

California Institute of Technology
Committee on Reconstituting On-Campus Research

Recommendations on Expanding On-Campus Research

31 March 2021

On-campus research activities came to an abrupt halt on 16 March 2020 as the COVID-19 pandemic intensified in our area. This committee was subsequently formed and issued a report on 21 May 2020 with recommendations for the initial phase of reconstituting on-campus research. Once the recommendations were approved by the Institute, research groups prepared operating plans consistent with the recommendations, and division offices reviewed and approved them. Research activity soon reached the reduced density limit of 25% set by the Pasadena Public Health Department, and has continued at this limit since. As plans were updated, they were resubmitted for approval. The Institute implemented the Caltech COVID-19 Reporting Application (mandatory as of 16 July 2020) for all Caltech persons coming to campus and instituted the Campus Surveillance Testing Program (mandatory as of 30 November 2020) for all Caltech persons coming to campus. Importantly, there has been no known outbreak due to on-campus research activity since the restart in May 2020.

The Pasadena Public Health Department has now allowed campus to gradually increase on-campus research activity to a density of 50%. The damage to research by the extended period of extremely limited density, the impact on the careers of early-stage researchers, the availability of vaccines to our community, the low number of positive cases detected by the Campus Surveillance Testing program, and the experience of operating over the last eight months with no known outbreak due to on-campus research activity all argue in favor of increasing activity.

We have to balance this with the recognition that the pandemic still continues (the new case rate in the community is in fact currently higher than in early fall 2020), much of the campus community has still not been fully vaccinated, it is still to be established that full vaccination prevents asymptomatic transmission, and the recent opening of indoor dining and other activities in the area and the likelihood that members of the Caltech community will travel during the spring break add to the risk of increased activity. These factors argue in favor of continuing caution and vigilance.

Therefore, **we recommend that the campus cautiously expand on-campus research** presence. In doing so, we **recognize that COVID-19 is still present in our community** and we must approach this expansion as a **progression of reversible steps**. Specifically, we recommend the following:

1. All research activities should continue to **follow the ten recommendations** in our 19 May 2020 report, and all researchers should use the Caltech COVID-19 Reporting Application and participate in the Campus Surveillance Testing Program. In particular, everyone should **stay home when sick** and continue to use **face coverings, physically distance, frequently wash hands and sanitize their work places** when on campus.
2. Institute communications should emphasize the **message** that the pandemic is not over and all of us should continue to take all required precautions.

3. We recommend that the Institute continue the following **assessments** and make the results available to the appropriate groups for follow up:
 - a. Regular review of compliance with the reporting and testing requirements by comparing data from the Caltech COVID-19 Reporting Application and the Campus Surveillance Testing Program against card-swipe data.
 - b. Survey of air-handling systems and, in particular, determination of air change rates in various rooms.
 - c. Impact of increased research activity on custodial, facilities and support staff.
4. The expansion of our research presence should take place in **two phases**: (1) increasing to 37.5% density in the first phase, and (2) increasing to 50% density in the second phase. This phasing allows us to understand and respond to changes in behavior, assess any increased risk, and reinforces the message that the pandemic is not over. We recommend a six-week gap between the two phases assuming that the surveillance tests show no increase in infection rate after phase one.
5. All research groups should submit **new operating procedures** to the cognizant division office for review. New procedures can only commence upon the approval of the division office. The operating procedures for **both phases can be submitted and reviewed together**. However, the timing of the transition to phase two will be determined by the Institute. In creating and reviewing these new operating procedures, research groups and divisions should take into account the overall density in the building, the specific condition and design of the building, as well as the availability and presence of custodial, facilities, and support personnel.
6. For **laboratory spaces**, we recommend:
 - a. Phase 1. At least 200 square feet per person.
 - b. Phase 2. At least 150 square feet per person.These recommendations may be appropriately adjusted taking into account the air-handling, laboratory layout, and other local factors, with approval of the Division Chair. Further, accommodations may be made for training with proper personal protective equipment in consultation with the Institute Bio-Safety Officer and with the approval of the Division Chair. Finally, in reviewing the laboratory plans, the cognizant division offices should take into account the goals of 37.5% overall occupancy during phase 1 and 50% overall occupancy during phase 2.
7. For **theoretical and computational research**, as well as data analysis, literature review, and other **non-laboratory research** activities, we recommend that work that can be performed remotely continue to be performed remotely. However, there is a growing recognition that not all such other non-laboratory research can be conducted remotely over a period of months. Therefore, we recommend opening the campus for necessary other non-laboratory research.

We note that spaces used for such research are often configured similar to offices and have less frequent air-changes compared to laboratories. The Institute, using methodology developed within the Division of Geology and Planetary Sciences, is conducting tests of the number of air-changes per hour in various rooms. As this testing is completed, we recommend that the divisions set limits on the maximum occupancy of

each room and the minimum time interval between personnel changes based on the air-flow rate¹, room area, and layout.

In the absence of such an assessment, we recommend that the Institute proceed cautiously as follows:

- a. Phase 1. Rooms that are smaller than 600 square feet: one person per room per day. Rooms that are 600 square feet or larger: form cohorts with only one cohort using the room per day. The number of people in a cohort should be limited so that there is at least 300 square feet per person.
 - b. Phase 2. Rooms that are smaller than 500 square feet: one person per room per day. Rooms that are 500 square feet or larger: form cohorts with only one cohort using the room per day. The number of people in a cohort should be limited so that there are at least 250 square feet per person.
8. We recommend that whenever possible, **meetings** continue to take place outdoors in designated meeting places. We recommend that the number of approved outdoor meeting spaces be increased. However, there is a growing recognition that some indoor in-person meetings are necessary for the conduct of research. Therefore, we recommend limited in-person meetings in designated meeting areas.

We note that such spaces have less frequent air-changes compared to laboratories. Therefore, we recommend that the assessment proposed for non-laboratory research activity include indoor meeting rooms, and no meeting rooms be open prior to such an assessment. We recommend that the divisions set limits on the maximum occupancy of each room and the minimum time interval between personnel changes based on the air-flow rate, room area, and layout. These rooms should also have adequate cleaning supplies.

The largest meeting group in both indoor and outdoor spaces should consist of no more than 10 persons.

9. In view of legal privacy protections and current incomplete knowledge about the ability of vaccination to prevent asymptomatic transmission, and because a substantial portion of the extended campus community is not yet vaccinated, we recommend that no particular decision about occupancy be made based on the **vaccination status of individual researchers**. This includes decisions by individuals themselves while on campus.
10. We recommend that the Institute continue to strongly encourage vaccinations (subject to individual health exceptions) to all campus community. We also recommend that the Institute collect self-reported data and report it in aggregate. Finally, we recommend that the Institute consider a **comprehensive vaccine policy** that would require students and employees to be vaccinated as a condition of their on-campus presence, subject to all legal, logistical and health/safety requirements as the vaccine becomes widely available.

¹ Consistent with the WHO recommendation (<https://www.who.int/publications/i/item/9789240021280>)