

# University of Pennsylvania, Neural and Behavioral Sciences Building

Philadelphia, Pennsylvania

## Category: Architecture

The genesis for the new Neural and Behavioral Sciences (NBS) building is the acknowledgment that the study of complex behaviors will be a fundamental focus of life sciences in the 21st century. The NBS building strongly identifies itself as an iconic gateway into campus and celebrates a new life sciences precinct by defining a new academic quadrangle.

## Site

The site is situated between existing university buildings to the north and south, a lush campus botanical garden/biopond to the east, and a busy street on the western edge of campus. The design strengthens campus identity internally and externally by clearly articulating the convergence of key pedestrian and vehicular routes by the adjacent community and the city as a whole. Rather than function as a barrier that separates the school from the neighborhood, the building serves to link the two, providing a smooth transition between the academic environment and the surrounding community. The NBS building presents a new public façade to University Avenue, a vehicular thoroughfare between campus and the residential community to the west.

## Program

The 74,000 gsf facility is a center and connector for interdisciplinary programs including psychology, biology, and behavioral sciences that integrate the study of genes, the brain, and behavior. It houses dry research laboratories, wet teaching facilities, a 180-seat lecture hall, faculty and graduate student offices, and spaces designed for interactions to foster socializing and collaboration.

## Solution

The building, in a simple bar configuration, connects directly to the Leidy building to the north and to the Lynch laboratory to the south via a below-grade tunnel to accommodate interaction between departments. The bar is broken into a patinated copper volume that houses the labs, a white metal and glass volume for faculty offices and the penthouse. The ground floor is largely transparent welcoming building users while connecting interior and exterior space.

The white metal and glass volume gently cantilevers into the garden to minimize the building's impact on the adjacent tree roots. This volume houses faculty offices which have views into the tree canopy of the adjacent botanical garden, the auditorium is placed below grade to the south of the building due to its longer span requirement and is covered by a green roof, a portion of the new life sciences quad.

A biomorphic aluminum sunscreen shades the curtain wall on the south side of the building. The south-facing curtain wall forms the edge of interaction and circulation spaces just outside the labs. While the light levels inside the labs must be carefully controlled, these corridors provide dynamic, softened, yet expansive light due to the cut-outs, perforations, and solid portions of the aluminum sunscreen outside. The sunscreen is designed with only two patterns that connect to each other whether rotated or mirrored.

The corridors and interaction spaces are animated throughout the day with light, shadow, and reflections generated from the moving sunlight through the curtain wall and sunscreen. From the exterior, the sunscreen works to suggest the function of the building and to extend the forms of the garden to the public face of the building on University Avenue.



*"This project will create a new gateway to the campus, and will stand as an important symbol of Penn's commitment to teaching and research in the sciences. The complex will enhance existing interactions and facilitate new ones to promote the integrated study of genes, the brain, and behavior."*

Dr. Rebecca Bushnell, Former Dean of Penn's School of Arts and Sciences



Penn was committed to a design that is of its time, expressing 21st century innovation and discovery. The building nests among architectural icons designed by Louis Kahn, Cope & Stewardson, and others.





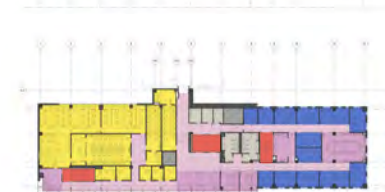
Lower Level



Ground Floor



2nd Floor



3rd Floor



4th Floor



Penthouse

#### Program Legend

Corridors	Interaction Gathering Space
Dry Labs	Mechanical
Elevators, Stairs	Office
Instructional	Toilet Rooms, Elec, Plumbing, Etc.
Instructional Labs	

Site Plan. The site is defined by existing buildings, knoll, garden, and the western edge of campus.



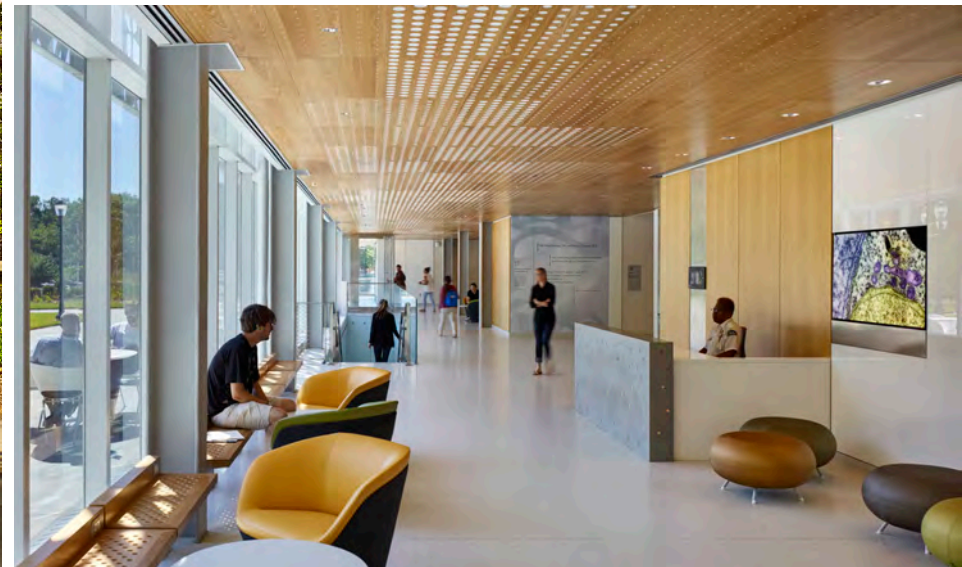


The copper volume contains the labs. Testing and rooms that need controlled light are located in the center of the space and graduate student workrooms are located at the perimeter where north-facing windows provide generous light.



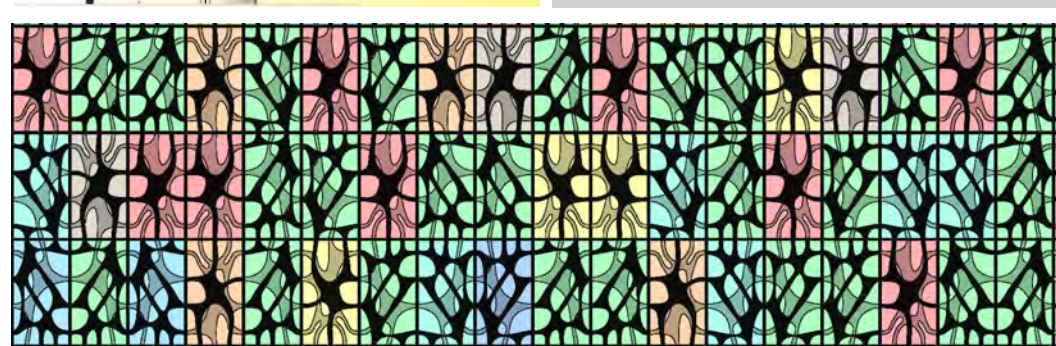
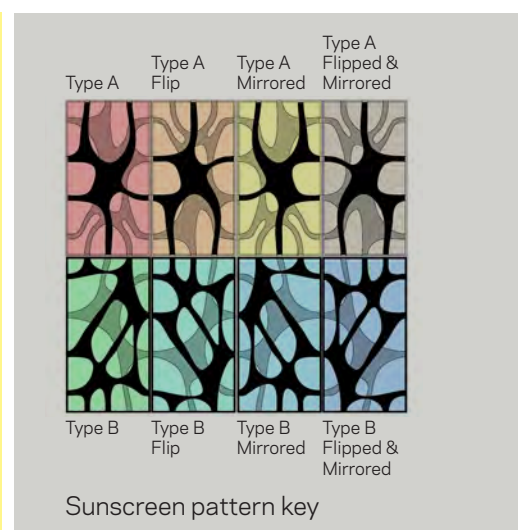
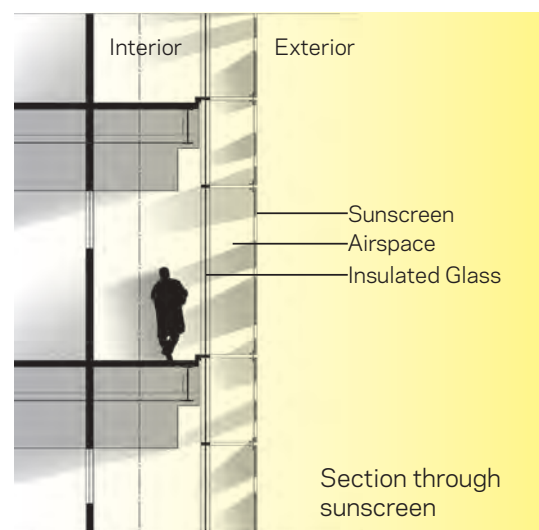
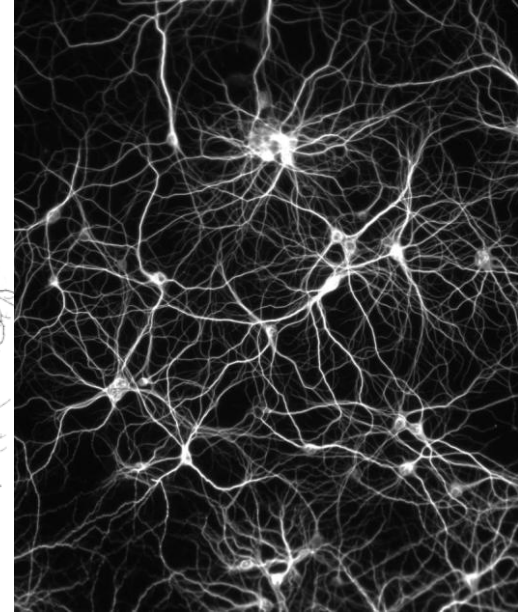
The east porch is protected by the cantilever and offers expansive views of the adjacent botanical garden.





From the campus, the building is typically approached from an extension off of Hamilton Walk, a primary pedestrian axis. The building is entered at the porch. The ground floor features floor-to-ceiling glass visually connecting the adjacent life sciences buildings, the new quad, and Kaskey Park.





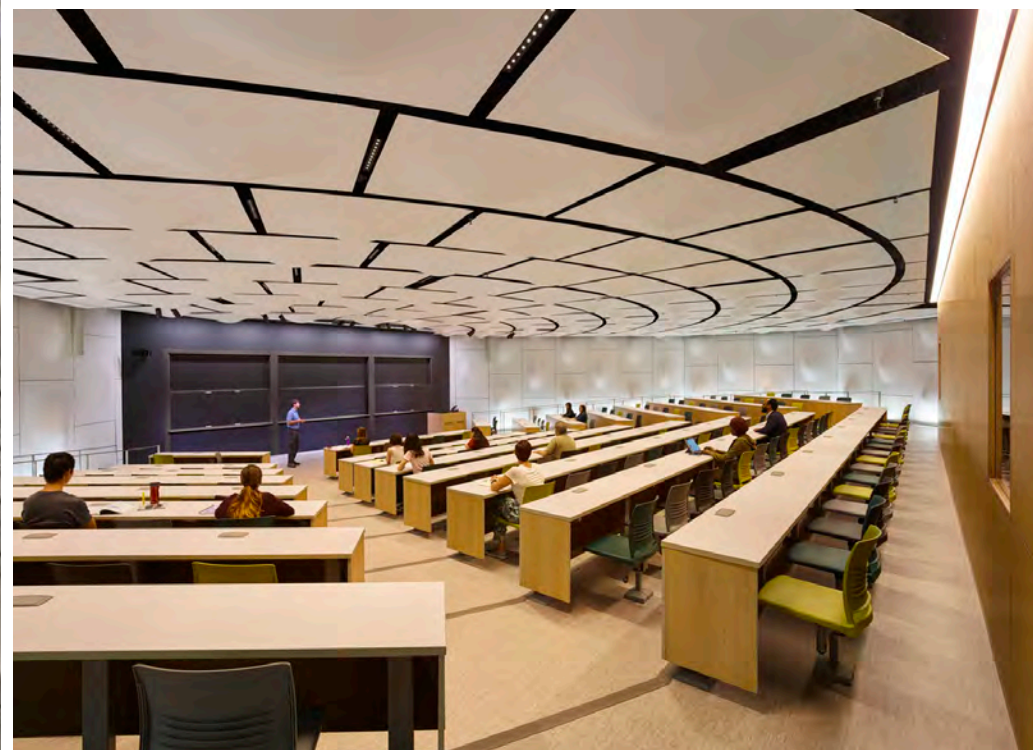
As a reference to biology using the absolute minimum to create complexity, and to maximize the efficiency of construction, the sunscreen panels were configured with only two patterns which could be installed in four configurations totaling eight variations. The panels were designed to connect at the same points, no matter how the panels were configured. The sunscreen reduces heat loads and glare on the south facing glass but still allows for expansive views.





Each upper floor elevator lobby doubles as an informal gathering or teaching space. Important to an emerging multi-disciplinary program to encourage the chance conversation, convenient spaces like this work as lounges, teamwork areas, and impromptu learning environments. White glass panels allow ideas to be worked out directly on the walls. A backlit wood ceiling provides soft, even light and warmth to the space.





A monumental stair connects the ground floor social space with the lower level labs and auditorium, thereby providing continuity of the design throughout the various space types. The labs are configured with north facing window wells allowing the space to be generously daylit. The auditorium features gently misshapen wall and ceiling panels which are highlighted by low angle light.





The iconic south facing scrim heps define the life sciences precinct. The sunscreen creates ever changing shadows on the interior and exterior of the building.



