

# **the lightest things float to the top**

**by  
Kittie Cooper**

M.Ed. (Special Education), George Mason University, 2020

B.Mus. (Music Education; Classical Guitar Performance), Northwestern University, 2017

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## Declaration of Committee:

**Name:** **Kittie Cooper**

**Degree:** **Master of Fine Arts (Interdisciplinary Arts)**

**Title:** **the lightest things float to the top**

**Committee:** **Chair: Claudette Lauzon**  
Associate Professor, Contemporary Arts

**Mauricio Pauly**  
Supervisor  
Assistant Professor, Contemporary Arts

**Nadia Shihab**  
Committee Member  
Assistant Professor, Contemporary Arts

**Sasha J. Langford**  
Examiner  
Instructor, Mass Communication  
Columbia College

## **Abstract**

*the lightest things float to the top* is an intermedia instrument and solo performance for sound, light, and objects. This instrument comprises several containers of various sizes and qualities that are filled with found objects. The found objects are put into motion using motors hidden inside the containers. The objects' movements are then amplified sonically using microphones and live electronic processing, and are amplified visually as moving lights and shadows projected onto the walls of the performance space. In this work, I reimagine lights and shadows from my living spaces as an intermedia instrument for performance, and I explore the hidden vibrancy of everyday objects and spaces. Patterns of the everyday, and their minute variations, provide the creative material and a gentle form for this semi-improvised performance.

### **Keywords:**

sound art; found objects; improvisation; intermedia; light art; DIY electronics

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## **Defence Statement: the lightest things float to the top**

*the lightest things float to the top* is an intermedia instrument and solo performance for sound, light, and objects. The work comprises a series of containers of various sizes and qualities that are filled with found objects, including dried plants, artificial plants, scraps of plastic and aluminum foil, and other materials that I sourced from my past artistic projects, my house, and the free table in my neighborhood. The objects are put into motion by motors hidden in the containers, and their movements are amplified using both sound and light. The objects' movements are amplified sonically using microphones and live electronic processing, and are amplified<sup>1</sup> visually as moving lights and shadows projected onto the walls of the performance space.

In this work, I reimagine lights and shadows from my living spaces as an intermedia instrument for performance. Patterns of movement in these lights provide the form and pacing of the performance. The spaces that have most informed the composition and performance of this work are my living spaces in Vancouver, BC and in Charlottesville, Virginia. The lights projected from the objects are inspired directly by the lights that filter into my indoor living spaces through windows. I was first drawn to these lights partly because it requires much attention to notice how they change over time. Some of the changes happen too slowly or minutely to be perceptible. However, I decided to try to perceive them and to see what I could learn from the process.

The materials I used to create this instrument are found objects from the two places where I live. I explore the hidden vibrancy of these objects and the spaces they inhabit by amplifying their tiny motions and unpredictable variations in patterns of motion. The audience catches glimpses of the objects, but cannot possibly see or hear

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<sup>1</sup> I use the word "amplified" as I am primarily a sound artist and that is how I was thinking about it. More visually-oriented words could include "projected" and "magnified". More on the parallels between sound and light later.

everything, as the objects' movements are filtered through the containers, amplification and live processing, the media of sound and light, and the limits of human perception. Both media—sound and light—are affected by the particularities of their containers (including the larger container of the performance space) as well as any human bodies present.

## Background

### previous work

*the lightest things float to the top* is informed by a number of my previous works. My work *its being is in it alone* (2020-2021) for a custom-built system of synthesizers, objects, and light invites people to imagine the memories and life held by objects. The synthesizers in *its being* respond to the varied weights and shapes of objects, as well as different states of light. When performing this piece, I arrange altar-like settings of objects and lights [see image below], in order to coax different sounds from the synthesizers. Performing this piece is an exercise in learning the minute qualities of the objects with which I am performing, as even the smallest changes affect the overall system—small gestures can create cascading effects that throw the instrument into a state of instability and unpredictability. The system is capable of settling into states of equilibrium, but will become unbalanced at unpredictable moments, sometimes as a result of my moving an object, or sometimes because an object or a few electrons have settled into different patterns on their own. In this way, *its being is in it alone* feels similar to perform as *the lightest things float to the top* [from here referred to as *tltfttt*].

Two main elements of *its being* informed *tltfttt*: the performance mode of amplifying tiny gestures and changes, as well as the method of slowly learning a new system and its corresponding objects. This method necessitates that I build my relationship with the instrument over a long period of time. The relationship starts with



the origins of the found objects—*its being is in it alone* uses objects I have collected over many years, specifically rocks, pebbles, and little trinkets. I imagine that all of these objects could hold my memories of their origins, and perhaps even some of their own. Some of the differences between the two works arise from the designs of their respective interfaces. Placing and rearranging objects in *its being is in it alone* gives me more control over the movements of the objects (although there are always slight shifts that are out of my control). In *t/tfttt*, I am nowhere near the objects during the performance and more of their movements are left up to chance.



Figure 1. *its being is in it alone* (2020-2021)

My work *edgewise* (2020) for two performers deals more with the vibrancy of spaces, rather than objects. In *edgewise*, heavily amplified room tone interacts with the performers and, through live-processing and the performers' physical gestures, becomes an active third performer in the piece. Through the lens of Electronic Voice Phenomena (EVPs), this work explores the agency of spaces and the power dynamics at play when humans impose meaning and interpretation onto spaces. When recording EVPs, paranormal investigators conduct and record seemingly one-sided conversations in paranormally active spaces. They then listen back to the recordings later for sounds they perceive as voices: EVPs that are interpreted as replies of paranormal entities. The electronics in *edgewise* come from recordings of heavily amplified room tone, which is

what paranormal investigators sift through when they are listening for EVPs. The resulting sound world is one where humans, recorded sounds, and spaces are all fighting to be heard in a wash of room tone.



Figure 2. *edgewise* (2020), performed by Popebama

An earlier realization of my ideas from April 2022 (also called *the lightest things float to the top*) consisted of a solo performance in which I rummaged through drawers of a retrofitted dresser and rearranged motors and objects inside, in order to affect sound and light that emerged from the partially-open drawers. The objects' movements were amplified sonically using speakers hidden inside the drawers and visually as shadows projected onto a wall. After performing this very early version of *tltfttt*, I realized that I was more interested in continuing to explore space and my living spaces than the objects I had been working with (including the dresser). This new imagining of *tltfttt* began as an explosion of what happened inside the drawers outward into the room itself. The drawers became so large that they became the performance space and did not exist anymore as furniture, but rather as walls. This increase in scale would allow the audience, in some sense, to exist alongside the objects in the drawers. In addition, during the performance, rather than opening and

closing different drawers to change the sound and light, I would affect the performance space itself with the audience inside it.



Figure 3. an early version of *the lightest things float to the top*, performed in April 2022

Lastly, a collaboration with Torien Cafferata and Salome Nieto, *8 Spaces*, also informed *t/t/t/t*, particularly in encouraging me to continue to explore certain physical materials. *8 Spaces* deals with little worlds set up inside of boxes, manipulated and moved around by performers. The boxes contain lights, which amplify the movements of the the performers into large shadows on the wall. The sounds of the boxes are also amplified sonically with speakers hidden inside the boxes, using contact mics to amplify the sounds of the performers' nails scratching the boxes and the friction of the boxes rubbing against each other. The emergence of light and sound from different containers was my starting point for the design of *t/t/t/t*.



Figure 4. *8 Spaces* (2021), collaboration with Torien Cafferata and Salome Nieto

In addition to my intermedia work, I compose fixed media electronic pieces that integrate recordings of found sounds and field recordings. Much of my work in these areas explores how recording changes what we hear, and how recording the spaces we inhabit changes how we experience those spaces (this parallels *edgewise*, detailed above). My 2023 work *gasses (and goldfish) expand to fill their containers* explores the messy insides of electronic instruments as well as the messy insides of spaces—I use field recordings of Tower Beach in Vancouver and samples of Hildegard Westerkamp’s *Kits Beach Soundwalk* (1989) to explore how recording can help us uncover the sonic layers of the spaces we inhabit, and how listening to recordings can expand our awareness of those sounds in new directions.

I have also explored these ideas in other contexts, including in my teaching practice. As an educator, I consider listening to the sounds of the world and using those sounds as creative material foundational to learning to create original works. I teach at a summer program for young people, where the curriculum is founded in listening and the *Musique Concrète* tradition. We start the first day of class with a sound walk, and discuss how spaces change the kinds and qualities of sounds we hear. The students then record sounds and use them to compose pieces in the *Musique*

Concrète style. I have also integrated into my teaching practice a more open version of a sound walk—one where students are invited to pay attention to a sense of their choosing, including the option of a light and shadow walk. These practices of listening and noticing are the foundation for my creative work, and I have found that they can provide useful starting places for students as well.

In *tlfttt*, I have been exploring how sonic practices of listening and using found sounds can inform similar practices in performing with light. What does listening look (sound) like when applied to lights and shadows? How can one amplify tiny movements in lights and shadows, as one amplifies a quiet sound? How do amplification and reproduction change light, and how we experience it? Can one use found lights as creative material in addition to found sounds? Can the language of Deep Listening<sup>2</sup>, found sounds, field recording, and other similar sonic practices be useful in exploring the medium of light? These are all questions I have been grappling with as I work on this piece, a continuation of my practices to this point—questions which will be approached with more detail later in this paper.

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<sup>2</sup> a practice developed by Pauline Oliveros (described in more detail later in the paper)

## memory gaps / missing documentation

“For if you draw a line between the light part and the dark part, then if you have that part which is dark immediately before your eyes, you will see no light. When you begin little by little to turn the light part to your eyes, first you will see horns of light, then it makes a crescent, finally all the light part is before your eyes so that nothing of the dark part is seen. If then little by little you turn it, the darkness begins to appear and the light to diminish, and finally again it returns to horns, and when all the light is turned from the eyes, again only the dark part is able to be seen.”

*On the Nature of Things, “XVIII. On the light of the Moon,”* Isidor of Seville (560-636)

A common thread through all of my sound work is starting from a place of listening. *t/t/t/t* began similarly, with my noticing and documenting the shifting lights that filter in through windows in my living spaces.



Figure 5. example documentation of lights from 2021-2023

When I create works with sound, I embrace the imperfections that emerge from interactions with recording technologies. Recording already changes the way something sounds, so I use those changes as room for creativity, rather than fighting them in my creative process.

Similarly, I decided to embrace the imperfections of my attention to and documentation of these lights. Rather than taking a more data-driven approach, I decided to have attention for the lights when I could, document them when I was able

or when I noticed some significant change, and otherwise embrace the gaps in my memory and the documentation I collected. I see this process as being similar to developing a field recording practice. As I might visit the same location multiple times to hear how the sounds change from day to day, I noticed and documented these lights in many sessions over approximately eighteen months. Furthermore, in the same way that I am always trying to expand my listening, I also strove to stretch my attention for these lights.

### **Description**

*the lightest things float to the top* is an intermedia instrument composed of sound, light, and objects. The objects are held in containers of various sizes, qualities, and origins (including two wooden boxes, a cookie tin, a fabric bin, and a flower pot). Inside each container is a motor that vibrates the objects. Each container also holds a lightbulb, which shines light through the objects such that shadows of the objects and the edges of the container are projected onto walls of the performance space. In addition, each container holds an omnidirectional lavalier microphone that amplifies both the sounds coming from inside the containers (vibrating objects and the motors themselves) as well as any other sounds present in the performance area<sup>3</sup>. The found objects in each container vary, but the motor, lightbulb, and microphone is consistent for all containers, though they are positioned in different ways.

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<sup>3</sup> The omnidirectional mics also make it such that I can intentionally raise the levels of certain sounds in order to create different pitches of feedback.



## Basic Container Contents

*\*\*\*all containers differ in shape, motor attachment, found objects, and the positioning of the items shown\*\*\**

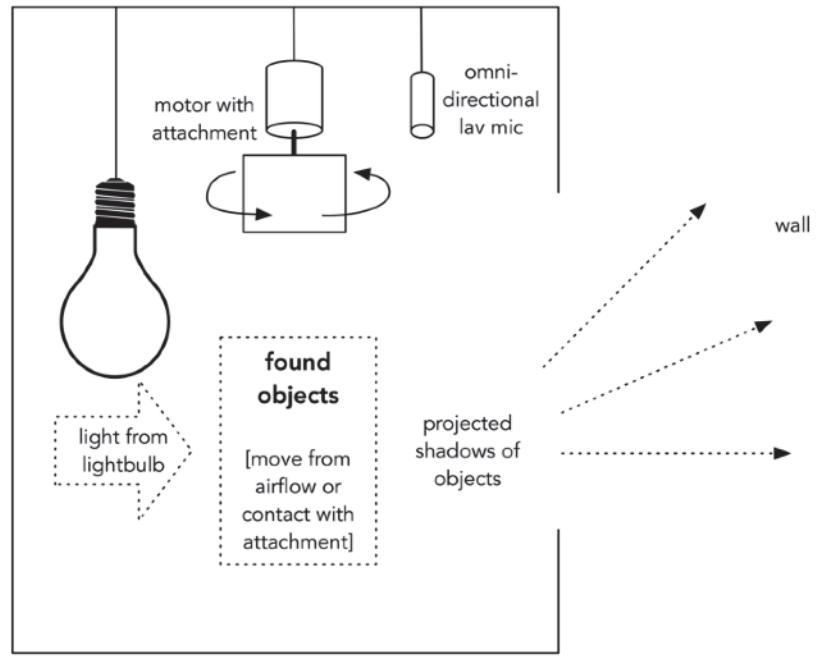


Figure 6. basic container contents

From the performance area, I can turn on and off each motor individually, as well as change the speed of each motor's rotation. The controller for the motors is one I built specifically for this purpose.

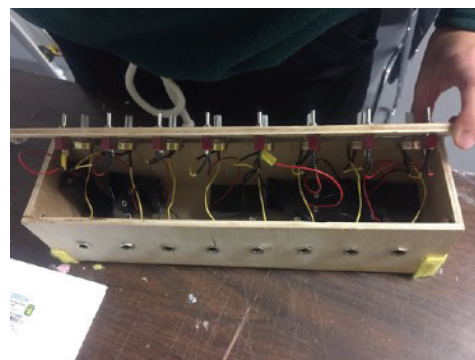
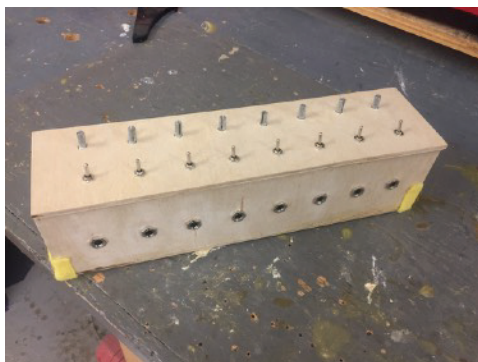


Figure 7. controller for the motors (during construction)





Figure 8. controller for the motors (completed)

I also change the brightness of each lightbulb using a DMX system and lighting controller. The acoustic sound of the motors and objects is constant when the motors are on, though it may not always be audible to the audience<sup>4</sup>. The microphones inside the containers connect to a mixer in the performance area as well as an effects pedal chain, so that the sound from the microphones can be amplified both with and without effects. The effects I used in these performances were pitch shifting and timbral freeze, though I experimented with others throughout the compositional process and may use more or different effects in future performances.

The performance system projects moving and flickering lights and shadows onto multiple walls of the performance space. The motion of the objects and the shape of the performance space affect the shadows moving on the walls. The sound operates somewhat independently but still in conjunction with the lights, as the changes result from the same sources: the movement of the same found objects, and performer intervention. Because the microphones inside the containers are omnidirectional, they amplify any sounds present in the performance space and produce feedback, which

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<sup>4</sup> Some of the natural sounds of the performance space are more or less constant as well, though not always audible. This threshold of audibility (and visibility) became a rich compositional parameter for my performance.

then becomes part of the instrument<sup>5</sup>. The live processing of the amplified sounds from the containers and performance space allows me to emphasize certain pitches or timbres present in the acoustic sounds. Thus, the objects moving inside the containers and the resonance of the performance space itself (affected by anything inside the performance space, including audience members) provide the sound for the piece.

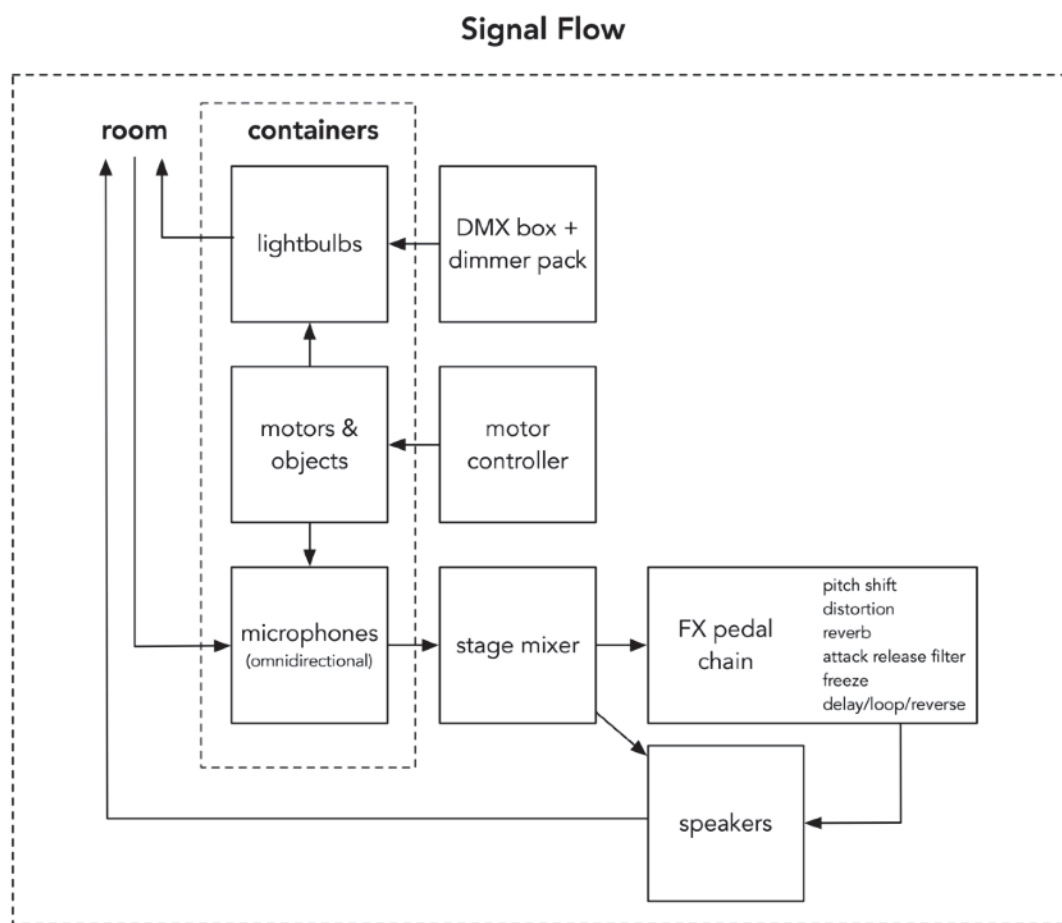


Figure 9. Signal Flow

<sup>5</sup> The feedback became easier to perform at a safe volume once I had an audience in the room absorbing some of the frequencies—in a way, the bodies of audience members were integrated into the performance system as well.

## Signal Flow: interaction of light, objects, and sound

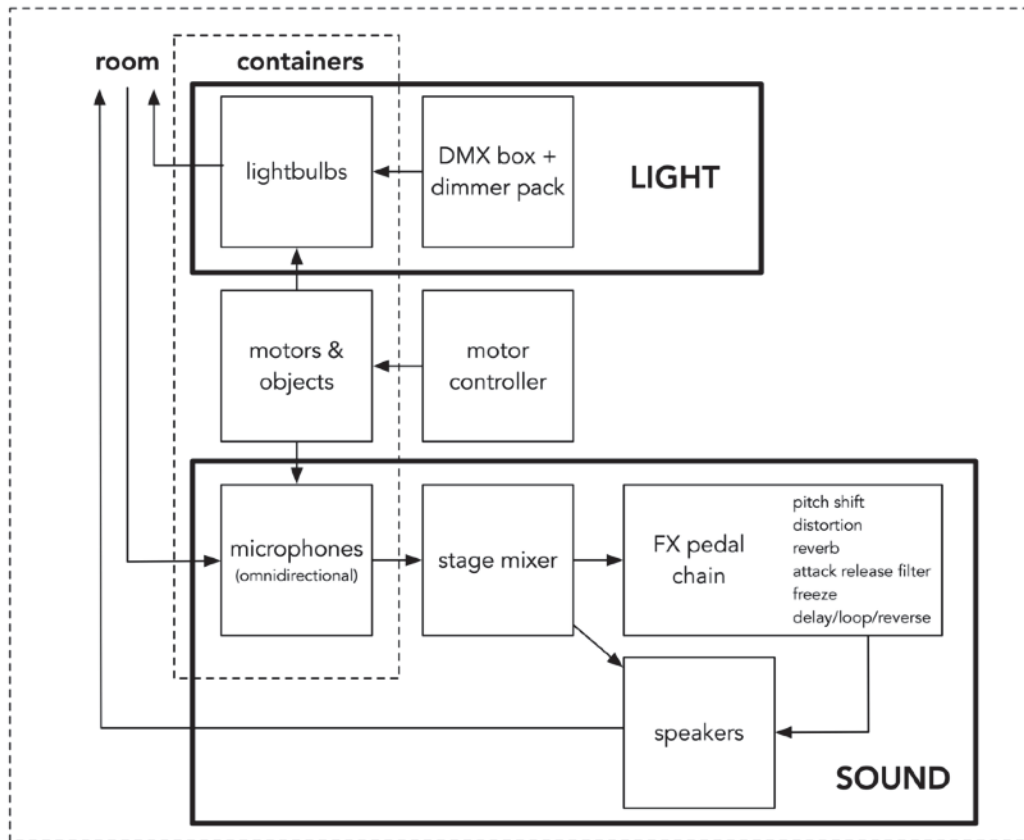


Figure 10. Signal Flow: interaction of light, objects, and sound

### modular system

“And are not we [...] nothing but the minuscule capering of electron clouds? Positive and negative charges arranged in space? And is our existence not the result of subatomic collisions and the interplay of particles, though we ourselves perceive those cartwheels as fear, longing, or meditation? And when you daydream, what transpires within your brain but the binary algebra of connecting and disconnecting circuits, the continual meandering of electrons?”

*The Cyberiad: Fables for the Cybernetic Age*, “The Seventh Sally:

Or How Trurl’s Own Perfection Led to No Good”, Stanislaw Lem (1967, p. 140)

My previous work with synthesizers informed my approach to composing this system. The motors produce acoustic sound, which I then amplify and process

electronically in a live improvised performance. Unlike much of my other work, the system contains no synthesizers or electronic sound (other than what comes from applying effects to the amplified acoustic sound). The signal flow is similar to what you would see in a modular synthesizer or in other more typical electronic music performance setups<sup>6</sup> (see diagram “Signal Flow” above). However, in a modular synthesizer, typically there are oscillators (or some other sound source) routed through an effects chain and then out to the speakers. In the system used for performing *tlfttt*, the motors function as the sound sources that then are routed through an effects chain and out to the speakers. Motors and objects work very unpredictably, and—unlike many common oscillators—their unpredictability presents at a scale where humans can perceive the variations. When the objects in *tlfttt* are shaken around by motors, they are often on the verge of shaking loose or breaking off, and as such there is pressure on the system to break apart (no matter how well everything is stuck down)<sup>7</sup>. Thus, though the main sound sources are motors spinning fairly regularly (that produce fairly regular sounds), the system is founded in unpredictability, which leads to indeterminacy in the performance.

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<sup>6</sup> You can also see this influence in the design of my box which controls the motors’ speed from offstage. The box is a visually simple design with a row of sockets (for going out to the motors), a row of switches (for turning them on and off), and a row of knobs (for controlling speed)—functioning almost like a mixer module on a modular synthesizer.

<sup>7</sup> For example, one of the boxes has dried leaves hanging in it, which the motor bounces a piece of cardboard against to make a rustling sound. The leaves sometimes break apart, or come loose mid-performance, and you can see the shadows of them falling to the bottom of the box. When I tried to affix the leaves more securely, they no longer made the rustling sound. So, I decided to leave them in a more precarious state and to leave some of the performance variables out of my control (more about this in the next section).

## my role as performer

“We cannot predict whether a given photon will arrive at A or B. All we can predict is that out of 100 photons that come down [for example], an average of 4 will be reflected by the front surface. Does this mean that physics, a science of great exactitude, has been reduced to calculating only the probability of an event, and not predicting exactly what will happen? Yes. [...] Nature permits us to calculate only probabilities.”

*QED: The Strange Theory of Light and Matter*, Richard P. Feynman (1985, p. 19)

Because *tlfttt* is built around objects moving erratically, there are always new things that happen during the performance that I respond to in real time. Most of my work as an improviser has been collaborative—playing in ensembles with other humans. When I build electronic instruments, I strive to create a similar sort of collaboration between myself and the instrument. I prefer my instruments to have a degree of unpredictability so I can respond to them in real time as I would respond to a human collaborator. This approach encourages me to learn the system as I would learn any acoustic musical instrument, a step I consider especially important when working with electronic sound (as computers and other electronics are frequently smart enough for it to be tempting to skip the learning step and go straight to a virtuosic performance).

I prioritized this collaboration with my instrument in all aspects of composing this piece—from the fabrication process to planning my performances. Midway through the process of creating *tlfttt*, I considered scoring out its performance and deciding which sounds would happen when and in what order. However, I realized that in doing so I was fighting the unpredictability of the motors and objects—there were always sounds and shadows I did not expect and could not plan coming from the system. I decided that I would not be a very good collaborator to my instrument if I insisted on the system being consistent when it did not want to be. So, instead, I embraced the variability of the system from day-to-day. Embracing this variability improved the

performance in turn, because I was listening more carefully and responding to sounds and shadows in the moment (rather than focusing on initiating what was going to happen next).

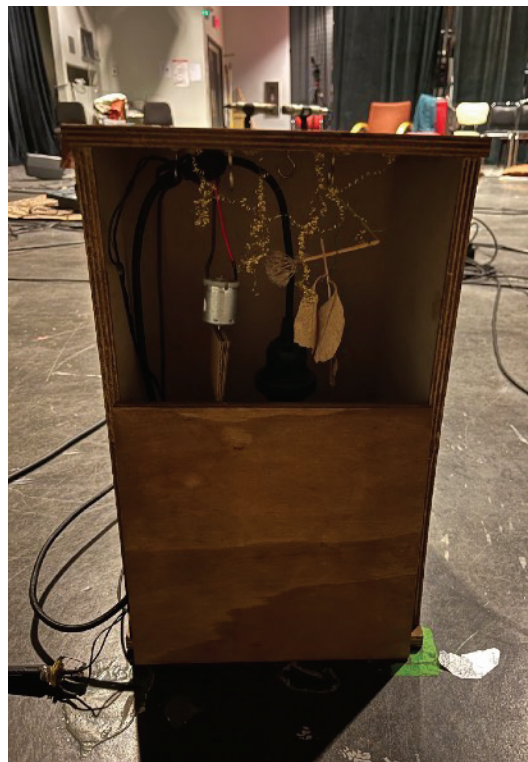


Figure 11. containers and their contents (from left to right)





Figure 12. the same container (4th from the left), inside and outside



Figure 13. the same container (5th from the left / far right), inside and outside



Figure 14. performance area

from left to right: interface for recording (does not affect performance), mixer, FX pedals, motor controller, lamp, DMX lighting controller

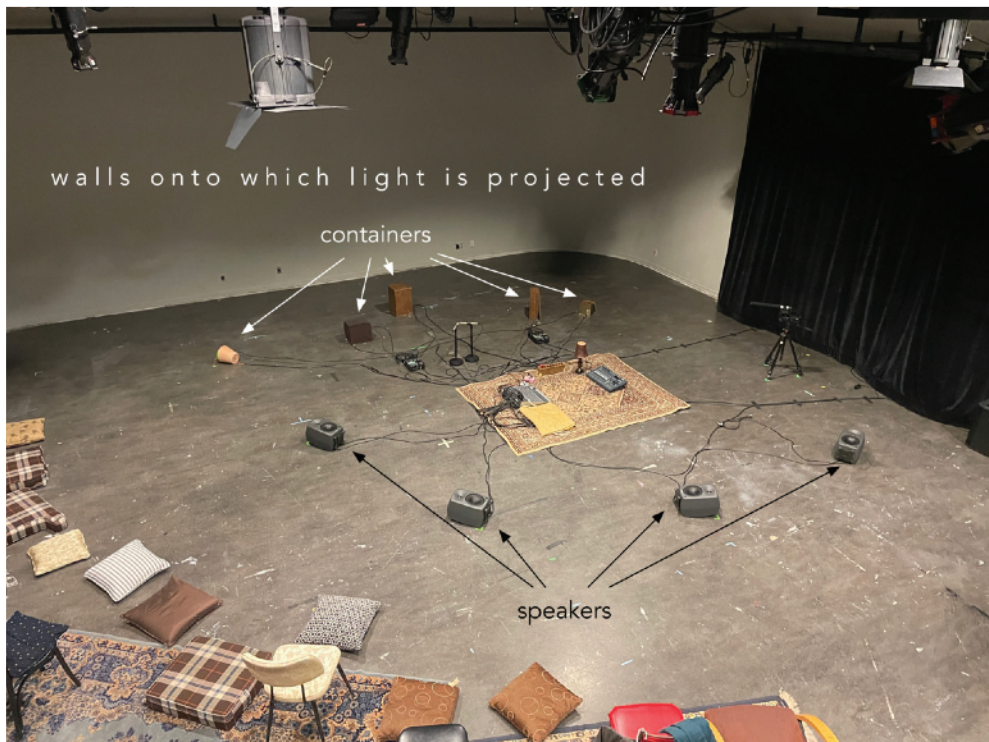


Figure 15. layout from above (labelled)



## Context & Process

### found sounds

“Listening is not the same thing as hearing and hearing is not the same thing as listening.”

*Deep Listening: A Composer's Sound Practice*, Pauline Oliveros (2005, p. 21)

“What is heard by the listener is changed by listening and changes the listener.”

“Each listener, through the act of listening, affects the field and thus the form. The form affects the listener in a dance of reflections in the space in between.”

*Quantum Listening*, Pauline Oliveros (2022, p. 30 and 54)

The composition of *tltfttt* applies the practice of Deep Listening (as developed by Pauline Oliveros) to working with light as an artistic medium. Oliveros describes Deep Listening as follows: “*Deep* coupled with *Listening* or *Deep Listening* for me is learning to expand the perception of sounds to include the whole space/time continuum of sound—encountering the vastness and complexities as much as possible” (2005, p. xxiii). She continues, “Attention is directed to the interplay of sounds and silences or the sound/silence continuum. Sound is not limited to musical or speaking sounds, but is inclusive of all perceptible vibrations (sonic formations). The relationship of all perceptible sounds is important” (2005, p. xxiv). Pauline Oliveros’s text scores were my introduction to music by living composers (and music not by men) as well as experimental music. Her intense appreciation of sound and her focus on community-building drew me in immediately. Her work has been foundational to my practice as a sound artist, and as such I try to start all my work from a place of listening.

However, what does this listening look like when applied to a visual medium like light? This was a question I explored in creating *tltfttt*. As I described in the section “memory gaps / missing documentation,” I decided to embrace the imperfection of my ability to pay full attention to the lights in my living spaces at all times. It did not

feel in the spirit of my listening practice to accumulate data (e.g. time lapse recordings) so I could have a full picture of the lights I was watching. Rather, I decided to pay attention when I could, and to always strive to pay more attention—in the same way that I strive to listen, and then always listen more in my sound art practice. The effort came in the practice of noticing and watching, rather than an increase in documentation.

For me, the practice of listening frequently leads in the direction of using found and/or recorded sounds. I followed this trajectory with the lights and shadows in my piece as well. Once I had spent a long time paying attention to the lights in my living spaces, I started trying to recreate them for *t/tf/ttt*—including the ways the lights move (often in the same patterns for long periods of time), and the ways they seemingly do not move for long periods of time (at least at a scale that is easily perceptible to humans). I see these two states of being for the lights as being similar to hearing a repetitive noise somewhere in the environment (that may be changing subtly or drastically over time), and hearing a drone or what is perceived as silence (a lack of motion). In similar ways, these states can become abstracted into creative material.

My practice also frequently includes amplification of tiny sounds<sup>8</sup>. I wanted to see what happened when I amplified tiny movements in lights and shadows (as one amplifies a quiet sound). The act of amplification necessarily changes the sound being amplified—things get lost and added as the sound is translated into its electronic form. How do amplification and reproduction<sup>9</sup> change light and humans' experiences of it? This is an open question of *t/tf/ttt*. I started thinking of the lights as “found lights”, ones

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<sup>8</sup> See *edgewise* and *gasses (and goldfish) expand to fill their containers* in my previous works section, among others not listed.

<sup>9</sup> As it is not logistically possible to bring the audience into my living space, the dimension of reproduction is added into the mix.

I was amplifying, reproducing, and manipulating with the intention of using them as creative material, as one might do with found sounds.

### **found objects**

“In this assemblage, objects appeared as things, that is, as vivid entities not entirely reducible to the contexts in which (human) subjects set them, never entirely exhausted by semiotics.”

*Vibrant Matter*, Jane Bennet (2010, p. 4)

In an effort to carry through the “found-ness” to all parts of *tltfttt*—not just sounds and lights—many of the physical materials of *tltfttt* were sourced through a months-long process of gathering unwanted items from around my house and neighborhood. Many of the materials come from my shared house, my past and/or abandoned artistic projects, and from the free table at Strathcona Co-Op in my neighborhood. The origins of the lights in *tltfttt* are a bit cyclical in nature—they are inspired by “found” lights in my living spaces, and I used found objects from these living spaces to reproduce these lights in turn. The found-ness of the lights is a different sort of found-ness though, as the objects are still the same objects (just relocated to the performance space), but the lights are reproduced based on my memories of the original lights and the space they were in<sup>10</sup>.

I deliberately left the insides of the containers visible to the audience, so that if they choose to walk around after the performance when the house lights were up, they could see what objects were making the sounds and shadows come from the containers<sup>11</sup>. I imagine that this series of realizations could feel like noticing a shadow making a particular movement on the wall at night, and then walking outside during

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<sup>10</sup> More on this in my conclusion.

<sup>11</sup> Leaving the containers at least partially open is also a necessary aspect of the design, as light needs to be able to escape.

the daytime and realizing what it was. Or, listening to a sound outside and later walking by the source. In my practice, this is an important aspect of the found-ness of objects—even if they are removed from their original contexts, there is still the potential for connecting them to their origins.

Jane Bennet has had a large impact on how I think about the objects used in my artistic practice. In *Vibrant Matter*, she writes about the power grid—the mess of electrical lines and power plants that distributes electricity around North America. She describes the grid as an assemblage—one that holds a sort of distributed agency<sup>12</sup>—particularly in its creation of a massive power blackout in 2003. She writes of assemblages, “The effects generated by an assemblage are, rather, emergent properties, emergent in that their ability to make something happen [...] is distinct from the sum of the vital force of each materiality considered alone” (2010, p. 24). As in the situation with the power grid, the agency of assembles can emerge from them being (for lack of a better word) a mess. Messiness<sup>13</sup> comes with its own form of agency, as it leads to unpredictability, increasing what Bennet refers to as emergent properties. In my artistic practice, I like to invite this messiness and the agency of the assemblages with which I am working into process. The objects in *tltfttt* frequently cause sounds and shadows I cannot predict (sometimes by breaking or falling over unexpectedly), and this form of agency or messiness is designed into the way I perform with the instrument. Rather than fighting the agency of the objects, I embrace them as fellow collaborators.

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<sup>12</sup> Bennet defines agency as a combination of efficacy, trajectory, and causality (2010, p. 31).

<sup>13</sup> By messiness, I mean the logic may not be immediately clear or easily traceable, the processes may not be efficient, and the components and properties may not fit into neat categories.

## Conclusion

### found lights

“She fancied that the rooms brightened as she came in; stirred, opened their eyes as if they had been dozing in her absence. She fancied, too, that, hundreds and thousands of times as she had seen them, they never looked the same twice, as if so long a life as theirs had stored in them a myriad moods which changed with winter and summer, bright weather and dark, and her own fortunes and the people's characters who visited them. [...] She, who believed in no immortality, could not help feeling that her soul would come and go forever with the reds on the panels and the greens on the sofa”.

*Orlando*, Virginia Woolf (1928, p. 316)

“One can only believe entirely, perhaps, in what one cannot see.”

*Orlando*, Virginia Woolf (1928, p. 198)

In *tlfttt*, what started as parallel processes of working with found objects and found lights eventually revealed the different potentialities of found-ness in each medium. I was able to bring found objects from my living spaces into the same physical space as the audience. However, the found lights (lights and shadows from the same living spaces) necessitated some form of reproduction<sup>14</sup>. Thus, I recomposed these found lights using a different type of found-ness—found objects circling around as shadows, objects that were not the same objects that originally created the lights I observed (and in fact many of the objects did not have any relation to the lights at all). As such, the lights became something new, although still imbued with found-ness—an entirely different sort of found-ness that expanded beyond a quality of objects and incorporated my imperfect memory of the light and my experience of it in its original space. While the found objects were somewhat removed from their contexts to be

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<sup>14</sup> As the performance could not logistically happen at my house, nor could I transport windows, plants, cars going by, streetlights, the sun, etc. into the performance space

used for art-making, the found-ness of the lights re-introduced memory and space back into the instrument. I began to work with found-ness itself, alongside the media of sound, light, and objects. In *tlfttt*, found-ness exists separately but still in relation to the other media—it brings the media together while allowing me to build my relationships with each in different ways.

I see these two performances not as the culmination of *the lightest things float to the top*, but rather as a few events in what I hope will be a long relationship with this instrument. These performances and structured improvisations were just one “piece” I performed with this instrument—the materials and qualities of the instrument are rich enough to provide room to create new works. However, found-ness is an essential quality and ties all aspects of the work together. This quality affords expansion and recreation of the instrument as I collect new materials and continue to perform, perhaps discovering new forms of found-ness that can be incorporated along the way.

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## **Appendix A. What do spaces hold that we cannot perceive?**

This question is central to my artistic practice, and in this paper, I approach answering it through theoretical, scientific, and paranormal lenses. Spaces are dynamic and contain happenings beyond practiced perception. They are living systems that hold objects and beings, as well as all of their complex interactions. Spaces are also constellations of then and now (past and present) superimposed upon one another in a tangled web of memory and unseen forces. Based on these explorations and understandings of space, I strive to create systems in which these imperceptible qualities of space are more noticeable for audiences, frequently using technology alongside objects, sounds, and lights found in the spaces with which I am most familiar.

### **Spaces as Living Systems**

The first section of this paper will explore how spaces hold agency and life, beyond what humans typically attribute to them. I will examine two theories that deal primarily with objects, after examining how spaces can fit into their respective definitions of “object”. The first theory I will examine is object-oriented ontology, in which Graham Harman describes the constantly shifting sensory qualities of objects as essential to object-ness. The second theory is the vibrancy of matter, in which Jane Bennet discusses many similar qualities of objects, but refers to them as vibrancy. She goes on to explore how vast networks of objects (assemblages) possess agency through their sheer complexity and unpredictability. Then, I look at the life held in spaces via Robin Wall Kimmerer’s discussions of the differences between Ojibwe and English as languages, and their differing understandings of the boundaries of animacy.

Graham Harman defines “object” as “anything that cannot be entirely reduced either to the components of which it is made or to the effects that it has on other



things”.<sup>15</sup> Harman recognizes that he is referring to objects in “an unusually wide sense”, and does this partially in response to other philosophical lines of thinking that differentiate between objects and things—and in doing so get tangled up in comparing rival definitions of words that are very close to being synonyms.<sup>16</sup> Jane Bennet describes this practice of referring to objects as things as recognizing the objects as “vivid entities not entirely reducible to the contexts in which (human) subjects set them, never entirely exhausted by their semiotics,”<sup>17</sup> and she goes on to mostly use her own related term “vibrant matter” for the remainder of the book (choosing to mostly stay away from differentiating between “object” and “thing”). Rather than also adding to the comparisons between objects and things, I am going to focus on the relationship between objects and spaces under these two definitions. Combining these two definitions, spaces, like objects, cannot be entirely reduced to their components, the effects they have on other things, nor the contexts in which human subjects place them. Furthermore, Bennet goes on to describe thing-power, “the curious ability of inanimate things to animate, to act, to produce effects dramatic and subtle.”<sup>18</sup> Spaces, too, possess their own version of this power and agency as demonstrated in the examples below.

Graham Harman uses the phrase “bundles of qualities” to describe objects, starting with the specific example of the White House (as well as an apple, as detailed later in this paper):

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<sup>15</sup> Graham Harman, *Object-Oriented Ontology: A New Theory of Everything* (Penguin Books: 2018), 43.

<sup>16</sup> *Ibid.*, 42

<sup>17</sup> Jane Bennet, *Vibrant Matter: A Political Ecology of Things* (Durham and London: Duke University Press, 2010), 5.

<sup>18</sup> *Ibid.*, 6.

Supposedly, none of us has ever seen an object called 'the White House' in Washington, but only a rectangular shape of generally off-white colour, with a combination of semi-circular and columnar shapes in the centre. Since these qualities seem to remain together in stable fashion, and since everyone apparently agrees about this, we form the habit of speaking of a unified object called 'White House' even though the 'object' part of it does not seem to add anything to our perception of the bundle of its various qualities.<sup>19</sup>

Harman's description of objects as a "bundle of qualities"<sup>20</sup> holds many similarities to assemblage theory, which Bennet elaborates on more. Spaces are bundles of real and perceptual qualities, and they have just as much of a role in larger assemblages as objects do. They are constantly shifting bundles of sensory qualities—and these qualities change with angles and amounts of light, how sound is filling the space, how air is moving, any smells present, and much more. All of this sensory information is complex and constantly changing, so that we cannot possibly perceive all of the qualities of spaces or foresee all of their emergent qualities. In other words, a space cannot entirely be reduced to its components (the sum is more than the parts).

Jane Bennet theorizes that the agency of objects is in fact a distributive agency that comes, at least in part, from their complex relationships to each other and their roles in forming assemblages: "While the smallest or simplest body or bit may indeed express a vital impetus, [...] an actant<sup>21</sup> never really acts alone. Its efficacy or agency always depends on the collaboration, cooperation, or interactive interference of many

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<sup>19</sup> Graham Harman, *Object-Oriented Ontology: A New Theory of Everything* (Penguin Books: 2018), 154.

<sup>20</sup> from philosopher Edmund Husserl

<sup>21</sup> Jane Bennet cites Bruno Latour in defining actant: "something that acts or to which activity is granted by others. It implies no special motivation of human individual actors, nor of humans in general." (9)

bodies and forces”<sup>22</sup>. In demonstrating the agency of a specific assemblage, Bennet draws on the example of the massive and unwieldy power grid in the United States. Bennet uses this example to discuss the agency of objects, and how the interconnectedness of objects in a larger system can result in unpredictable outcomes that demonstrate distributive agency across the system (such as power blackouts). Though Bennet describes the power grid as a network of objects, it is equally a network of spaces—individual power plants—connected by the flow of electrons. Similarly to how Bennet views the grid as a network of objects with distributed agency across the system, my practice treats spaces as networks of objects (and bundles of ever-changing qualities) with their own agency. The line between object and space becomes blurred when they can both be viewed as assemblages or larger systems of interconnected elements.

Robin Wall Kimmerer addresses the agency of spaces in her book *Braiding Sweetgrass* as well, when she speaks of learning Ojibwe as someone who grew up speaking English, and having to re-learn the differences between nouns and verbs. She uses the specific example of a bay:

A bay is a noun only if water is *dead*. When *bay* is a noun, it is defined by humans, trapped between its shores and contained by the word. But the verb *wiikwegamaa*—to *be* a bay—releases the water from bondage and lets it live. ‘To be a bay’ holds the wonder that, for this moment, the living water has decided to shelter itself between these shores, conversing with cedar roots and a flock of baby mergansers. Because it could do otherwise.<sup>23</sup>

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<sup>22</sup> Jane Bennet, *Vibrant Matter: A Political Ecology of Things* (Durham and London: Duke University Press, 2010), 21.

<sup>23</sup> Robin Wall Kimmerer, *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge, and the Teachings of Plants*, (Canada: Milkweed Editions, 2013), 55.

As she learns more Ojibwe, Kimmerer discovers that animacy means something different between the two languages, and that this foundational idea changes the understandings of nouns and verbs. In English, we view a bay as a static location, distilling it to a single feature, rather than a dynamic assemblage of water, land, and all the other beings that occupy that space. However, in Ojibwe, bay is a verb, and the word for bay holds all the life that an actual bay can hold.

Not only are spaces bundles of qualities and networks of objects, those objects' agency and the way they interact with each other create living systems. Understanding spaces in this way affords a clearer view of the complexities of the spaces we inhabit and the spaces' influence on us, as well as all the nonhuman beings around us. The human is de-centered, and the hierarchy between living human and nonliving space becomes less confining and one-dimensional. Spaces provide containers and organizational structures for these dynamic exchanges between qualities, objects, and other beings. When we recognize spaces as dynamic, we can see how they take on a form of agency and life as their own.

### **The Movement of Particles**

Through a scientific lens, there are countless (or perhaps very countable, but very many) things that are happening in every space, and at a level that humans cannot perceive. When studying calculus and chemistry, word problems frequently come with the disclaimer that the person solving them should ignore the physical characteristics of the container a given substance is in. For instance, calculate the number of kernels of corn a truck can hold, but assume the truck bed is a perfect rectangular prism. The characteristics of the container of a substance affect everything that happens inside of it. For instance, what if the truck bed has dents from larger objects it has held in the past clanging around? Those dents could hold a few kernels of corn apiece and change the outcome of the equation. And what is a room, other than a large and not-completely-rectangular prism (have you ever seen a completely rectangular truck bed)?

For the purposes of this paper, I will be focusing on sound and light, the two media I am working with, and how the container they fill (space) influences how they move.

Sound is vibration, and most of the sound we experience as humans is transmitted through air. Because sound is the movement (compression and rarefaction) of air molecules, sound does not move in a straight line like we often picture it. Rather, air molecules are bouncing around messily off of every surface in a given space, including the bodies of any listeners. Pauline Oliveros writes in *Quantum Listening*, “What is heard by the listener is changed by listening and changes the listener.”<sup>24</sup> She elaborates later in the book: “Each listener, through the act of listening, affects the field and thus the form.”<sup>25</sup> The form affects the listener in a dance of reflections in the space in between”.<sup>26</sup> Oliveros is drawing attention to a natural quality of sound, that it reflects or reverberates off of surfaces before returning to ears. So, every sound that you hear is naturally reverberating off the walls (or trees, or puddles, if you’re outside) around you. Sometimes this happens at a level humans can perceive—such as when you yell into a cave and can hear the echos—and sometimes it happens less noticeably or so quietly we don’t hear it at all. But it is almost always happening (unless you’re in a theoretically reverb-less anechoic chamber). By being in a space, you affect the field of sonically-reflective surfaces, but—whether a human is there or not—the space itself affects every sound inside of it.

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<sup>24</sup> Pauline Oliveros, *Quantum Listening* (Ignota Books, 2022), 30.

<sup>25</sup> Oliveros describes “field” and “form” in the following way: “The field of sound can be felt as a potential force. There is active participation by the listener and co-creation of this form between the listener and sounds.” Later, she goes on to describe how a listener’s placement in a field of sound will cause them to hear the form in different ways. “Different listeners would have to occupy different locations in the field thus their experience of the field would be different. This is no less true when listening to a piece of music in an audience in a concert hall.” (53-54). She does not specifically define “form” but it can be understood as the relationship between listener and sounds, and the sonic outcomes of this relationship.

<sup>26</sup> *Ibid.*, 54.

Similarly, the movement of light particles (photons) is affected by the characteristics of the space they fill. Light is constantly reflecting off all the surfaces in its surroundings, changing the appearance of every object we see. Returning to the work of Graham Harman, “If I turn an apple in my hand, then toss and catch it repeatedly, I see a constantly shifting parade of different qualities. [...] The vaunted ‘bundle of qualities’ is really just a bundle of shifting accidental appearances”.<sup>27</sup> Light is a big part of this equation—which parts of the apple photons are reflecting off of the most, and which parts of the apple photons are reflecting off of less often. Furthermore, it’s impossible to predict exactly how photons will behave: “we cannot predict whether a given photon will arrive at A or B. All we can predict is that out of 100 photons that come down [for example], an average of 4 will be reflected by the front surface. Does this mean that physics, a science of great exactitude, has been reduced to calculating only the *probability* of an event, and not predicting exactly what will happen? Yes. [...] Nature permits us to calculate only probabilities”.<sup>28</sup> This dance between photons and all of the surfaces they encounter occurs in ways that are so complex and minute that they are beyond our practiced perception. At the atomic and subatomic levels, things that we cannot perceive, and that influence how we see and hear the world, are happening around us all the time. Similarly to how Bennet’s networks of objects function, the reflections of particles afford emergent and unpredictable outcomes through their complex movements around a space.

Two main conclusions from all this science are important to this paper. 1) Sound and light are reflecting around spaces all the time, whether we perceive these reflections or not. They are also reflecting in a manner that is so complex that the

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<sup>27</sup> Graham Harman, *Object-Oriented Ontology: A New Theory of Everything* (Penguin Books: 2018), 76.

<sup>28</sup> Richard P. Feynman, *QED: The Strange Theory of Light and Matter* (London: Princeton University Press, 1985), 19.

outcomes of these reflections are not fully predictable. And 2) by entering a space, we give sound and light an additional surface to bounce off of, and therefore these reflections—and how we perceive the sound and light in a space—are influenced by our presence, as much as they are influenced by the space itself, as well as the non-human objects inside the space.

### **Constellations of Then and Now**

In addition to atomic and subatomic particles, spaces also contain remnants of the past that are beyond what is perceivable by humans. For this section, I would like to apply the idea of space-as-constellation—that every space is a constellation of the past, present, and possible futures (and for the purposes of this paper, I will focus on just past and present). Movement between these temporalities can be a productive act in removing hierarchies between the present and past, and can help us understand the memories and pasts that the spaces around us hold. María del Pilar Blanco discusses the benefits of removing these barriers between present and past in her descriptions of image-as-constellation. She writes of “a productive multiplicity in vision and scope that brings the past forward, allowing a dialogue between both temporalities, [...] the simultaneous alignment of the then and now. [...] To perceive this constellation is to admit a weight of responsibility toward that which precedes us and also that which is yet to come.”<sup>29</sup> While the medium is different, spaces, like images, provide a means for capturing moments of the past. Spaces hold the same potential as images—that what has happened before in a space can be just as alive and present as what is happening now.

These ideas are reflected in contemporary paranormal investigation technology, much of which operates on the understanding that spaces hold things that we cannot perceive. One example of these technologies is the spirit box. The spirit box is a radio

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<sup>29</sup> María del Pilar Blanco, “Hauntology” from *Supernatural America: The Paranormal in American Art* (Chicago and London: The University of Chicago Press, 2021), 29.

which scans through channels (radio frequencies that are already in a room and in most spaces we occupy), in order to give paranormal entities the chance to influence these radio waves to communicate with the living:

Radio waves are all around us—and not only do they exist on a frequency, but every type of energy has a frequency as well. So, why not ghosts? That’s the theory behind the Spirit Box. “The device scans through radio frequencies fairly quickly,” says Adam<sup>30</sup>, “and in turn it creates white noise. We speculate that spirits [are able to] manipulate that white noise and actually start forming words.<sup>31</sup>

In addition to spirit boxes, paranormal investigators also use sound to connect with unseen forces in their analyses of electronic voice phenomena (EVPs), which can be recorded unintentionally or can be intentionally requested and recorded. Humans record EVPs by conducting conversations in supernaturally active spaces: people speak to and record the space, and then listen to and edit recordings later, interpreting any replies. EVP recordings frequently take the form of extremely amplified room tone, which humans listen to later, paying careful attention to any sounds that are vocal in nature. Both spirit boxes and EVPs depend on the imperceptible qualities of spaces, that there are sounds present in spaces that human ears cannot hear (at least unaided by amplification, or in the case of radio waves the translation of light into sound<sup>32</sup>).

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<sup>30</sup> Here Alyssa Smith quotes Adam Berry, a paranormal investigator, producer, actor most known for being in *Kindred Spirits* (2016) and *Ghost Hunters* (2004).

<sup>31</sup> Alyssa Smith, “The Mother-Daughter Ghosts” from *Ghost Hunting: Talking to the Dead* (Canada: Better Homes and Gardens, 2022), 23.

<sup>32</sup> Radio waves are light waves. They are a form of electromagnetic radiation that moves at the speed of light. Source: <https://hubblesite.org/contents/articles/the-electromagnetic-spectrum#:~:text=Other%20types%20of%20light%20include,second%20%E2%80%94%20the%20speed%20of%20light.>



However, these technologies also access forces and memories tied to past events that happened in spaces. Sound merely provides a vehicle for doing so.

These technologies have their roots in older paranormal investigation technologies, like the talking board, that are meant to communicate with the paranormal entities already present in a space. These entities are often imperceptible and unreachable for living humans without a mediating technology. They are also often site-specific, meaning they are tied to a specific space and the events that happened there in the past. This paper and my practice do not aim to speculate on whether or not these paranormal entities are real. Whether or not they are, the practices of using technology to try to contact them are very real, and these practices inform the ways in which humans interact with and understand space, as well as our own relationships to the past. Technology, in paranormal investigation practices, serves as a means for tapping into the unseen forces and remnants of the past that are already present, to differing degrees, in every space we encounter. Similarly, my practice seeks to make the imperceptible qualities of spaces—including memories held by them—more perceivable for an audience. Technology serves as a conduit for this heightened perception in my practice as well. By amplifying sounds that are too quiet to be heard and magnifying the tiny movements of light, these qualities of space become the media of performance.

### **Conclusions**

Given that human senses are imperfect and that spaces hold qualities beyond what we can perceive, attributing agency and life to spaces affords a de-centering of the human that can allow us to be more responsible in our encounters with the world around us. Jane Bennet writes,

One moral of the story is that we are also nonhuman and that things, too, are vital players in the world. The hope is that the story will enhance receptivity to the impersonal life that surrounds and infuses us, will generate a more subtle

awareness of the complicated web of dissonant connections between bodies, and will enable wiser interventions into that ecology.<sup>33</sup>

By placing humans as just one more factor in a complex and living system, we begin to notice how our interactions with the world around us can have an impact beyond what we can see.

Some argue that perhaps by attributing agency to spaces, we just anthropomorphize them, furthering the dominance of humanness in the narrative. Attributing agency and life to space is, in a way, giving space human characteristics. In doing so, however, we can be cautious not to fall into the trap of making spaces more human simply so we can understand them better:

Maybe it is worth running the risks associated with anthropomorphizing (superstition, the divinization of nature, romanticism) because it, oddly enough, works against anthropocentrism: a chord is struck between person and thing, and I am no longer above or outside a nonhuman 'environment.' Too often the philosophical rejection of anthropomorphism is bound up with a hubristic demand that only humans [...] can bear any traces of creative agency. To qualify and attenuate this desire is to make it possible to discern a kind of life irreducible to the activities of humans [...]. This material vitality is me, it predates me, it exceeds me, it postdates me.<sup>34</sup>

There is life in the movement of particles and the relationships between objects. Complexity affords unpredictability, and with unpredictability can come agency. Spaces then can be seen as living systems—with humans just being one more part of these systems—as constellations of past and present, including all the interactions between the objects they contain.

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<sup>33</sup> Jane Bennet, *Vibrant Matter: A Political Ecology of Things* (Durham and London: Duke University Press, 2010), 4.

<sup>34</sup> *Ibid.*, 120

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## **Appendix B. Photo and Video Documentation**

Please find documentation of *the lightest things float to the top* at [kittiecooper.com/thelightestthingsfloattothetop](http://kittiecooper.com/thelightestthingsfloattothetop).

Appendix C. *the lightest things float to the top* Program and  
Text Score

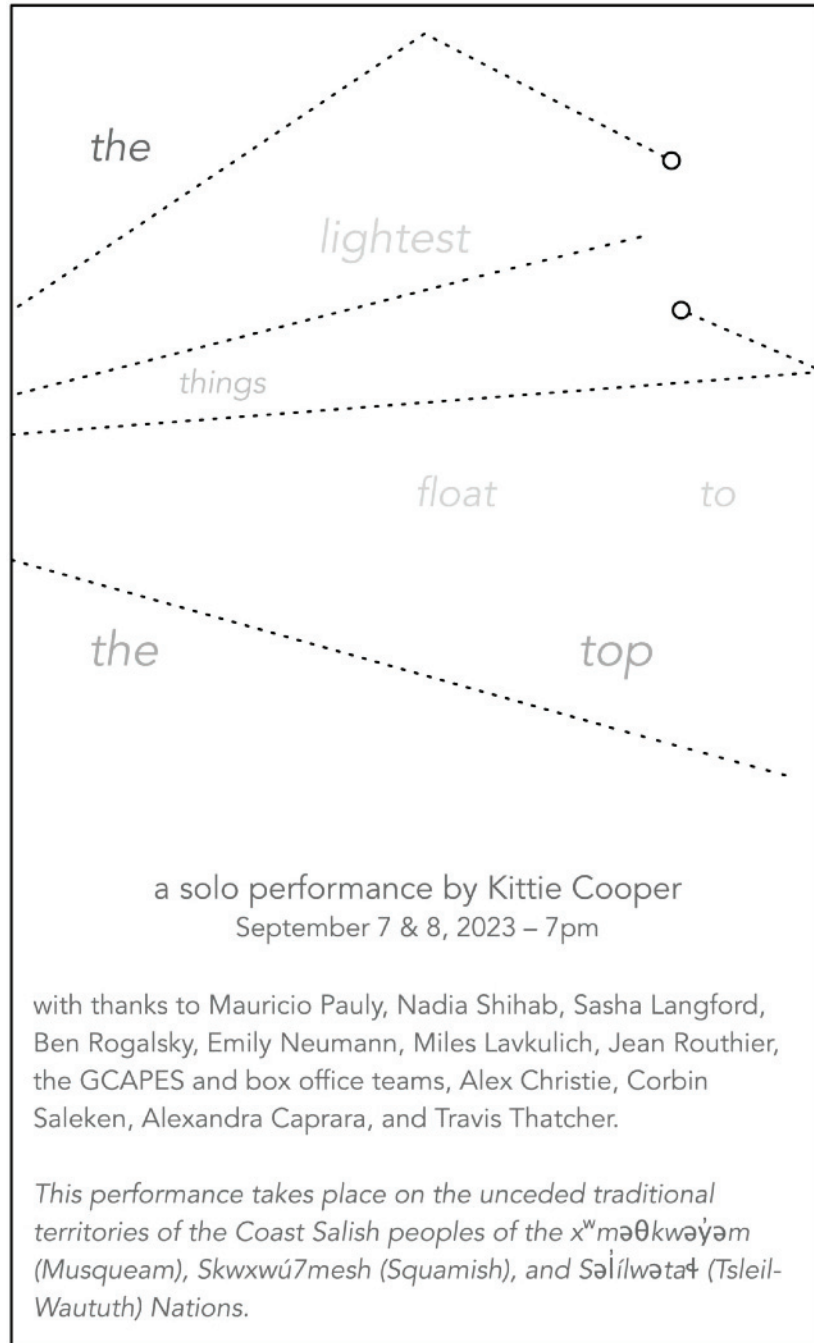


Figure 16. *the lightest things float to the top*  
program & text score, front

## *an invitation*

Fold, tear, colour, or by any other means transform this paper. The new shape of the paper may be something that reminds you of something else, or it may be completely abstract. When you are finished, place the paper near (or affix it to) a window in a space you regularly inhabit.

Notice the shadows the paper creates in the space.

### DAY

Continue to notice these shadows throughout the day. Note any changes.

### WEEK

Note any times at which you are particularly drawn to the shapes of the shadows. Times may be approximate. Try to return to noticing the shadows at these times, as you remember to do so.

### SEASON

Continue to notice the shadows at these times. You may discover new times, or forget old ones. Notice any changes in the shadows across the days.

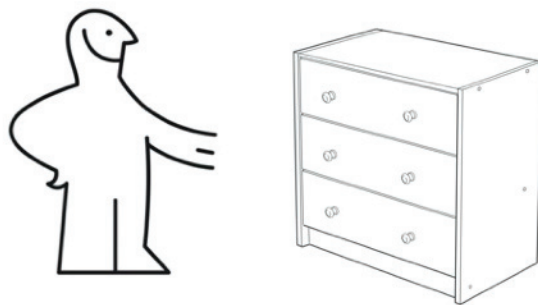
Figure 17. *the lightest things float to the top*  
program & text score, back

Appendix D. *the lightest things float to the top* (April 2022 version):

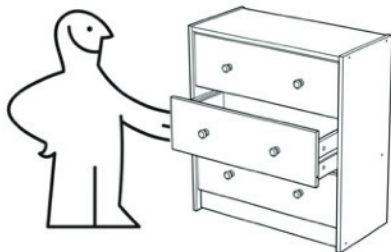
Contribution to Publication for 2022 MFA Spring Show at Simon Fraser University

**instructions for human and chest of drawers**

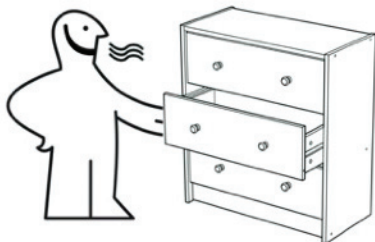
to be performed with your own chest of drawers



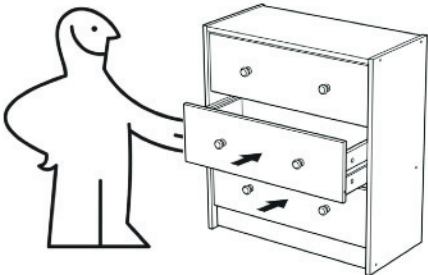
1. open drawer. inspect the objects inside.



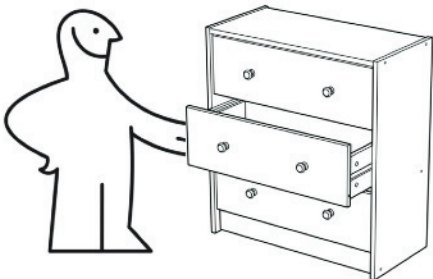
2. breathe into your drawer. feel your breath move past the objects.



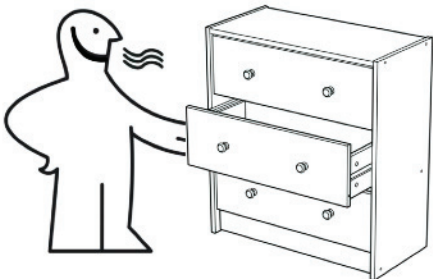
3. close drawer and listen for signs of life.



4. open drawer again.

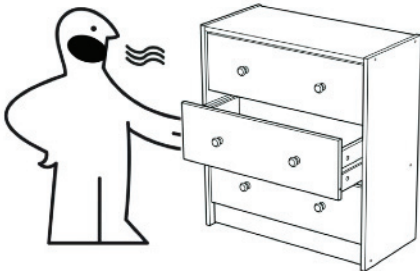


5. continue breathing into drawer until the objects come back to life.

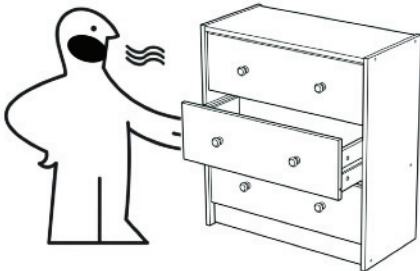




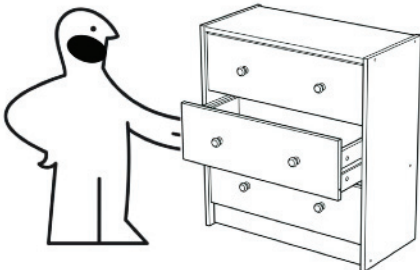
6. if the objects do not come back to life, scream on the objects.



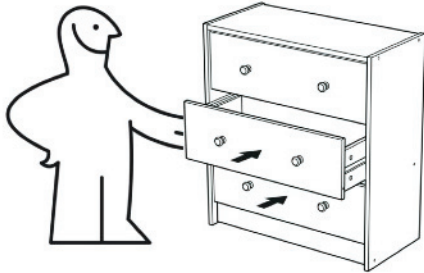
7. feel your breath move past them more erratically.



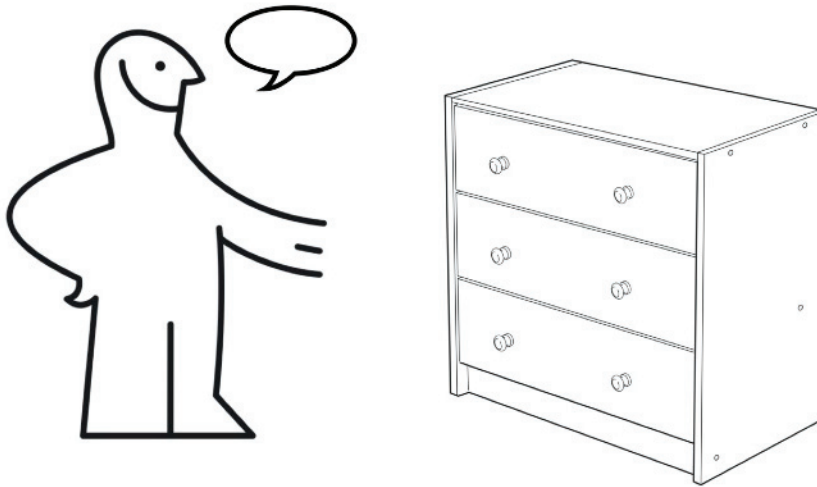
8. continue screaming until the chest of drawers is full of your breath.



9. close drawer. listen to the objects moving inside.



10. thank your chest of drawers for holding these objects.



by Kittie Cooper, 2022

some graphics borrowed from Ikea RAST instruction manual

Thank you, Ikea!

Figure 18. *instructions for human and chest of drawers  
(to be performed with your own chest of drawers)*