“The distant universe and our immediate world can both be found in paper.” – Kenya Hara

Paper-engineering can be a bridge between concepts, mathematics, narrative, and our human sensory experience of the world. In this class, we will explore the wide variety of ways that a humble piece of paper can produce function. And how that function can support a design goal, a narrative, or an explanation.

What we can learn from paper engineering comes from non-overlapping disciplines of origami, book arts, compliant mechanisms, pop-ups, industrial design, volvelles, Victorian papercraft, and 16th c. Astronomy books. These mechanisms and techniques originate from sources as disparate as Troublewit performance props, pre-television paper-based entertainment (like Meggendorfer’s linkage-based cards), and NASA’s deployable spacecraft design. This class will provide entrance into this large body of knowledge, most of which has not yet been digitized.

When we fold, we imbue an inert material with pattern, structure, animation, function, and tangible “interface”. Folded structures give us a means to touch and manipulate difficult problems—offering an inroad for applying physical intuition. Because of this, interactive physical structures offer an infinitely more vast possibility for sensory drama, sensory narrative, and sensory explanation than their digital counterparts.

Physical prototyping with paper also offers a nimble back-and-forth between digital and physical realms, allowing ideas to be quickly tested against physical forces. Students will understand how their digital and manual skills might be used in a complementary manner to explore new dimensions in their design, book-arts, architectural, or sculptural practices. They will be shown several different ways to prototype and produce their work, ultimately working towards a final project.

Students will be provided an overview of various cross-cultural paper engineering techniques and resources, as well as prototyping strategies

and support for their independent final project. We will develop manual folding and cutting skills—as well as discuss the challenges of documenting/presenting interactive paper pieces online. We will fold together, troubleshoot together and there will be lectures, artist presentations, software demos, and field trips (virtual for the Zoom class).

Using paper to give physical form to abstract concepts and make invisible forces in the world tangible

Experience using paper to tap into physical forces in the world in order to produce function

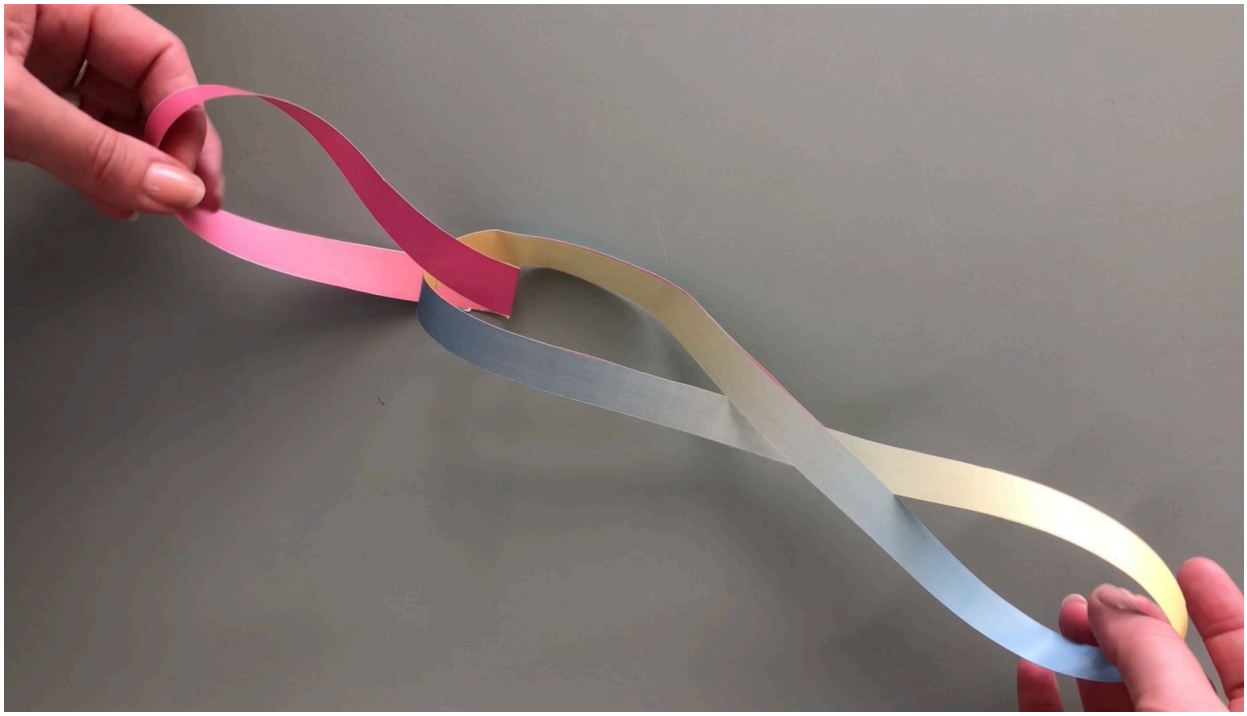
A thorough discussion of what paper-based and folding disciplines can bring to 21st century tech problems

An introduction to prototyping methods, equipment, code-based modeling and testing strategies

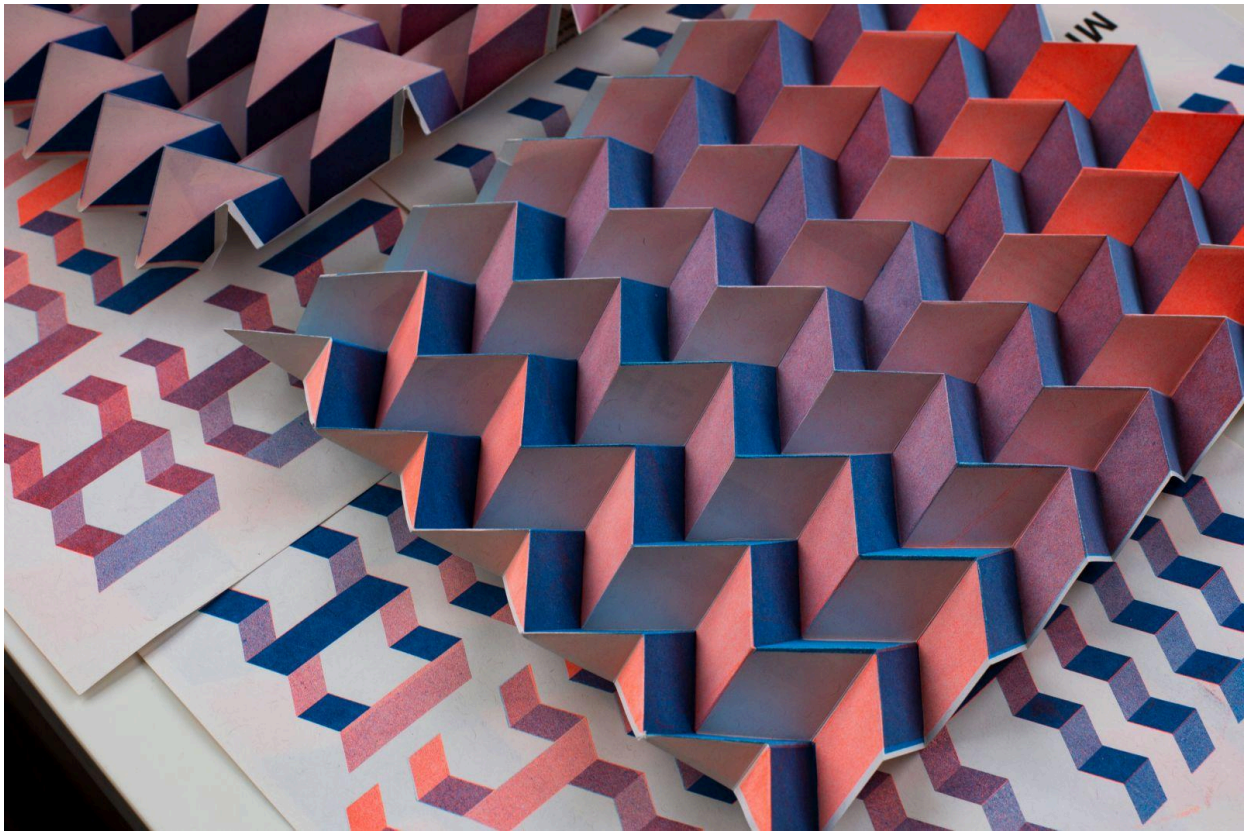
This class is right for technically-minded students with great manual skills. Students will walk away with strengthened conceptual skills in giving content a physical format, an abundance of open-source real-world resources to draw upon, and better manual construction skills. The knowledge of this class might be applied to art-making, artist bookmaking, packaging design, pop-up book design, data physicalization problems, architecture, product design, and pedagogy.

SCHEDULE

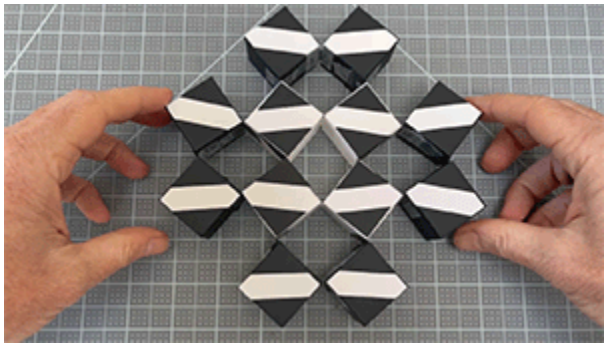
3/6 CLASS 1 • Introduction -
Who are you?, basics, food for thought, möbius strips, course material list. Also featuring: Not slicing your finger!
Homework:
Do: Play with the format of the möbius strip and/or explore cutfoldtemplates.com
Read: Designer Kenya Hara and mathematician, Masao Morita, in Subtle by the Takeo Paper Show



3/13 CLASS 2 • Origami Tessellations -
Discuss homework, fold origami tessellations, Paper folding and spacecraft design slideshow
Homework:
Do: Tessellation homework options
Read: (v short) A Rant about Technology
Watch: the Origami Revolution



3/20 CLASS 3 • Paper as Tech -
Discuss homework. Troubleshoot tessellations. Why are some functional mechanical systems called “craft” and some called “tech”?, Plotter show-and-tell, Make a basic jitterbug structure in class
Homework:
Do: Invent a more complex jitterbug
Watch: Ron Resch’s Paper and Stick Film



3/27 CLASS 4 • "Air Made Visible" -

Various poetic (rooted in attention) ways to think about paper. Paper can be used as a structural metaphor. Paper can be used as an interface. ~~Also: Paper engineer Simon Azripe visits class~~

Homework:

Do: How can you use paper on an interface to understand air? Can you build something that helps reveal a hidden tendency of air, wind, gravity?

Read: L'Infraordinaire by George Perec (3 pages)

*(Optional: skim **An Attempt at Exhausting a Place in Paris** (many pages- no need to actually read))*

https://www.kellianderson.com/readings/perec.pdf

4/3 CLASS 5 • Paper as an interface (we will build *This Book is a Camera* together) -
Discuss the homework. Together we will build a pop-up structure that helps make qualities of light visible, which are normally imperceptible
Homework:
Do: Use your new camera! Or, alternatively: play with pleats
Read: (well, listen) To this podcast about the purpose of attention:
"The power of attention in a world of distraction" Sean Illing talks with Michael Sacasas, an author and teacher exploring the relationship between technology and society

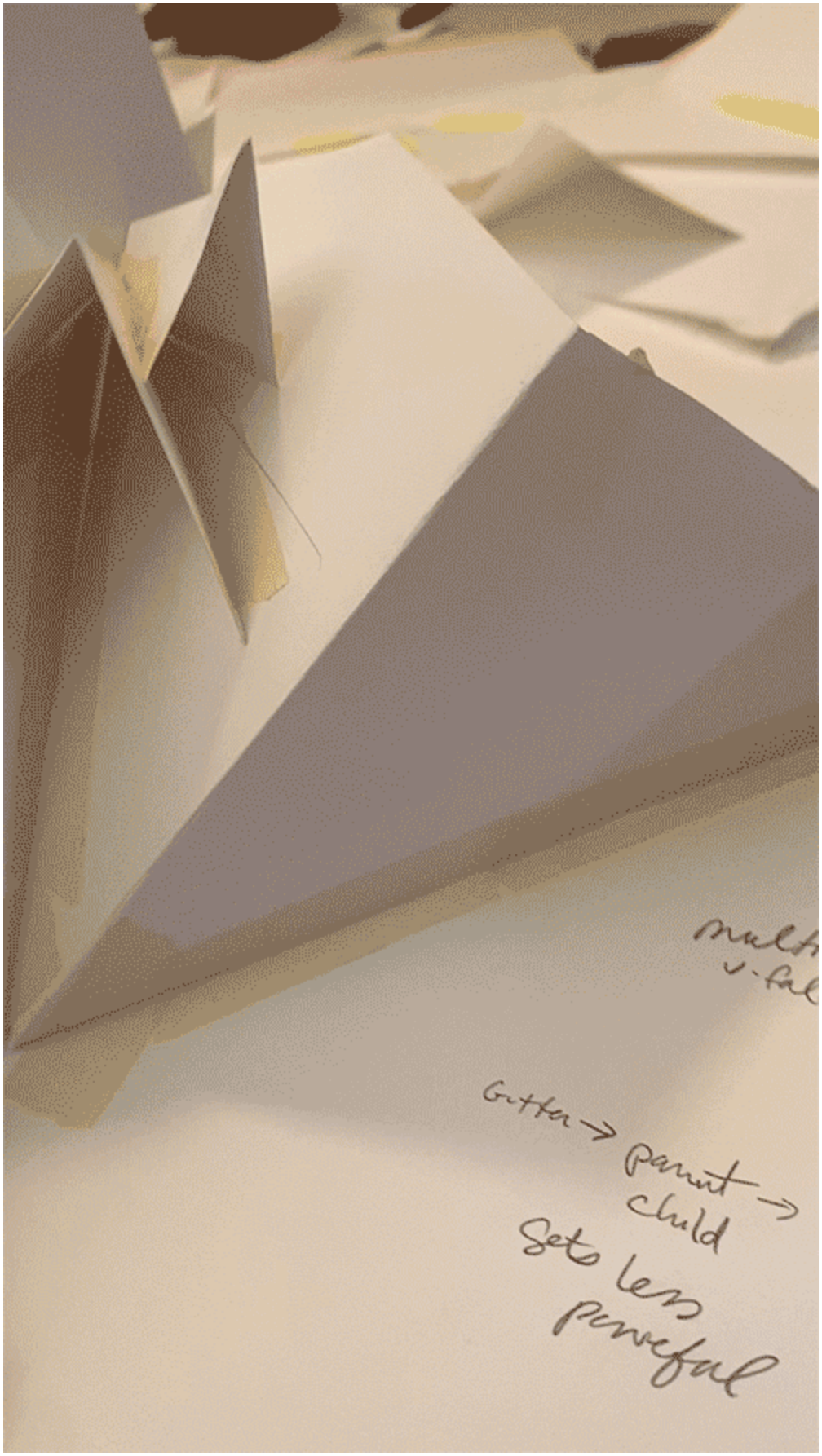
4/10 CLASS 6 • Paper as an interface (continue building the camera) |
One last Paper-as-a-Metaphor exercise

- First, we'll complete the camera, if we need extra time (usually it is challenging to get it done during a single class.
- Next, we build a flipping pop-up form. This is a format that can live inside a pop-up book or as a standalone card. *What is it for? Does the animation remind you of anything? What direction does it ask you to take it?*
- The afternoon class has already build the hand protest sign. The evening class has already had an introduction to tunnel books. I wanted to build in some time to catch the other group up.

Homework:
Do: Use your new camera! Or, alternatively: play with pleats

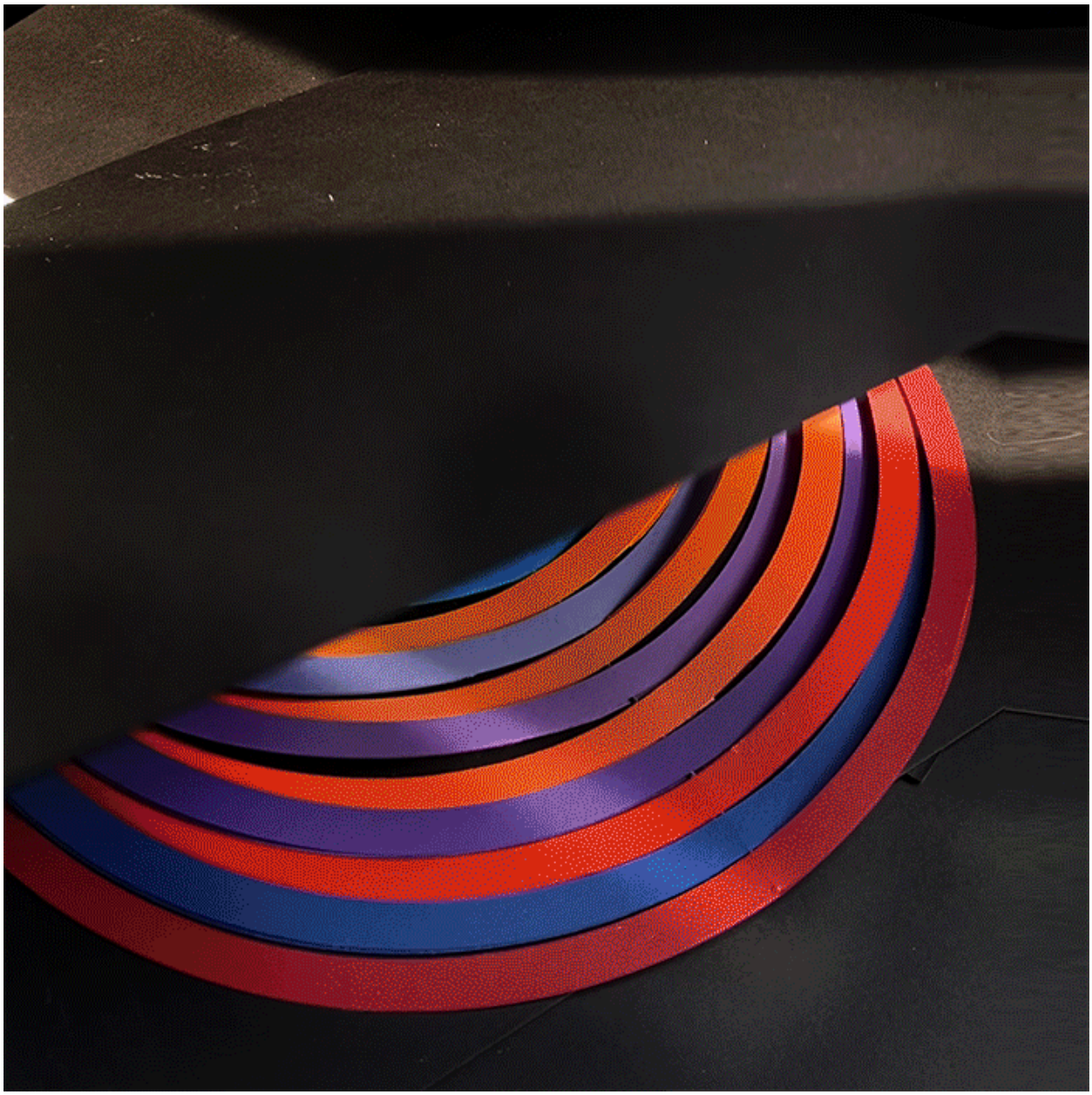
4/17 CLASS 7 • Pop-up Techniques 1 -

The mysterious logic of v-folds


Gutta → Parent → child
Sets less powerful

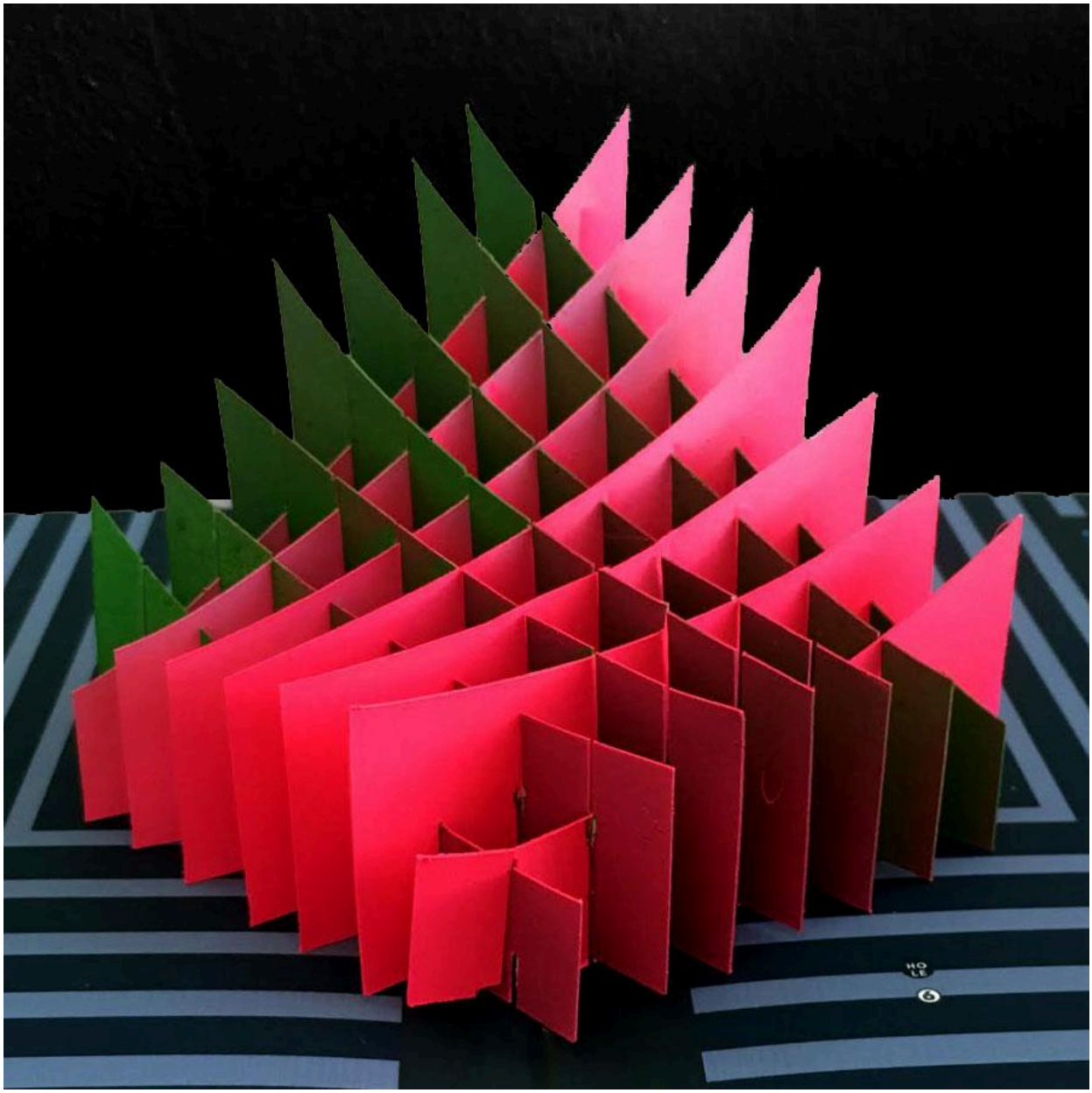
4/23 CLASS 8 • Pop-up Techniques 2– NOTE: THIS CLASS WILL BE HELD OVER ZOOM FOR BOTH GROUPS

Risers, and other pop-up basics



5/1 CLASS 9 • Sliceforms + Field Trip!

Sliceform pop-ups, (plus Nomadic furniture, Donald Judd, adventures in modular building systems) Where *do* boxes come from? Let's visit a production facility and learn how to scale up our projects. We will visit the fun production machines of Suzanne Fox in Long Island City.



5/8 CLASS 10 • Volvelles–
The apps of the 1600s! Kind of like a paper computer! Let’s make one.

5/15 • Independent Projects Discussion/Troubleshooting Sessions
Visiting artist / Field trip

FINAL SHOW DATE TBD