

Equity and Inclusion in the Department of Physics

A report delivered to the Department of Physics at New York University
2020 September 14

Respectfully submitted by the Ad-Hoc Committee on Equity and Inclusion:

Yacine Ali-Haïmoud
 Lauren Altman (graduate student)
 David W Hogg, chair
 Lauren Kayli Jones (undergraduate student)
 Evette Ma (staff member)
 Andrew I MacFadyen
 Angus McMullen (postdoctoral scholar)
 Maryam Modjaz
 Frank Moscatelli
 Anthony Pullen

Executive Summary

This report contains findings and recommendations from work done by the Ad-hoc Committee on Equity and Inclusion during the 2020 Summer. The primary recommendations are that:

- the Department create a Director of Equity and Inclusion and an associated Standing Committee for Equity and Inclusion;**
- the Standing Committee be composed of members of all parts of the Department community, and that the Director and the Standing Committee members be elected;**
- the Department move towards greater transparency in its operations, its by-laws, its committee compositions and responsibilities, its email lists, and its budget process;**
- the new Standing Committee on Equity and Inclusion keep records of its demographic make-up, and the demographics of its seminars and colloquia;**
- the Standing Committee keep track of Departmental efforts in inclusion and equity, and assessments of those efforts, and make annual reports on activities and progress;**
- the Department pursue active efforts to make hires that increase the number of members of under-represented groups on the faculty, including cluster hiring and searches targeted at hiring from under-represented groups;**
- the Department research and employ best practices in all of its faculty hiring, and monitor search committees' compliance with those practices;**
- the Department work to actively seek job applications from under-represented groups for staff positions;**
- the Chair and Chief of Staff work to make sure staff members are being**

- treated equitably with respect to each other and with respect to counterparts in other departments;**
- the Department adopt and enforce good hiring practices for postdoctoral scholar positions, including on PI grant hires;**
 - the Director of Undergraduate Studies and the Undergraduate Committee make inclusive education a core goal of the Physics Major, provide training in inclusive education for the teaching faculty, and ask faculty teaching required Major courses to teach inclusively;**
 - the Department support BIPOC students with a tutor dedicated to serving their needs;**
 - the Department investigate CAS admissions, and try to influence future admissions policies;**
 - the Department appoint undergraduate-student and graduate-student members to its committees;**
 - the Graduate Committee not apply admissions cut-offs based on GRE scores;**
 - the Graduate Committee and the Department take seriously the one-year experiment of dropping the GRE as an admissions requirement and consider dropping the GRE permanently;**
 - the Graduate Committee consider using all of the PhD-advising faculty of the Department in the first rounds of PhD-student application reading and filtering, if the institution of fair and equitable practices makes application-reading more time consuming;**
 - the Department create a Director of Outreach position to lead and coordinate outreach efforts, with a focus on inclusion;**
 - the Chair and Chief of Staff find staff and budget to support the Director of Equity and Inclusion, the Standing Committee, and their activities; and**
 - the Chair and the Department community develop a statement of purpose or mission statement for the Department, and organize an external review to assess the Department's work in relation to that mission.**

Findings related to these recommendations, and arguments underlying them, are given in the report below. Because the committee made use of open meetings, open to all members of the Department community, the committee owes thanks to many individual members of the community for help in researching and formulating these recommendations.

1. Introduction

By an informal count conducted by this committee, in preparation for this report, and prior to the start of the 2020/2021 academic year, we found that the Department only has four Black community members. That is in a community of more than 200 students, faculty, researchers, and staff. That is abysmal.

In the summer of 2020, the United States and the world was confronted, once again, by police killings of unarmed Black people, leading to street protests and an academic-science-oriented [Strike For Black Lives](#) on 2020 June 10. During activities around that strike, the Department of Physics established this ad-hoc committee to do research on—and to make recommendations regarding—race, equity, and inclusion in the Department. This document is a partial product of the work of this committee, work which was (very unusually for an academic committee) performed in the summer months of 2020.

The work of this committee was (also very unusually for an academic committee) performed out in the open, with open meetings and open minutes, and many contributions from Department community members outside the committee itself. We are very grateful for the community input—it transformed our thinking, our directions of research, and the content of this report in countless ways—and we were made optimistic by the strong commitments to equity and inclusion demonstrated by Department members.

The primary charge to the committee, in good academic style, was to make recommendations about *forming another committee*, this time a permanent, standing committee. We begin with that recommendation, and then continue on to other areas where we believe changes can be made to substantially improve the climate for, and representation of, Black people and members of groups that have been discriminated against in our world, in our fields of research, in our institution, and in our community.

In this report, we highlight our recommendations in **bold** and summarize them in an executive summary (above). Some of these recommendations are mature. We believe the mature recommendations could be implemented now, without further study. Some of them could be implemented by the Chair of the Department, some would take a motion and a vote of the faculty. Other of these recommendations are less mature. The less mature recommendations are really recommendations to perform further study along particular lines. They could form part of the charge to the new, standing committee of the Department that we propose.

In an appendix, we attach the statement on anti-Black racism that the committee published, with the support of the Chair of the Department, in 2020 August.

2. Director and Standing Committee for Equity and Inclusion

The committee recommends the appointment of a Director for Equity and Inclusion.

This position (which would replace the Director position held by Hogg currently) is necessary in order to continue institutional memory on this important topic and to have a point person—similar to the positions of the Director of Undergraduate Studies or the Director of Graduate Studies. However, unlike these other directors, this position concerns *all* groups and all aspects of the Department (undergraduates, graduates, postdocs, faculty,

staff). We suggest that this position be associated with a budget to do research, host events and bring about institutional changes (see more comments on this below). We suggest that this position be respected and have either teaching relief or compensation associated with it, given the large amount of time we expect it will take, including timely interactions with unforeseen incidents and interfacing with units and organizations within NYU and outside. We suggest that this position have some staff support to help collate and maintain statistics from all the various agencies at NYU for the different constituencies in the Department (see below for details on statistics), to launch and keep the Physics Equity and Inclusion web pages up-to-date, and to help with the planning and operation of events. **The committee further recommends that the Director for Equity and Inclusion be elected, not appointed,** preferably on a basis of something like three-year terms.

The committee proposes that the Director for Equity and Inclusion chair a Standing Committee on Equity and Inclusion. We propose a charge and membership for this Standing Committee as follows:

Charge to the Standing Committee

The Standing Committee on Equity and Inclusion in the Department of Physics has the overarching goal of promoting and strengthening a culture of equity, inclusion, and respect for diversity in the Department, and a goal of addressing issues of racism, sexism, and other prejudices, biases, and systemic forms of oppression that have reduced the participation in physics and in the Department of members of under-represented groups, and which continue to do so. The Committee works to benefit all of the members of the Department community, including students, researchers, faculty and staff. The Committee's role is to make concrete recommendations to the Department to achieve equity and inclusion goals. These recommendations will be submitted to the Chair or to the entire faculty for votes of passage, as appropriate. The Committee may also organize events, seminars, workshops, or other programming in the Department, and be responsible for relevant administrative activities.

Composition of the Standing Committee

Issues of equity and inclusion concern all members of the Department, and as such, the committee should be approximately representative of the Department's composition. It should include undergraduate and graduate students, postdoctoral researchers, staff, and junior and senior faculty members. In order for the students' voices to be heard, the committee should have at least two student members of each category (undergraduate and graduate). A tentative proposal for the composition for the Committee would be 2 undergraduate students, 2 graduate students, 2 postdocs, 1 staff member, 2 junior faculty members and 2 tenured faculty members. In addition, faculty members in key administrative roles in the Department (such as the directors of undergraduate and graduate studies) could have ex-officio memberships. The Committee shall be chaired by the Director of Equity and Inclusion.

Election of Standing Committee members

Each Departmental group (undergraduate, graduate student, postdoctoral, staff, and faculty) shall conduct their own annual elections to designate their members. The faculty members shall be elected during a faculty meeting in the Fall. The elections for graduate-student members could be conducted by, for instance, G-PHORCE. The elections for undergraduate student members could be organized by the Society of Physics Students.

3. Transparency

The committee finds that transparency in all matters of governance is critical to operating an inclusive and equitable Department. Many students in the Department—and even many staff and faculty members—find the operation of the Department to be opaque and inscrutable. Decisions of the faculty are hard to find, the minutes of even innocuous committee meetings are almost never visible publicly, the make-up and establishment and charges of Department committees are unknown. The committee does not regard any of this lack of transparency as malfeasance; the Department runs on a set of traditions that aren't all written down and haven't been interrogated deeply for a long time. The lack of transparency is harmful, however: It negatively impacts efforts on equity and inclusion for many reasons. One is that members of under-represented groups are less likely to have been informed of implicit or unstated rules of an academic entity. Another is that opaque actions of the Department cannot (because of their opacity) be analyzed in terms of process, inputs, considerations, and fairness. This prevents close study, and sows mistrust.

Transparency with Department rules, by-laws, and committees

The committee found, in its open sessions and its interviews, that most members of the Department—including the faculty—are confused or at least uncertain about what committees exist, what their purviews are, what their memberships are, and how those members are chosen. That is, little about the committee structure of the Department is known confidently by most Department faculty, let alone the community as a whole.

The committee recommends that the list of all Department committees, their memberships, and their charges, all be clearly laid out on publicly viewable Department web pages, along with the methods by which committee members are chosen. Some of this has already started, with a new Department web page for the committees. This recommendation serves many purposes that go beyond the goals of equity and inclusion. The responsibility for creating and maintaining these pages could become part of the portfolio of the Secretary of the Faculty, who is the faculty member responsible for the minutes of the Faculty Meetings.

The committee recommends, further, that the rules or by-laws by which the Department operates also be laid down on a set of publicly viewable web pages. Once again, the committee learned that most members of the Department have no idea how the Department operates. These by-laws should represent actual Department practice, and not just be a paste-in of old rules that are no longer followed, and they should make sure to cover the roles of the Chair and the Directors (of Undergraduate Studies and Graduate

Studies and the various Centers and so on). Once written, the Department must be held accountable to follow these public, written by-laws so as to maintain—and benefit from—the transparency they provide.

The committee recognizes that many of the things that ought to be on these web pages are not currently written down anywhere. That's bad! And it also means that the implementation of this recommendation will require faculty time and resources. Once again, we recommend that this could be added to the portfolio of the Secretary of the Faculty, or perhaps given to a small ad-hoc committee. Some other departments at NYU have developed handbooks for their faculty; our modification is that we want this to be a handbook for everyone.

Finally, to toot our own horns, this committee performed a useful and important experiment this summer: We held more than one third of our meetings out in the open, permitting any member of our community to attend, listen, and speak. And we put all of our meeting minutes on public display, available for anyone in the Department to read or search. *The committee found this experiment to be a big success, and we encourage the other committees of the Department to learn from this.* Very little that happens in committees is confidential, and a lot of what happens in committees benefits from constructive criticism and contributions from the larger community. Certainly this committee benefitted enormously from the community input, something to which the content of this document itself attests, we hope.

Transparency with Department email lists

The Department has countless email lists, so many that even the faculty don't know what lists are available and important. And, furthermore, essentially none of these email lists has any kind of policy or guidance associated with its scope or usage. **The committee recommends that a complete list of Departmental email lists be kept in an easily found location on the Departmental web pages, along with policies about who is invited to join, how to join, who can post, and what subjects or scope are considered good practices for each list.** This will reduce confusion, make implicit rules explicit, increase inclusion in the lists, and reduce potential for flame wars or abuse.

Related to these policies: *The committee finds that the use of the “everyone” list to announce Departmental events about inclusion and equity is clearly and obviously appropriate.* These matters are of great importance to the whole Department and contribute to our mission as physicists. *The committee finds that the use of the “everyone” list to discuss in detail the content and motivations of papers brought up for discussion is not appropriate, and especially when these are in regards to race and inclusion.*

Transparency in the Department budget process

Yet another thing the committee heard about opacity, and from faculty and staff as well as students, was that the Department budget and budget process is not understood by most members of the community. The Department puts in an Annual Planning Report every year in April, which re-justifies existing budget items, and proposes new ones. This Annual

Planning process has been opaque, in part because many budget items involve personnel matters, and in part because the budget process is extremely complex. The opacity not only makes the activities and budget priorities of the Department invisible, it makes it nearly impossible for Department members to contribute their ideas and time to making the APR priorities and arguments as good as they can be.

The committee recommends that the proposed priorities of the Annual Planning Report get some kind of open hearing or forum in the Department, many weeks prior to the April deadline. This permits community members to see the forward-going priorities of the Department, and to react in ways that can constructively criticize—and usefully contribute to—the budget priorities and arguments. This open hearing can very straightforwardly be structured so that priorities can be discussed without infringing on any confidential personnel matters.

4. Statistics, record-keeping, and assessment

Related to transparency, it is critical that the Department keep a record of its people and its activities and its progress (or lack thereof) on matters of inclusion and equity. The committee found that it was quite difficult to even find out how many community members report themselves to be in different categories, and no way at all to obtain statistics into the past. The problems are even more severe for Department seminars and colloquia. It is critical for us to understand who is in the Department, and who has access, and whose voices we are hearing.

That said, the committee also finds that there are stereotype-threat-like considerations, and also privacy considerations, in taking such data. That is, there are ethical considerations around how such data are gathered, who has access to it, and how it is used. **The committee recommends that the Department (possibly in the form of this committee) research the ethical and legal considerations in the taking and keeping of relevant demographic data, and propose a data-taking and data-management regimen that is simple, useful, and strictly ethical.**

Once that research is in place, **the committee recommends that the Department start keeping demographic data on its community members for all levels (undergraduate, graduate, postdoctoral, faculty, and staff), and also for the seminars and colloquia.** This data collection and management will require staff support to be identified. It also requires some training, because there are some ethical and privacy concerns.

There is another kind of important data we need to keep, which is about what efforts we have made in the areas of equity and inclusion, and how those efforts have fared. Are we making efforts, and what are we learning from them? This kind of record keeping is also challenging, but not for the same reasons as personnel records: This kind of record keeping is challenging because it is hard to design and perform useful assessments of complex activities. However, it is critical that we track our work in equity and inclusion, so we can be accountable to ourselves and our institution and communities. It is also critical for justifying existing and new resources from our funding sources, and for motivating and designing new activities.

The committee recommends that the Standing Committee on Equity and Inclusion

be charged with keeping records of events and activities related to equity and inclusion in the Department. It also recommends that equity and inclusion initiatives in the Department be associated with assessments. These assessments could be qualitative or quantitative, but they must be designed to guide future activities and help us learn from our work. This recommendation has associated costs, because it will require some Departmental staff support. **The committee recommends that the Standing Committee produce and disseminate an annual report on activities, assessments, and demographics.**

5. Faculty Hiring

The Department web pages currently list 40 full-time faculty members on the New York campus (this does not include associated, affiliated and global campus faculty members). Although the faculty are not asked to provide an explicit gender, race, or ethnic identification, the committee estimates the following: Men make up 87.5% of the faculty. The faculty is more than 80% white. White men alone comprise 75%. Out of 40 faculty, there is only one Black faculty member. *These numbers are unacceptable. These numbers are far from being representative of the US population, nor of the local population of the City of New York in which we work, nor of the global population that NYU recruits from and serves.*

The NYU Department of Physics must take concrete steps to address the lack of diversity on the faculty, a lack of diversity that provides strong evidence of racism, sexism, and other kinds of systemic and institutional bias and oppression. A diverse faculty—in addition to being the natural product of a fair, equitable, and inclusive system and process—creates representation for members of currently under-represented (or un-represented) groups, which in turn creates a better environment for students, postdocs, and the execution of our mission as physicists. But diversity is not the goal in itself; diversity provides the evidence that deeper goals have been achieved: A Department with representation across many groups is a Department demonstrating that physics is, and should be, accessible to all. While there are several directions along which NYU can become more welcoming to, and supportive of, members of under-represented groups, faculty hiring is arguably the most important.

FAS initiatives on diversity

In 2018, the faculty of Arts and Sciences (FAS) created the office of the FAS Director for Faculty Diversity, Equity, Inclusion, and Development, currently directed by Susan Antón. This office has put together [tips for faculty search committees](#). In addition to suggested readings and videos (e.g. on implicit bias), this includes concrete tips, e.g., on how to write a job ad—for instance, create a job ad that describes the position in broad, wide-ranging terms. This office currently only has a counseling role, however, and does not enforce the application of any of the guidelines.

Recommendations

Cluster hiring is a proposal for improving diversity at any level, including faculty (see, e.g., [this article in *Inside Higher Ed*](#) and [this article in *The Chronicle of Higher Education*](#)). The idea behind cluster hiring is that positions are not filled one at a time, but rather in groups of several (where the department simultaneously, or near-simultaneously, advertises multiple positions with or without constraints on the specific fields). Studies (e.g., [this one by the Urban Universities for Health](#)) suggest that when a number of positions are filled at the same time, biases impeding progress for under-represented groups are less pronounced. **The committee recommends that the Department investigate how or whether cluster hiring could be implemented, and whether cluster hiring could be used to change the representation of under-represented groups on the Department faculty.** This will include understanding the variants of cluster hiring and interfacing with FAS on rearranging upcoming faculty lines to facilitate cluster hiring, such that a plan for cluster hiring would be consistent with the development plans and goals for the Department.

Another approach to changing representation on the faculty is direct diversity-line hiring. Currently a number of our peer institutions are taking this approach. **The committee recommends that the Department set a concrete plan for making hires directed at correcting for past hiring biases, with clear targets so progress can be assessed over time.** The Department could work with FAS to gain a new faculty line constructed for this purpose in a way that satisfies legal considerations while directly increasing the membership of under-represented groups on our faculty. We should also investigate how diversity-line hiring could be implemented in a complementary way with any plans for cluster hiring.

Whatever cluster or targeted recruiting the Department does—indeed for any faculty hiring of any kind—it is critical that the Department obey best hiring practices. This is extremely important for all our hiring, as it directly connects to fairness and equity: Good practices lead to more equitable and inclusive outcomes. And the best hiring practices can be actively anti-racist. **We recommend that the Standing Committee on Equity and Inclusion maintain an internal guide to best practices for Department faculty hiring with respect to job advertisements, application pressure, short-listing, interviewing, decision-making, and recruitment.** This guide should be publicly available on the web, so that it is easily accessible to both the faculty and all members of the Department, and so that it can be seen and criticized, and be used to hold hiring committees to account. The already extant FAS resources are extremely relevant here. In addition, **the committee recommends that the Department put in place concrete strategies to control and enforce real implementation of best practices in hiring, including in the appointments of faculty to the search committees.** This could be, for instance, in the form of some kind of “audit” of the faculty search committee by a separate Departmental entity, or it could be audited by some kind of visiting committee, as proposed below.

6. Staff and postdoctoral hiring

The racial make-up of the Department staff does not demonstrate a commitment to

diversity and inclusion. However, the committee was assured that the advertising and hiring processes for Department staff obey best practices and are taken seriously, especially as regards racial biases. **The committee recommends that the Department ensure, in future staff searches, that the utmost is done to make sure that there are good numbers of applications from under-represented groups.** This might require research on networks and channels for job advertisements. Good hiring practices can only serve us well if we have good pools of applicants.

The diversity among postdoctoral researchers is very low. This lack of diversity indicates that our postdoctoral advertising and hiring practices may not be obeying good practices. Postdoctoral hiring is often executed in informal, opaque, and one-off ways, often by individual principal investigators, often without much regard to larger issues of how our Department operates—or should operate. Postdoctoral positions are not always publicly advertised, or not advertised broadly enough, and many excellent candidates may not know who to ask, or not be in the right networks. These problems are likely to be worse for members of under-represented groups. **The committee recommends that the Standing Committee on Equity and Inclusion collect demographic data statistics, develop guidance on best practices for the hiring of postdoctoral researchers, parallel to the guidance for faculty hiring, and that the Department encourage or even require that searches be run consistent with the guidance.** This guidance should be public on the Departmental web pages, to make it easy to find and follow, and also to make it possible for the Department community to see, criticize, and hold accountable the Department's hiring practices.

There are institutional resources around postdoctoral researchers. The committee recognizes that while the [NYU Provost's Postdoctoral Fellowship program](#) is laudable given its mission and intent, its limitations and compensation structure make it an inferior position for Physics postdocs: the NYU Provost program only awards fellowships for 2 years, while a 3-year postdoc is customary in Physics; those postdocs are effectively less eligible for NYU postdoc housing, while many Departmental grant-funded postdocs are, and Provost's Program adds a teaching component which is not necessary or valuable for many Physics Department postdocs.

Finally, the committee heard some concerning things from staff members about workloads and compensation equity, both within the Department and as compared to other departments in FAS. *It does not serve the goals of equity and inclusion to recruit diverse staff into positions that are poorly compensated, over-assigned, iniquitous, and frustrating.* **The committee recommends that the Chair and Chief of Staff convene meetings with the staff to understand what things the Department can do to improve Department staff jobs, fairness, transparency, and compensation.** On a related side-note: It is very rare for a committee of the faculty to interact with staff at this level; the fact that we heard these things is itself a strong argument for having staff representation on Departmental committees in the future.

7. Undergraduate Education

The very strong view of this committee is that anyone can learn and do physics. There are

no intrinsic or innate barriers to participating in physics education and research. There are only external, structural, environmental, economic, and educational barriers. There are barriers that result from failures to support students, and especially failures to support students in ways that are sensitive to their backgrounds, their personalities, and their individual challenges. It is our job as educators and researchers to understand these barriers and break them down. It is our job as educators and mentors to find places where we are not providing adequate or appropriate support and provide it.

Inclusive education

The committee heard from students that some aspects of the Physics Major create exclusions for people with certain kinds of preparation. There are relationships between preparation for the Major and race, gender, and socioeconomic background. In particular, the phasing of the introductory Major classes with the introductory Calculus sequence can be problematic. This could be adjusted in the Major, or the Department could work with students to design extra-curricular supports that emphasize, re-teach, or re-frame math concepts that are critical to the Major. Any changes here, if well designed, would help all Majors, independent of background.

We also heard that some required classes in the Physics Major are viewed as “weed-out classes” or “gatekeeping” classes that exclude or dishearten students from many different backgrounds. The committee wants to emphasize here that *even though the Department’s classes are not intended to be weed-out classes, some of them are legitimately experienced by the students to be weed-out classes*. The committee finds that what is important is not the designed intention of the curriculum and our teaching, but rather the received effect of our curriculum and our teaching.

The committee recommends that the Undergraduate Committee be charged to work with the Standing Committee on Equity and Inclusion to analyze the aspects of the Major that connect to inclusion, with a goal of having as inclusive a Major as possible. The committee recommends making inclusion a core principle that underlies the design of the Major, and making inclusion a core principle that underlies the teaching of the required courses in the Physics Major. The committee suggests thinking “outside the box” in terms of what educational supports we might provide; they don’t have to all be in the form of credit-bearing, registered classes. See, for example, the remarks below about tutoring and tutorials. This is such an important goal for the Department that it makes sense to start an inter-committee effort between the Undergraduate Committee and the Standing Committee on Equity and Inclusion to design curricular changes, teaching policies, and extra-curricular supports.

Related to this, **the committee recommends that all newly hired faculty members receive some formal training in inclusive education, as well as a thorough introduction to the Physics curriculum and to the diverse backgrounds of students that they will teach.** We moreover recommend that faculty members—and, indeed everyone who teaches in the Department—receive “refresher” training sessions every few years. It is the feeling of the committee that training in inclusive education should not be dependent upon the proactiveness of individual faculty, but should be structured by the Department, and

considered an integral part of any faculty's job.

Going slightly further, **the committee recommends that the Department ensure that faculty members assigned to required Physics Major courses make commitments to teaching those courses inclusively in particular**, with training and knowledge in inclusive teaching best practices. The committee finds that the required courses of the Physics Major play a critical role in inclusion: If a student does not feel welcome in these classes then, by construction, that student does not feel welcome in our Department.

Some courses at NYU have inclusivity statements attached to their syllabi. **The committee recommends that the Undergraduate Committee look at inclusivity statements for syllabi and give some guidance to the faculty about how these are useful, what things they might say, how they could or should be addressed in the early class meetings and throughout the semester.** It could also give some example statements for faculty to adopt and adjust, and some example practices from faculty who have used them.

One idea that came up in the open committee meetings was that of prioritizing a faculty hire in the burgeoning field of physics education. The committee did not get a chance to properly discuss this idea, but it is worth analysis; in particular, it is interesting to understand whether having an education researcher in the Department has salutary effects on teaching, education, and culture. In general the committee was very supportive of having more formal and informal discussion of teaching, teacher training, and seminars and colloquia by education researchers.

Tutoring, and a designated tutor for BIPOC undergraduate students

One idea that the committee heard repeatedly in its open meetings is that we should be providing more support for the mathematics connected to physics, both in the introductory courses themselves, but also in additional extra-curricular events, such as tutoring or regular tutorials, or informal mathematics reviews. The committee expects that there is a large pool of graduate students, postdocs, and faculty who would be interested in helping to design and staff such tutorials and reviews.

Another idea that the committee heard is that BIPOC students and students in other kinds of under-represented groups are often in need of extra or specialized support relative to white peers and members of well-represented groups. The committee finds that, in addition to providing tutoring, the Department needs to be providing additional tutoring that is directly aimed at supporting BIPOC students. **The committee recommends that an additional Departmental tutor be hired over and above the current complement of tutors, and that an additional tutor be designated as a BIPOC-serving tutor.**

Right now, the BIPOC student group in the Department is already arranging some tutoring sessions in September and also creating a peer-mentoring program. The committee commends the work the self-organized Department BIPOC student group is doing to tutor, mentor, and support students, and **recommends that the Department provide the BIPOC student group with all the resources that they need to do this work.** With that said, the BIPOC student group isn't any official or institutional entity of the Department or NYU; none of the members should be expected or required to take on more responsibilities

than they already have. The Department must not, under any circumstances, be looking to them to provide solutions to Departmental problems.

Student-led and peer support and mentoring

This connects to another important aspect of undergraduate education and the undergraduate experience that the committee heard about in its community discussions: Students benefit enormously from peer support, and especially students in under-represented groups. It is already the case that the Department's (entirely student-organized and student-run) Society of Physics Students (SPS) already has a peer-mentorship program that pairs a first-year student with a junior or senior. While this program does not have a racial focus, mentees can select their mentors based on who makes them feel the most supported, so it connects strongly to inclusion.

More generally, the committee commends the work of the SPS to improve the learning environment in the Department and create supports for undergraduate Physics Majors. The committee also commends the SPS on its work towards creating an inclusive culture in the Department.

Undergraduate Students on Departmental committees

It has been suggested that undergraduates are hard to involve in Departmental decisions because for many, there is uncertainty about their commitments to the Department or the institution. The committee does not share that uncertainty; the work of undergraduates in the SPS, the Undergraduate Committee, regular curriculum reviews, and on this committee demonstrate clearly their commitment to making the Department better. At a minimum there should be undergraduate representation on Departmental committees that deal with undergraduate studies and Department culture. **The committee recommends that declared third or fourth year Physics Majors be chosen by elections administered by SPS and/or a similar organization to serve as members on relevant Departmental committees.**

Bridge programs

Bridge programs—bridges from high school to college—represent an approach to managing the broad spectrum of mathematical and analytical backgrounds students arrive with. Bridge programs also help with the large sizes of the introductory mathematics and physics Major courses, where it is difficult for the lecturer and section leaders to deliver help as individually as they would like. NYU currently provides two bridge efforts of relevance to us. (The following was gleaned from conversations with Anna Ortega Chavolla.)

The Science Technology Entry Program (STEP) is for 7-12 grade New York State Black, Latinx, and Native American students. The program has a 95% retention rate and students typically remain in the program (some 85%) for the full 5 years. Of these, students an average of 30-40 apply for admission to NYU with anywhere from 15-25 attending. It includes a 4-week summer program where students are in Math and Science courses and

do a hands-on research/project. These courses are taught by upperclass students who are themselves alumni of the other program NYU offers (see later), this allows for students to see someone like them teaching them STEM fields as well as discussing their STEM journey at NYU. This program also has an academic year component that usually runs on Saturdays so the students had an additional 6-hour day after a full week at their regular school. Currently there are 302 students in the program, 125 in the summer and 225 in the AY (they tend to be over enrolled)

The other program is called simply STEM and is a true summer bridge. It is for Black, Latinx, Native American New Yorkers interested in science, technology, engineering and math. This is an alternative admissions program which means students are required to participate in order to start in the fall. In the 6-week summer program students are in non-credit courses. These serve as previews to their fall classes (typically 4 classes) with homework, midterm and finals. They actually use the credit-bearing-course syllabi. The program leadership works with the NYU office of Admissions to identify students who would otherwise be considered inadmissible. That group is then invited to participate in an info session to learn about the Opportunity Programs NYU offers. About 60 students are selected to participate in this mandatory summer program. After a student completes this summer program, no contact between the program and the eventual major department is made. This is likely an attempt to maintain anonymity and avoid possible stigmatization of the student.

The committee hopes that, in the future, programs such as these keep closer contact with STEM departments so that new synergies can develop. In our investigations, we found that only one or two faculty members in the Department were even aware that these programs exist.

Influencing undergraduate admissions

The committee finds that undergraduate admissions in the NYU College of Arts and Sciences is opaque, and relatively or completely uninterested in obtaining input from the faculty. Certainly they have never approached the faculty for comment or advice or input in the memory of any committee member. And yet *admissions is the most important thing that a University does*. Nothing is more core than this. Admissions has the most direct influence on the make-up of our community and the first point of inclusion or exclusion for a student.

Right now it is just a rumor (see opacity issues mentioned above), but we are led to believe that NYU CAS's admissions have substantially higher effective requirements for female applicants than male applicants. You read that right: We understand that NYU CAS may discriminate against women in its admissions criteria. **The committee recommends that the Department take a very strong stand against any NYU CAS admissions policies that discriminate, effectively or explicitly, against women, especially when it comes to CAS applicants who are interested in studying physics.** If the admissions criteria were re-balanced for physics-interested students, given the University's very strong applicant pool, NYU might become a leading institution, nationally, for the education and training of women in physics.

The committee recommends that the Department, through the Chair, the Director of Undergraduate Studies, and the new Director of Equity and Inclusion, intervene with NYU CAS admissions to find out how we can influence admissions, and especially with regards to prospective or likely Physics Majors from under-represented groups. This could have an important impact on the make-up of the Department community. It is worth emphasizing here that such work in admissions only makes sense if we are going to put time and resources into supporting those students once they are admitted, in ways like those we recommend above.

8. Graduate Education

PhD admissions

The committee commends the Department for voting to drop the GRE for the 2021/2022 admissions cohort. The GRE has been shown to be both racially biased, and a poor indicator of success in PhD programs, once other factors are taken into account (see, e.g., [this article in Science Advances](#)). This decision was motivated by the pandemic crisis, but it was adopted at least in part as an experiment for possible longer-term adoption. **The committee recommends that the experiment of dropping the GRE from admissions to the PhD program be taken seriously, and that the Department consider dropping the GRE permanently if the experiment is deemed a success.** The committee hopes and expects that this analysis will happen in the 2020-2021 academic year. The committee endorses [the statement about the GRE made by the American Astronomical Society](#).

In the open meetings of the committee, many Department community members pointed out that *the programs that have dropped the GRE get a far more diverse applicant pool.* This fact was explicitly said to be decisive by several faculty in voting on the GRE this round. This fact should not be forgotten when long-term decisions about the GRE are made.

Whether or not the GRE is dropped, **the committee recommends that no cutoffs be applied on the basis of GRE scores in the graduate admissions process** and that all applications be carefully considered taking into account the full portfolio of application materials.

The committee recognizes that all admissions criteria are race- and gender-biased, including transcripts, letters, and research productivity. It isn't just the GRE. This means that dropping the GRE must be associated with greater scrutiny and greater care with the remaining admissions information that we have about PhD-program applicants. If the GRE has been used to up-rank applications from lesser-known schools or less-represented countries, then the application-reading we do will now need to dive deeper on those applications. One idea worth exploring—to permit applications to be read more carefully and evaluated in more time-consuming ways—is to expand the group of faculty involved in the first pass of application evaluation. *The committee feels that every faculty member who is eligible to advise a PhD student could be trained and called upon to read PhD applications.* *The PhD admissions process is one of the most important things that the Department does.* And, indeed, the committee understands that some other STEM departments do involve the entire PhD-advising faculty in admissions. No PhD advisor

should find it burdensome to be asked to work hard on PhD admissions. **The committee recommends that, if (as we would urge) the Graduate Committee creates a more fair but more time-consuming PhD admissions process, that the Graduate Committee be empowered to assign application reading to the entire PhD-advising faculty of the Department.** This both gives the Graduate Committee more freedom to set good practices, and also represents to everyone the great importance of PhD admissions in our practice as a Department.

Bridge programs, again

Above, we discussed bridge programs from high school to college. There are also very successful bridge programs from college to PhD, some of them aimed at students from under-represented backgrounds (see, e.g., [the bridge program at Fisk and Vanderbilt](#)) The committee did not discuss these programs in detail this summer. However, there are rumors that FAS or GSAS would be interested in such initiatives. NYU, and the Department in particular, would be in a great position to act in this space, possibly in concert with other STEM departments, or the NYU Center for Data Science, or partnering with other NYC institutions. A useful, unique bridge would take significant additional personnel and resources; this cannot be done at current Departmental staffing levels. That said, it is the kind of ambitious, ethical, and high-profile activity that is very good for fundraising from internal and external entities. If the Department considers starting some kind of bridge program, we would recommend that the discussions be held in open forums, to gather input from all members of the Department.

Graduate-student activities and representation

The committee commends the student-led establishment of the G-PHORCE group, representing the graduate students in the Department. This group has given voice to many matters of great importance to the graduate students, and to the Department community. It has also started extremely constructive Departmental activities, not the least of which are several discussions of race and physics, and a new reading group on matters of race and equity.

The committee recommends that the various committees of the Department, and especially those with connections to the graduate programs and Departmental life, be augmented with graduate-student members. These members could be appointed by the Chair (as most committee members are now), or (as the committee would prefer) elected by a process that G-PHORCE could be asked to design and execute. The committee also asks that if committees do take on graduate-student members, that those committees include at least two graduate students as members, or that meetings be held publicly, so as to correct for the imbalance of power between faculty and students. The committee expects—in part based on its own work and experience—that graduate-student representation on Departmental committees will improve committee decisions and recommendations, and also make committee activities more transparent to, and representative of, the Department community. The committee recognizes, however, that the

responsibility to advocate for graduate students should not fall solely on those student representatives, and that all faculty on committees are expected to be receptive to, and advocate for, the voices of the students.

9. Outreach

Of course one of the principal reasons for the small numbers of Department community members from under-represented groups is that even undergraduate admissions happens after a K-12 educational pipeline and diverse modes of discrimination. For this reason, it makes sense for this Department, committed to equity and inclusion, to engage with the K-12 educational system and to support and encourage students of all backgrounds with interests in Physics and related fields. Importantly, we have an important role to play in broadcasting the point that physics is for everyone; that everyone can learn and participate in physics, despite how it all looks right now.

The committee finds that there is great interest among Department community members in engaging and participating in outreach work in informal settings (like the Park) or formal settings (like classrooms). **The committee recommends that the Department develop outreach plans that leverage this interest and excitement in outreach among community members at all levels.** These plans should be designed with equity and inclusion goals at high priority; the committee notes that it is hard to do inclusive outreach well, and easy to do it poorly.

In 2020 the Department lost Professor Andre Adler, who devoted his life to physics education, including especially inclusive physics education. He was also our leader in coordinating outreach activities. **The committee recommends that the Department appoint a faculty member to serve in a Director of Outreach role, with a particular focus on inclusion.** This appointment must be associated with provision of sufficient support and resources for the Director of Outreach to organize and do important things. But it is also clear that many Department members would voluntarily help.

10. Budget, staff support, and external funding

We have identified, along with our recommendations (above), some places where implementations will require some resources. Some are inexpensive, such as tracking data, some are expensive, such as new faculty hiring! It is clear that the activities of the Director of Equity and Inclusion and the Standing Committee will be making decisions and running activities that require both budget and staff support. **The committee recommends that the Chair and the Chief of Staff find an interim solution to give some staff support and budget to the new Standing Committee, and prepare an Annual Planning Report request for ongoing support of the Director and the Standing Committee.** The Standing Committee can be employed to help write the relevant parts of the APR document.

The committee finds that there are many external entities, including national and international funding agencies, private foundations, and even private companies, that are interested in supporting equity and inclusion interventions in the sciences and in Physics

in particular. **The committee recommends that the Standing Committee for Equity and Inclusion research external funding opportunities and determine whether there are proposals that ought to be prepared.** External funding for Equity and Inclusion efforts would give the Department a lot of freedom and opportunity to try new, ambitious things.

11. Mission and purpose of the Department

Organizations and communities have purposes and functions. If these purposes and functions are understood only implicitly, and not explicitly, they can distort, they can be perceived or understood very differently by different constituents, and they can evolve in unwanted directions. For these reasons, **the committee recommends that the Department draft and adopt a living mission statement.** This statement could be passed as a Departmental resolution, but revisited annually or on some regular basis for edit and adjustment, to reflect the evolving attitudes and commitments of the faculty and the community of the Department. It makes sense for such a statement to be drafted in an open forum, but it also makes sense for it to be passed by a formal resolution of the Department. Of course this committee recommends that any mission statement center ideas of equity and inclusion! But the most important thing is to have clearly stated shared goals which can be used to guide the Department's hiring, spending, events, curricula, teaching, and mentoring. And to have those shared goals be openly available for discussion, debate, and revision over time.

With that statement in place, **the committee recommends that the Department appoint an external review committee or visiting committee to assess the activities and plans of the Department.** This committee could have a narrow focus on particular issues of concern—such as race—or it could have a broad charge to consider all the different aspects of the Department's mission and purpose. This recommendation requires some research, so we are pushing it to the Chair, or the Standing Committee on Equity and Inclusion, for research and implementation. It also will take some budget, so as a plan becomes more specific, **the committee recommends that mission development and external review be put into the 2021 Annual Planning Report in April** with a request for funding to support these activities. The April deadline for APR submission suggests that research towards a Department mission and visiting committee ought to be prioritized in Fall 2020. If the Department wants an external visiting committee with a focus on issues of equity and inclusion, one of the possible frameworks for a visiting committee is the [APS Climate Committee](#). A framework for an internal resource is the new [“NYU BeTogether” program](#) from NYU's Office of Global Inclusion, Diversity and Strategic Innovation, the goals of which are aligned with those of this committee.

Related to mission and purpose, the most difficult kinds of changes for a department to make are cultural changes. The committee heard repeatedly in our open meetings that there are aspects of the culture of physics that are exclusionary and off-putting. We have to understand and work on these things. If the Department adopts a mission statement that foregrounds inclusion, that mission statement, in turn, might motivate spending thought, time, and resources on matters that impact our culture for the better for everyone.

Appendix: Department Statement on Anti-Black Racism

In 2020 July and August, with input from a significant part of the Department community, the committee produced the following statement on anti-Black racism, which it distributed internally and which is visible externally on the committee web pages.

Statement from the NYU Department of Physics on anti-Black racism

2020 August 6

With sadness and anger we read about the police killings of George Floyd and Breonna Taylor, two more among hundreds of killings by police (and others) of unarmed Black people in America in the last decade. We condemn police actions that kill Black people and make our City and Nation unsafe for Black people. We express solidarity with Black communities and all people of color who are suffering from attacks on their lives, livelihoods, and peace as a result of systemic racism.

Racism is not confined to the streets. Here in the Department of Physics at New York University, we are part of a system in which very few Black people have the opportunity to obtain undergraduate physics degrees, even fewer are in our graduate programs, and fewer still are faculty. At present the Department has only four Black members, in a community of roughly 200 (when we include students, researchers, faculty, and staff). This is way below any reasonable representation given our City and our Nation.

Furthermore, police violence and structural racism against Black people make our spaces unsafe. We need to make changes that will improve the representation and raise the voices of Black people in the Department. We must make it a safe haven, safe from police violence and racism. But it is not enough not to be racist; we need to also be actively anti-racist in our practices.

We commend researchers from around the world who have devoted their scholarship to studying the complex problems and systems of racism. We recognize those who are working on solutions. We promise to seek out and attend to the scholarship of these researchers and activists, along with Black voices more generally.

In the [Strike For Black Lives](#) on 2020 June 10, the Department convened conversations, which led to the creation of a Committee on Equity and Inclusion to research and work on the following kinds of goals:

Undergraduate and graduate programs: We will help NYU get applications from and admit more Black students interested in the Physics Major and the graduate programs. We will develop structures to better support Black students in their learning and research in physics. We will re-evaluate our curricula and courses with inclusivity in mind. And we will learn how we can work outside of NYU to support Black students in grades K-12 who are interested in physics.

Postdoctoral scholars and staff: We will find ways to make sure that Black people are applying for our postdoctoral and staff positions. We will revise and monitor our hiring practices to ensure that their applications are being fairly considered.

Faculty: We will understand and create paths for increasing the number of Black people on our tenure-track faculty. We will create structures to support the teaching, research, and careers of Black faculty.

Department culture: We will foster an environment for Black people in the Department that is safe from police violence and racism. We will work to understand and eliminate processes and behaviors that contribute to exclusion, oppression, and inequity. We will increase representation and participation of Black physicists in our events, seminars, and colloquia. We will change Department procedures to make the workings of the Department more transparent.

We commit to these goals and we commit to changing our Department. We put these efforts at the same priority as the physics education, training, and research that we do. Most importantly, *we are committed to the principle that anyone can learn and do physics*. We recognize our failure in the past to create—in a truly anti-racist way—conditions in which all members of our community reach their potential. We are committed to making new and better opportunities for Black students and Black physicists. Black Lives Matter.

Signed, The NYU Department of Physics Committee on Equity and Inclusion:

Yacine Ali-Haïmoud, *Assistant Professor*

Lauren Altman, *PhD student*

David W. Hogg, *Professor (chair of the Committee)* david.hogg@nyu.edu

Lauren Kayli Jones, *undergraduate Physics Major*

Evette Ma, *program administrator, Graduate Studies*

Andrew I MacFadyen, *Professor and Director of Graduate Studies*

Angus McMullen, *postdoctoral scholar*

Maryam Modjaz, *Associate Professor*

Frank Moscatelli, *Clinical Professor and Department Chief of Staff*

Anthony Pullen, *Assistant Professor*

Endorsed by:

Matthew Kleban, *Professor and Chair of the Department of Physics*
