AIP American Institute of Physics FOCUS ON February 2022

Changes in Access to Resources During the COVID-19 Pandemic for Faculty Members in Physics and Astronomy

Courtney Walsh and John Tyler

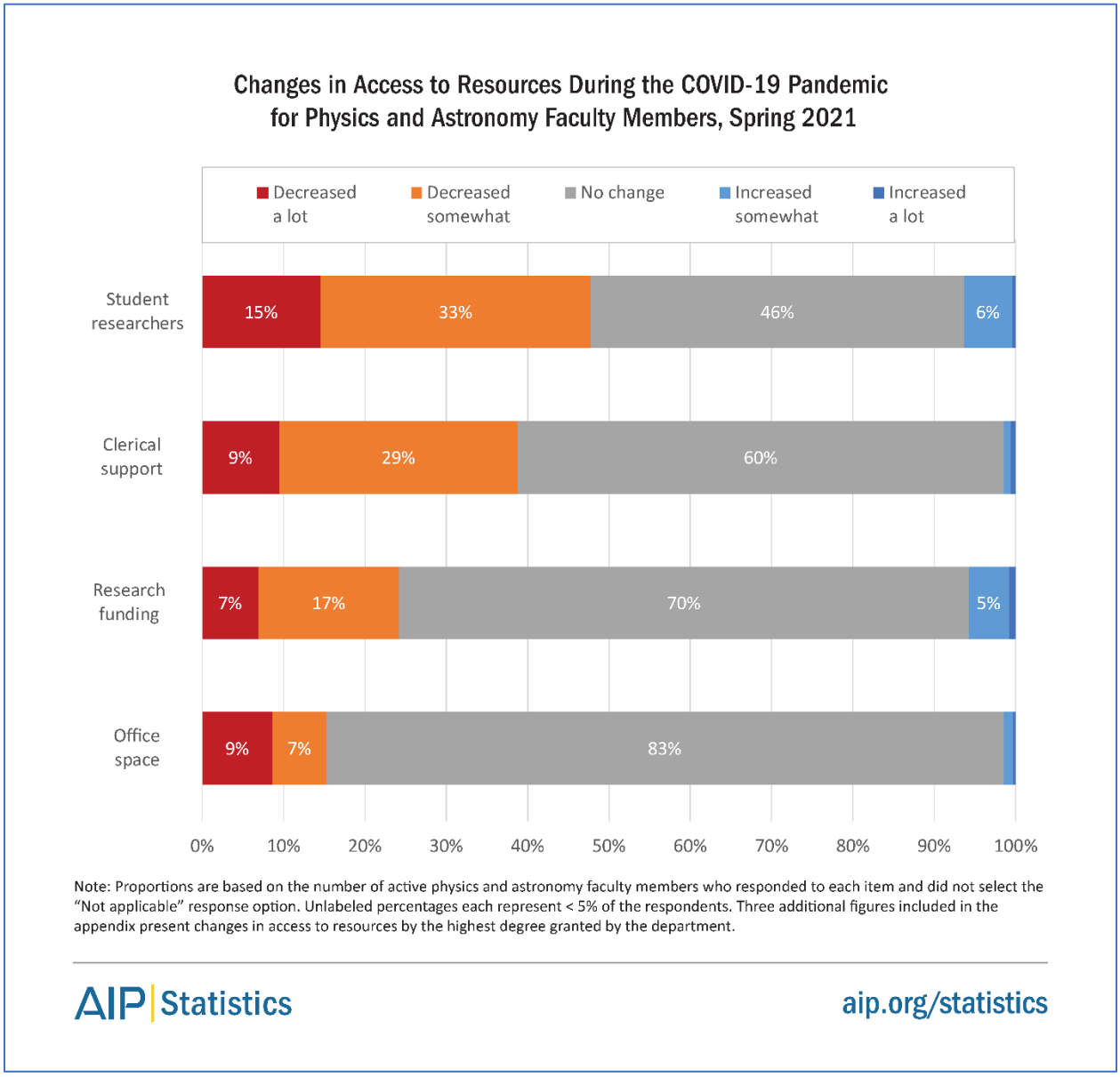
Throughout the COVID-19 pandemic, faculty members faced numerous challenges related to their teaching and research. Among other challenges, many faculty members encountered reduced access to the resources they needed. This Focus On briefly outlines faculty-reported changes in access to resources and compares those changes across the highest degree granted by the department in which faculty were employed. Compared to before the pandemic, in the spring of 2021, over 70% of respondents reported having less access to at least one of the following resources: Student researchers, clerical support, research funding, and adequate office space. Reduced access to student researchers was the most commonly reported change, and this change was more prominent in PhD-granting departments than in departments granting bachelor's degrees. Changes in access to the other three resources we assess did not statistically significantly differ based on the highest degree granted in the department, suggesting the faculty resources were similar impacted across department types.

In the spring of 2021, 1,793 physics and astronomy faculty members across 286 US physics and/or astronomy departments shared how the pandemic impacted their time allocation, teaching and lab adjustments, access to resources, quality of work, and well-being. In this Focus On, we report changes in access to resources during compared to before the pandemic for the 1,407 respondents who were employed as active faculty members in physics or astronomy when the survey was administered. We asked respondents, "Compared to your experiences prior to the COVID-19 pandemic, how has your access to the following changed?" to which faculty members responded using a 5-point Likert scale from "Decreased a lot" to "Increased a lot," with the option to select "Not applicable" for each of the four resources we assessed:

- Student researchers
- Clerical support
- Research funding
- Adequate office space

Overall, 71% of respondents reported having less access to at least one of these resources compared to before the pandemic. Most commonly, faculty members reported having access to fewer student researchers and less clerical support (**Figure 1**). Across all departments, about 1 out of 14 respondents (7%) reported an increase in access to at least one resource. About 1 in 5 respondents (22%) reported no change in their access to *any* of the resources. These trends were similar across all three department types, so we show the overall trend in Figure 1. We present changes in access to resources by highest degree granted in the department in the **appendix**.

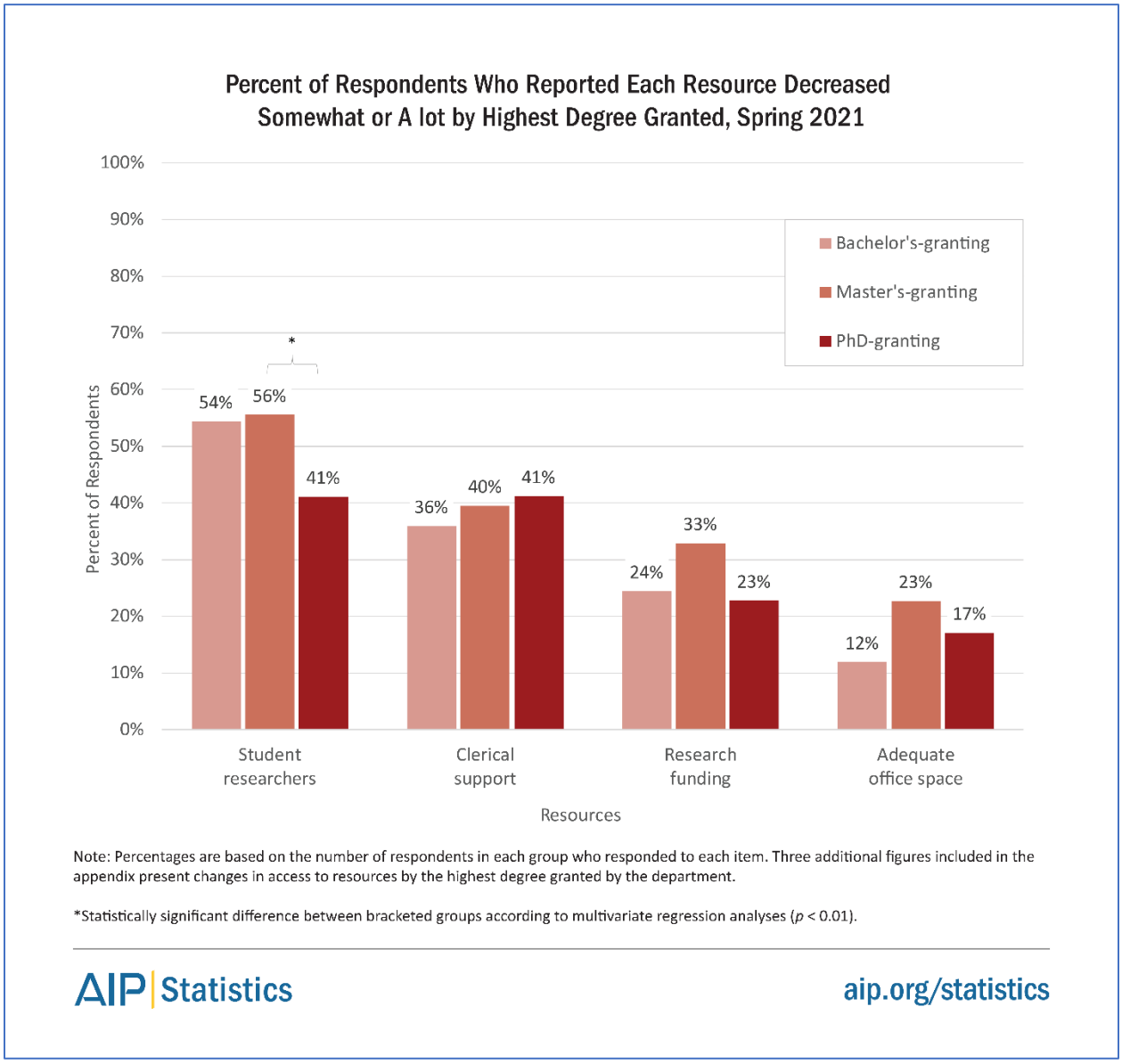
Figure 1



Changes in access to resources varied somewhat based on the highest degree granted by the department. Multivariate regression analyses suggested that changes in access to student researchers statistically significantly varied by department type, such that respondents

employed in PhD-granting departments were more likely to report reduced access to student researchers in the spring of 2021, compared to respondents in departments which granted bachelor's degrees (**Figure 2**). Changes in access to the other three resources did not significantly vary based on department type.

Figure 2



Note: Percentages are based on the number of respondents in each group who responded to each item. Three additional figures included in the appendix present changes in access to resources by the highest degree granted by the department.

*Statistically significant difference between bracketed groups according to multivariate regression analyses ($p < 0.01$).

AIP Statistics aip.org/statistics

Conclusions

In this Focus on, we briefly outlined faculty members' reported changes in access to resources. The majority of respondents reported reduced access to at least one of the resources they needed to fulfill their responsibilities as a faculty member in physics and/or astronomy. This is in addition to the numerous other challenges faculty members encountered, including reallocating time across various responsibilities (see related AIP Focus On [1] here), adjusting courses to accommodate for remote or socially distanced environments, and struggling to balance their work and personal life (see related AIP Focus On [2] here) all while trying to maintain the quality of the work they produced (see related AIP Focus On [3] here). Additional analyses are needed to understand the connections among these experiences, which we plan to explore in future reports in addition to dissecting how the trends we presented here vary across faculty members' identities (e.g., gender and racial or ethnic identities) and positions within their department (e.g., current rank).

Survey Methodology

The Faculty Member Survey is administered by the American Institute of Physics approximately every five years. The survey focuses on the demographics, training, and experiences of faculty members. In this cycle, the Statistical Research Center included a special section on the impact of the COVID-19 pandemic.

We asked 5,488 physics and astronomy faculty members across 315 US physics and/or astronomy departments to complete the Faculty Member Survey in the spring of 2021. The institutions were selected using cluster sampling; we randomly selected 39% of all US departments that offered degrees in physics, astronomy, or both physics and astronomy from 4-year colleges or universities, including both public and private institutions and oversampling Historically Black Colleges and Universities (HBCUs).

From each sampled department, we collected all faculty members' names and contact information from the department websites. All listed faculty members within those departments were emailed a link to complete the survey.

A total of 1,793 individuals from 286 departments responded to the questionnaire; however, a total of 1,407 respondents were included in this Focus On. Respondents who indicated they were not active faculty members or who were not currently working at the institution from which we collected their contact information were removed from the sample. Nearly half of active faculty members were full professors (45%), while fewer were associate professors (20%), assistant professors (17%), or in other faculty roles (15%).[a]

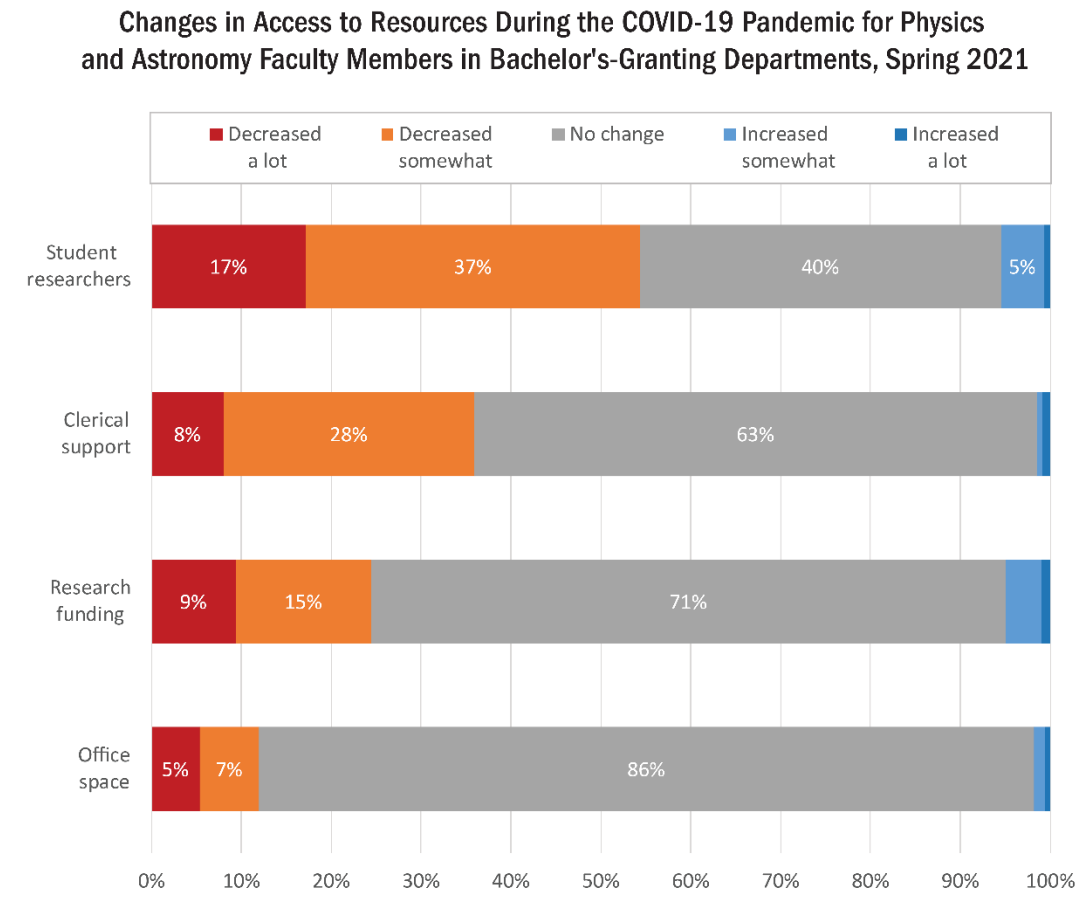
[a] These numbers are similar to those collected in AIP's Academic Workforce survey, in which the chair from each physics and astronomy department in the US was asked to report the number and rank of all faculty members in the department. Therefore, we believe this sample is a good representation of the population of physics and astronomy faculty member ranks in the US.

In order to test the associations between department type and changes in access to resources, we conducted a series of multivariate regression analyses. This allowed us to test the associations while accounting or controlling for other potentially confounding effects. In order to isolate the effects of department type, each regression analysis included the following characteristics in each model.

- Gender identity
- Citizenship and race or ethnicity
- Marital status and child status
- Other dependents status
- Rank
- Department field (i.e., physics, astronomy, or combined)
- Institution type (i.e., public or private)

Appendix

Figure 3. Bachelor's Degree-Granting Departments

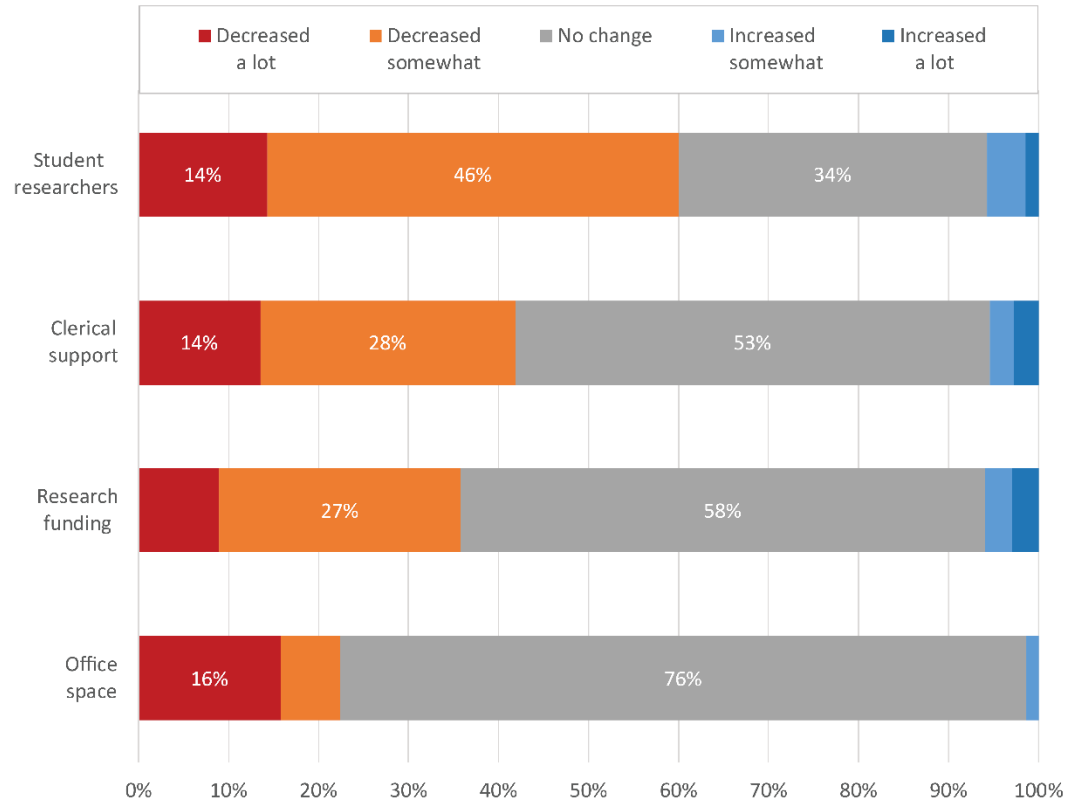


Note: Proportions are based on the number of active physics and astronomy faculty members in bachelor's-granting departments who responded to each item and did not select the "Not applicable" response option. Unlabeled proportions each represent < 5% of the respondents.

AIP | Statistics

aip.org/statistics

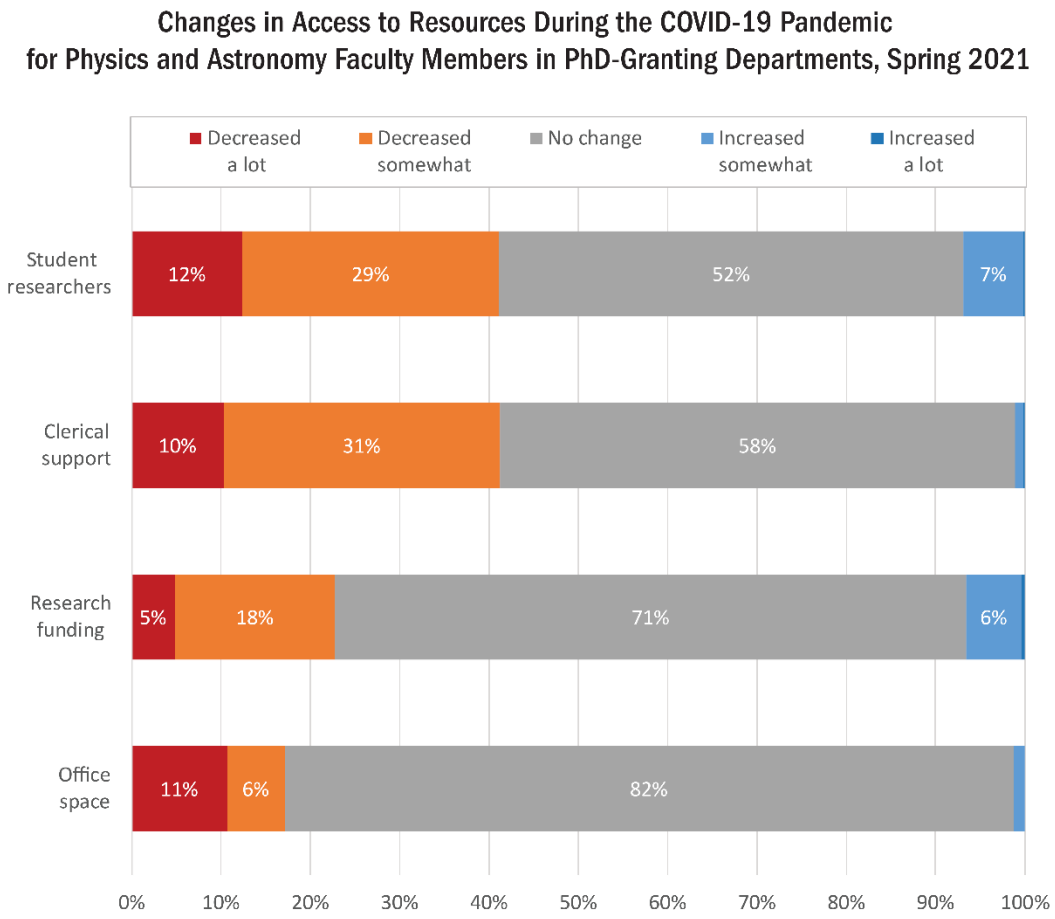
Figure 4. Master's Degree-Granting Departments



Note: Proportions are based on the number of active physics and astronomy faculty members in master's-granting departments who responded to each item and did not select the "Not applicable" response option. Unlabeled proportions each represent < 10% of the respondents.

AIP Statistics aip.org/statistics

Figure 5. PhD-Granting Departments



Note: Proportions are based on the number of active physics and astronomy faculty members in PhD-granting departments who responded to each item and did not select the "Not applicable" response option. Unlabeled proportions each represent < 5% of the respondents.

AIP Statistics aip.org/statistics

References

[1] Walsh and Tyler (2021). Changes in Time Allocation During the COVID-19 Pandemic for Full-time Faculty Members in Physics and Astronomy. https://www.aip.org/statistics/reports/changes-time-allocation-during-covid-19-pandemic-full-time-faculty

[2] Walsh and Tyler (2022). Physics and Astronomy Faculty Members' Well-Being During the COVID-19 Pandemic. https://www.aip.org/statistics/reports/covid-faculty-wellbeing

[3] Walsh and Tyler (2022). Self-Reported Changes in Quality of Work as a Result of the COVID-19 Pandemic for Faculty Members in Physics and Astronomy. https://www.aip.org/statistics/reports/covid-faculty-qualityofwork

e-Updates

You can sign up to receive email alerts that notify you when we post a new report or resource. Visit https://www.aip.org/statistics/stats_subscribe to sign up. We will send you an e-Update only when we post something new. You should receive no more than 20 messages in a year.

Follow Us on Twitter

The Statistical Research Center is your source for data on education, careers, and diversity in physics, astronomy, and other physical sciences. Follow us at @AIP_Stats.

Changes in Access to Resources During the COVID-19 Pandemic for Faculty Members in Physics and Astronomy

By Courtney Walsh and John Tyler

Published: February 2022

A product of the Statistical Research Center of the American Institute of Physics

1 Physics Ellipse, College Park, MD 20740

stats@aip.org | 301.209.3039 | aip.org/statistics