One of the drawbacks to living in a dense urban area, particularly a tall building, is the lack of connection to the outdoors. Moving from the suburbs to the city, often leaves regret for loss of private landscapes. This exhibit explores unique connections to the outdoors though the concept of an urban garden. It simulates conditions that may be applied to a high density Chicago dwelling, and presents experimental components that enhance the performance and quality of an architectural space. The Center for Design Research at Virginia Tech is presently working with SOM Chicago to develop an industrialized housing protocol in which the urban garden is a central architectural and performance feature.

The experiments in this exhibit are the next generation of the Eclipsis System (back wall) designed as part of the LumenHAUS, which won the international Solar Decathlon Europe Competition in Madrid, Spain in June, 2010. The Eclipsis System is comprised of two sliding panels; a stainless steel shutter shade and a translucent insulating composite wall. It is a transformable fenestration system that qualifies and quantifies conditions of open and closed. Representing a new typology of building skin, the precision of digital calculation is embedded in material expression, producing for LumenHAUS a façade that remains unanticipated, yet familiar; technically efficient, yet beautiful.

As Virginia Tech expands its research into the areas of medium and high density housing, the next generation Eclipsis System merges sustainability, energy optimization, mass production and conservation with market demands and trends. The configuration and operation is derived by a combination of parametric modeling and computational simulations. Form/Object studies explore exactitude of material through digital fabrication processes, offering opportunities to investigate the inherent limitations and possibilities. Parallel to these studies is the examination of form as derived by environmental data through computational simulation. Qualities of material and environment coalesce through the quantitative language of structured data systems to yield an articulate expression of form and performance.