

Arch 3690 | Spring 2019

Intermediate Computation and Fabrication

Tues: 10:30am - 12:35pm V-834B | Fri: 10:30am - 12:35pm V-817

Prof. Ravi Raj (rraj@citytech.cuny.edu)
CLT: Henry J Aguilar (haguilar-morales@citytech.cuny.edu)

Department of Architectural Technology
New York City College of Technology
City University of New York
300 Jay Street, Brooklyn, NY 11201

ASSIGNMENT 01: GLUELESS PLEXI LAMP

The challenge is to construct a sphere-like object that fits into a 12" x 12" x 12" cube and holds together without the use of glue or hardware, thereby using only detailing and the material itself for structural stability.

CONCEPT:

You will be using forms at vastly different scales to begin your design research. At one end of the scale spectrum you will study nebulae, the explosive and dynamic remains of stars that have gone supernova, while at the other end of the spectrum you will study the near alien life forms that live at the extreme depth of the ocean. Although extraordinarily different in scale and content both subjects capture our imagination with light. The nebulae through rapidly expanding, ionized clouds of gas, resulting in luminous shapes of infinite variation. And the deep sea creatures, through their soft, translucent and pliable anatomy use bioluminescence, releasing light energy through chemical reactions in their cells. Both of these subjects operate in a medium utterly devoid of light yet their forms are manifested through the release of light.

MATERIAL:

1/8" acrylic sheet - Use primarily translucent, clear plexi. You are allowed to use ONE colored plexi of your choice. Note that plexi thicknesses differ slightly from sheet to sheet so you should use a caliper to measure the material for consistency before you buy.

You can purchase this from Canal Plastics:
<https://www.canalplastic.com/> - 345 Canal Street, NY, NY 10013

FABRICATION: Precise detailing; structural stability; expression of construction methodology

Critical issues to remember:

1. How can your design incorporate LIGHT as form maker? How do you use both translucent and opaque materials to control light?
2. Test the material as you develop design ideas, joints, and assembly techniques BEFORE you cut your final pieces.
3. Possible starting points for research are PLATONIC SOLIDS and/or ARCHIMEDEAN SOLIDS. Look up these forms to help rationalize the complex geometry of a sphere (see Fig. 1 below) - also, reference the geometry of crystal formations.
4. How to design a detail that will allow assembly of flat material into a 3d dimensional structure?
5. Is the 'detail' repetitive while the 'structure' it holds together varying or is each detail unique?
6. Are the detail and structure one system or separate? In other words, are you creating one component that can attach to itself to create the sphere (structure and detail in one) or are you creating separate logic systems in several different components.
7. The final shape of your objects do not have to be round, they can be elongated, truncated or unfolding as long as they are structurally stable. You will all start with a sphere and, using Rhino, deform and manipulate the sphere to create a more complex shape.
8. Look at the attached student projects as examples of previous solutions.

Fig. 1 - Rationalization of complex double-curved sphere.

