

Sculpting Light – A Collection

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Form to Fire

Fall 2024



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1 – Project Concept

‘Sculpting Light’ is a collection of glass forms that can stand on their own as sculptures, but also act as tools for ‘sculpting’ light.

Throughout the semester, I experimented with different glass-working techniques to result in forms of varying texture and thickness that, when lit, act as lenses to focus and project patterns onto other surfaces.

In addition to using glass as a lens to project light, I also explored LED filaments and creating wire support structures to ‘sculpt’ the light source itself.

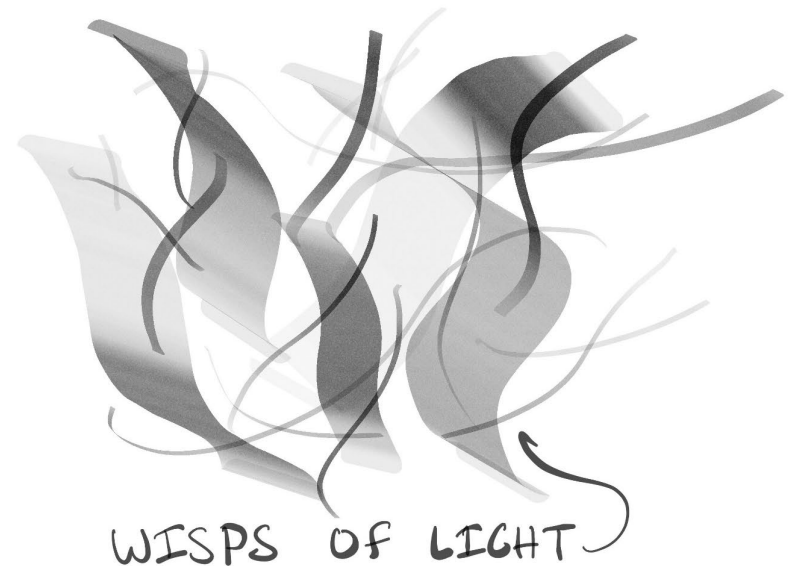
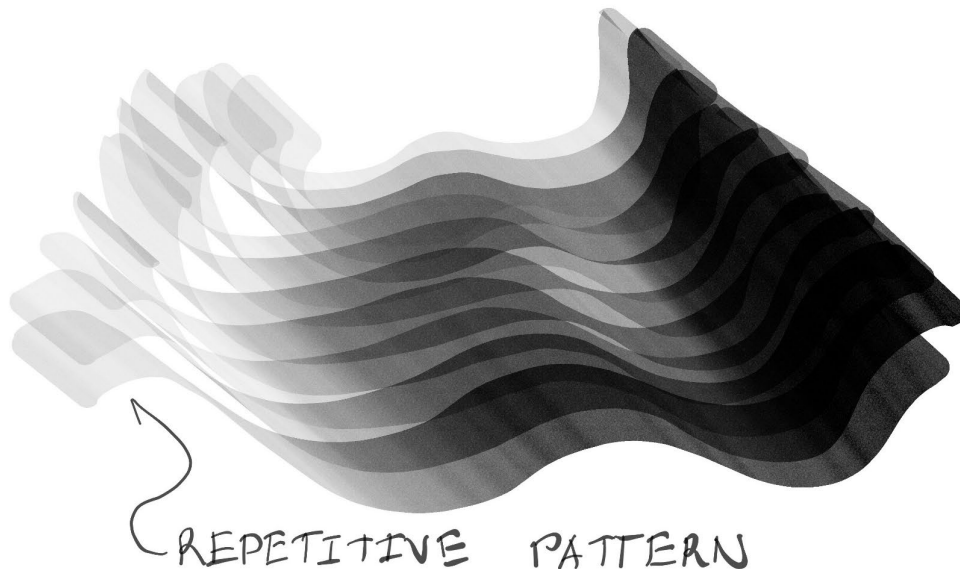
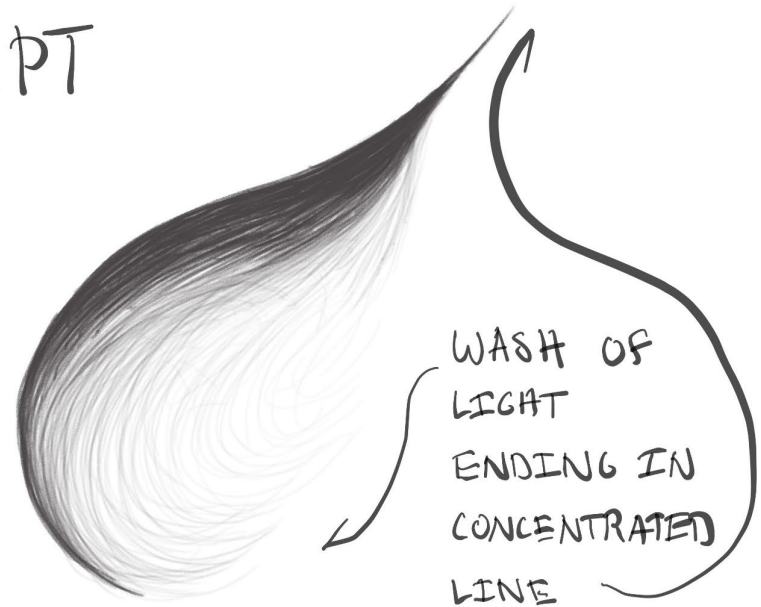
Project Concept – Initial Concept Sketch

HIGH-LEVEL CONCEPT

EXPLORE THE INTERACTION BETWEEN
LIGHT AND GLASS

I WOULD LIKE TO CREATE A LIGHT SCULPTURE
THAT MAKES USE OF VARYING GLASS FORMS,
THICKNESS, AND SURFACE TEXTURE TO BEND LIGHT
INTO DIFFERENT SHAPED PROJECTIONS

THE PRIMARY LIGHT PROJECTIONS I AM
ATTEMPTING TO CREATE ARE CONTROLLED,
REPETITIVE PATTERNS AND ORGANIC,
WATER-LIKE WISPS OF LIGHT



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2 - Inspiration

Inspiration - Concept



Bending - Philippe Bompas



Tendrils (series 1) - Michael Skura



"The Ordinary?" - Leandro Erlich

Inspiration – Glass Forms



Ripple – Poetic Lab via Dezeen

Clear Happy Light – Caleb Siemon & Carmen Salazar



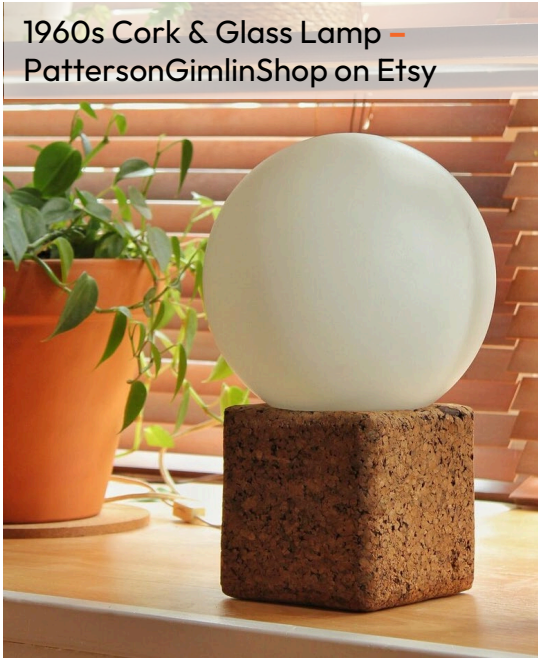
Ellisse Optic Blown Glass – Hammerton Lighting



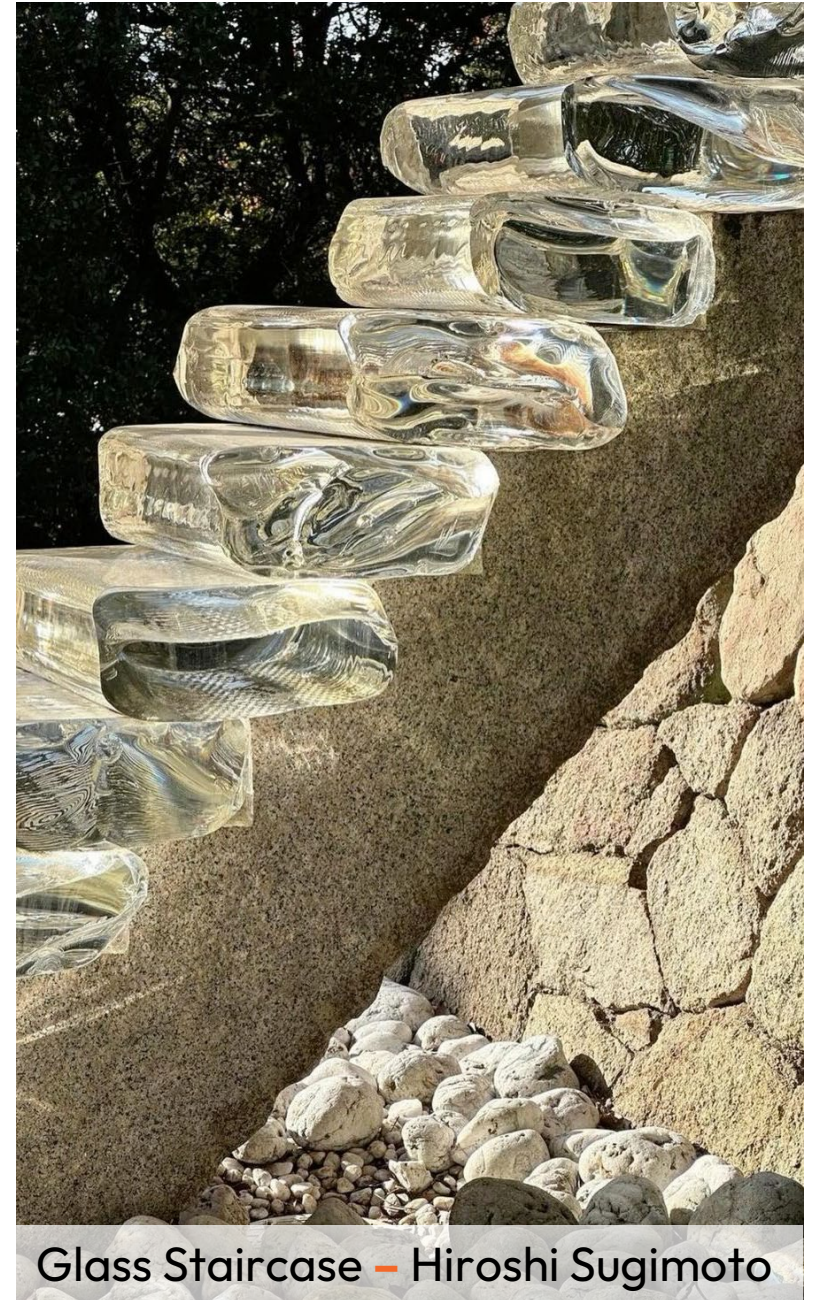
3D-Printed Transparent Glass – Neri Oxman Et al. via MIT News

Inspiration – Aesthetic & Materials

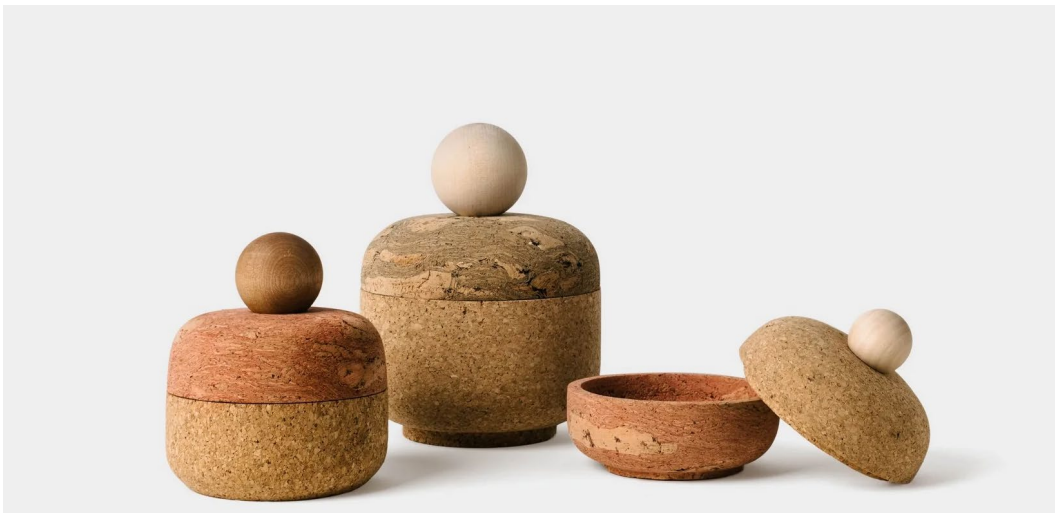
1960s Cork & Glass Lamp –
PattersonGimlinShop on Etsy



Rock LED Bulb – Anthropologie



Cork Bolo Canisters – Melanie Abrantes Designs



Glass Staircase – Hiroshi Sugimoto

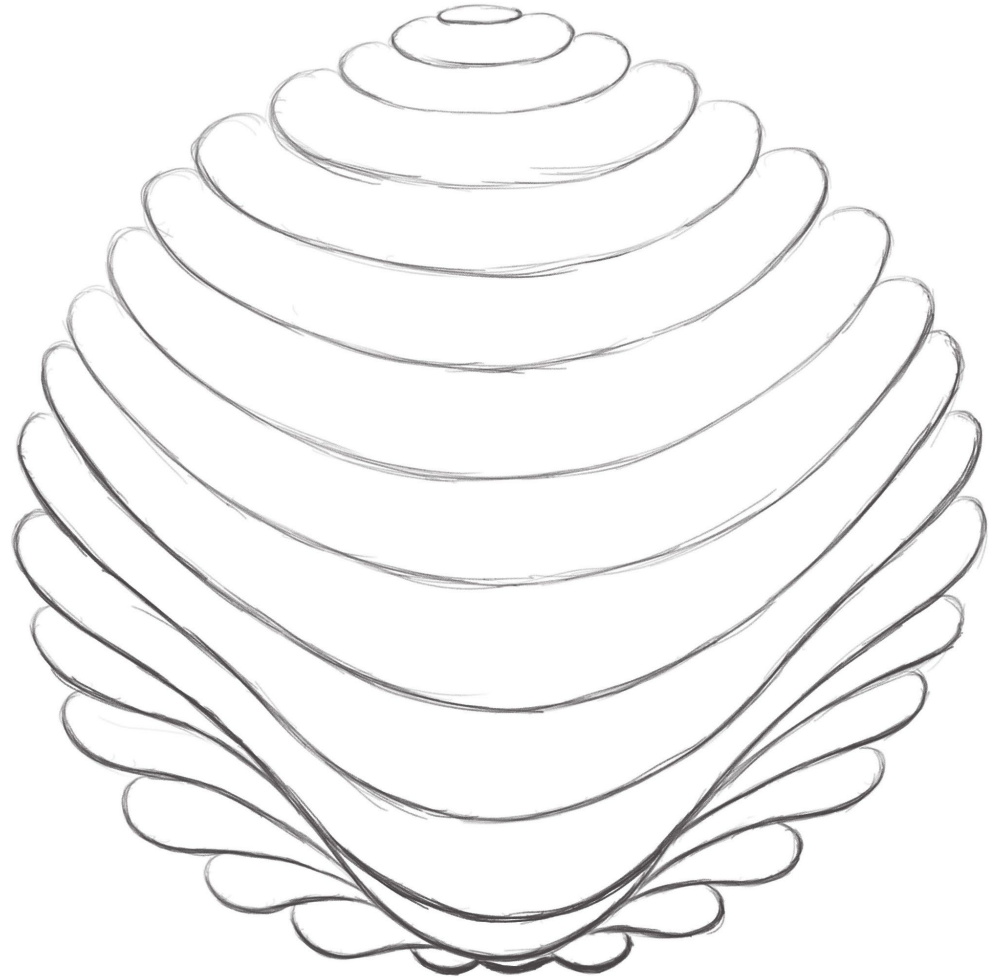
3 - Sketches

Sketches – Individual Forms

ORGANIC FORM

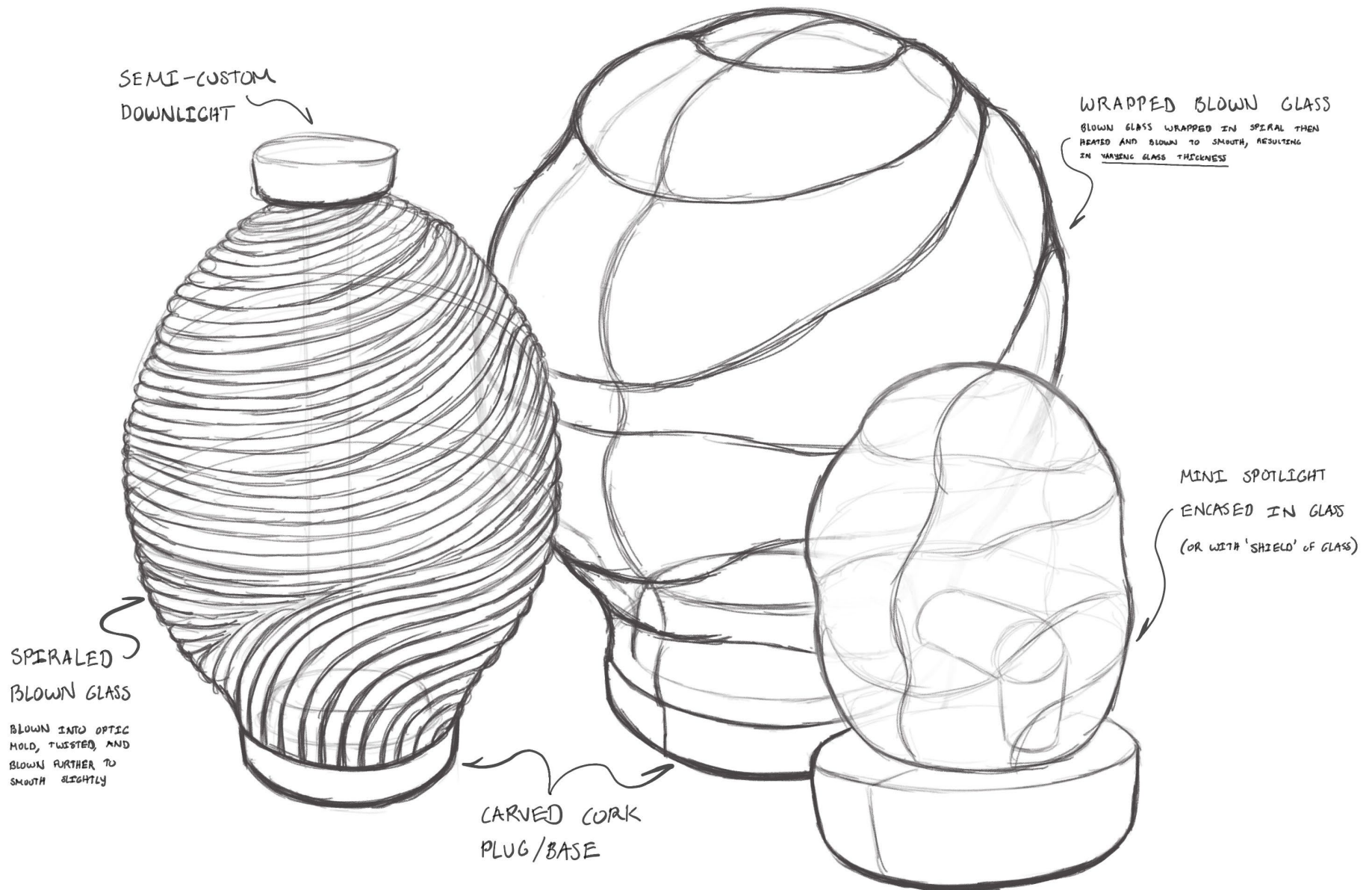


FLUTED FORM



The initial concept called for creating organic, undulating, forms as well as repetitive, fluted, forms and combining them either into a single piece or mounting on a single base.

Sketches – Collection of Forms



Halfway through the semester, I moved towards creating a collection of glass forms with different effects when lit, rather than combining textures into a single piece.

4 - Optic Glass Experimentation

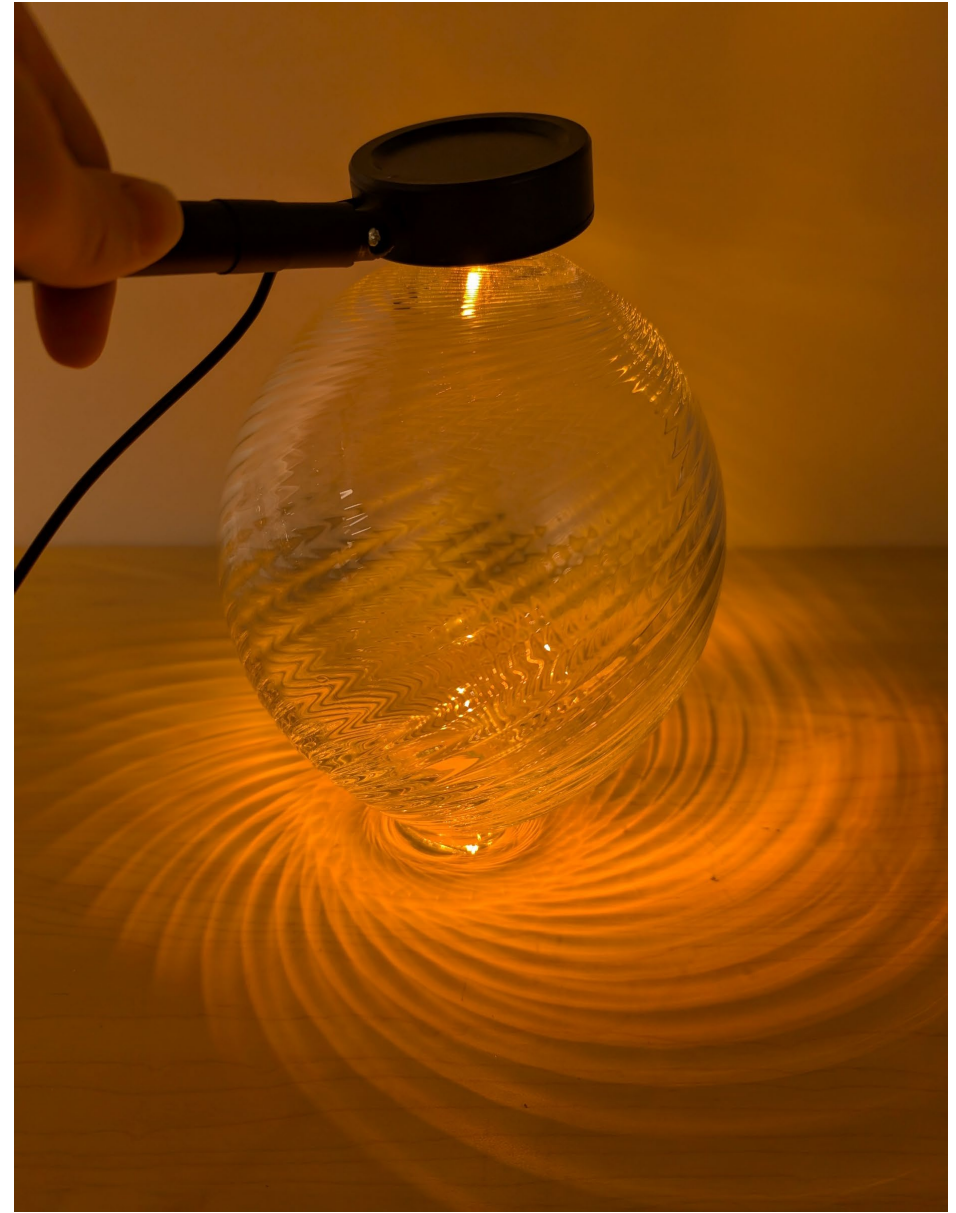
I experimented with different techniques for forming glass to test how each resulting piece affected light passing through the glass

Optic Glass Experimentation – Sculpting



I experimented with sculpting flat and blown glass using tagliols (paddles) to make the forms uneven and add ridges, with the intention of later making a metal shaping tool.

Optic Glass Experimentation – Optic Molds



I explored traditional optic glass methods by using optic molds (star-shaped molds) to form fluted glass, which could be twisted into a spiral and blown out to smooth the ridges.

Optic Glass Experimentation – Wrapped Glass



A technique with potential was wrapping a spiral of glass around a bubble and then blowing it larger to smooth out the surface, resulting in thick, lens-like, bands of glass.

Optic Glass Experimentation – Final Wrap

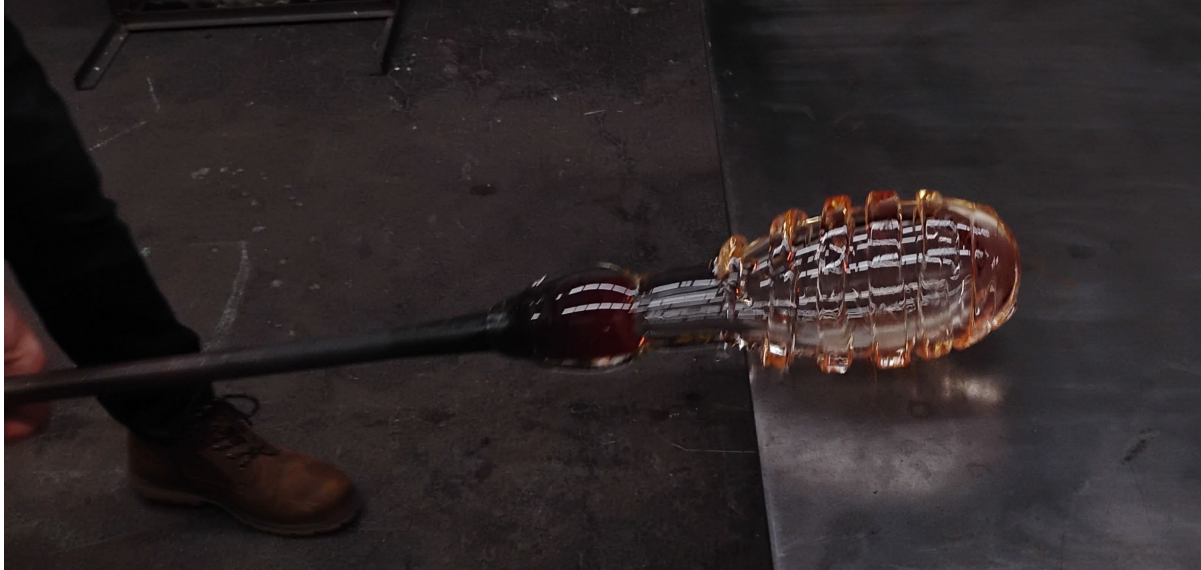


The technique for my final piece was a modification of the wrapped glass method.

We left a stem for mounting and began with a narrower bubble to keep the final form slightly elongated rather than spherical



Optic Glass Experimentation – Final Blow

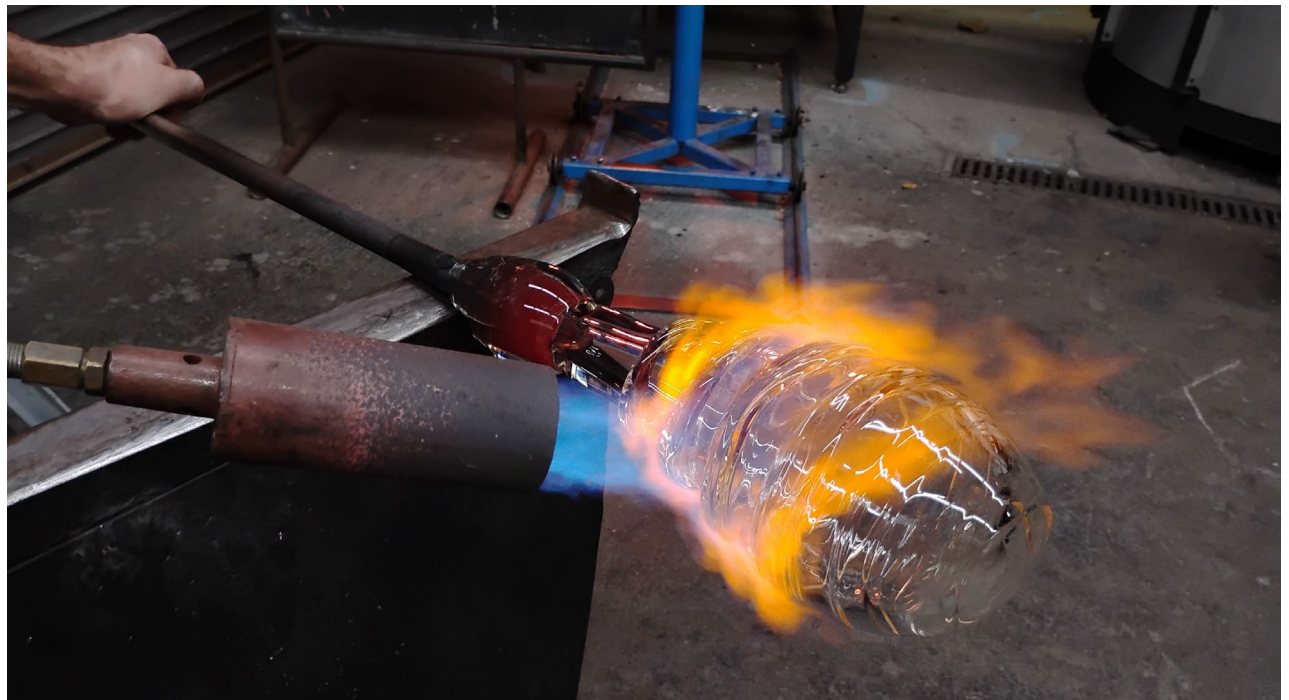


Rolling the wrapped glass on the marver (worktable) sped up the process of blending the spiral into the bubble.

The additional step also led to the spiral forming flat bands rather than smooth bumps, which was not ideal.

Torching the piece before blowing the second blow smoothed out the spiral and heated the bubble without allowing the stem to get too warm.

During the second blow, I used compressed air to cool the top of the bubble in an attempt to help the stem area expand further.



5 – Cork Carving

Cork products are typically produced by grinding natural cork (bark of the cork oak tree), adding a polyurethane binder, and pressing the mixture into molds.

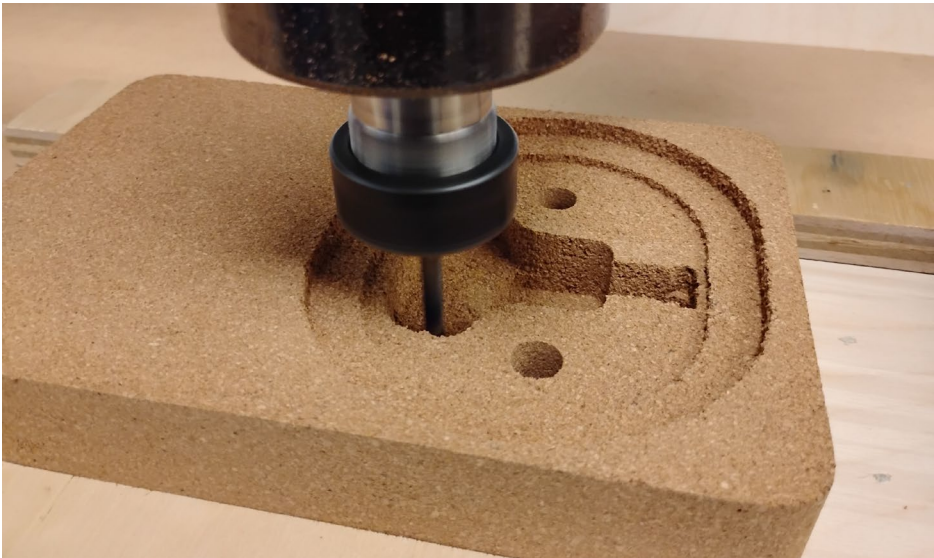
Cork yoga blocks were an inexpensive way to source thick cork stock, but they needed to be carved and finished to reach their final forms of cushioning bases for my glass pieces.

Cork Carving – Experimentation



I tried carving and sanding cork with a flex-shaft, cut cork blocks on a bandsaw, and tested out parameters for routing cork using a CNC router with different sized endmills.

Cork Carving – Combining Processes



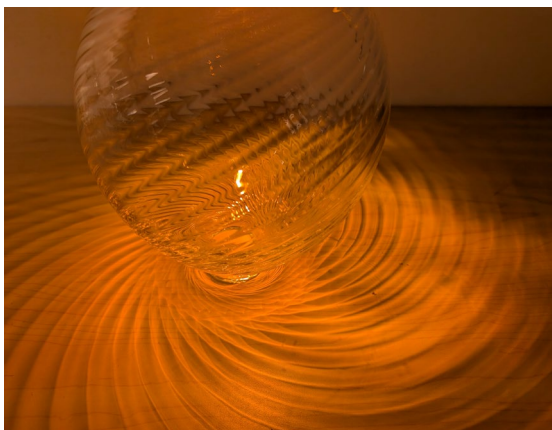
To create cork bases, I first used the CNC router to carve rough forms and internal pockets, then I manually cut and carved the edges to fit my existing glass pieces.

6 – Custom Lighting

Using glass forms as lenses to focus and project light required a lot of testing to determine what types of lighting would produce the desired effect.

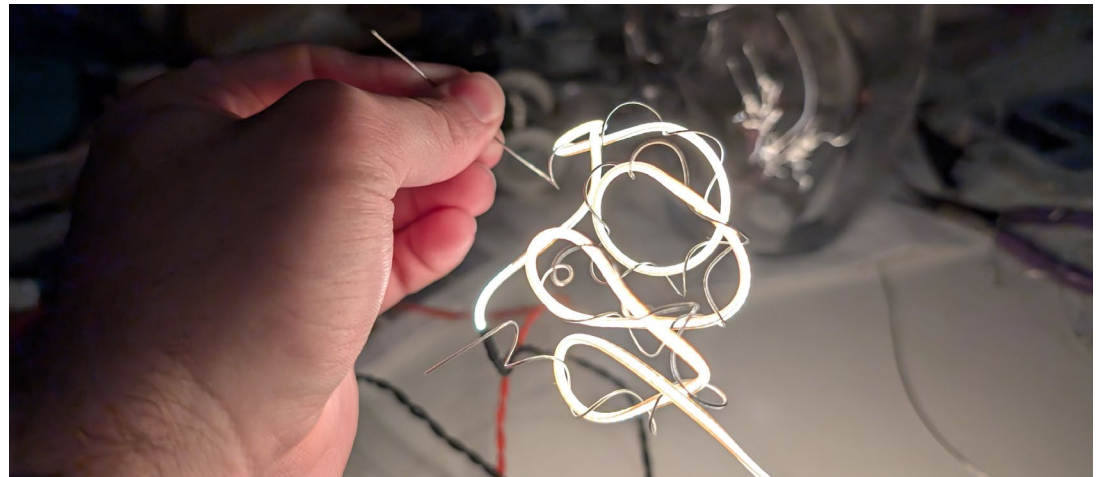
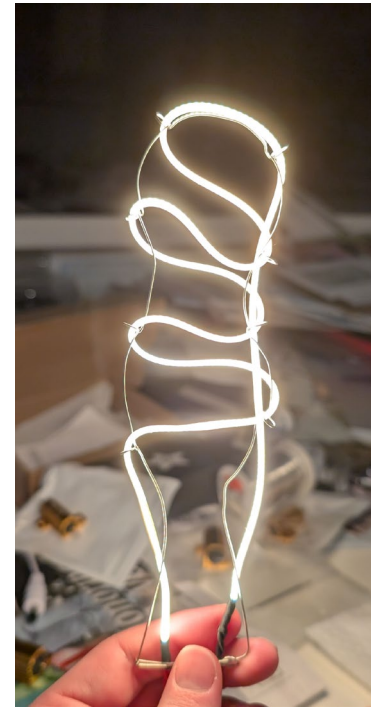
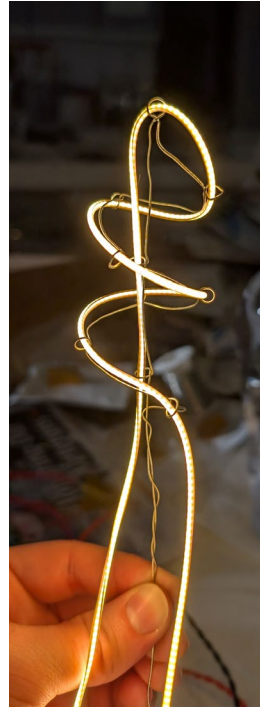
Many commercially-available glass lamps that produce projections are made of crystal, which has a higher refractive index than standard glass formulations. To work with the glass available in the hotshop, I had to make up for the lower refractive index by projecting focused light from a distance.

Custom Lighting – Choosing Light Sources



Lights inside the glass did not produce clear projections, so I used a sunset lamp to project focused light through the pieces. I settled on small LED spotlights for a more neutral color.

Custom Lighting – Exploring Sculptural Forms



Using thin wire, I experimented with forming different styles of supports through which I threaded an LED filament, effectively, making my own Edison-style lightbulb.

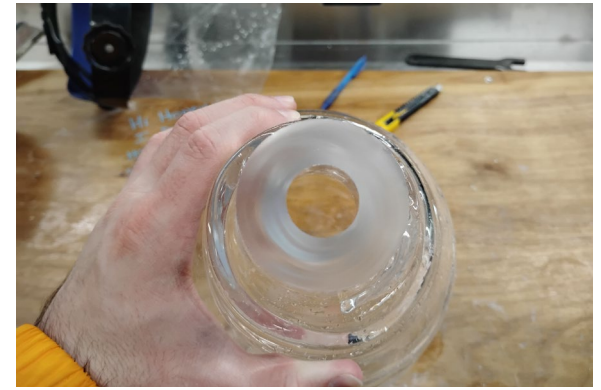
7 – Finishing

Finishing – Cork Surfacing



CNC routing the cork left rough, pitted, surfaces, so I sanded each piece from 80 to 180-grit and finished by burnishing with cork for a smooth finish similar to factory molding.

Finishing – Cutting & Grinding Glass



Some pieces could be cut with a saw, while others were too delicate. In every case, I ground the surface flat, marking the surface before grinding and working until the marks disappeared. I ground and polished a chamber on each piece to smooth the sharp edges.

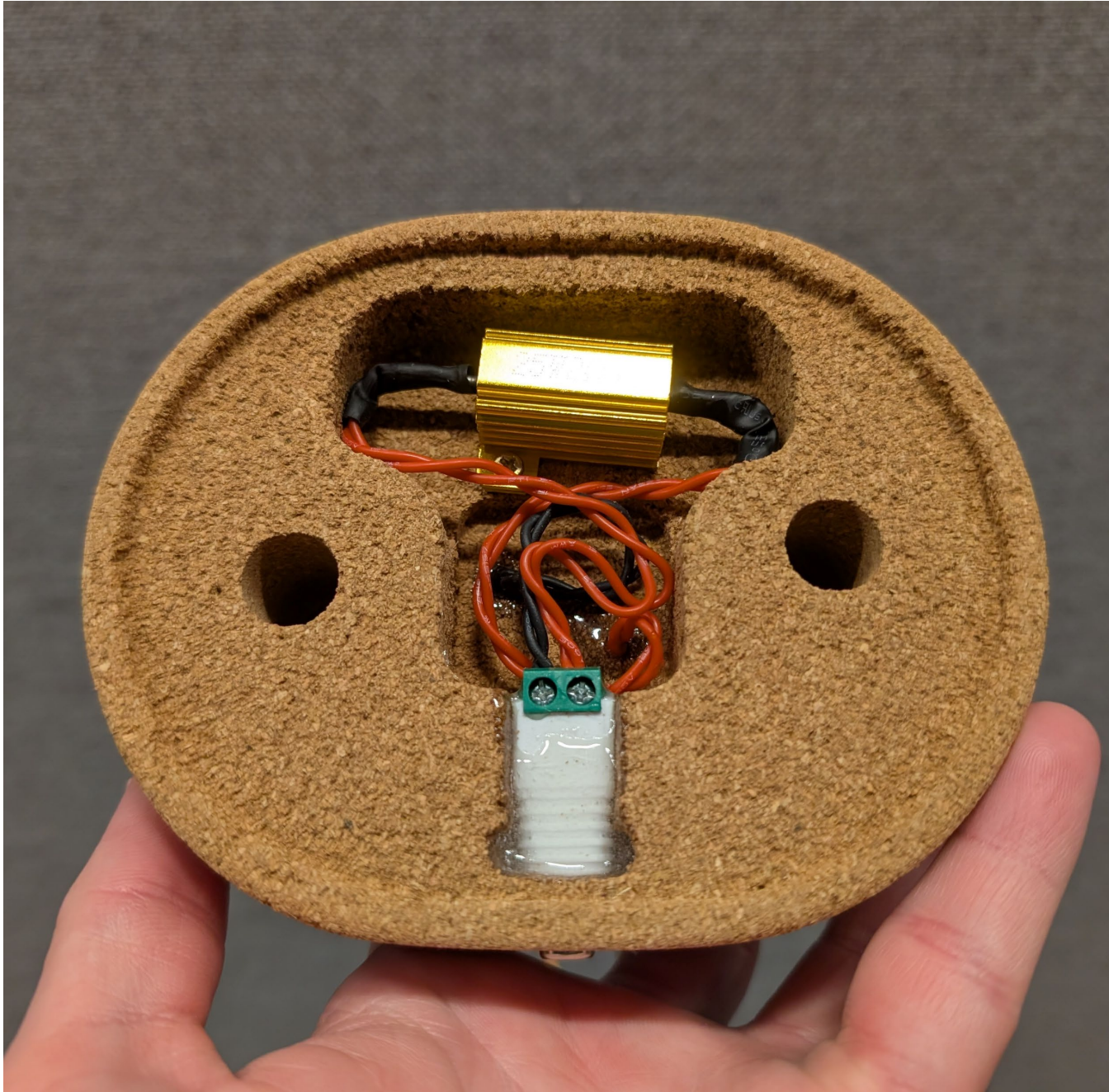
8 – Assembly

Assembly – Threaded Inserts



I used threaded inserts glued into the glass to mount the piece on a cork base. For large holes, we used a hollow bit and cracked the remaining column out. The glass cracked while drilling, and optically-transparent resin did not completely fill the gap.

Assembly – Lamp Base



After drilling holes in the lamp base for bolts and power, I soldered the wiring and secured ports, lights, and wire, with 5-minute epoxy.



9 – Final Collection

Final Collection – Full Collection



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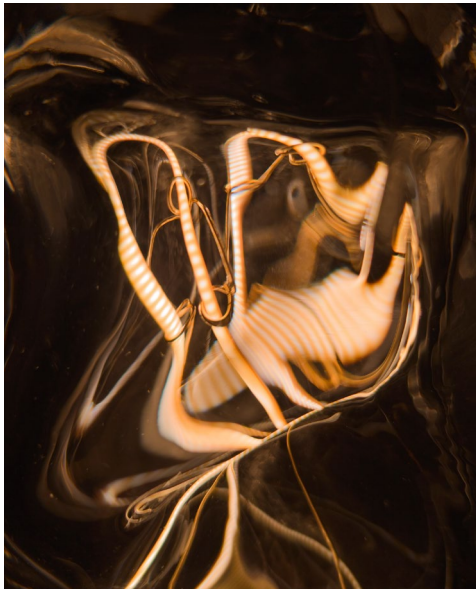
Final Collection – Serenity

Created using the modified wrapped glass technique, 'Serenity' is the culmination of my glass + light experimentation this semester.

When lit, the piece projects mesmerizing ripples of focused and blurred light.



Final Collection – Frozen Flame



In addition to functioning as a glass lens for projections, 'Frozen Flame' is a standalone table lamp. The internal LED filament light source is a sculptural form in itself.

Final Collection – Shell/Waves



'Shell/Waves' is an open vessel made using the twisted optic molding technique.

When placed against a wall and lit with a spotlight, it projects a repetitive spiral of waves reminiscent of a crustacean shell.



10 - Thank You

Thank you to the entire Form to Fire teaching team for supporting all our projects and providing an opportunity to work with new mediums

Thank you to every student I've had a chance to speak or work with this semester. Our conversations were a wonderful way to close out my college experience, and I hope you got as much out of them as I did

Chris, thank you for your willingness to experiment with processes and for bringing my glassblowing ideas to fruition, especially when they were too heavy for students to handle on our own

Dyllan, thank you for helping me think through ideas and supporting my cork-carving experimentation on the ShopBot

Ethan, thank you for driving back to MassArt this semester. You're a parallel marking master!

