***SuperLattice*** is a theoretical exhibition and creative framework.

SuperLattices are structures built from data, each layer contains a grid of information stored in a similar manner to a two dimensional array — a computational structure used to store data.

In a SuperLattice these layers of information can be combined and recombined in different orders, and layers can be removed or added, making it easy to transform the constituent parts of information into something new.

SuperLattices allow new ways of relating to seemingly overwhelming quantities of information, and the ability of exploring new possibilities that emerge from interactions between the layers of information.

This publication acts as a guide to navigating the physical and ephemeral investigations I have undertaken.

```
int num[3][4] = {
  {1, 2,  3,  4},
  {5, 6,  7,  8},
  {9, 10, 11, 12}
};
```

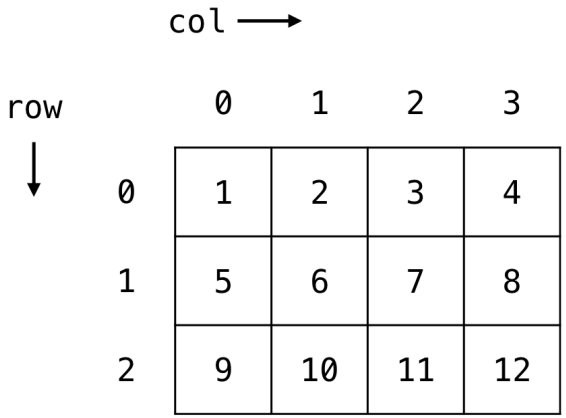



*Illustration of a two dimensional array*

The SuperLattice exhibition is itself built from a number of layers, placed inside a cabinet. The exhibition acts as a form of SuperLattice combining multiple layers of information in the form of:

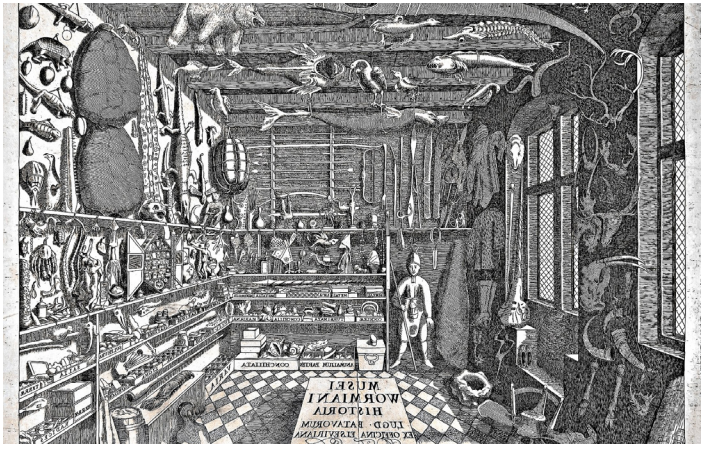
**Projections**. Digital and analogue projections of films, animations, still images, light and shadows.

**Ephemeral Objects**. Transparent and refractive devices that manipulate light. These take the form of crystals and transparencies.

**Mechanical Devices.** Sensors and machines that gather information from their surroundings and respond through sonic or kinetic action.

**Miscellaneous**. Objects that do not fit into the above categories. These consist of found objects such as historical slides and 3d models generated from data derived from SuperLattice processes. These objects manipulate light and information in their creation but are now static forms.

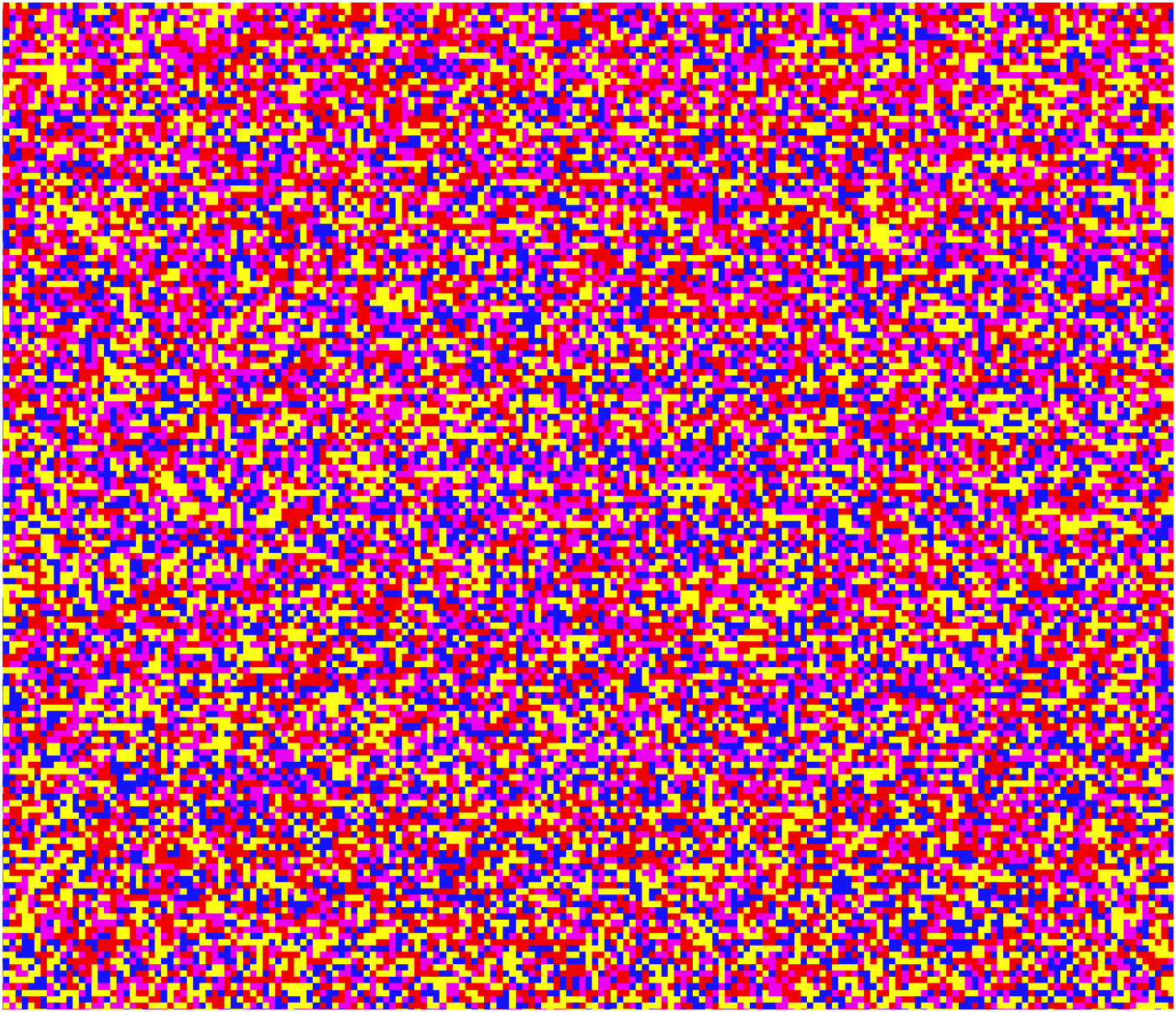
SuperLattices act as a form of sensory Wunderkammer where viewers become part of the SuperLattice, processing sensory and textual information to create a layered, morphing understanding of what they are experiencing.



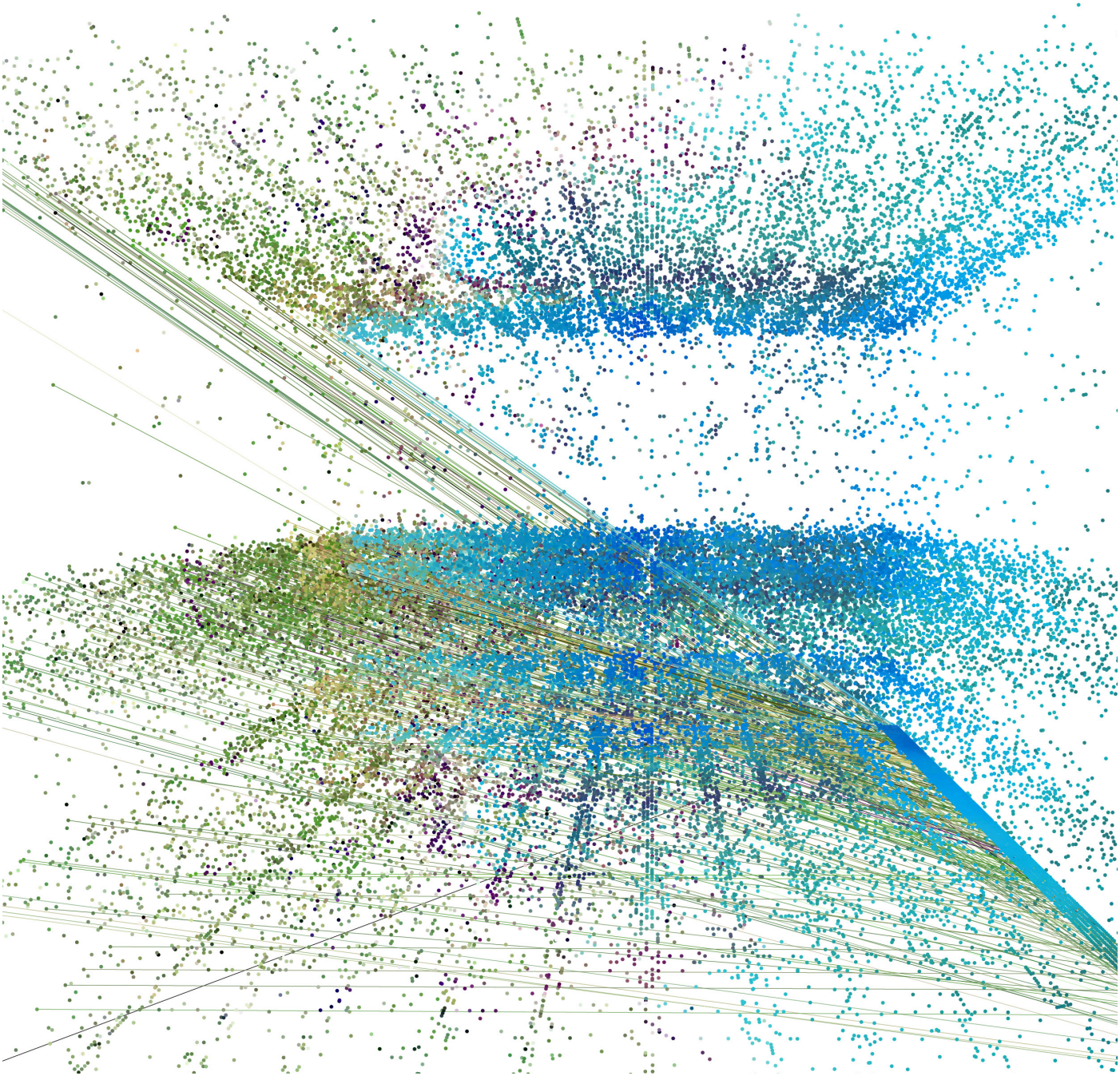
*An illustration of the Wunderkammer of Ole Worm whose collection was said to include ancient scultpures, clockwork automata and the remnants of strange, mythological beasts.*

*Many Wunderkammers such as Moles mixed fact and fiction allowing naturally occuring items such as a Narwhal tusk to be interpreted as otherworldly and mystical.*

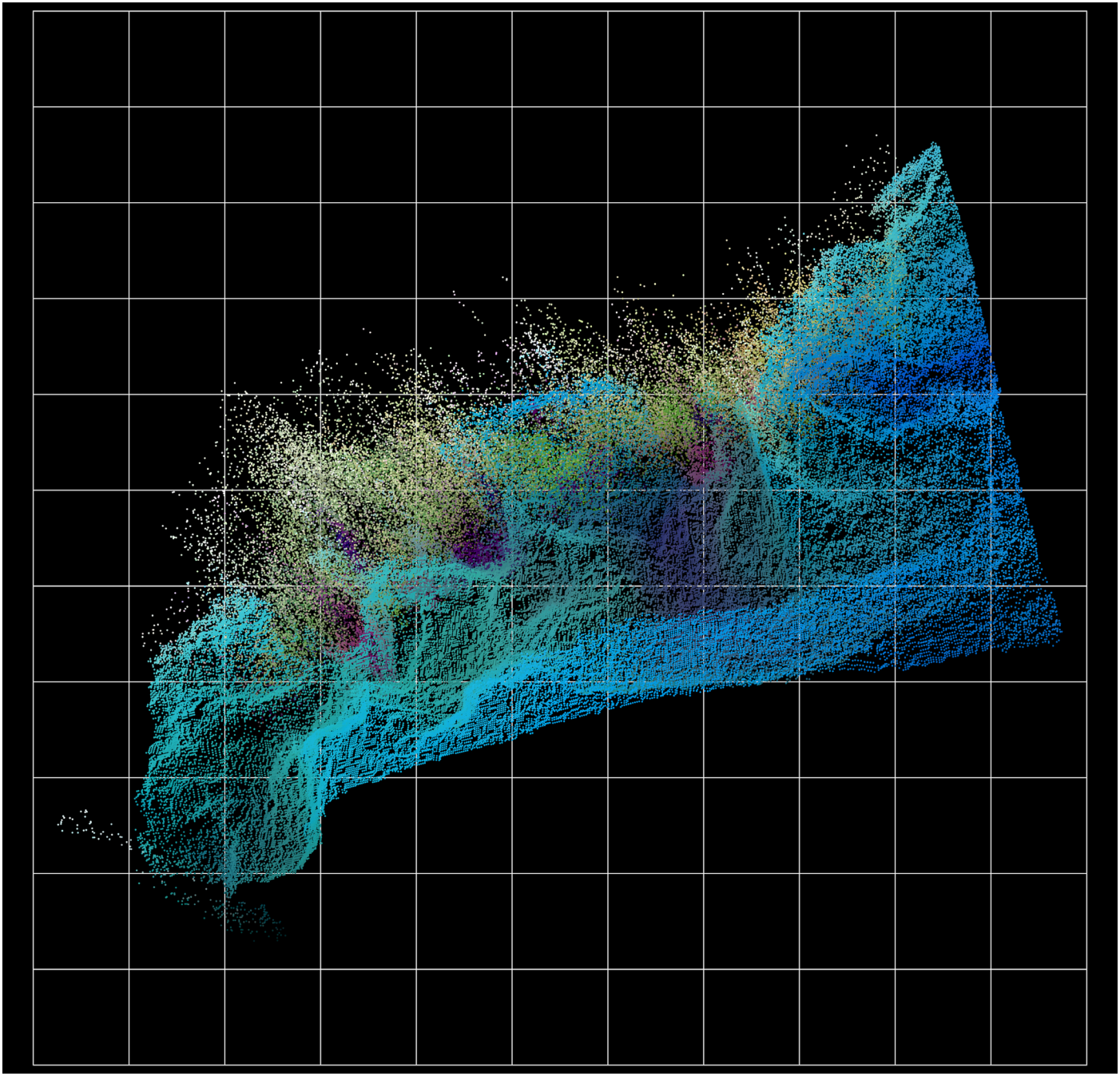
***Projections*** - layers of information form the foundational layers of SuperLattice. These images/animations will be projection mapped as well as projected directly at the central cabinet in the SuperLattice exhibition.



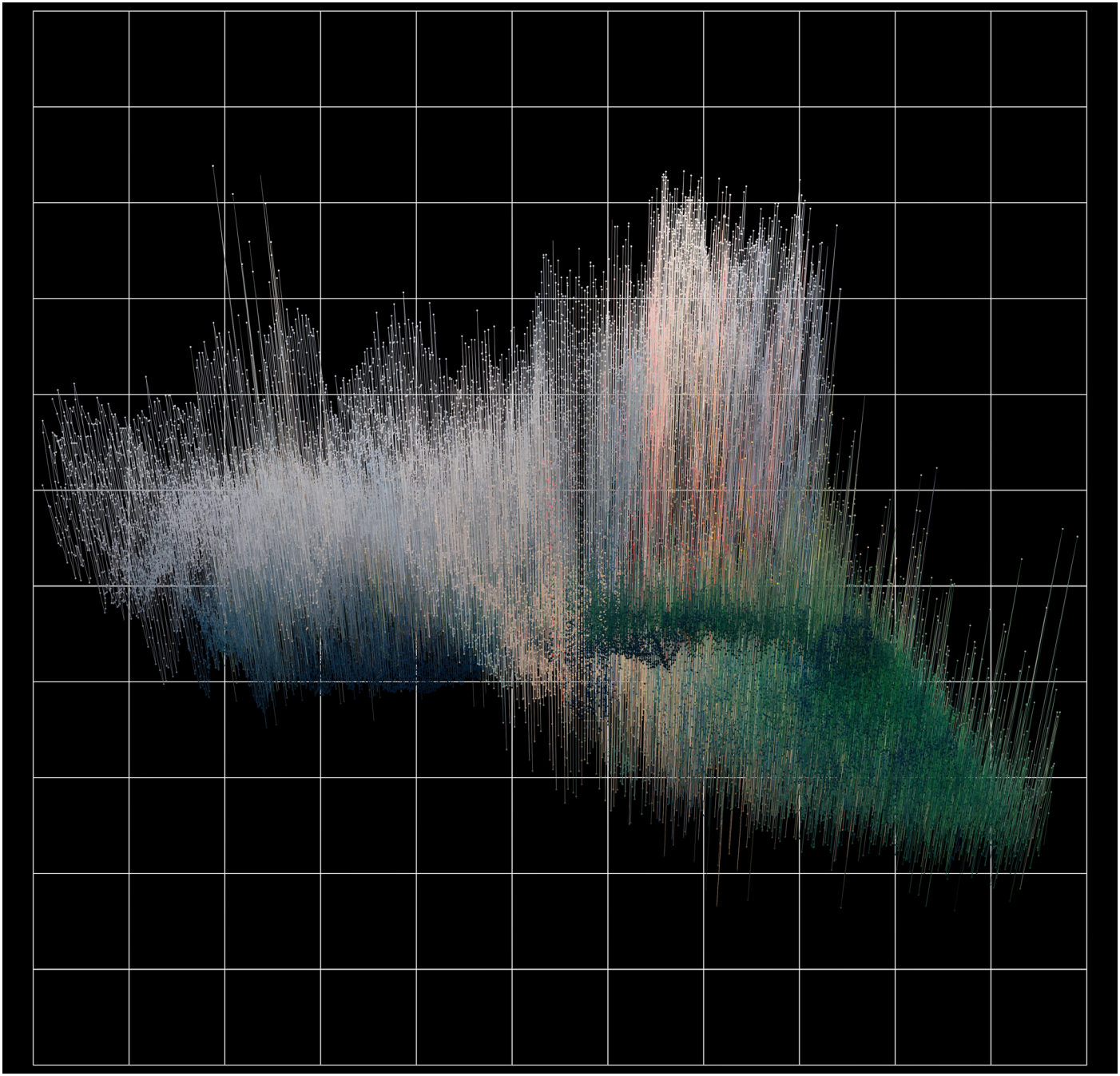
*Visualisation of Adenovirus, nucleotides represented as colours*



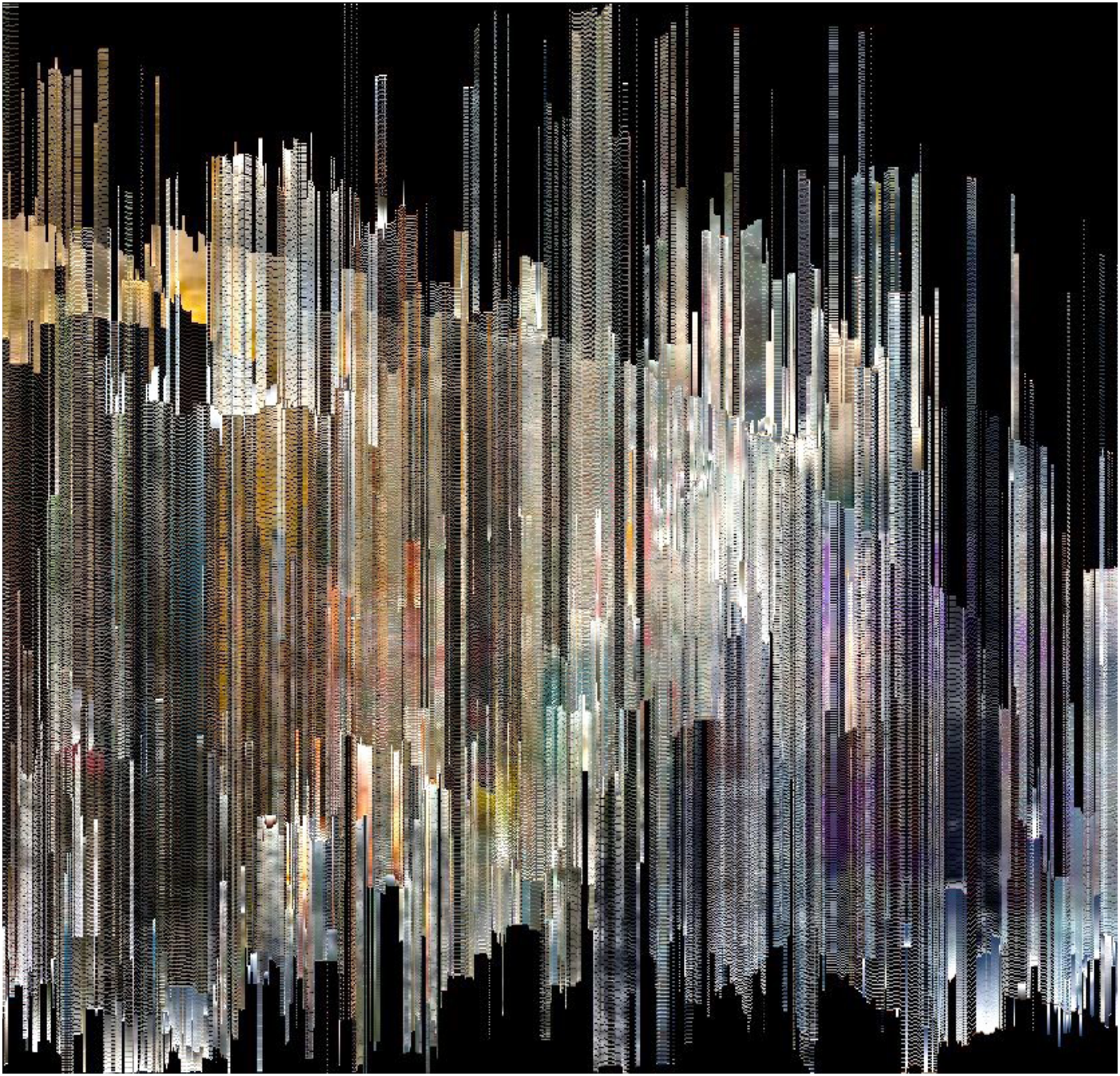
*Satellite imagery infected by Adenovirus*



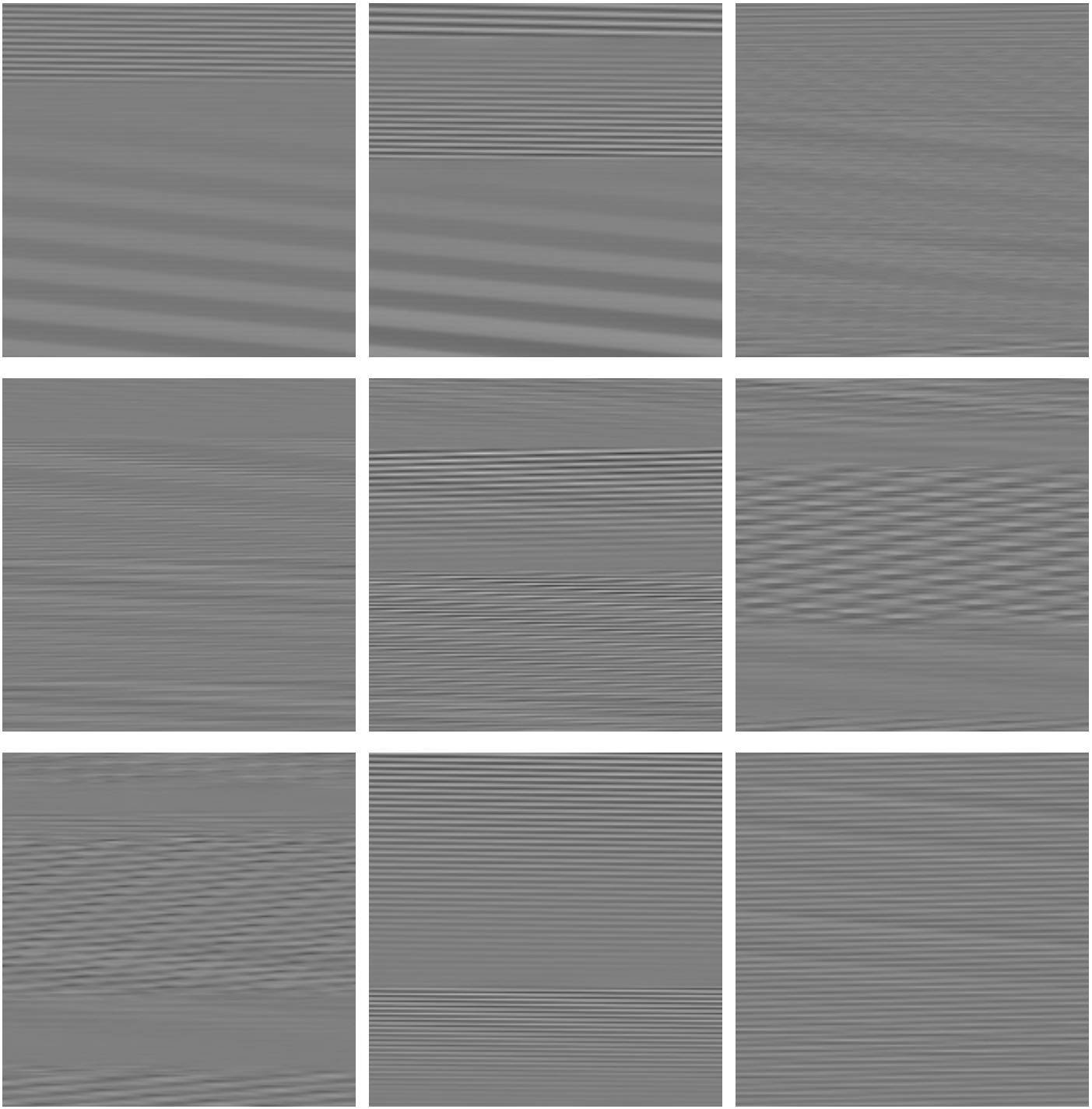
*Satellite imagery infected by data from polluted rivers depositing sediment and pollutants off the North Carolina coast.*



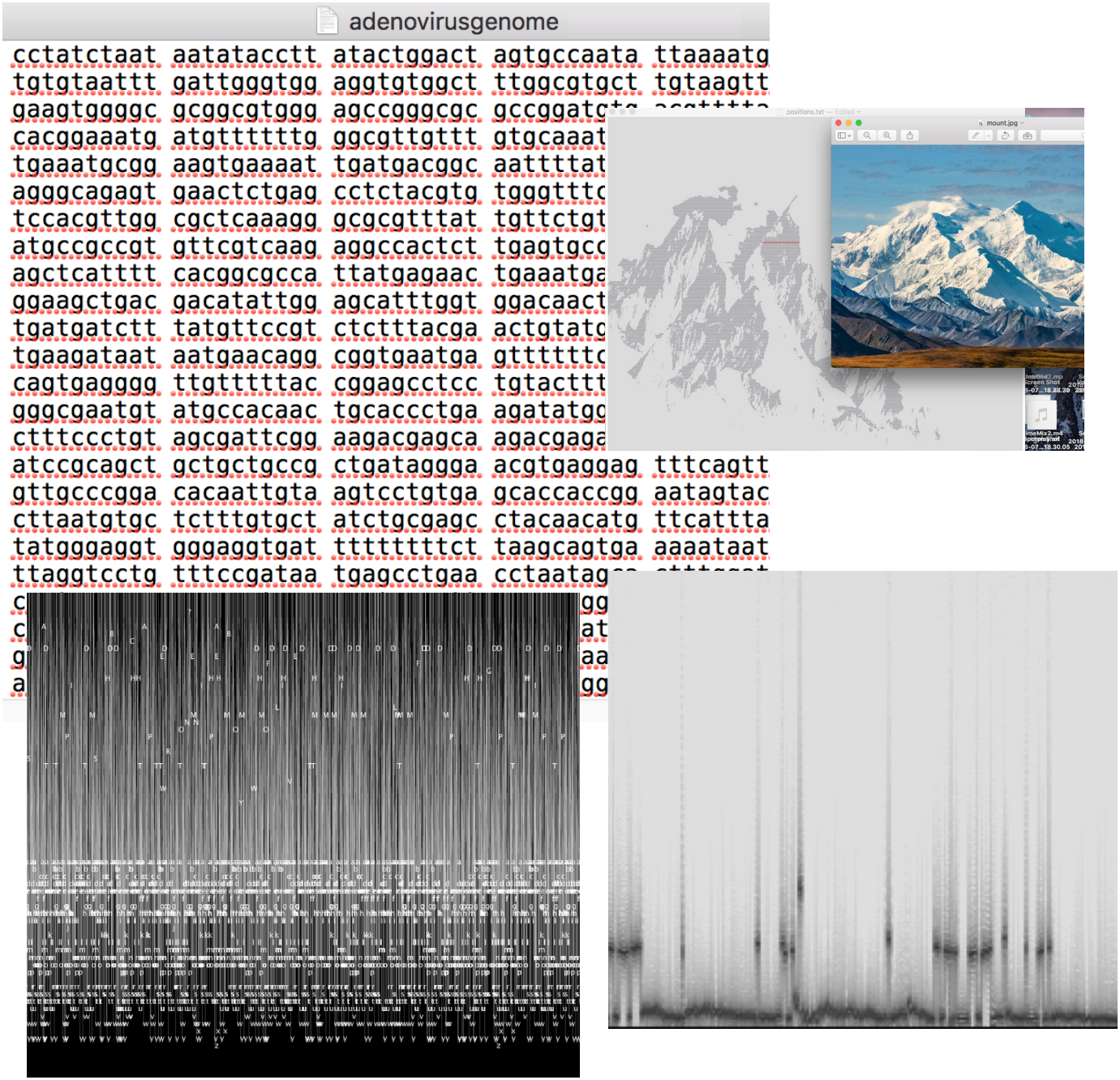
*Satellite imagery infected by data from Californian wildfires in 2019*



*All news reports on Australian wildfires sorted by colour content*



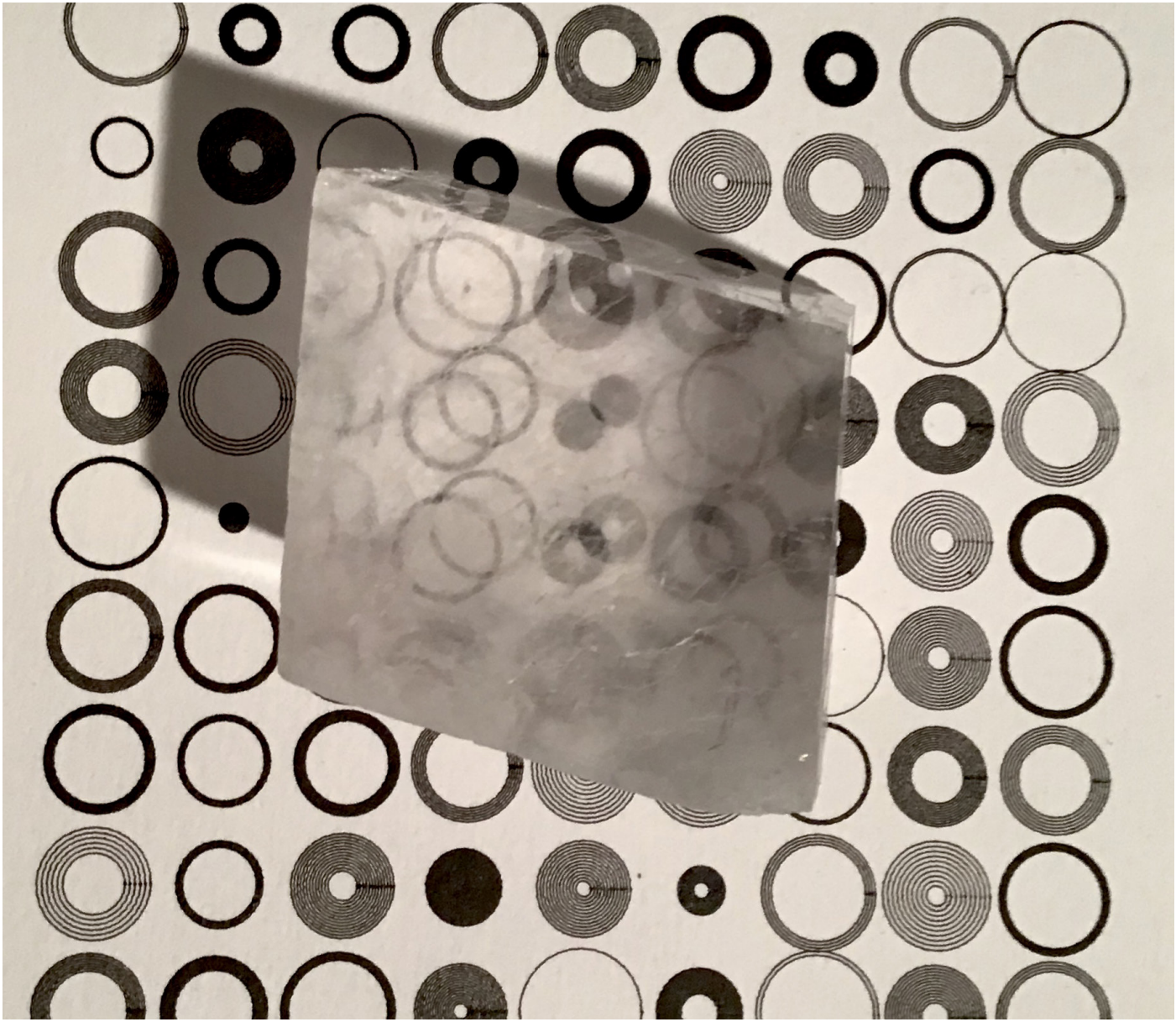
*Audio converted to image and altered through Machine Learning processes*
*Selection of images from Daisy Bell, Max Matthews, sound to image.*



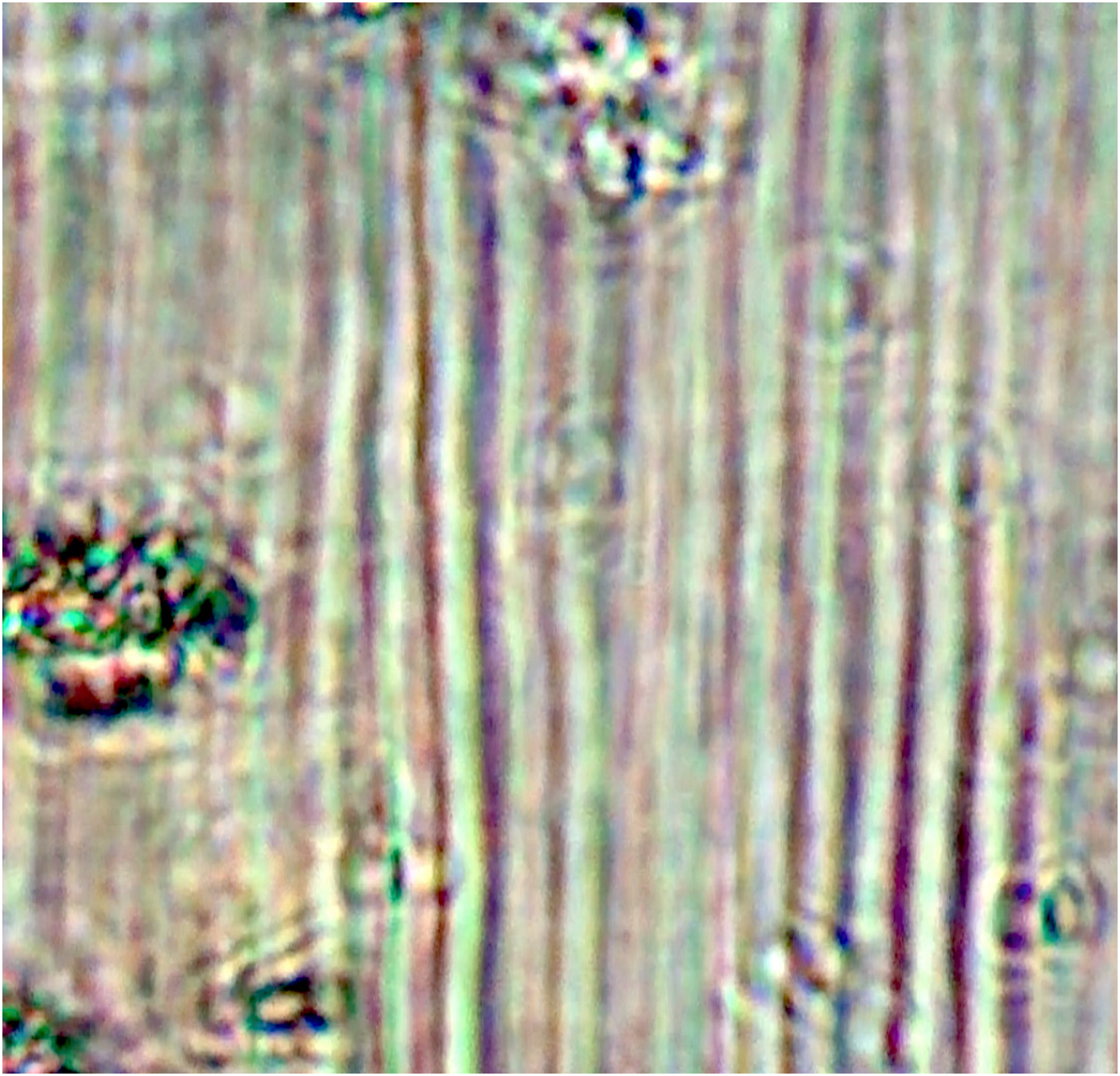

*Raw data and text*

*Supernova information distributed through projections and light*

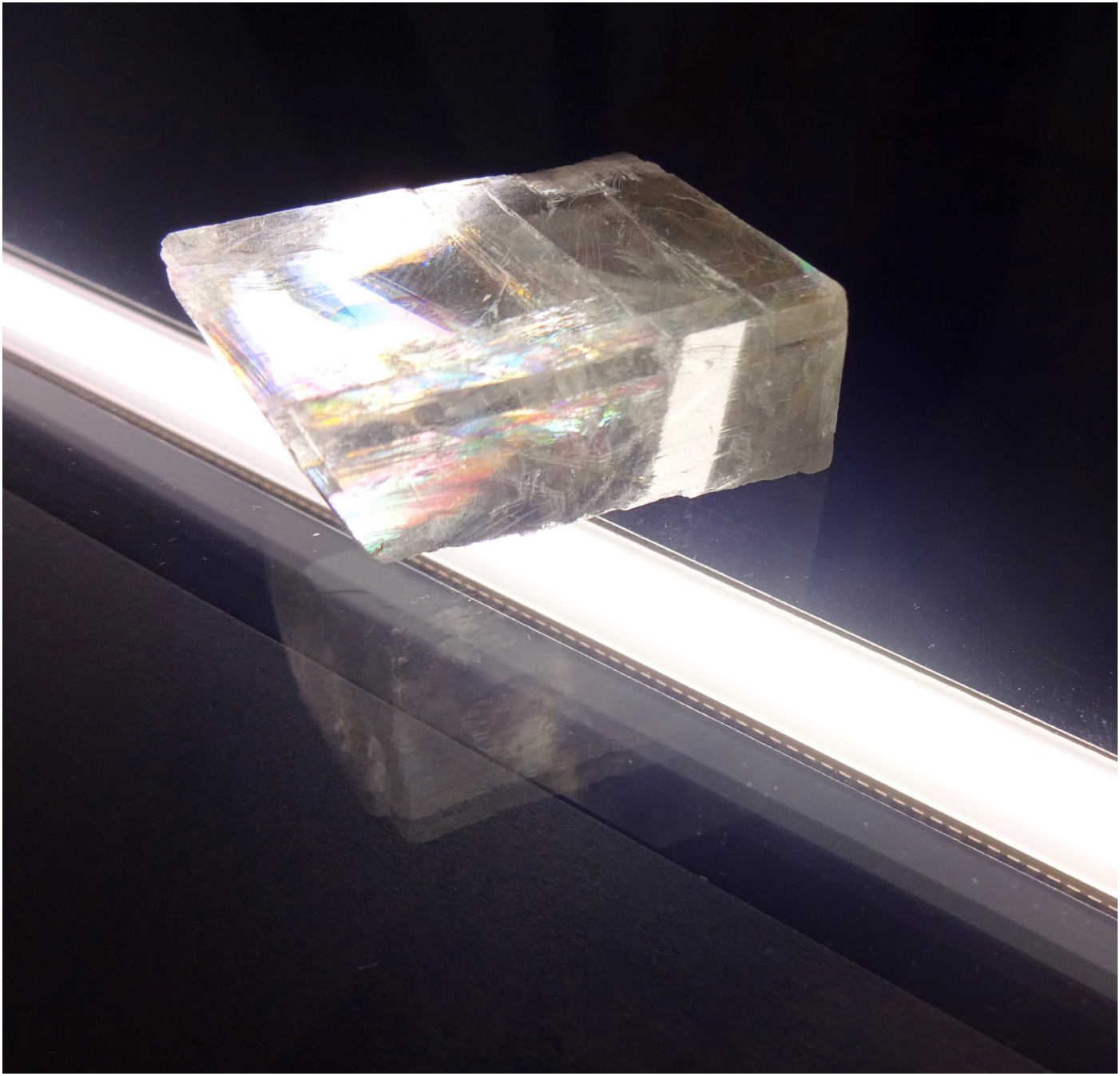
***Ephemeral objects*** - Objects that reflect and transform light creating distorted and new forms. These objects are transparent and hard to observe but their effects on image and information is profound.



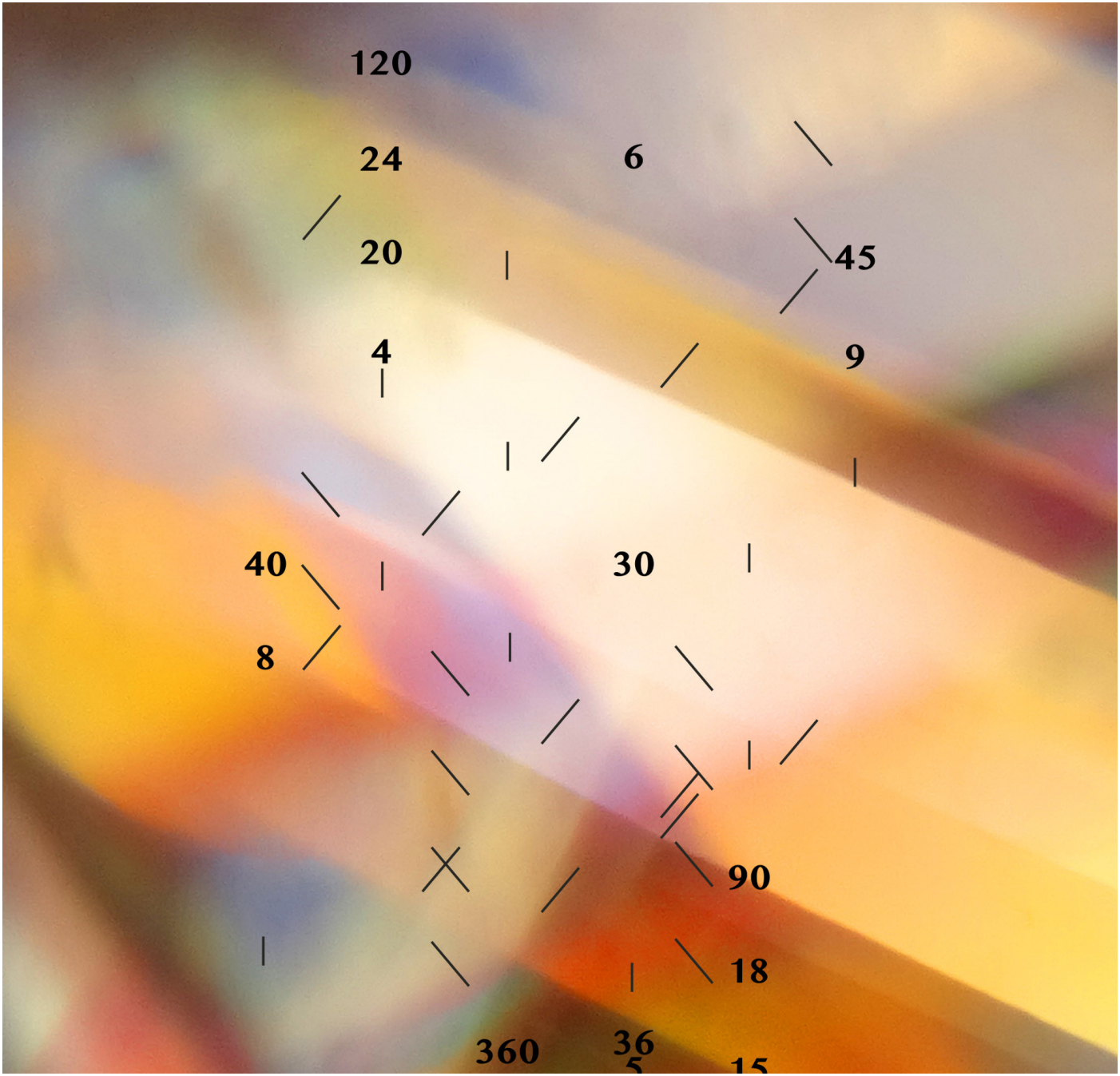
*Calcite crystal distorts and splits light*



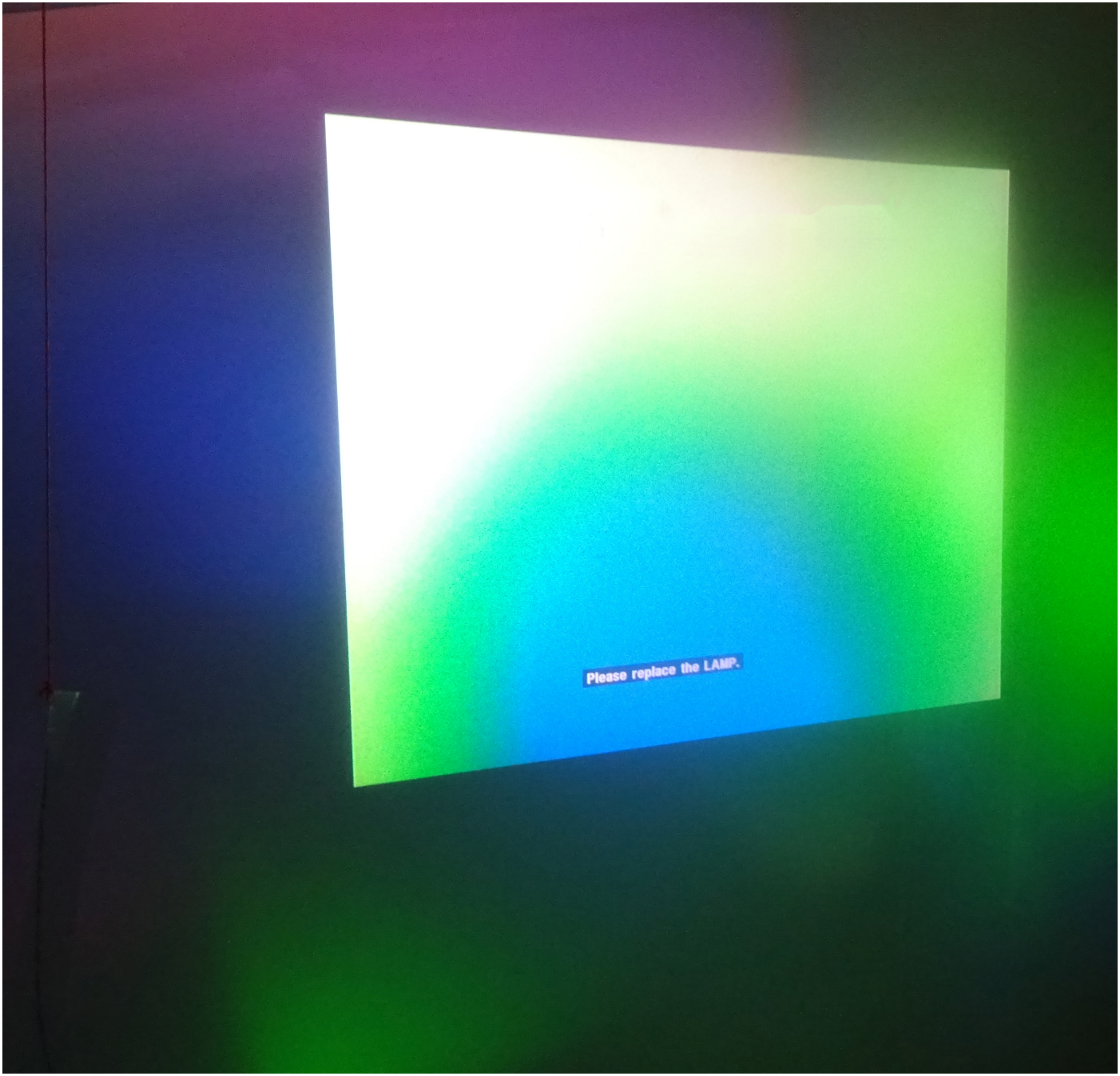
*Calcite crystal causes moire pattern like efects under microscope*



*Calcite crystal moves light while scanned*

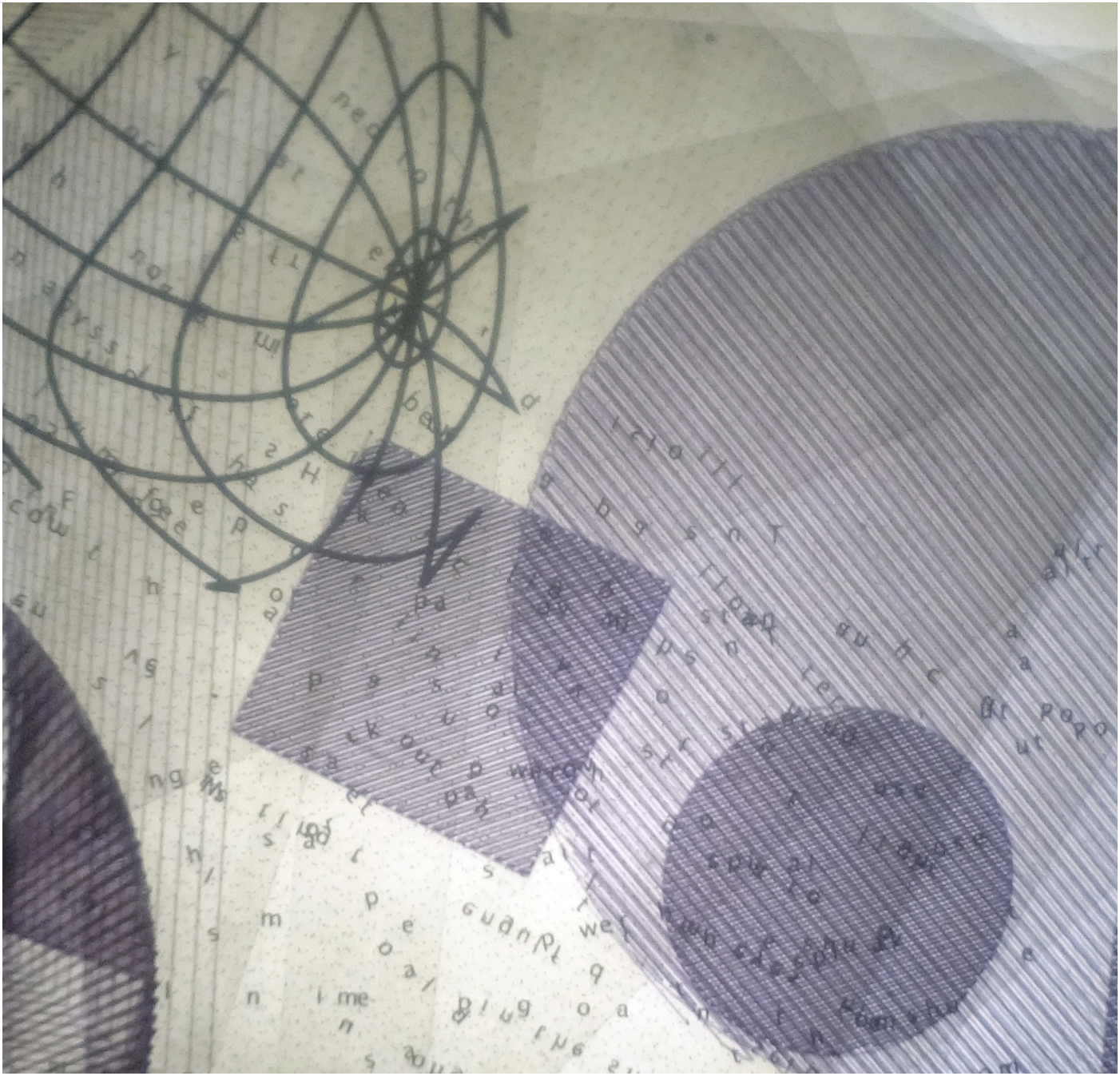



*A Score for Navigating Crystals, Calcite crystal scan with manipulated mathematical representation of a crystal lattice superimposed.*

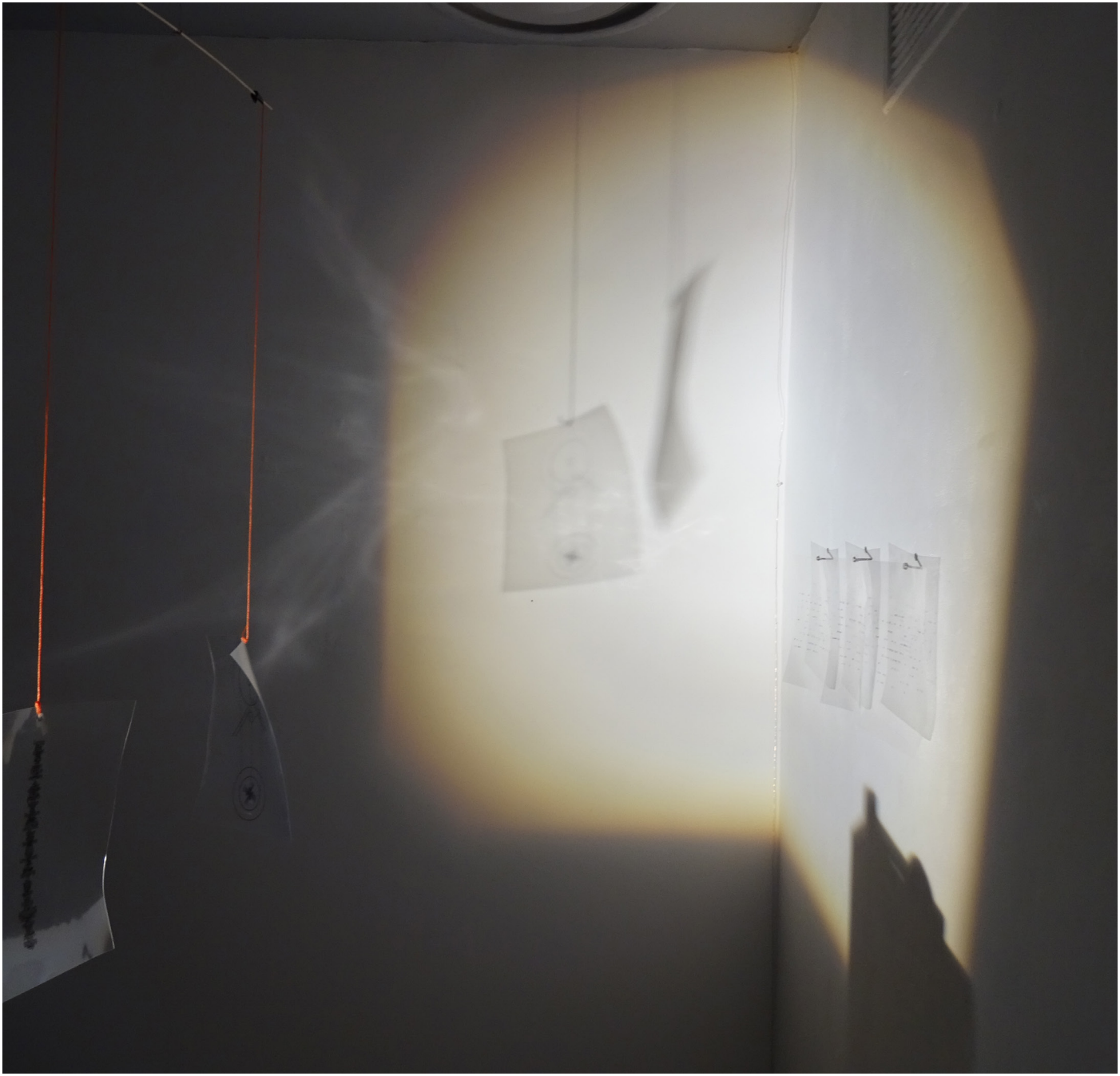



*Calcite applied to projector, manipulating solid green light*

*Calcite placed over slide*

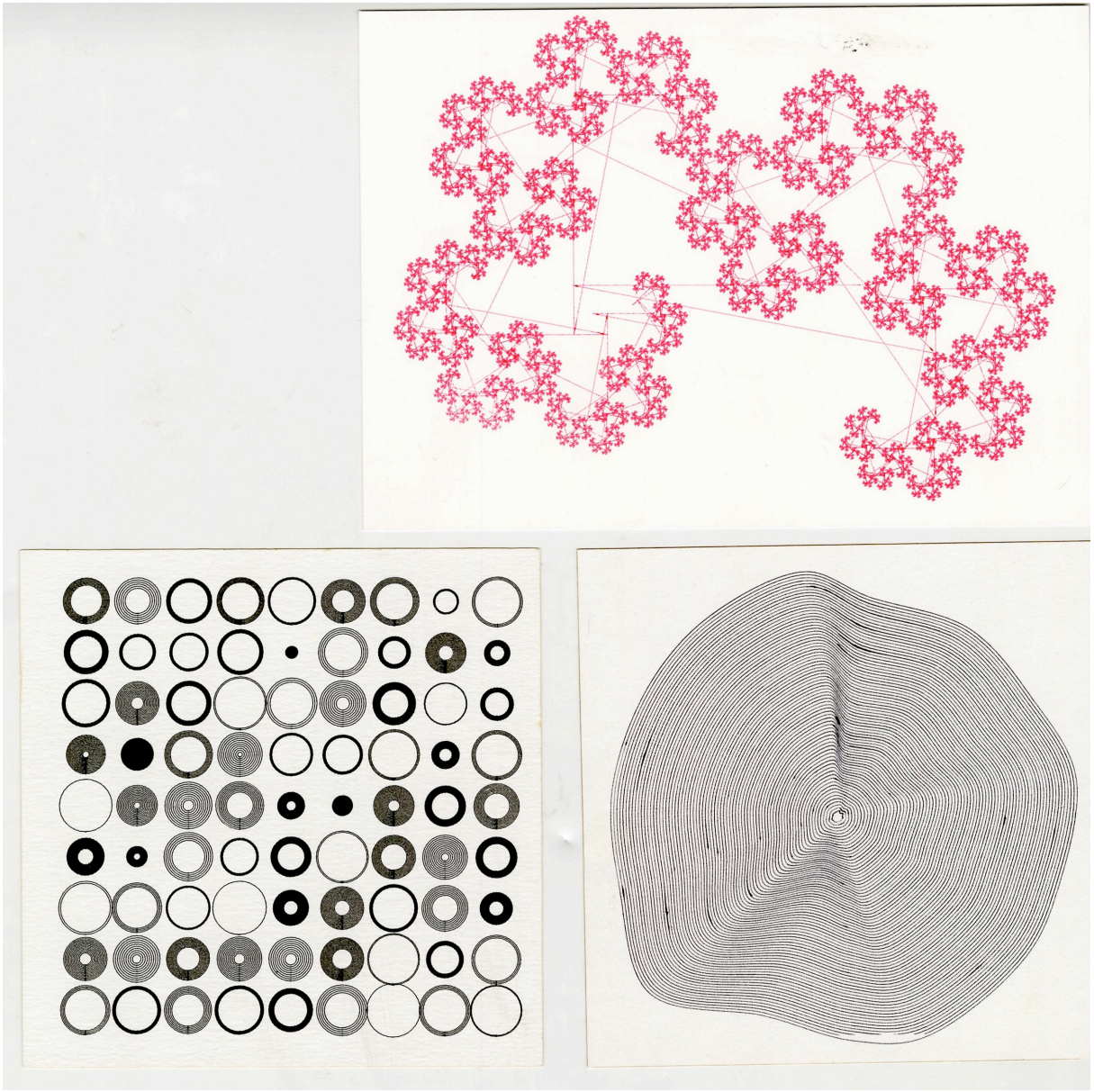


*Accumulations of acetates on overhead projector*

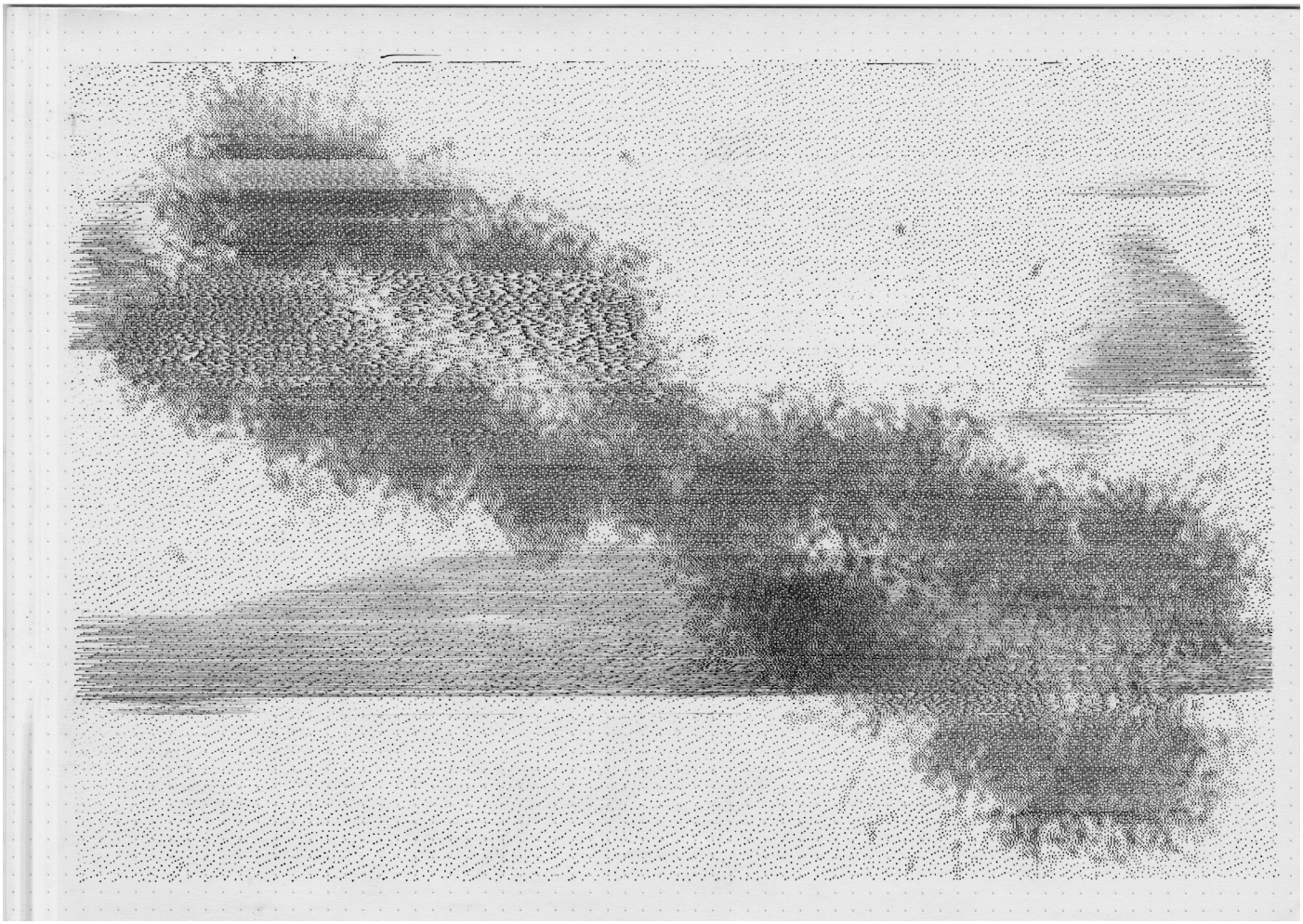


*Astronomical information split between acetates and recombined through light*

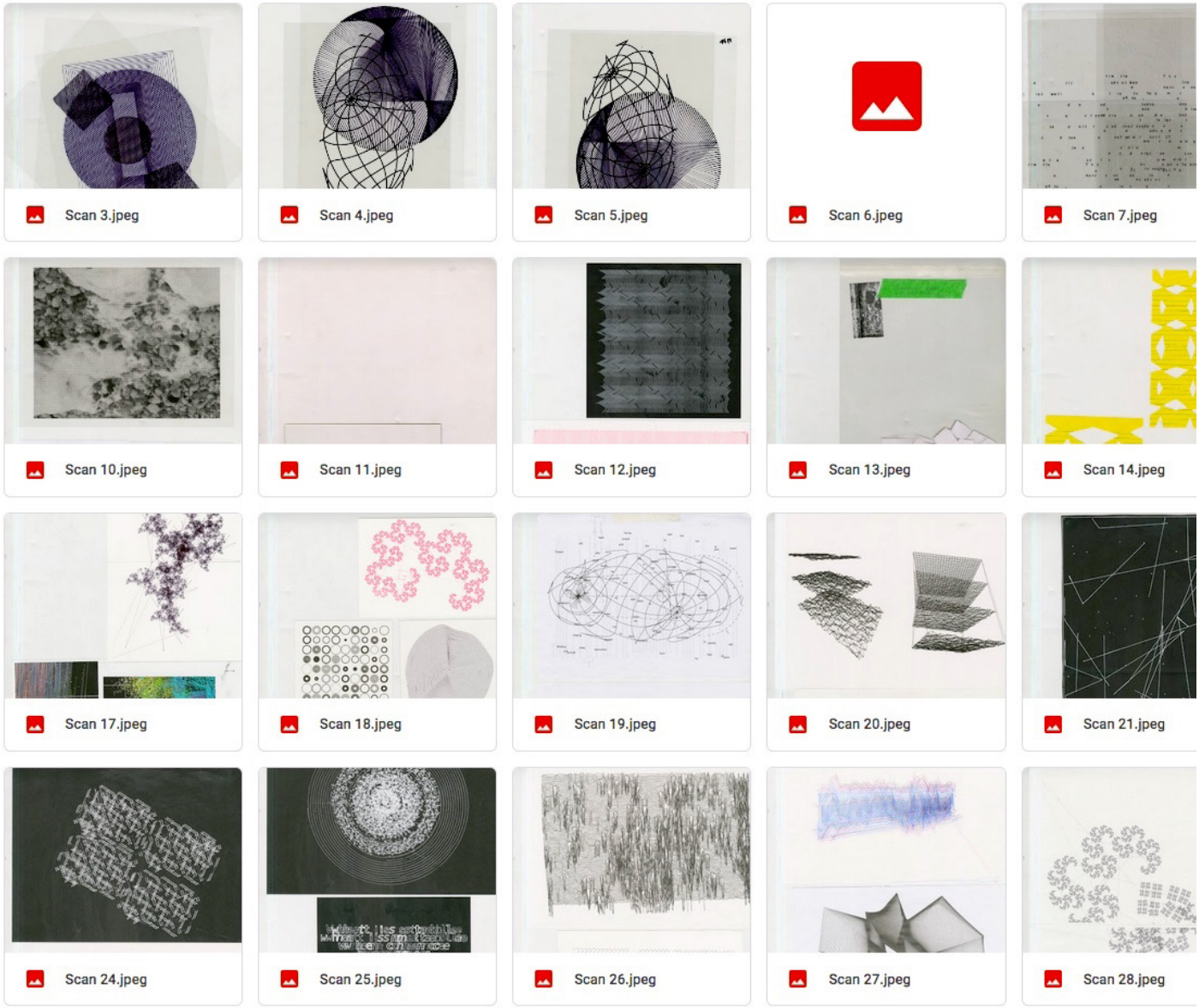
***Mechanical Devices*** - Machines that transform information into kinetic actions. The information transformed comes from other layers of the SuperLattice alongside real time information gathered by sensors placed in the exhibition



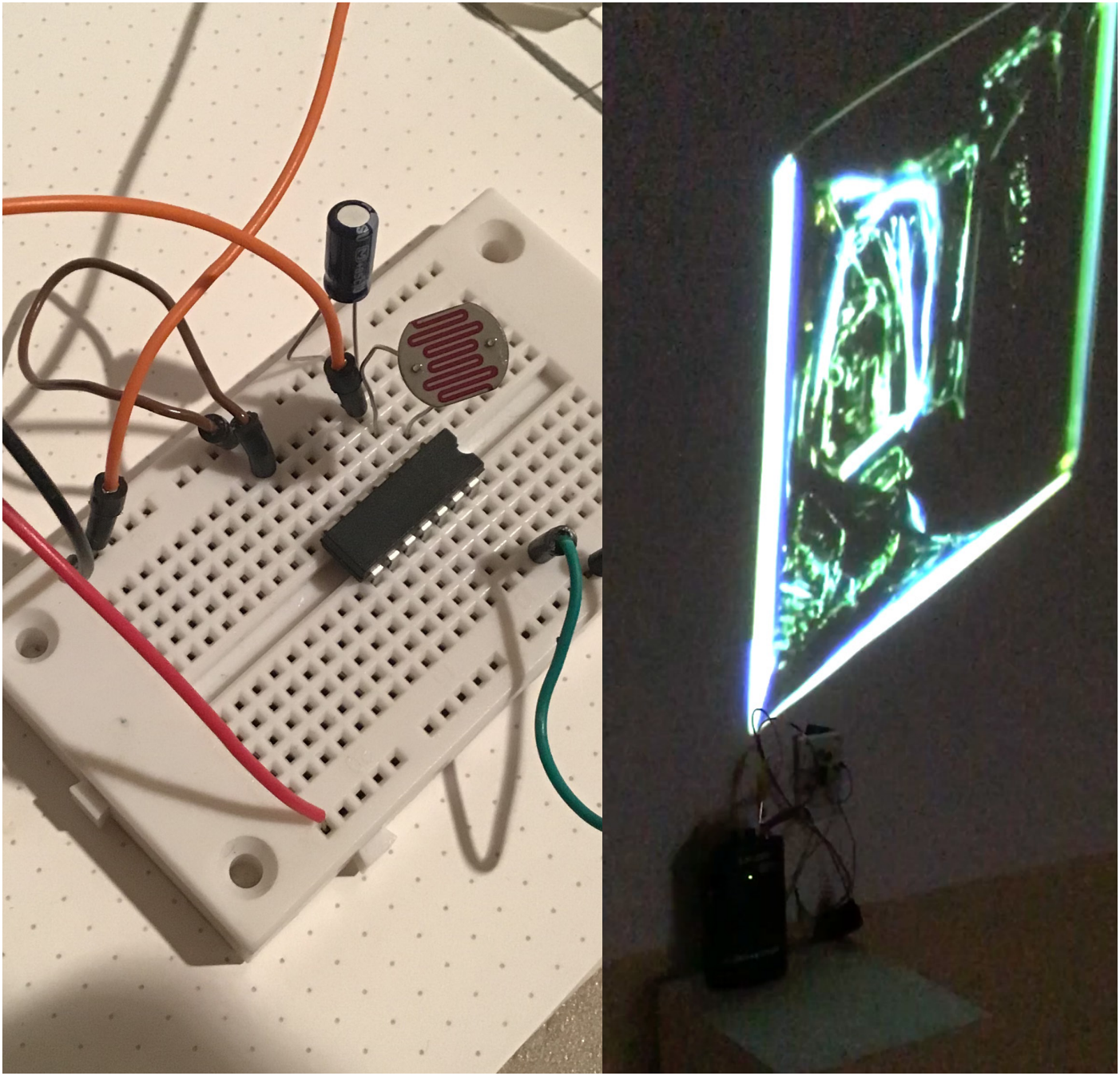
*Data drawings translated by pen plotter machine*



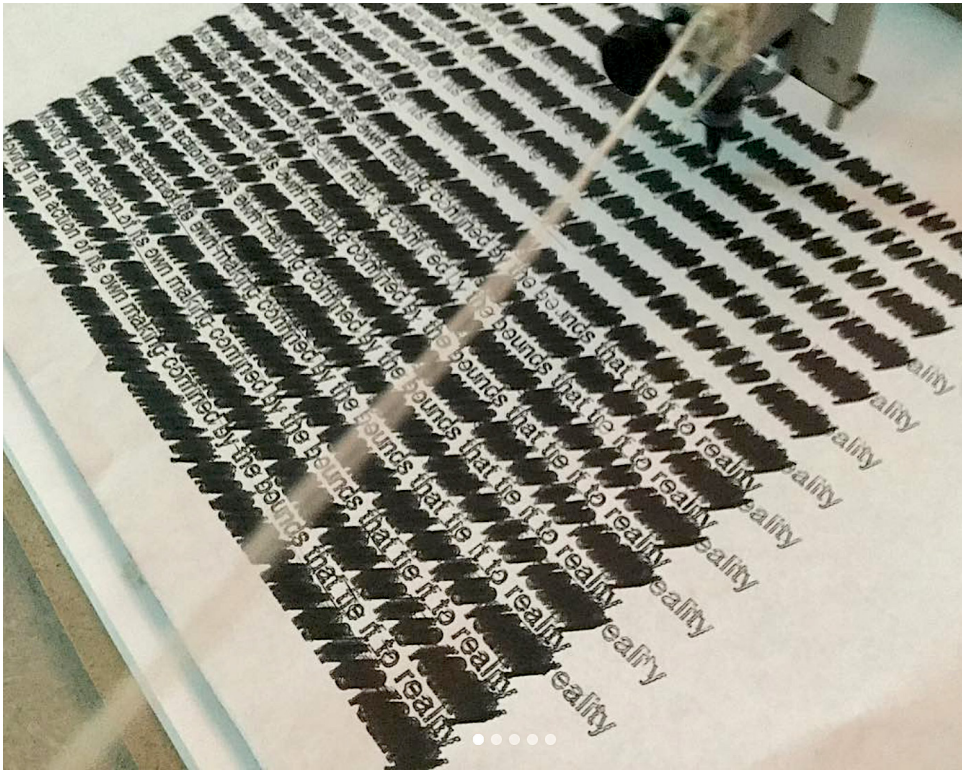
*Dithered chromosome, drawn by pen plotter machine*




*Multiple pen plots*



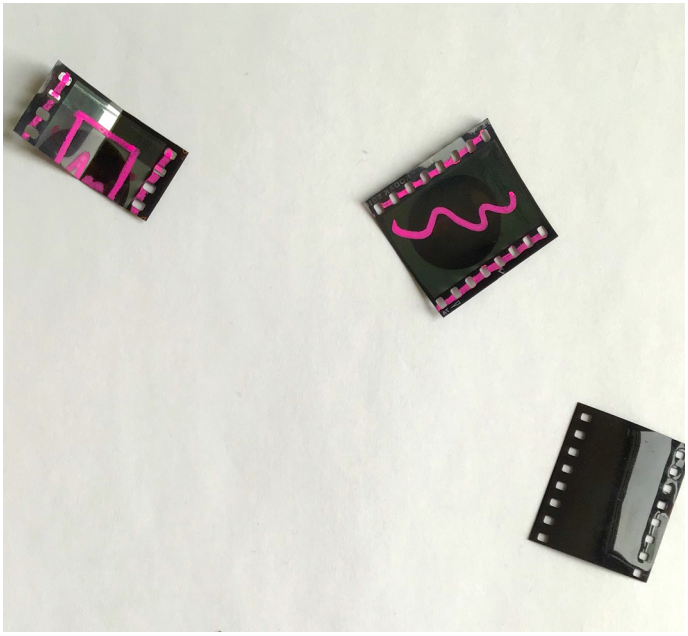
*Photoresistors and other optical sensors convert light into sound and transmit this information to be converted into mechanical drawings*

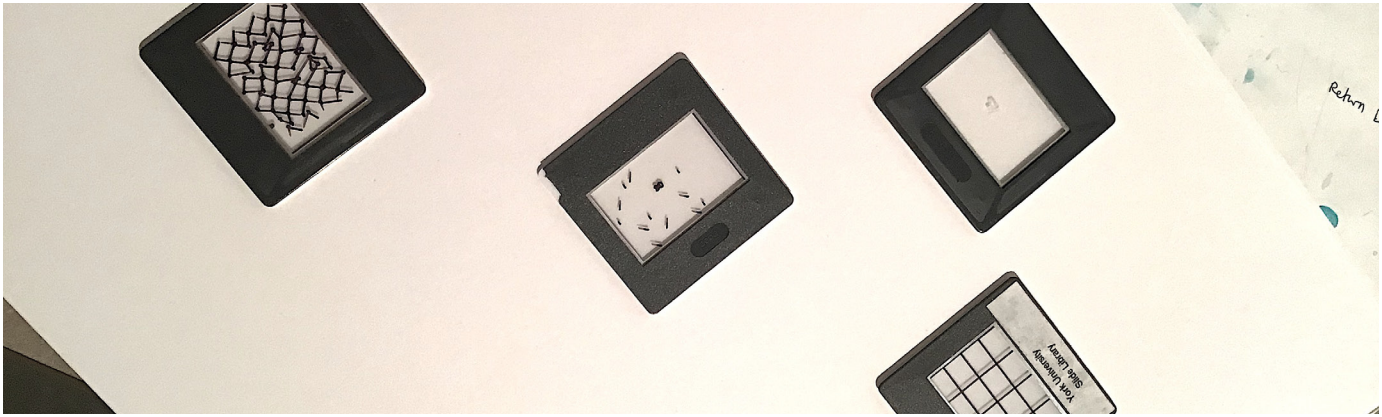


*Machines feed back on themselves - processing output as input*

*Information lasercut and lathecut into playable records.*

***Miscellaneous*** - Objects that do not directly fit into the above categories. These play with the mythology aspect of the Wunderkammer and consist of found objects such as historical slides and 3d models generated from data derived from SuperLattices.

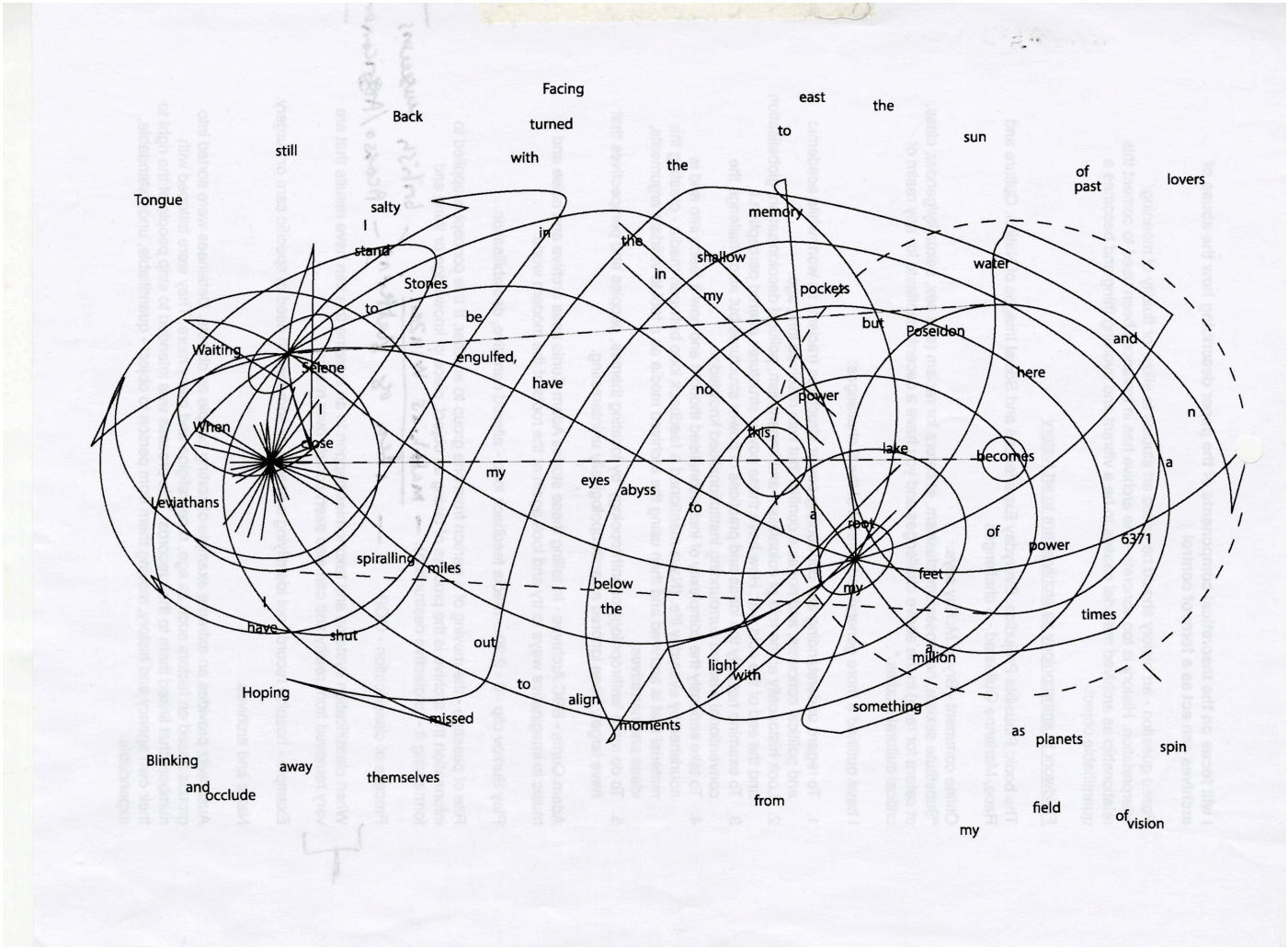




*Modified slides*

*Transfers and contact prints*

*3d printed models - recent quarantine experiment testing how data can effect 3d models when applied.*




*Repurposed scientific diagrams from textbooks. Modified constellation map and diagram of syzgy pictured.*

***Exhibition sketches*** the previous chapters highlight the content and visual aesthetic that will make up the components of the cabinet in the SuperLattice exhibition. The following sketches intend to provide some idea of how these items will come together in the exhibition layout.

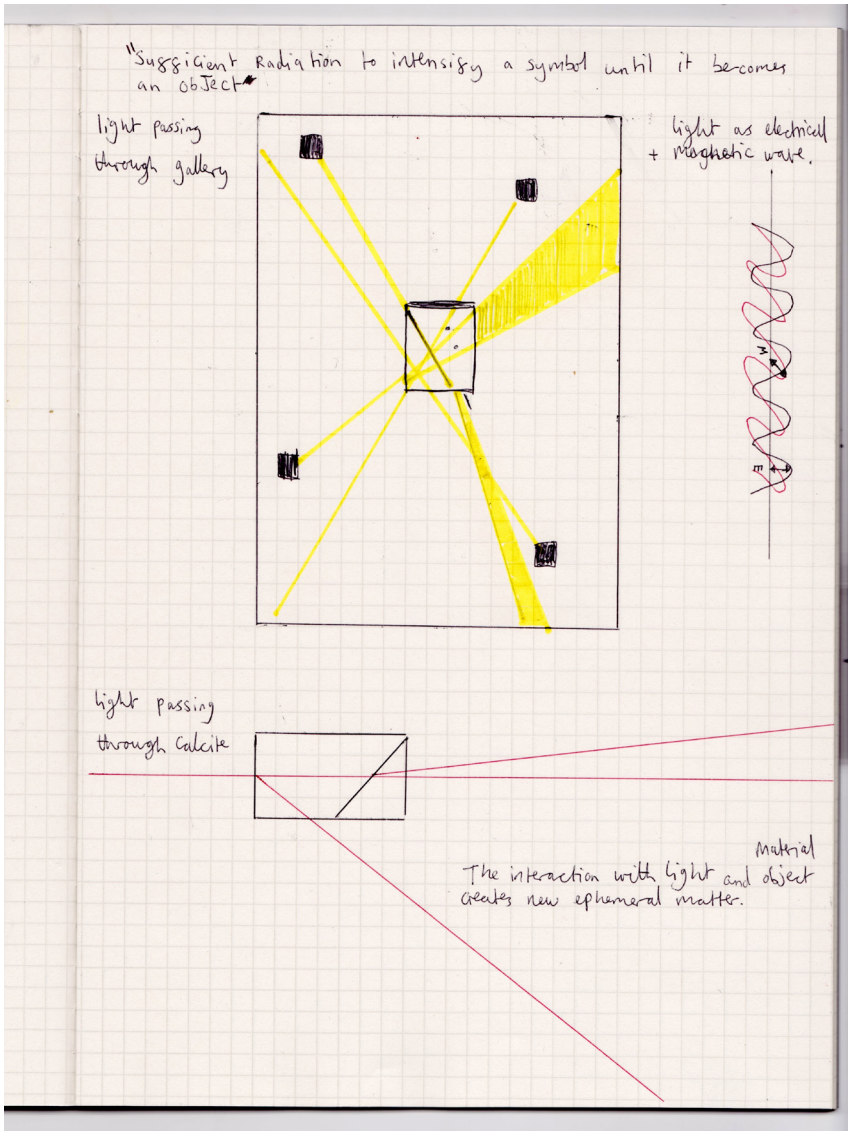



*Illustration of projectors in relation to the central cabinet*

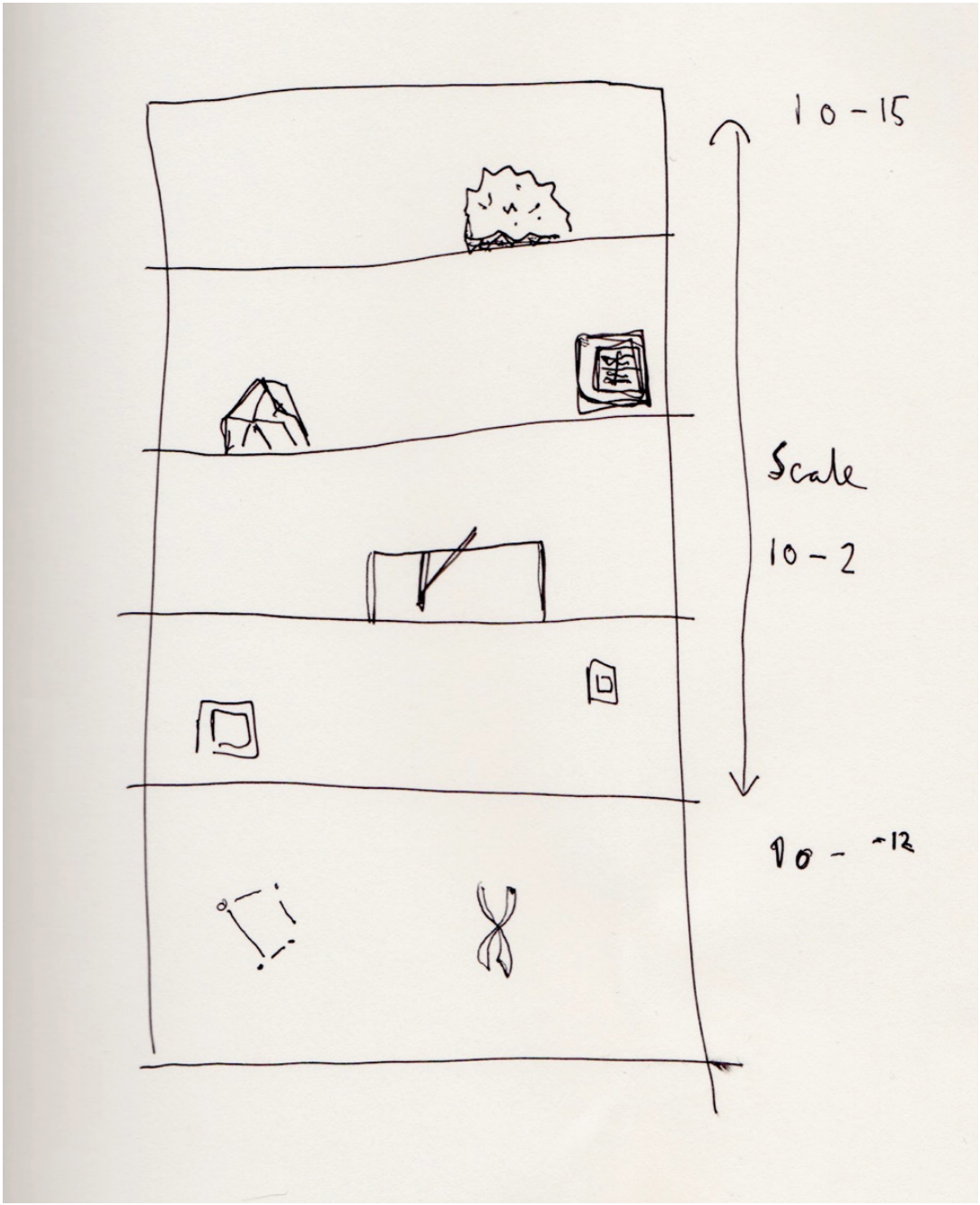
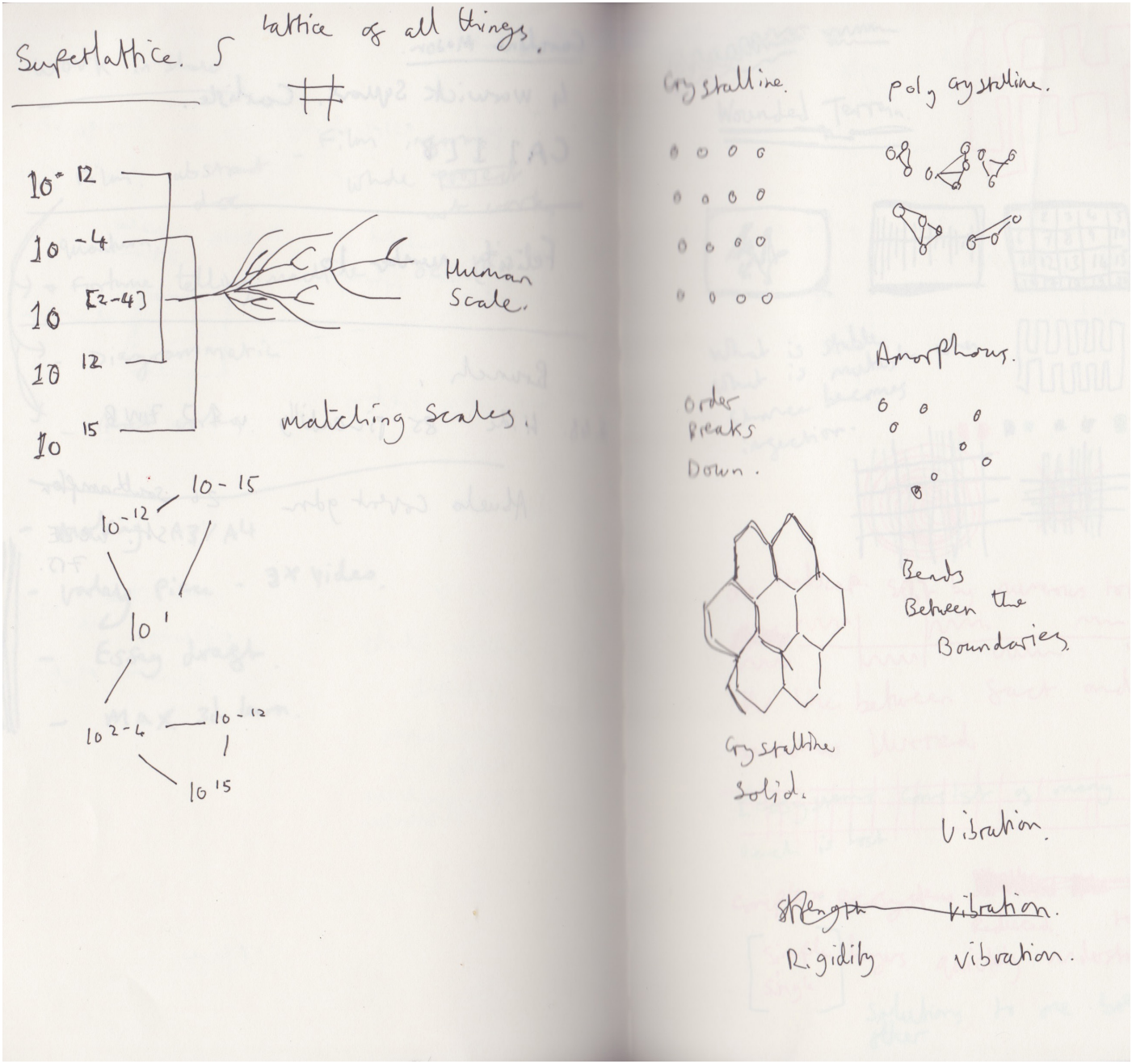
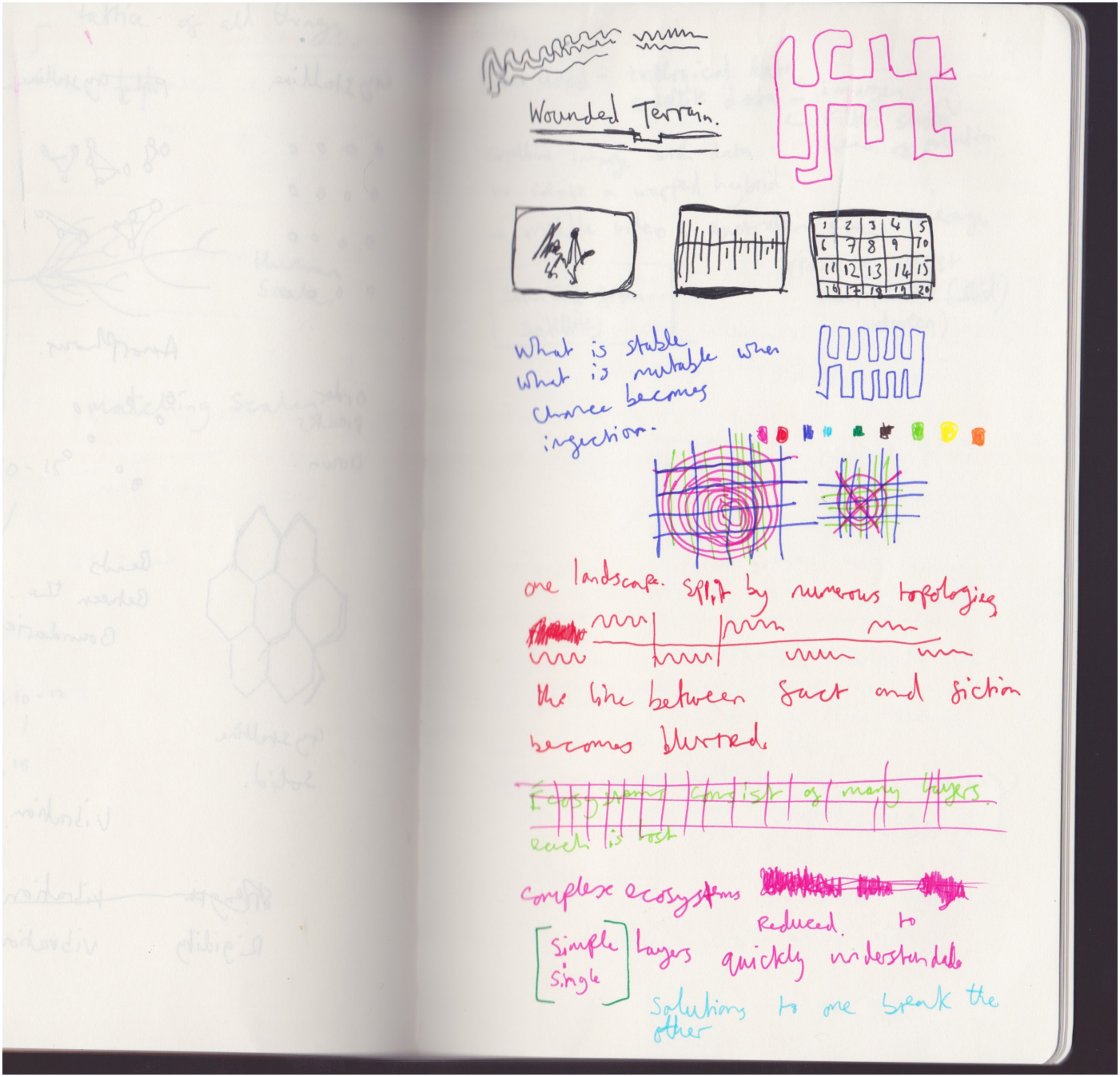


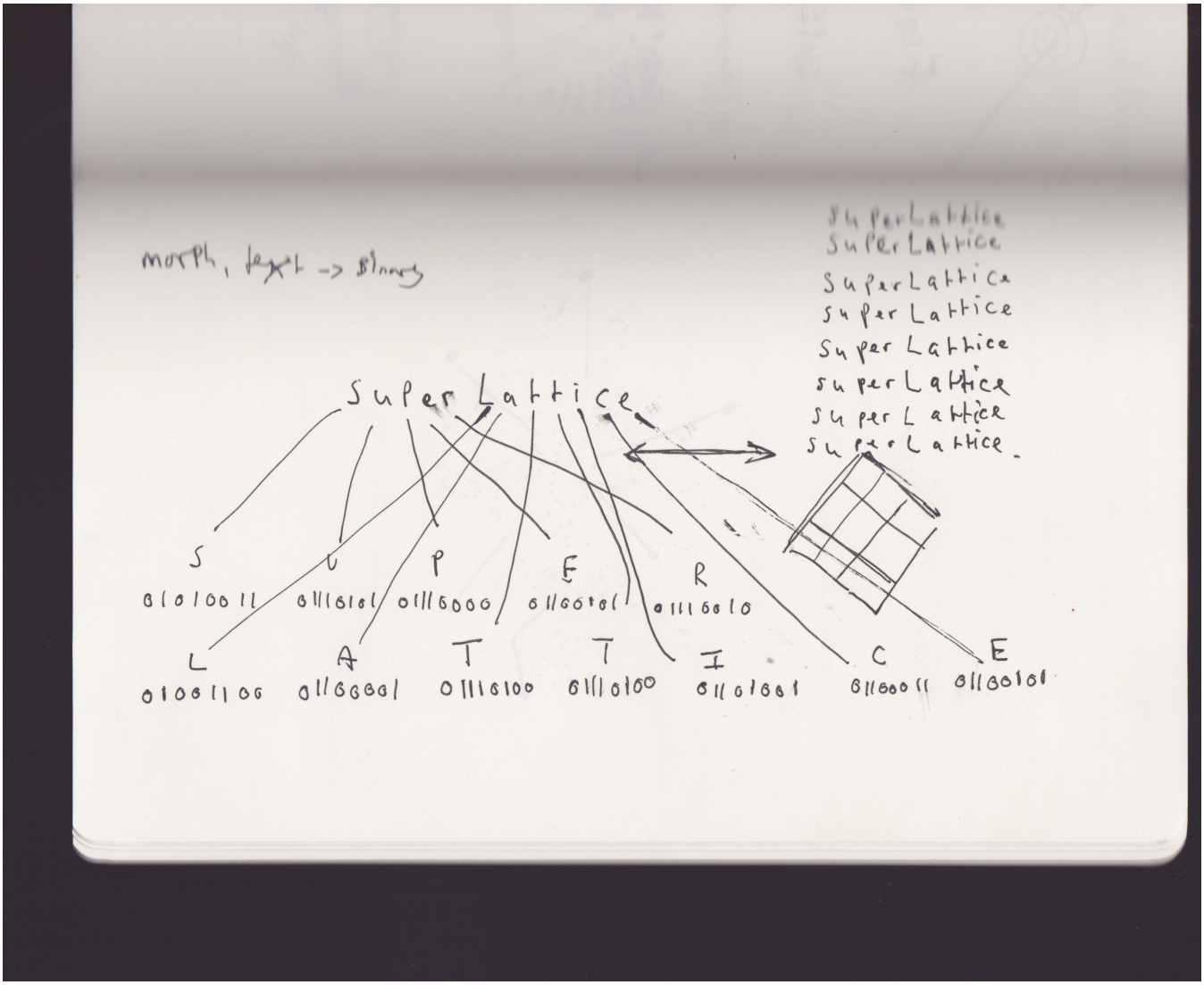

*Illustration of the scale of data presented in the cabinet.*



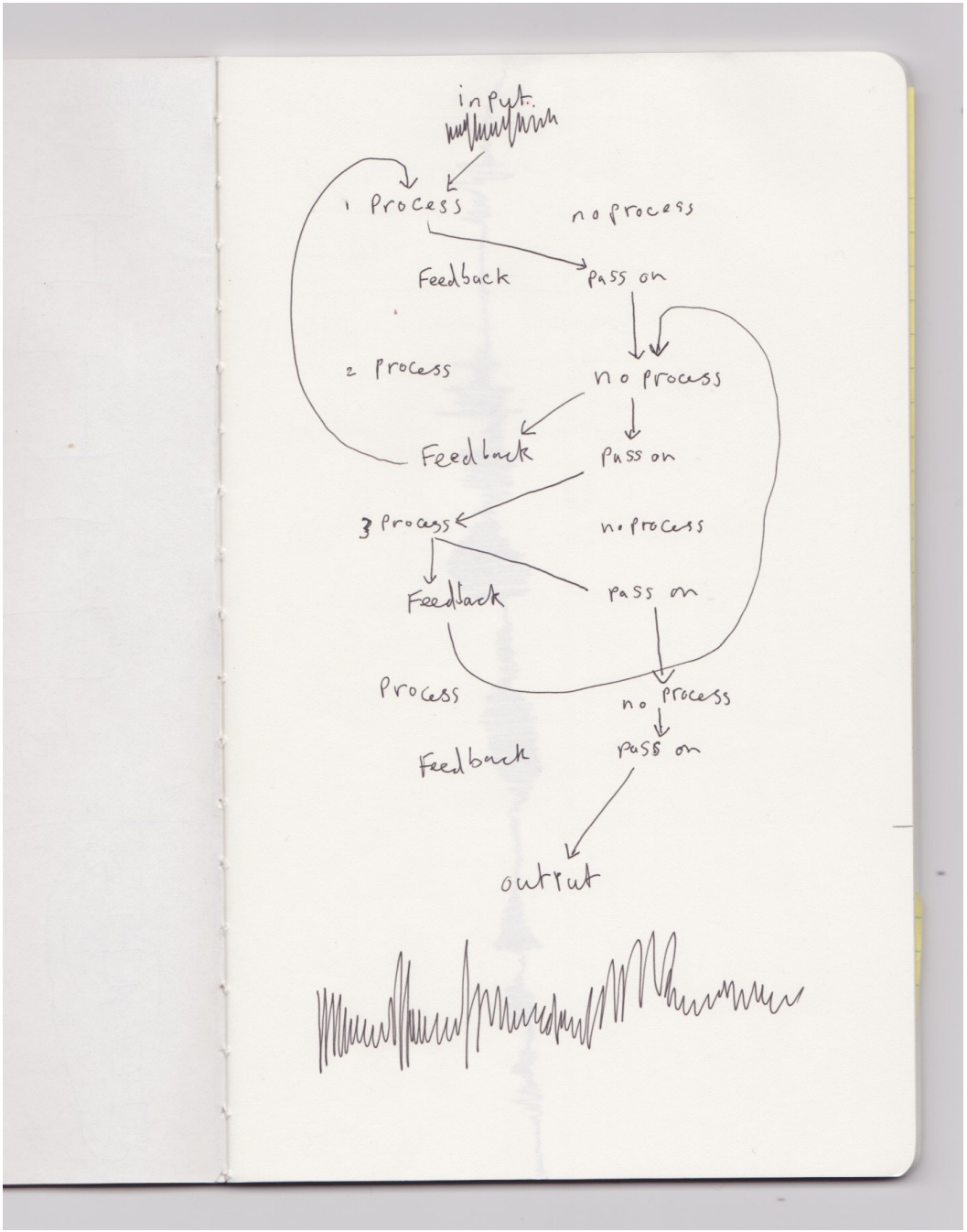

*Early sketch relating scale to crystal structures*




*Sketch detailing the concept and early creation stage of my work Wounded Terrain which features as part of the content projected into the cabinet.*




*Text movement and conversion sketch*




*Early sketch mapping out a system where information is processed and fed back into itself*

***Links*** - detailing videos and useful accompanying media to give a greater understanding of the aesthetics and content in SuperLattice.

***Wounded Terrain*** - a series of three interconnected animations created through manipulating satellite images of highly polluted areas. These images are distorted through custom code that combines the original images with data detailing the major pollutants in the area. The results are diagrammatic and abstract with the intention of breaking the image into something seemingly quantifiable but foreign from its source. Through this process the images are rendered unrecognisable in a similar way to how man made interferences have altered the landscape beyond recognition

Water, length: 06:52 - https://vimeo.com/415006387
Lake St Clair, Canada. Algal blooms feed on agricultural runoff and deplete oxygen from the aquatic environment.

Thwaites glacier, Antarctica. This huge glacier (100km long, 32km wide) is melting unexpectedly fast and has lost over 540 billion tons of ice since the 1980s.

Polluted rivers, Carolina, USA. Increased flooding results in rivers carrying excess pollutants and sediment that is deposited into the sea off the Carolina coast.

Air, length: 03:53 - https://vimeo.com/415004824
Bush fires, Australia: Australia's dry weather and increasing heat have resulted in the worlds worst bush fires, killing 25 people and displacing thousands from their homes.

Earth, length: 09:26 - https://vimeo.com/414997933
Carrera marble quarry, Italy. This quarry has been used since ancient Rome where high quality marble is cut for use in building, interior design and sculpture.

Bolivian deforestation. Bolivia. Large swathes of forest are cut down leaving traces visible from space. The largest use of this deforested land is for mechanised agriculture and cattle ranching.

Kansas, USA. Circular irrigation patterns dot America creating strange crop circles of life in dry and arid areas.

***Inbound // Unbound*** - https://vimeo.com/410742951
Recent experiments made during quarantine and sketches around recording and manipualting 360 video, depth scans and 3d photogrammetry. The idea was to work within the limitations of the current quarantine and to try and work with the tools I had access to - (iPod touch, Xbox Kinect and Laptop) the 360 camera footage is from a test taken in my studio at York 3 days before campus closed.

***Helios*** - https://vimeo.com/410492784
Film documentation of a recent exhibition held at the Factory Media Centre in Hamilton, 2019. The central work builds upon my earlier audio-visual piece *Heliosphere* and creates a more visually ambitious work using solar data from the 1 year period before the show. The techniques used in *Helios* have been developed to inform my work with information in *SuperLattice.*

***Turbulent Forms*** exhbition publication - https://issuu.com/canadianmusiccentre/docs/turbulent_forms_monograph_issuu
Publication documenting the 2017 exhibition of Turbulent Forms at the Canadian Music Centre. The publication goes into detail on the works displayed and my methods of working with data.

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Sed ut perspiciatis unde omnis iste natus error sit voluptatem accusantium doloremque laudantium, totam rem aperiam, eaque ipsa quae ab illo inventore veritatis et quasi architecto beatae vitae dicta sunt explicabo. Nemo enim ipsam voluptatem quia voluptas sit aspernatur aut odit aut fugit, sed quia consequuntur magni dolores eos qui ratione voluptatem sequi nesciunt. Neque porro quisquam est, qui dolorem ipsum quia dolor sit amet, consectetur, adipisci velit, sed quia non numquam eius modi tempora incidunt ut labore et dolore magnam aliquam quaerat voluptatem.

Ut enim ad minima veniam, quis nostrum exercitationem ullam corporis suscipit laboriosam, nisi ut aliquid ex ea commodi consequatur? Quis autem vel eum iure reprehenderit qui in ea voluptate velit esse quam nihil molestiae consequatur, vel illum qui dolorem eum fugiat quo voluptas nulla pariatur? At vero eos et accusamus et iusto odio dignissimos ducimus qui blanditiis praesentium voluptatum deleniti atque corrupti quos dolores et quas molestias excepturi sint occaecati cupiditate non provident, similique sunt in culpa qui officia deserunt mollitia animi, id est laborum et dolorum fuga.

Et harum quidem rerum facilis est et expedita distinctio. Nam libero tempore, cum soluta nobis est eligendi optio cumque nihil impedit quo minus id quod maxime placeat facere possimus, omnis voluptas assumenda est, omnis dolor repellendus. Temporibus autem quibusdam et aut officiis debitis aut rerum necessitatibus saepe eveniet ut et voluptates repudiandae sint et molestiae non recusandae. Itaque earum rerum hic tenetur a sapiente delectus, ut aut reiciendis voluptatibus maiores alias consequatur aut perferendis doloribus asperiores repellat.