [members of marginalized groups](#). The Department can help build these extra mentorships more naturally into physics graduate education in a number of ways.

First, we recommend the creation of a program with professional development, mentorship, and community-building events like the [Stanford EDGE](#) fellowship program, which serves URM and women physics Ph.D. students. Such a program could be run within the Physics Department or build community for underrepresented students across all departments in the School of Science, like at Stanford.

Second, we strongly support the continuation of the [Student Success Coaching Program](#), which provides advisors *outside of the Department* for students who opt in, even when academic activities at MIT are no longer in significant disruption due to COVID-19. Anecdotally, students feel that this program has filled important gaps in their mentor network.

Third, we recommend that the Department significantly expand the role of academic advisors, especially in the early years of graduate education. Meetings and check-ins should be far more often than once per semester; in the first year these check-ins should be biweekly, and then at minimum 2-3 times per semester in later years. This also provides students with a second close contact to approach if their relationship with their research advisor deteriorates.

Fourth, in some divisions (particularly theory), students often express that they have difficulty finding research advisors. Given that multiple mentor models are considered best practice, but theory students often only have a single academic advisor during their first year, we recommend that Divisions provide students with the option for more structure when they first arrive. This could be accomplished in a number of ways, depending on the preferences of the division, such as: assigning a trial research advisor for the first year, providing research rotations, publicly posting a list of faculty with known openings in their research groups, or simply assigning students a second faculty point of contact in the Physics Department from their first semester until they permanently join a research group.

Finally, we reiterate our strong endorsement of the appointment of a graduate student advocate and hiring a staff member specifically dedicated to diversity, equity, and inclusion in the Department.

**Recommendation 13. That the Department take steps to help individuals improve their research, teaching, advising, and mentoring practices.**

Advising, teaching, and mentoring play a critical role in the development of physicists at every stage of their careers. This can be especially true for underrepresented physicists who may lack role models and face additional challenges compared to their peers. It is vital that our community members be able to fill these roles well.

We recommend that the Department develop and disseminate guidelines for best advising practices geared towards all types of mentors in the Department. Mentors should be educated as to [how to best mentor](#) and [how to be an ally](#) to marginalized students. Mentors could also discuss with mentees how to be successful at each stage of their careers; that is, what the expectations are for succeeding in graduate school and then later as a postdoc. This last point is [briefly addressed](#) on the PVC website, but could be expanded upon as well as discussed in person.

We recognize that many aspects of mentoring look different depending on who is the mentor - a graduate student, a postdoc, or a faculty member. For example, a mentoring guide for faculty could help faculty to develop best practices when supervising graduate students. A mentoring guide for graduate students and postdocs supervising UROPs could include advice about helping undergraduates learn about existing areas of research, read scientific papers, or give effective presentations. Some experimental research groups already have effective hierarchical mentoring structures in place, and these groups could become leaders in discussions about what effective academic mentoring looks like for each career stage.

The Department should provide on its website a centralized list of formal programs offered on-campus to train mentors and teachers at all career stages. Examples for graduate students include the [Kaufman Teaching Certificate Program](#) and [TA Days](#), as well as smaller events such as multicultural training, professional development, and conferences. (See also Recommendation 23b.)

We also note that many students, especially those in divisions with minimal teaching requirements, have expressed desire for additional teaching experience but report a culture in which this is discouraged in favor of research output. We recommend that the Department create more opportunities for teaching and other community mentoring involvement, besides those offered through full-time TAs. An example of this could include offering 10% TAs for students to hold office hours for undergraduate classes or provide other forms of mentorship. (See also Recommendation 21.)

**Recommendation 14. That the Department create detailed undergraduate student and graduate student handbooks.**

Students should not have to rely exclusively on peer networks or having a conscientious advisor to receive guidance about important graduate school norms, professional benchmarks, and academic careers, outside of the pure process of science taught through lab work and theory research. Graduate students coming to MIT from departments that send fewer students to graduate school or top-tier PhD programs

need more explicit guidance than students coming from universities with highly-regarded and large physics departments, where these discussions may be more baked into undergraduate education and everyday department life. Explicit discussion of scientific and academic norms is also important for the advancement of students whose parents do not work in academia or hold science degrees. Furthermore, underrepresented students may not have as much access to peer networks as non-marginalized students.

We recommend the creation of a handbook that covers the aforementioned topics, as well as other important campus resources, information, and opportunities like those listed on the [PVC website](#). Graduate student groups would be willing to assist the Department in creating and regularly updating these handbooks. Since conventions and expectations for different subfields of physics can vary widely, the Department should also consider having separate sections in the handbook for each subfield, or even entirely separate handbooks, depending on the extent of the differences.

**Recommendation 15. That the Department actively work with students and provide *ongoing* administrative support to establish an organization for URM graduate students.**

We recommend that the Department provide funding for a URM student group at the level of GWIP, including biweekly dinners for graduate students and postdocs, a mentorship program with the undergraduates, conference funding, and other initiatives. Such an organization is vital for fostering community among underrepresented minority students across division boundaries and for providing a safe and comfortable space for discussing issues. We recommend that the Department advertise the availability of such funding on an ongoing basis every semester until a URM student group is firmly established in our Department.

Besides funding, there are many ways in which the Department can assist in the administrative burdens in successfully establishing a new organization. Physics Department staff and faculty could help put together a mailing list and provide other types of administrative support, especially at the outset. We note that Harvard organized an event for URM graduate students in the Boston area last year; our Department could also contribute funding for such events and possibly partner with Harvard in the future in its efforts to provide support and community building for local URM graduate students. PGSC and GWIP members would also be willing to offer assistance with administrative details, such as funding opportunities that exist in parallel for GWIP-like dinners, conference grant approval, and reimbursement procedures.

Initial steps for the Department should be to advertise this group, solicit interest, and organize a first community-building event.

**Recommendation 16. That the Department create a lounge for URM graduate students.**

[Studies have shown](#) that creating such spaces increases feelings of belonging among students of color. These spaces also hold broader psychological significance than that of mere gathering places -- they show students from underrepresented groups that they are welcome and valued by the Institute. In conjunction

with Recommendation 15, this room would provide a private, physical space for an underrepresented minority graduate student organization to safely operate, for students to work or study, and could provide modest amenities to foster community (e.g., free tea or candy). If there are too few URM students in the Physics Department for this room to be used effectively, the Department could consider liaising with the School of Science or departments in neighboring buildings to create this lounge. There is past precedent for such a physical space; namely, the [Margaret Wong Room](#) for graduate women.

**Recommendation 17. That the Department make the physical spaces in which we meet and work more inclusive.**

Subtle aspects and cues from the physical environments in which we study, conduct research, and socialize with our colleagues can affect inclusivity of underrepresented physicists.

The first aspect of the environment we would like to draw the Physics Department's attention to are the walls of our environs, and the artwork, portraits, and physicist photo walls decorating them. We commend the Physics Department for taking a first step in the right direction in the Pappalardo Room, by adding to the collection of commendable faculty members the first photo of a woman physicist and of a person of color: Mildred Dresselhaus receiving the Presidential Medal of Freedom from President Barack Obama.

However, the still strikingly low levels of racial and gender diversity at MIT Physics mean that the photo walls of researchers in each of our individual divisions, taken in isolation, could send an unintentionally unwelcoming signal to some who visit or consider joining our community. While we fully support displaying photos of current physicists as a way of building camaraderie and community, it is worth thinking about what photos and artwork we can hang alongside these photo walls to send messages of inclusivity as well. In choosing such artwork, we also need to avoid tokenism and should look for best practices suggestions from other universities. Graduate students have found poster walls of minority physicists in other physics departments particularly effective.

We should also consider the messages that the content of bulletin boards in the divisions can send. We can help build a culture of active involvement by listing on these boards outreach opportunities, ways to get involved in DEI work, and the related topic of science policy. These boards can also showcase upcoming DEI talks, events, and professional development. These spaces can also celebrate physicists who have made broader contributions to the community beyond pure physics research.

We applaud the astrophysicists' efforts to make referring to the McNair Building by name more common than referring to its number, Building 37, and we recommend that the rest of the Department follow suit.

We commend the Physics Department for its bathroom inclusivity in some of its divisions, in having all-gender restrooms in locations near where physicists work. We have a number of suggestions to improve upon this. First, some floors and buildings still lack all-gender restrooms. Second, for making our community members and visitors to our Department feel more welcome, the Department could hang signs near all restrooms indicating where the nearest [all-gender](#) or single-stall restroom is located.

Furthermore, [many community members](#) would appreciate if sanitary product dispensers could be added to *all* all-gender bathrooms as a first step. In the Center for Theoretical Physics, for example, there are multiple all-gender restrooms, but only one on each floor has sanitary products. As a second step, we note that transgender, nonbinary, and other men can also menstruate, and we should provide sanitary supplies and trash cans in men's restrooms. Ideally, if the Department is truly invested in promoting gender equality, it would make these products [available for free in its buildings](#) as this relieves stress upon people who menstruate that their non-menstruating peers do not experience. We believe [free menstrual products](#) are a small price to pay to be more inclusive and represent a step towards normalizing the act of menstruation.

**Recommendation 18. That the Department provide MIT health insurance coverage for all incoming graduate students for the month of August, when the Department requires students to be present on campus in person for Orientation and the written qualifying exams.**

Physical and mental health issues can arise at any time, including during Orientation. It is important to ensure healthcare coverage for all students when they first arrive on campus so that they do not encounter unexpectedly high bills for treatment offered at the nearest provider, MIT Medical. In their first August at MIT, graduate students have gone to MIT Medical for needs ranging from routine mental health care to emergency care for an allergic reaction. In cases, students have received bills that far exceed the price they would have otherwise paid on the MIT student health plan provided beginning in September, ranging up into thousands of dollars. These financial stresses affect everyone but could potentially cause especially undue burden on students from underrepresented backgrounds.

**Recommendation 19. That the Department reframe the Written Exam (as it is currently called) to four required core courses with the option to try to test out up to four times. The first attempt at the Written Exam in August of a student's arrival on campus should be framed as a diagnostic exam to help students gauge what material they need to review.**

Decades-old research in psychology strongly indicates that stereotype threat, a phenomenon in which people feel at risk of conforming to stereotypes about their identity, can have strong negative impacts on performance. While anybody can suffer from stereotype threat, the impacts can be particularly devastating for minorities. Studies on [African American students taking aptitude tests](#) and [women taking the Math GRE](#) have shown that language surrounding the purpose and context of exams can mitigate or exacerbate negative effects of stereotype threat. As such, we recommend that the description of the General Examination be revised to minimize the psychological burdens associated with the process.

We strongly emphasize that at this moment in time, we are *not* asking for a single change to the written exams or the process by which students satisfy those requirements --- we are only requesting a change in the way in which we name and frame that process.

We recommend that Section 6 of the [General Doctoral Guidelines](#) be changed to read as the new text below in red font. We also recommend that all sections of the doctoral guidelines be revised to convey more positive messaging along the lines of the below:

### **“General Doctoral Requirements and Oral Examination**

During the first three years of graduate study, students must demonstrate a mature grasp of the whole field of physics and detailed knowledge of their chosen area of physics. Students should **work together with their academic advisor and/or research supervisor to create (and as needed, adjust) a plan for completing required coursework and preparing for their oral examination. We only admit students that we believe are capable of passing these requirements. We have a strong desire to see every graduate student successfully make it through our program.**

The purpose of the core coursework and oral exam requirements are to assure the Department that its graduates have a broad background in physics and a firm understanding of a particular branch of physics. The format is based on the premise that it is valuable for each student to review their general knowledge of physics in a systematic fashion and to measure it against a set of “community” standards. Opportunities for students to make progress on these requirements are offered in the fall and spring **and consist of the four core courses, the option to test out of these courses, and the oral exam.**

### **Structure and Scheduling of the Requirements**

The Physics Department requires students to complete the General Doctoral Requirements -- four core courses and an oral examination on their field of specialty -- and the Elective Requirements -- two courses in a specialty area (three for NUPAT students) and two courses for breadth.

The four core courses include Classical Mechanics (8.309), Electricity and Magnetism (8.311), Quantum Mechanics (8.321), and Statistical Mechanics (8.333). Three of these subjects are offered every fall semester (CM, QM, SM) and one is offered each spring (EM). Students are expected to complete the core courses by the end of their second January at MIT.

There are two ways to meet the core requirement: either by passing the relevant course with a grade of B+ or by testing out via the corresponding Diagnostic/Advanced Standing Exam. The Department strongly urges students to take the Diagnostic Exam at the beginning of their first August. Students come to our department from a wide variety of academic backgrounds and life experiences, and every year we see diagnostic results ranging across the entire spectrum. We have students take a Diagnostic Exam to help them and their advisors determine which material the student needs to learn or review, and to help the student devise a coursework plan for their first few semesters at MIT. Diagnostic Exam scores are not indicative of academic potential or future performance; students beginning from all starting points in their first August go on to complete the Ph.D. program, do groundbreaking research, and have successful careers.

Students will have the opportunity to continue trying to test out of the courses using the Advanced Standing Exam at the beginning of each semester thereafter.

The questions for each part of the **Diagnostic/Advanced Standing Exam** are prepared by committees of physics faculty members. The questions are subsequently screened by faculty who are assigned to grade each part of the exam.

### **The Diagnostic/Advanced Standing Exams**

The **Diagnostic/Advanced Standing Exams** consist of two problems in each of four areas: quantum mechanics, statistical mechanics, electricity and magnetism, and classical mechanics. Demonstration of core competence in all areas may be achieved in one of two ways. A student may pass each area either by passing one of the two problems on the **Diagnostic/Advanced Standing Exams**, or by completing the corresponding graduate-level course (for classical mechanics, 8.309; for quantum mechanics, 8.321; for statistical mechanics, 8.333; for electricity and magnetism, 8.311) with a grade of B+ or higher.

The Department strongly encourages students to attempt the Diagnostic Exams upon arrival and requires students to take the Advanced Standing Exams every semester thereafter to help them and their advisors gauge their progress towards completing the core requirements. All students must satisfy all four components of the **Core Course** requirement by the end of the January of their second year.”

# Outreach and Advocacy

## **Recommendation 20. (Request immediate action)**

**That the Department foster an ethos of community involvement among MIT physicists and ensure that non-marginalized members of our community share in the division of labor.**

Our community is held together by a single, deep connection: a love of physics. Every one of us came to MIT because we want to spend our days engaged in the learning and discovery of this seemingly pure field of knowledge. Unfortunately, the actual practice of physics is inextricably intertwined with the messiness of the human beings involved in its advancement. Broader societal forces affect both access to and progression through academia. Factors like natural curiosity, interest, hard work, and talent are not the only ones that influence the opportunity to engage with our beautiful subject; matters of race, gender, class, and other factors come into play as well. Active work is needed from all members of our discipline to break down barriers and to allow everyone to just do physics.

Among many physicists in our Department, there is a mentality that involvement in DEI and community work is unimportant, if not actively harmful, because of the time it takes that could otherwise be spent on research. This type of mentality and the culture it creates perpetuate inequities that the field of physics has permitted for far too long. Everyone in the community needs to step up so that underrepresented physicists do not face the dual pressures of both contending with obstacles to doing physics and having to shoulder the full burden of knocking down those obstacles for the next generation.

Change needs to come from the top down. Faculty serve as teachers, role models, and gatekeepers to our field, and therefore have a responsibility to not only stop conveying the harmful message that DEI work is unimportant but also to actively communicate that DEI work is a vital part of our work as physicists. Faculty and staff should actively encourage all community members to take responsibility and actively praise student and postdoc involvement in advocacy organizations, department committees, mentoring initiatives, and other types of service and community work.

There are two forms of work that are often disproportionately assigned to underrepresented physicists. The first is DEI labor, the second is “office housework”.

1. *DEI labor*: While the important points of view that URM, women, LGBTQ+, and other marginalized physicists gain from their lived experiences are fundamental to the research and planning stages of DEI efforts, the burden of labor in designing and enacting improvements should not primarily fall upon members of underrepresented groups. It is important to ensure that non-marginalized members of the Physics community take part in the effort required to improve our community. We request that the Department require or incentivize participation in DEI work by non-minoritized faculty, both at the hiring and tenure stage (see Recommendation 22) as well as for senior faculty through other means, one possibility including a tie to merit pay increases.

Similar ideas can be implemented for postdocs and graduate students (see Recommendations 4 and 7). We note that the Physics Values Committee maintains on its website a list of [ways to get involved](#) that is particularly comprehensive for undergraduate and graduate students.

2. *Office housework*: The Department should also regularly remind research groups, committees, and other department organizations to evaluate to whom they assign “[office housework](#)” tasks [that are historically associated with women and minorities](#), such as note-taking during meetings, cleaning or organization of workspaces and labs, purchasing food for groups, scheduling events, planning parties, and other such duties. If a pattern emerges, group leaders should reconsider how they request volunteers and/or assign these roles. Committees should also consider how much of their work [is carried by underrepresented team members](#).

**Recommendation 21. That the Department provide recognition and compensation to those who perform large amounts of service to the Department beyond the regular duties of their position.**

Outstanding outreach efforts, mentoring, service work, and promotion of diversity, equity, and inclusion in physics are worthy of recognition, just as we recognize the importance of teaching responsibilities and laud those whose teaching performance is exceptional.

We recommend that the Department create Service Fellowships that can be funded at the 10% TA, 20% TA, and full-time levels for graduate students who devote significant effort to service, mentoring, and outreach in our Department. There are many examples of such positions at MIT and other institutions, including full-time TA positions at [McGill Physics](#), and extra pay positions through the [Harvard D&I Fellows](#), [Princeton Diversity Fellows](#), and MIT [Graduate Community Fellows](#).

Furthermore, we note that the Department provides [recognition](#) for undergraduates who engage in service to the Department; we recommend that the Department create a parallel award for graduate students who demonstrate outstanding outreach efforts, mentoring, or service to our physics community.

**Recommendation 22. That the Department reconsider its definition of merit at all career stages.**

We recognize that at this moment in time, the only explicit requirement that the Department imposes for faculty applications is research prowess; we do not even require any past teaching experience to receive a professorship. It would represent a major paradigm shift for the Department to require consideration of experiences and strengths outside of research in its review of candidates. However, we do not believe that such a paradigm shift is unreasonable, given our [community values](#). If we truly believe that mentoring and teaching are important, and that making our Department and our field more diverse, equitable, and inclusive (DEI) is a worthy goal, then requiring consideration of teaching experience and commitment to DEI in our hiring processes are steps that we as a Department should be willing to take. There are multiple possible ways that we as a Department can do so.

For example, the Department could institute a more holistic review of candidates that explicitly calls for hiring committees to consider an additional set of criteria outside of research in its review of candidates, including teaching, mentoring, advocacy, and outreach work. Alternatively, the Department could set a baseline level of participation in science-related advocacy or outreach work as a prerequisite for any postdoctoral or faculty application to our Department to even be considered, as well as for promotion cases. We note that instituting formal requirements that recognize and/or require activities outside of pure research has extensive past precedent in the field of physics; for example, in awarding grants, NSF evaluates applicants on the basis of two primary criteria: Intellectual Merit and [Broader Impacts](#).

Examples of acceptable activities include but are not limited to work to improve DEI in STEM through student and postdoctoral organizations, department bodies, university committees, or professional societies; mentoring activities; STEM outreach at the K-12 or university level; science advocacy in the political sphere; and in special cases, research-related mentoring of underrepresented and underserved students above and beyond the call of duty of one's job. These baseline expectations should be clearly specified on the Department website to encourage all physicists to become involved in community activities, advocacy, mentoring, and volunteer work.

To evaluate candidate participation in these efforts, the Department should require applicants to include on their CV sections about teaching and mentoring, as well as about outreach, advocacy, and service. The Department should also require candidates to write statements about their past and potential future contributions to DEI and teaching in all faculty hiring, promoting, and tenure cases (see, for example, [Cornell](#) and the [University of Oregon](#)). We also suggest that the Department look into possibilities for evaluating faculty candidate character outside of just research recommendation letters; for example, by calling applicant supervisors for all candidates on the shortlist. (See also Recommendation 7f.)

In addition, we recognize that in many fields, postdoctoral scholars often primarily serve the purpose of filling much-needed technical positions in research groups, due to the nature of the grants funding their employment. Nevertheless, it is important that the Department ensures equity at the postdoctoral level of hiring so that there is not an unintended leak in our pipeline of talented underrepresented physicists. In addition, postdoctoral scholars play a crucial role in mentoring students, as well as in setting the tone and culture of the laboratories in which they work. We urge the Department to examine ways in which it can provide more oversight of postdoctoral scholars in each of its Divisions, to ensure both the equitable hiring of postdocs, as well as the hiring and training of postdocs who promote equity. (See also Recommendation 4.)

While the above requirements would primarily set a precedent for ensuring that all physicists put thought into the role they can play in DEI efforts, they also serve another purpose. Underrepresented physicists are often burdened with a disproportionate amount of time doing committee work, service work, and unrecognized mentorship of marginalized students. Making this component of the application required will also allow those highly involved in these efforts to feel free to speak more openly to those experiences to the committee, which can then consider exceptional involvement in DEI activities that might have taken time away from even further improving a research record that is already spectacular.

## Education and Awareness

### **Recommendation 23. (Immediate action requested)**

**That the Department provide ongoing opportunities for formal education about diversity, equity, and inclusion in physics.**

Cultural beliefs and norms are ever-evolving in society, and it is important for that to be reflected in our Department's culture. Consider the physicists who have mentored the PGSC President: her master's advisor graduated college before the passage of the Civil Rights Act. Her bachelor's advisor was in college already when Title IX came about, and faculty members of her doctoral advisor's age graduated high school before the Americans with Disabilities Act passed. Even our current graduate students themselves were well into their undergraduate or graduate educations by the time gay marriage was legalized in the United States. It is important to provide students, staff, and faculty with regular and ongoing education and discussions about expectations for how we treat one another as society shifts, and that we teach one another how to actively create a positive environment for all around us.

A department-provided education regarding diversity, equity, and inclusion (DEI) in an academic setting is one of the most systematic methods we can implement to improve the knowledge, attitudes, and actions of our community. Currently, MIT requires graduate students to participate in interactive online trainings regarding sexual misconduct as well as anti-Black racism and microaggressions through Atlas during their first few weeks on campus, as well as an in-person introduction to the Physics Values Statement during Orientation provided by the PVC. Postdocs, staff, and faculty are required to take a Title IX training upon joining MIT as well.

It is important to ensure that our involvement in these important issues extends far beyond our first few days on campus, and that we continuously work to educate ourselves and help address deep-rooted DEI problems. To that end, we make a number of recommendations to the department.

23a) That the Department consider holding anti-racism training for new postdocs and faculty members.

23b) That the Department hold events to bring awareness and educate our community throughout the year, every year. Possible platforms include annual colloquia regarding the history of underrepresented groups in physics at MIT and beyond, regular DEI speakers at each seminar series, and professional development opportunities. It is important for us to learn from our history and our failures.

The Department should also help our community learn about the past and present of race relations in America. This is especially important for members of our community who may have had little or no prior exposure to these topics, such as new international arrivals, who may also be unfamiliar with American culture and customs, particularly surrounding activism and advocacy.

The Department should advertise, promote, and encourage its faculty to participate in existing in-person and interactive trainings already offered on campus, such as the two-hour training for the [You Are Welcome Here](#) campaign. The Department should also collaborate with [MindHandHeart](#) and the [Institute Community and Equity Office](#) to hold, advertise, and promote additional annual trainings for faculty and staff, especially those who are many years beyond their first arrival on campus. We emphasize that such trainings should be *voluntary*. Mandatory trainings have been shown to actually have a [negative impact on diversity](#), while voluntary trainings produce a substantial positive impact.

23c) We remark that certain subsets of the Department may wish to host their own internal professional development opportunities related to DEI. Moreover, individual members of our Department may wish to participate in opportunities related to DEI, including professional development events, DEI conferences, and minority-centered conferences off campus. (See also Recommendations 6 and 15.)

To facilitate participation in these activities, we recommend that the Department maintain a list on its webpage of professional development funding, travel grants, and other campus funding sources that individuals and organizations can access for hosting and attending conferences. This list should include both general funding sources and funding sources aimed at underrepresented physicists; for example, School of Science [Quality of Life](#) grants, [Committee on Race and Diversity](#) grants, the MindHandHeart [Innovation Fund](#), Graduate Student Council [Professional Development](#) and [Conference](#) grants, as well as [Division of Student Life](#) grants.

To fill existing gaps in DEI-related funding, we suggest that the Department create a grant for community members seeking to access professional development opportunities related to DEI, to travel to minority-centered conferences, and to attend other events that further our Physics Values. There is precedent for diversity conference grants in the [MIT Math Department](#).

23d) That the Department build formal education about ethics and DEI, as well as their intersections, into its curricula. While physics distilled down to its deepest conceptual foundations is a purely objective science, subjective measures influence its practice, its practitioners, and its applications.

Ethical questions that could arise for students trained in physics are manifold. For future teachers and professors, it is important to discuss the “why” of diversity, equity, and inclusion initiatives and highlight the aspects of society that influence who participates in physics, and the work that we must do towards creating a more equitable community. For future researchers, ethical questions in physics can arise across a range of areas from astrophysical researchers [constructing observatories on sacred Indigenous sites](#), to biomedical physicists grappling with questions of medical ethics, to disputes over authorship and research misconduct. For physicists who will one day take their technical skills outside of academic settings, it is important to think about the consequences of new technologies, ranging from the use of artificial intelligence [in policing](#) and its effect [on vulnerable populations](#) to the construction of the nuclear bomb.

One potential way in which the Department could implement ethics education for graduate students might be to hold seminars in small groups (<10) in which students meet 1-2 times per week to discuss relevant readings, moderated by a faculty member or a more senior graduate student trained in facilitation.

For undergraduate students, the [2015 BSU Recommendations](#) request that: “The current mandatory undergraduate HASS-Elective (Graduation Requirement) be restricted to a newly designated ‘Immersion studies’ HASS-Elective (a designation for current or future courses focusing on topics of multiculturalism or diversity [e.g. race, gender, sexuality])”. Such a requirement would allow non-marginalized students to engage in conversations on diversity and inclusion that they may not have had previous exposure to, and would indicate to minority students that their presence is valued and the issues they face are recognized by the Institution. We recommend that the Department consider instituting a scientific ethics subject requirement for its majors as well.

**Recommendation 24. That the Divisions foster regular informal discussions about diversity, equity, and inclusion.**

Having regular conversations about race in a safe environment can be a powerful way to teach participants how to recognize racist structures and their impact in their own lives.

24a) We recommend that the Divisions sponsor regular reading and discussion groups about DEI topics. The divisions could also provide funding for reading materials and refreshments, to support the image that DEI education should not be seen as something taking time away from research; it will make students better mentors, teachers, and research group leaders in the future. For example, see how hosting a virtual reading club has impacted the [University of Pittsburgh School of Medicine](#), or Beverly Daniel Tatum’s article in the [Harvard Educational Review](#) about leading a class on the psychology of racism.

In holding these events, it is important to foster a climate of safety by ensuring confidentiality, discouraging insults and judgmental remarks, asking participants to speak from personal experience instead of generalizing to broader groups (i.e. “I think…” instead of “People feel…”), and acknowledging that this is a difficult topic for most people to talk about.

24b) Furthermore, our physics students often feel that physics is the only appropriate topic of conversation in public or work settings. We would appreciate it if the Divisions could actively encourage nonacademic conversations. Such open discussion can not only improve the sense of community and inclusion felt by MIT students, but also facilitates learning regarding issues such as race and gender, which can be traditionally uncomfortable or difficult to discuss publicly at first.

**Recommendation 25. That the Department expand the resources and information on its website.**

We commend the Physics Values Committee for the recent launch of the [PVC website](#) and encourage the Department to carry forward these efforts to inform members of the community about DEI in both its current website redesign and in its physical spaces. It is important that our public-facing efforts reflect our ongoing internal conversations about making our community more diverse, equitable, and inclusive.

25a) That the website provide further educational materials. The training and professional development events discussed in Recommendations 23-24 provide important opportunities for physics community members to become more informed about DEI. However, it is important for community members to keep educating themselves beyond these one-off events. The Department can help bridge the gap between guided in-person introductions to these topics and further individual learning by providing a list of recommended resources for self-education on its website and in its reading room.

We recommend that the Department provide resources pertaining to MIT's campus, the physics community, and broader society. Like in the [GSC-DEI Allyship Guide](#), these resources should address a range of marginalized groups, including Black physicists, other POC, women, LGBTQ+ physicists, people with disabilities, international students, and intersections thereof. Information provided could include hard data, research papers, articles more focused on anecdotes and stories, as well as books. Community members have a range of preferred learning styles, and the Department should consider including in its list readings, podcasts, videos, and interactive formats.

In the physics reading room, perhaps the Department could maintain a bookshelf with materials about DEI in physics and make sure there are biographies of physicists from marginalized identities on display. Divisions that provide magazines or other reading material in common spaces and rooms can consider expanding the material they leave out in public beyond just pure research-focused journals.

The Department might find it useful to look to other physics organizations for examples of how it might publicize resources on its website. The Physics Values Committee made a great first step at providing educational materials in its [Anti-Racism and Self-Care Resources](#) page. The PhysREFS have already begun to compile a list of such resources as well. Other examples of lists compiled outside our Department can be found on the [MIT Office of Graduate Education](#) and [Particles for Justice](#) websites.

25b) That the Department improve its web pages about support for diversity, equity, and inclusion. In particular, the current [Diversity](#) and [Diversity Resources](#) pages should be significantly expanded (see e.g. [PVC Resources for Underrepresented Physicists](#), [PVC and Department Initiatives](#)). The web pages geared towards [prospective students](#) and [employment opportunities](#) should also contain in-line links to DEI information on the department website. Other information about potential support resources that could be included on the website appears in Recommendations 6, 7e, 8, 11, 13, 23c, and 28.

25c) That the website expand its discussion of our community and our history. Our Department website is an important location for us to show who we are and what we value to current and future members of our community, as well as set an example for other departments internationally.

We agree that it is important to highlight the inarguably impressive and praiseworthy achievements of our researchers, who have made huge advances in physics, as recognized by the many Nobel Prizes and other awards won by our faculty. While our celebrated physicists and their research prowess are perhaps the first strength one might associate with MIT Physics, the outstanding work done by our Department extends far beyond just the faculty and their research. Our department has prizewinning teachers, staff

and students who have improved the experience of all at MIT through leadership and service, alumni who have gone on to make a difference in their communities outside of research and development, and more.

At present, the [About](#) page describes the commendable achievements of Nobel Laureates, awards our faculty have won for teaching, and the development of TEAL. This section could be expanded to include the breadth of impressive work going on in our community, in particular by including in-line links to other sections of the webpage. Likewise, the [Alumni and Friends](#) webpage is misleading. Perhaps we could have separate “Alumni” and “Friends” pages; the former to publicize the career pathways and/or notable achievements of a diverse group of alumni, which would benefit students thinking about their futures; as well as a separate Friends section of the website to acknowledge and express our gratitude to our generous donors, without whom none of our learning, research, and initiatives would be possible.

Perhaps the webmaster could devise a function for sorting the articles linked from the [News](#) section of the website by topic (research advances, department initiatives, community involvement, etc.); by cohort in the community (undergrad, grad, research staff, administrative staff, faculty, alumni); by source (MIT articles, local newspapers, national recognition), and more. The News tab on the ribbon at the top of the website could also include sub-tabs linking to a broader set of pages than just faculty awards and honors.

Likewise, the [History section](#) of the Physics Department website should be considerably expanded and cover a more diverse array of topics. There are certainly many more interesting moments and characters in our Department’s history than are written in the current pages! It would also be great to see more DEI-related history in the Department, as well as the current status of these initiatives.

**Recommendation 26. That the Department work to actively identify and counteract harmful stereotypes and messaging that are common in our field, such as the false and ageist belief that physicists can only do groundbreaking work while young.**

We need to actively challenge people’s preconceptions of what a physicist looks like, along all axes of what “looking like a physicist” might entail. A number of harmful stereotypes and messages persist in our field, and the Department should hold regular conversations at faculty lunches to understand the harm in incorrect messages and to help actively counteract their perpetuation.

For example, longstanding [ageist stereotypes](#) in physics, such as the [false belief](#) that physicists can only do groundbreaking work while they are young, are often perpetuated in our Department, particularly in the theory divisions. Besides creating a negative environment for senior faculty through [stereotype threat](#), the messaging is particularly harmful for students who have taken a nontraditional educational path, who had less access to academic resources at a young age, who seek to start a family in the early years of their career, or who strive for a work-life balance. This message also de-emphasizes the need to dedicate effort to important activities outside of research like teaching, mentoring, outreach, and DEI efforts.

Another common and harmful message that we need to work to counteract in physics is the [myth of the lone genius](#) being the driving force behind advancements in the field.

# Feedback and Accountability

**Recommendation 27. (Immediate action requested)**

**That the Department develop a long-term strategic Diversity, Equity, and Inclusion (DEI) plan for our physics community. That the Divisions also form DEI committees and action plans for their own communities.**

The Department is currently taking in a substantial amount of information from student groups, divisions, and the broader university community about ways in which we can make our community more diverse, equitable, and inclusive. In order to ensure that we as a Department fully consider the available information, commit to making change as a collective body, and hold ourselves accountable for our goals, we recommend the development of a Department-level strategic action plan for diversity, equity, and inclusion. This would parallel the strategic DEI plan being created at the institute level.

We strongly commend the current situation where the Department holds a Town Hall as a community once per semester. We recommend that the Department also hold an internal review of progress every semester and provide the community an email update about progress a week prior to each Town Hall. At Town Halls, the Department can take in community feedback about where further improvements can be made and revise its action plan as needed. The responsibility for this review could be given to the Physics Values Committee, with separate check-ins with Department leadership, SPS and PGSC leadership, UWIP and GWIP leadership, and URM leadership. A scorecard with these recommendations could be made public on the Department website. There is precedent for creating strategic DEI plans at peer institutions, for example at [Stanford's Physics Department](#) and [Harvard's Physics Department](#). We also recommend that the Department regularly interface with the Visiting Committee about the plans and recommendations currently being developed and, in the future, our progress on these necessary goals.

Most of the day-to-day interactions and culture of the department for graduate students, postdocs, and faculty happen within individual research divisions. We strongly propound the creation of division-level DEI committees. The charge of these committees should be to advise their respective division heads (who should not be voting members of the committee) about matters of Climate, Culture, and Inclusion within their own communities; specifically including action items the divisions developed on June 10, as well as the recommendations issued by us and SPS. (Specific Recommendations from this document that could be worked on by divisions include Recommendations 2, 4-6, 11-13, 17, 20-24, and 26.) These committees should interface with the PVC and other relevant organizations like PGSC, SPS, and faculty committees for two-way feedback and ideas. Division DEI committees should also form strategic DEI action plans and hold an annual division Town Hall for feedback.

**Recommendation 28. That the Department post data to its website about representation.**

The Department should publicly post on its website an at-a-glance sheet about representation of URM and women physicists in our Department at all levels: undergraduates, graduates, postdocs, research staff, and faculty. Having such information available for everyone to see is crucial to holding ourselves accountable to our goals. Undergraduate data should be presented relative to MIT-wide demographics.

If the Department is concerned about the optics for prospective applicants, students, and employees, the Department could consider writing text and putting links on the same webpage to [historical data](#), [MIT Institutional Research](#) surveys, information about [representation in the field of physics](#), and [DEI efforts in our Department](#) to put this information into context. The act of contextualizing the raw data also will help hold the Department accountable for making sure that it is undertaking appropriate initiatives to improve DEI in ways that we would want prospective students, postdocs, and faculty to see.

**Recommendation 29. That the Department create an ombuds position to serve all members of our Physics Department community**

We are aware that having a true ombuds at the Department would be difficult due to the lengthy and intensive nature of training for such a position. However, having someone who is familiar with our Department, its culture, and its resources serve in an ombuds-like capacity would greatly assist in making Department members feel like they have a person to go to who can best help navigate conflicts that they feel cannot be resolved through ordinary channels.

For this position to be effective, it is important that the person and the purpose of the appointee be known by all members of the Department. On the graduate student end, it would be helpful to introduce this person to incoming students at Orientation and perhaps have them attend a PGSC event mid-year. We note that students would like their opinions to be included in the hiring or appointment process.