



“How does the twinkling light of Sirius A shape the space and time of our dreams at night?”

Each second of the star light (300,000 km/sec) can be seen as an unique piece of evidence indicating the huge scale of time and space. This enlarges the potential of magnitude to transport messages.

# Interstellar Dialog: Sirius A

*What if the magnitude of Sirius A in the night sky deliver information?*

*What if other possible lives on Sirius A manipulate our dreams to communicate with us?*

*What if we can decode those messages by speculating the potential patterns between the twinkling lights of Sirius A and our brain waves of unconscious dreams?*

*How can we respond to those messages?*

Solo Project  
Timeline: 3 months (2022)  
Tutor:  
Dr. Andy Simionato & Dr. Karen ann Donnachie  
  
Promote Video:  
<https://vimeo.com/762456467>  
  
Exhibited in RMIT University (2022)

The stars that we gaze upon the sky have traveled at the speed of light, for millions of years to enter our eyes. Sirius A is the brightest star in the night sky for observers on the earth. From the planet humans are standing, stars are seen as they were, not as they are.

## INSPIRATIONS: Literature

### Inspiration 01: Movie 'Interstellar'

The speculated five-axis dimension in the film includes three dimensions of the space, and fourth is the time. **The fifth is the emotion, story, the connection between humans.**

**Social Constructionism** is the theory I've been studying. Society is built up from social interactions, connections. Nobody is an island in human society.

*Those connections humans built within our own culture can travel along the universe. Those bonds become an unique axis for human kinds.*



'Five Dimension Space' from Movie 'Interstellar'

### Inspiration 02:

**A Cyborg Manifesto:**  
Science, Technology, and  
Socialist-Feminism in the Late  
Twentieth Century

by Donna Haraway

*The translation of the world into a problem of coding, a search for a common language.*

Our **best machines** are made of sunshine; they are all light and clean because they are nothing but **signals, electromagnetic waves**, a section of a **spectrum**, and these machines are eminently **portable, mobile**.

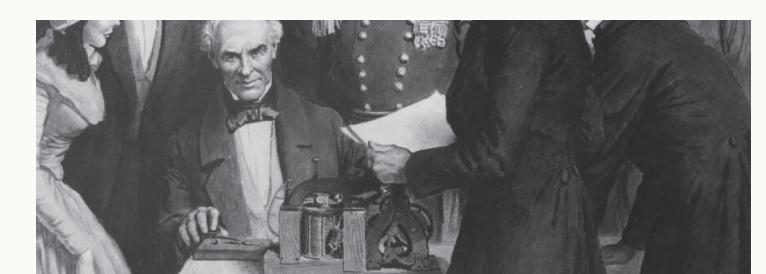
**Information is just that kind of quantifiable element** (unit, basis of unity) which allows **universal translation**, and so **unhindered instrumental power** (called effective communication).



### Inspiration 03:

**Technology and Ideology:**  
the Case of Telegraph

by James Carey



Samuel Morse sending the first public telegraph, 1844

### *Annihilation of time and space*

**Communication, exchange, motion brings humanity, enlightenment, progress and that isolation and disconnection are evidence of barbarism and merely obstacles to be overcome**

The telegraph allowed communication to control physical processes actively.

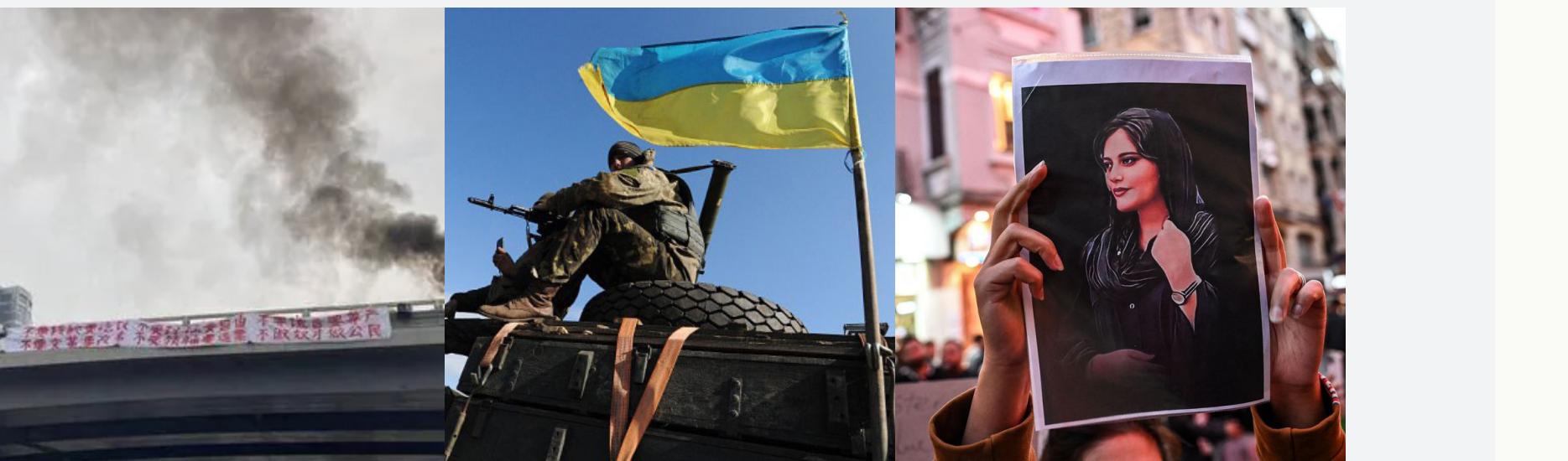
## RESEARCH: Why Matters

I am extremely sad for people who are suffering from wars, injustice worldwide at the moment.  
**The universality, inclusivity are indeed rooted within every piece of my work as I truly, heartfully believe:**

**"People were people-everywhere were the same."**

By exploring, decoding, speculating things that we are all under (sky, universe),

**I would like to empower lives of all kinds.**



Left: Rare citizen protest against communist party in Beijing, 2022 | Middle: War between Russia & Ukraine, 2022 | Right: Iran Protest: The death of Mahsa Amini, 2022

Events such as **Olympics, groundbreaking spaceship launch** and so on, **empower all human-beings without any social identity**.

**Universal moments as such remind us progresses that are relatively shared.**

**When we fight against each other, we are the ones to lose.**

"The goal of the Olympic Movement is to contribute to building a peaceful and better world by educating youth through sport practiced **without discrimination of any kind** and in the Olympic spirit, which requires mutual understanding with **a spirit of friendship, solidarity and fair play.**"



First man on the moon, Apollo



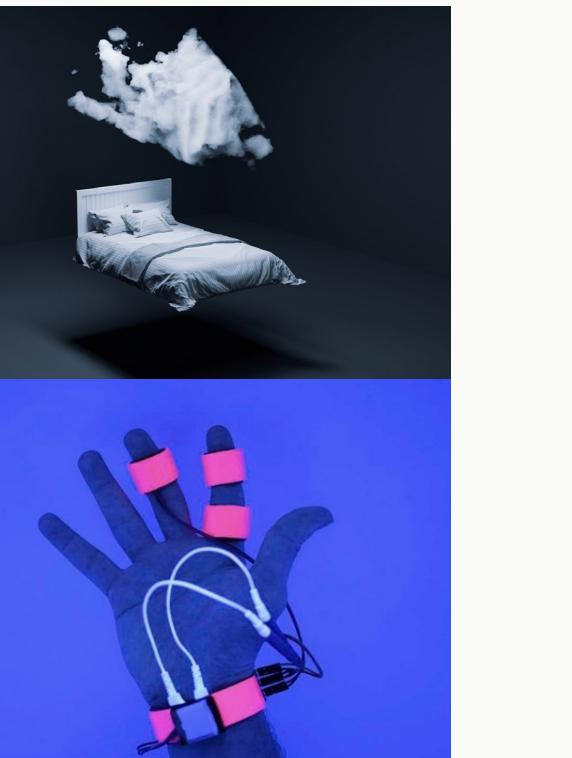
Olympics Tokyo, 2020

## RESEARCH: Fields of Interest (Why Dreams)

**Combining my own research interest in Self-determination Theory especially with a focus on autonomy studying, I am particularly interested in dreams.**

**We yet can not control what to dream about.**

Where I would go?  
What would I go?  
How would I do?  
What about others?  
We don't know.  
We can't control.



A Testing Machine Control Dreams: Dormio (MIT Media Lab, 2022)

## Self-determination Theory

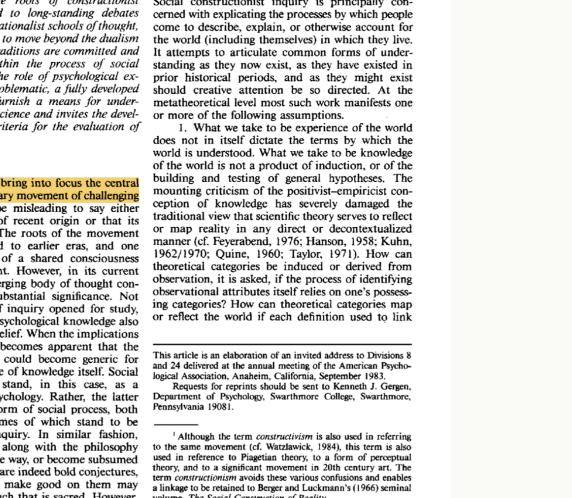
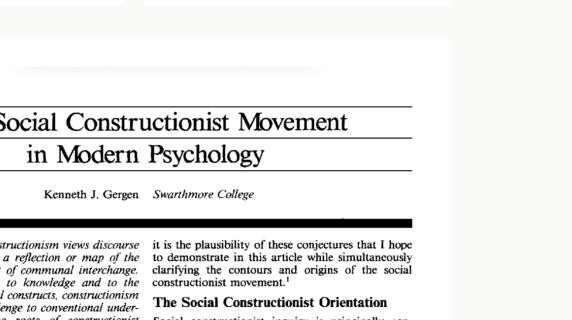
Social-contextual factors that promote feelings of autonomy and competence enhance intrinsic motivation, whereas factors that diminish these feelings undermine intrinsic motivation, leaving people either controlled by contingencies or amotivated.

## Social Constructionism

Inquiry into the social construction of self can roughly be divided into three categories.

The first is primarily concerned with establishing the **self as a social construction**. The second is focused on **specific social processes** in which the conception of **self is embedded**.

The third involves critical assessments of the cultural and political **outcomes of traditional beliefs in the self**.

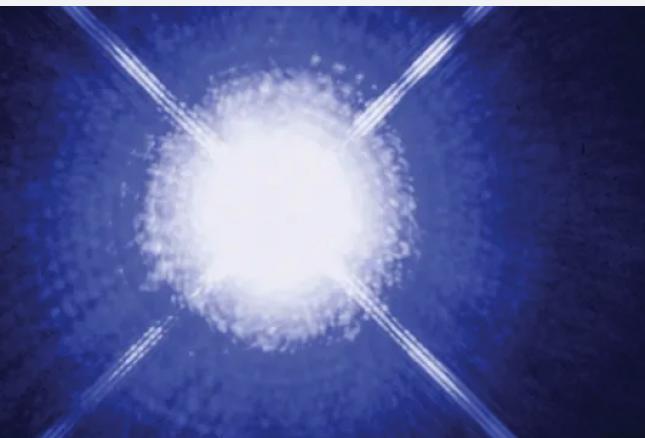


**Reading List:**  
1. Disengagement Theory: A Critique and Proposal (by Arlie Russell Hochschild) |  
2. The Self as Social Construction (by Kenneth J. Gergen) | 3. The Social Constructionist Movement in Modern Psychology (by Kenneth J. Gergen)

## RESEARCH: Sirius A (Why Sirius A)

**Sirius A is the brightest star in the night sky on earth.**

**With the unignorable brightness of Sirius A, I speculate the magnitude being the agency of other lives on Sirius to communicate with humankind.**



Sirius A

Sirius, also called **Alpha Canis Majoris** or the **Dog Star**, brightest star in the night sky, with apparent visual magnitude  $-1.46$ .



The Transiting Exoplanet Survey Satellite (TESS) launched to study the exoplanets of bright stars  
Credit: NASA

## Myth of Sirius in History

**Sirius A has been grabbing people attention since long times ago. I am not the only one who've been noticing it.**



Sopdet – The Egyptian Sirius Goddess



Ancient Greece Myth and Sirius

**"The Blazing Star has been regarded as an emblem of Omniscience, or the All Seeing Eye, which to the Ancients was the Sun."**

**Albert Pike**

In Greek mythology Sirius appears in many forms, however, she is usually said to be called Maira (Maera) from the Ancient Greek "marmairó", meaning "to flash, sparkle, glisten, and gleam".

**For the ancient Egyptians, the rising of Sirius, the brightest star, signaled a time of upheaval and flooding of the River Nile Valley.**



Interstellar Dialog: Sirius A

## RESEARCH: Why Music

Vibration/Sound/Music is decided as my agency to send out messages as the response to the possible information from Sirius A.

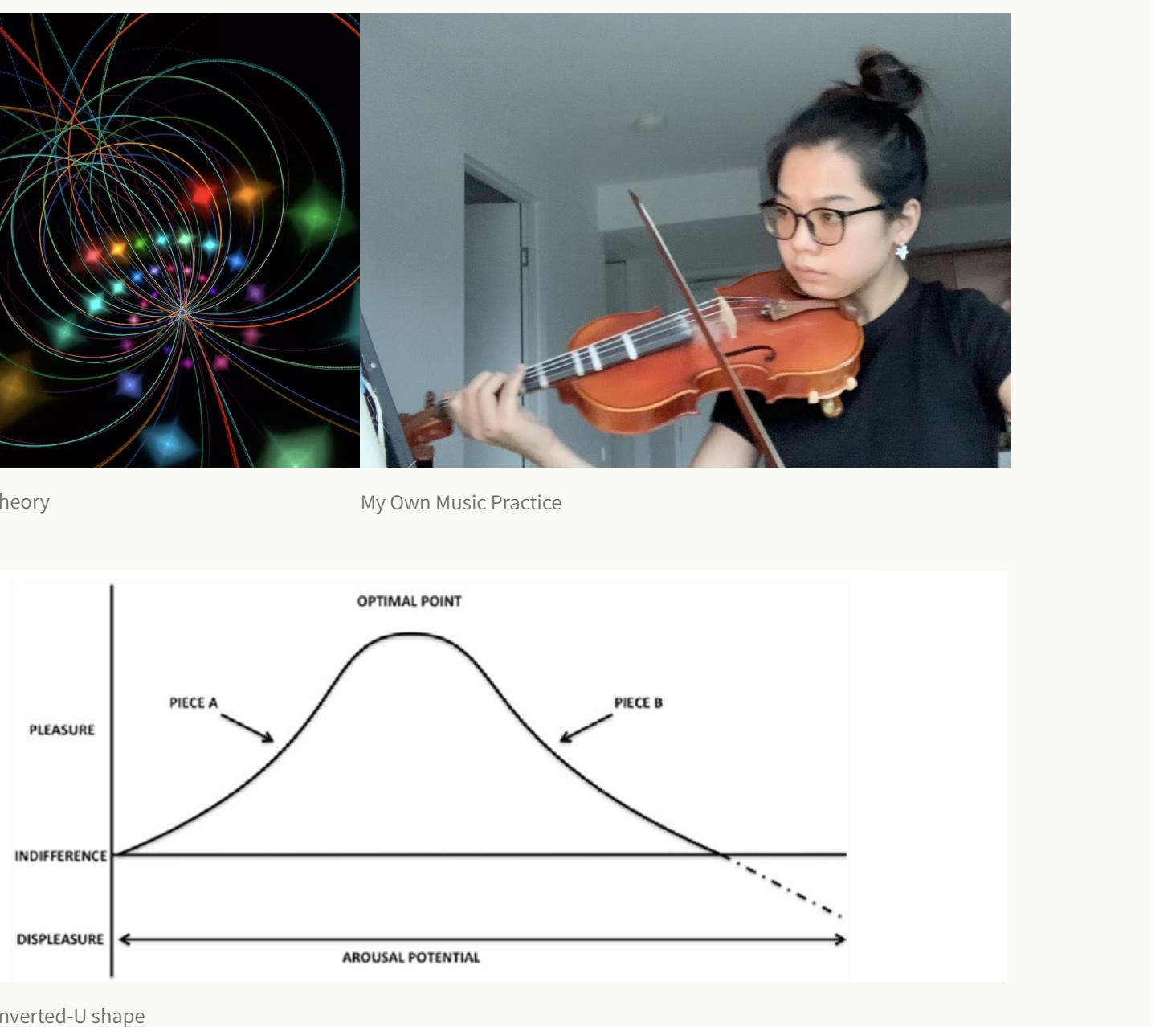
1. Sound can travel cosmically based on the hypothetical String Theory
2. Music (Vibration) is a known engaging media to empower human beings, and so, possibly other unknown lives.

### Music Pleasure

The experience of intensely pleasurable music can cause **dopamine release in the mesolimbic reward system** (Salimpoor et al, 2015).

### Music Surprise

Wundt inverted-U shape explains the Music Surprise. **Tension stimulated by expectation**, and its **denial or fulfillment** are in large part responsible for **emotional arousal** and pleasure in music.



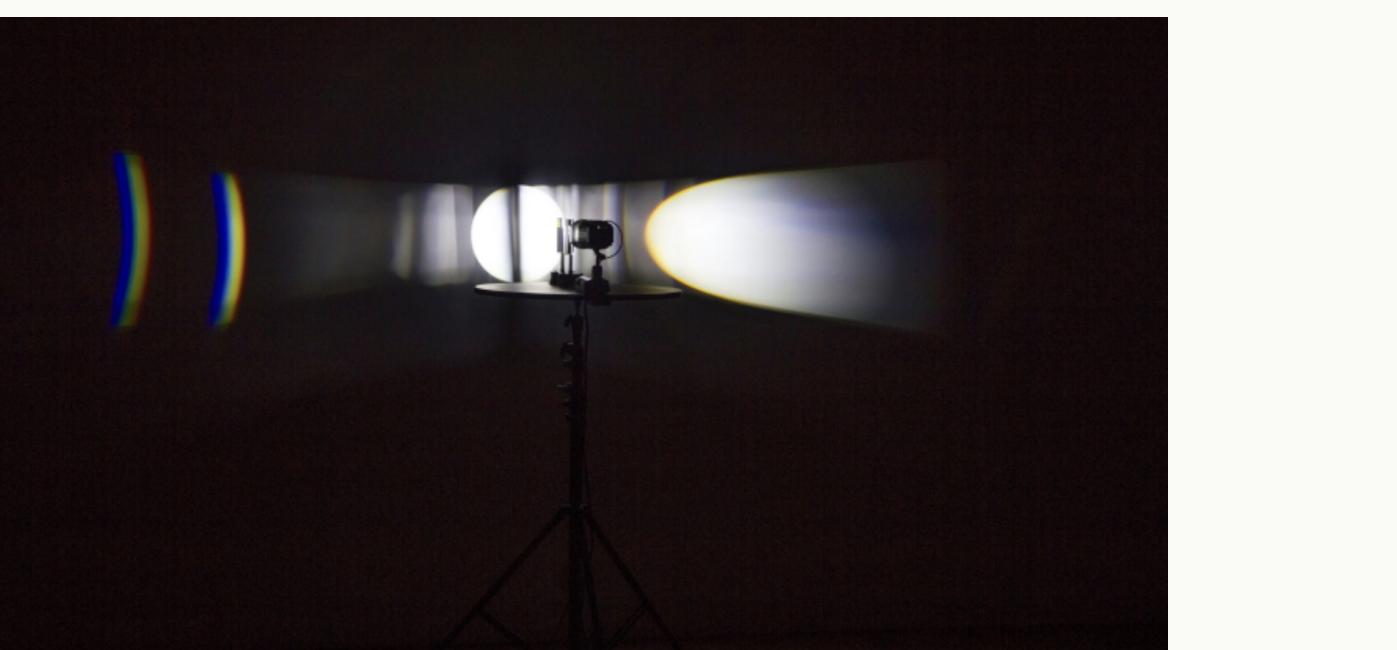
## RESEARCH: Inspiring Events & Works (Selected)

### Inspiring Events 01: The Golden Record: NASA



NASA Golden Record, 1977

### Inspiring Artists: Michaele Gleave



Eclipse Machine, Michaele Gleave

## CONCEPTUALIZATION: What to do

An interactive designed experience to empower lives living under the same Sirius A

A response for messages that appear in our unconscious dreams which might possibly be sent by potential lives on Sirius A through its twinkles.

### Expected Output

- Vinyl sent to Sirius A, collecting soundtracks
  1. Theta waves (brainwaves of unconscious moments) when people dreaming at night
  2. Sirius A magnitude
  3. dreams collection of people from diverse cultural background
- Interactive Website
 

playing sound track and presenting concept to audiences
- Conceptual Video
 

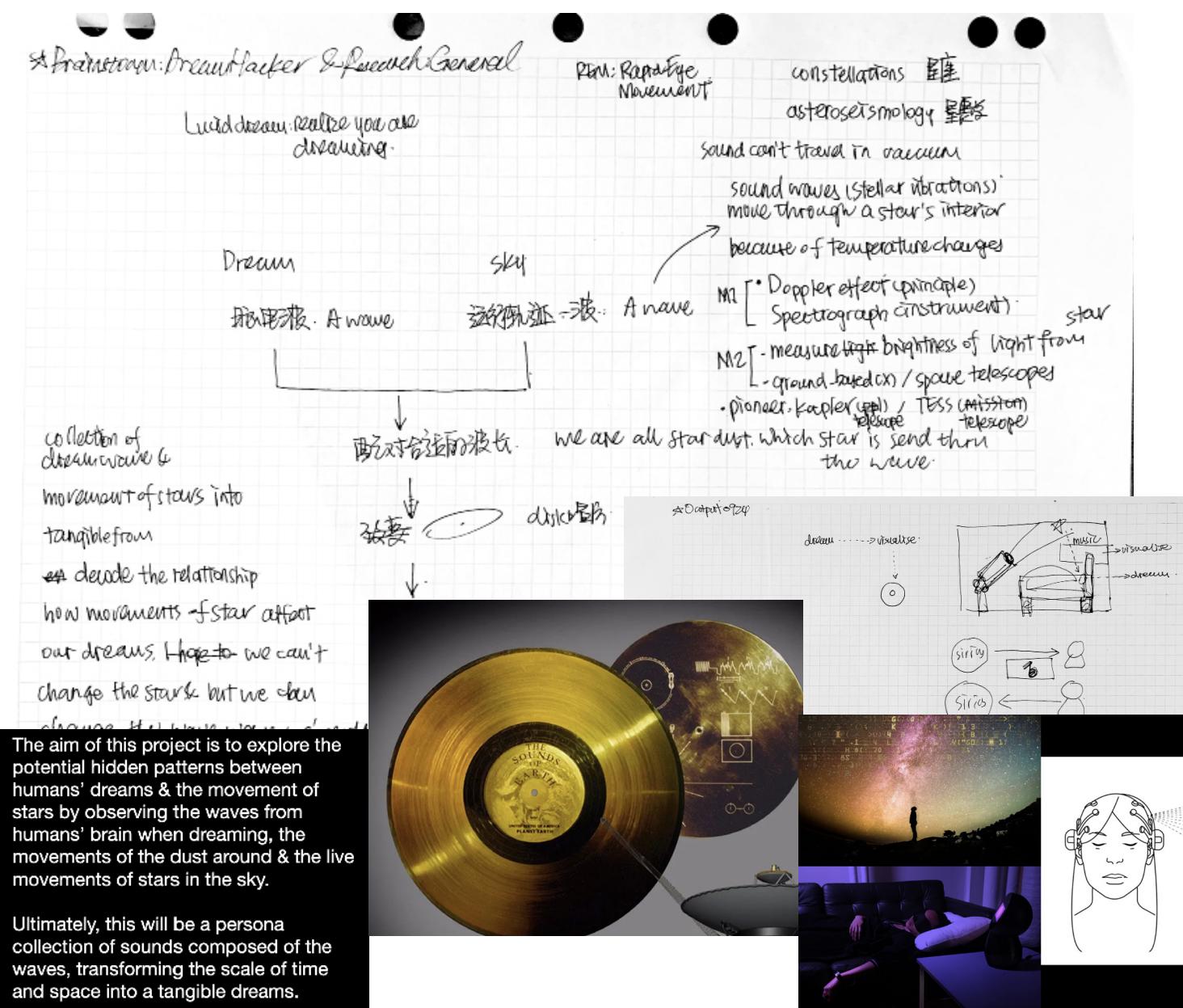
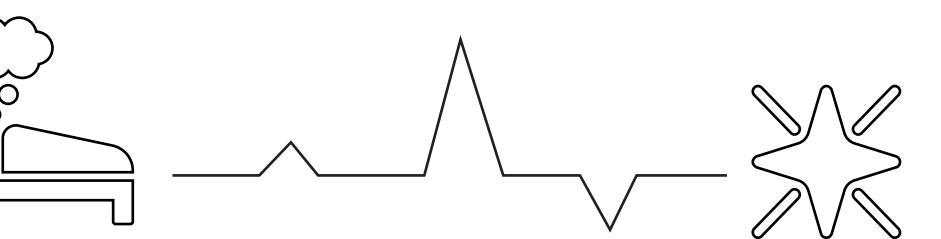
empower and engage with audiences

A tribute to all our mysterious dreams and fantasy upon the brightest star in the night sky

A trumpet of the strings vibrating in the whole universe

### Expected Agency (Machines)

- Brain Computer Interface
- Digital Camera
- Virtual Telescope
- Vinyl (inspired by 'The Golden Record')



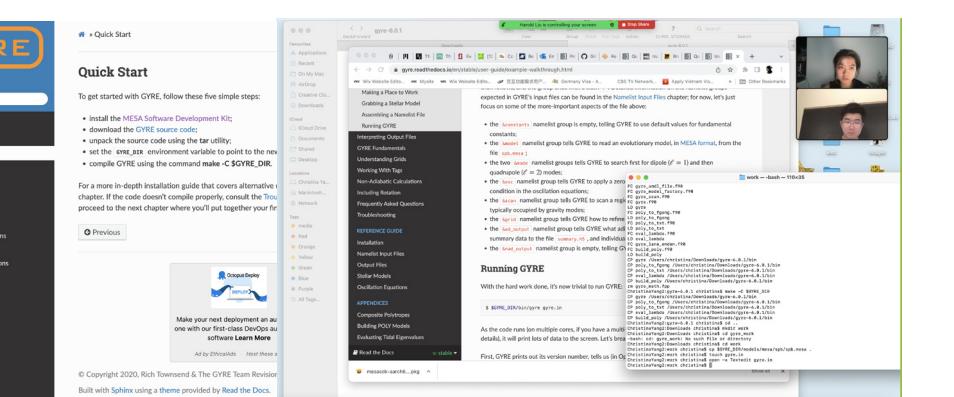
## EXPERIMENT: Sirius A Magnitude Extraction (Process)

### Experiment 01: GYRE+MESA

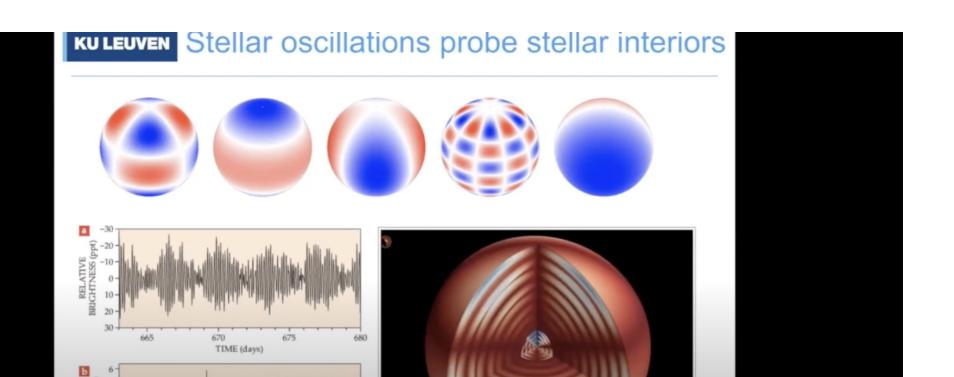
After researching different open source programs over Internet, I found **MESA (Modules for Experiments in Stellar Astrophysics)** and **GYRE**.

#### Why failed?

1. Coding was able to run successfully while ending up with a huge amount of confusing data
2. As an astronomical amateur, it was very difficult to understand the meaning behind those data. Failed to find the ones I was looking for.



Study Source & Notes



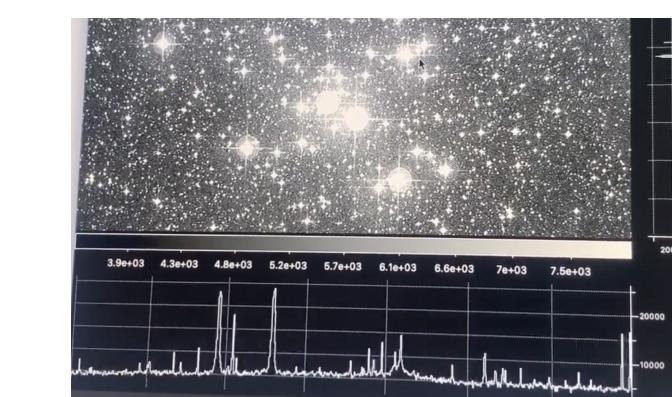
GYRE Open Source: <https://github.com/rhdtownsend/gyre>

### Experiment 02: SAODS9 + IRAF

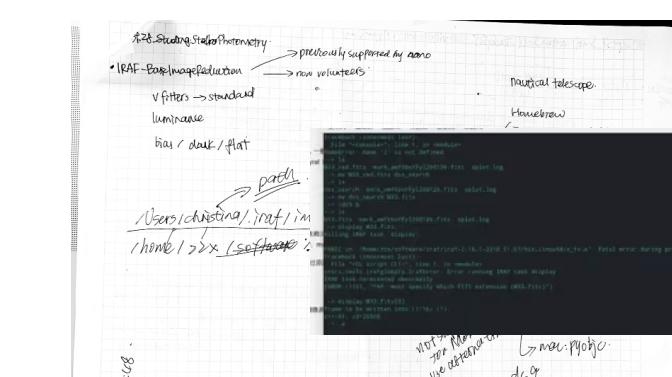
SAOImageDS9 is an astronomical imaging and data visualization application. It provides for **easy communication with external analysis tasks**.

IRAF is used at the Center for Astrophysics.

The Smithsonian Astrophysical Observatory Telescope Data Center creates and maintains software to process and archive data from optical telescopes at the Whipple Observatory and MMT Observatory on Mt. Hopkins in Arizona. **The software is freely distributed and documented online**.



Testing: M44

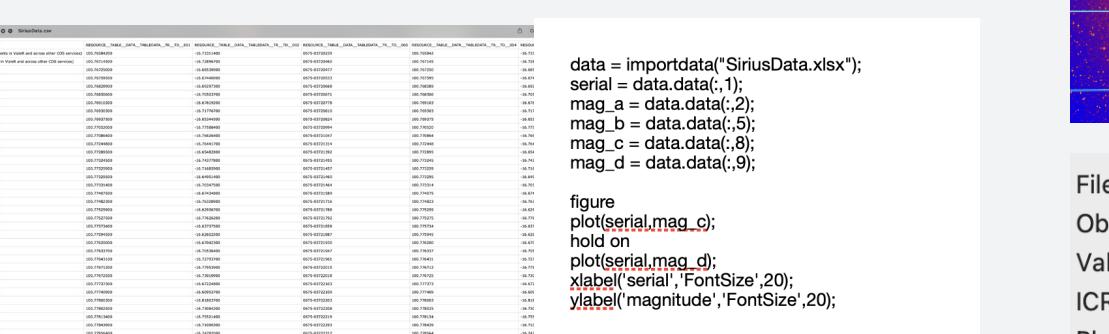


Study Notes & Source

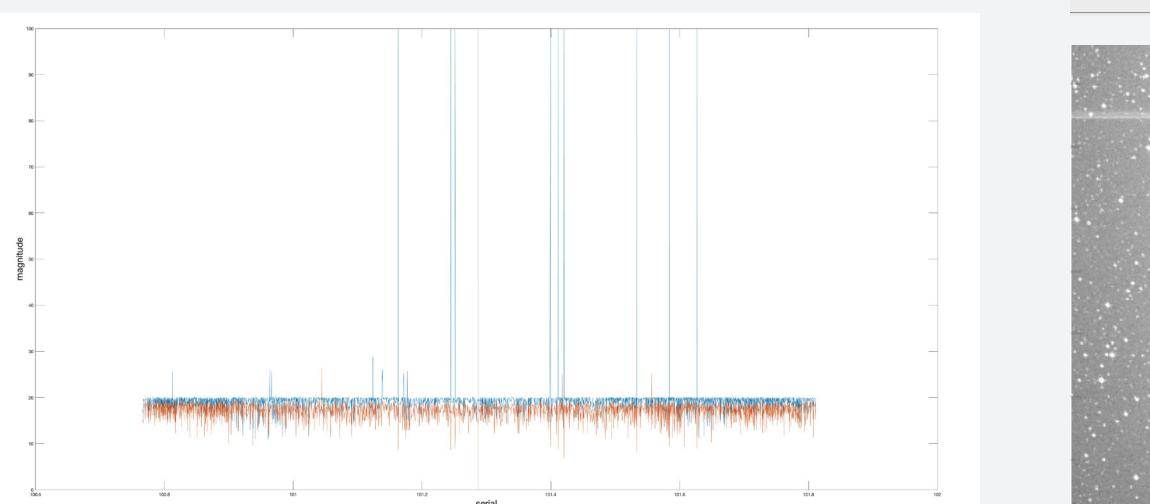
## EXPERIMENT: Sirius A Magnitude Data Extraction

Data of photometry of Sirius A can be extracted from SAODS9.

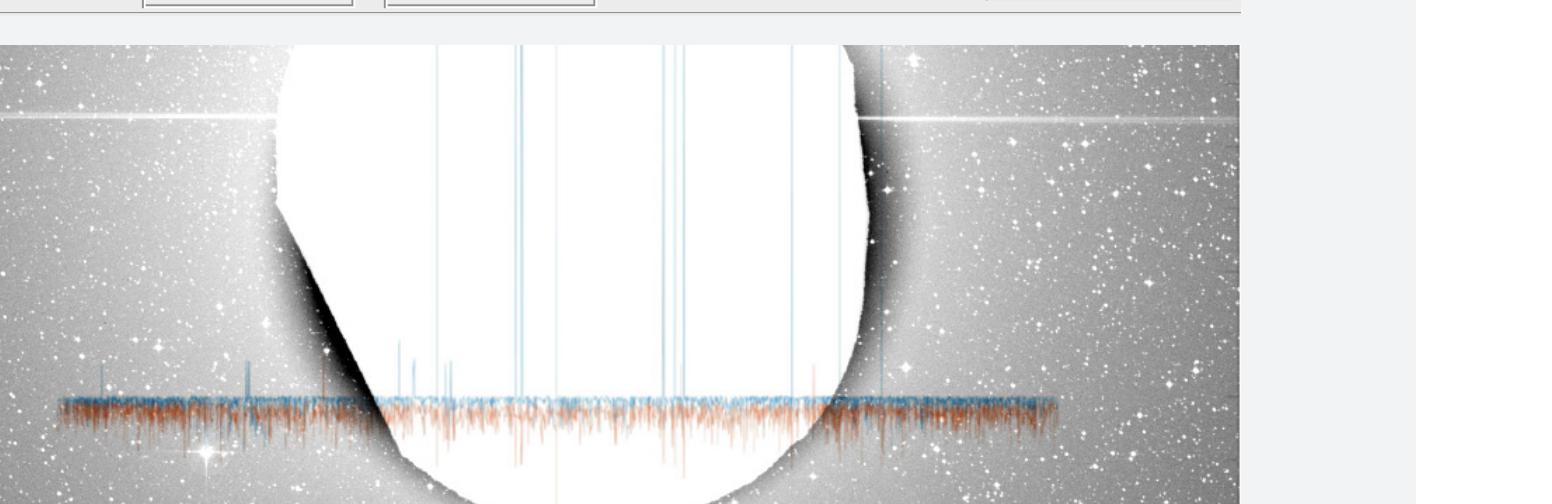
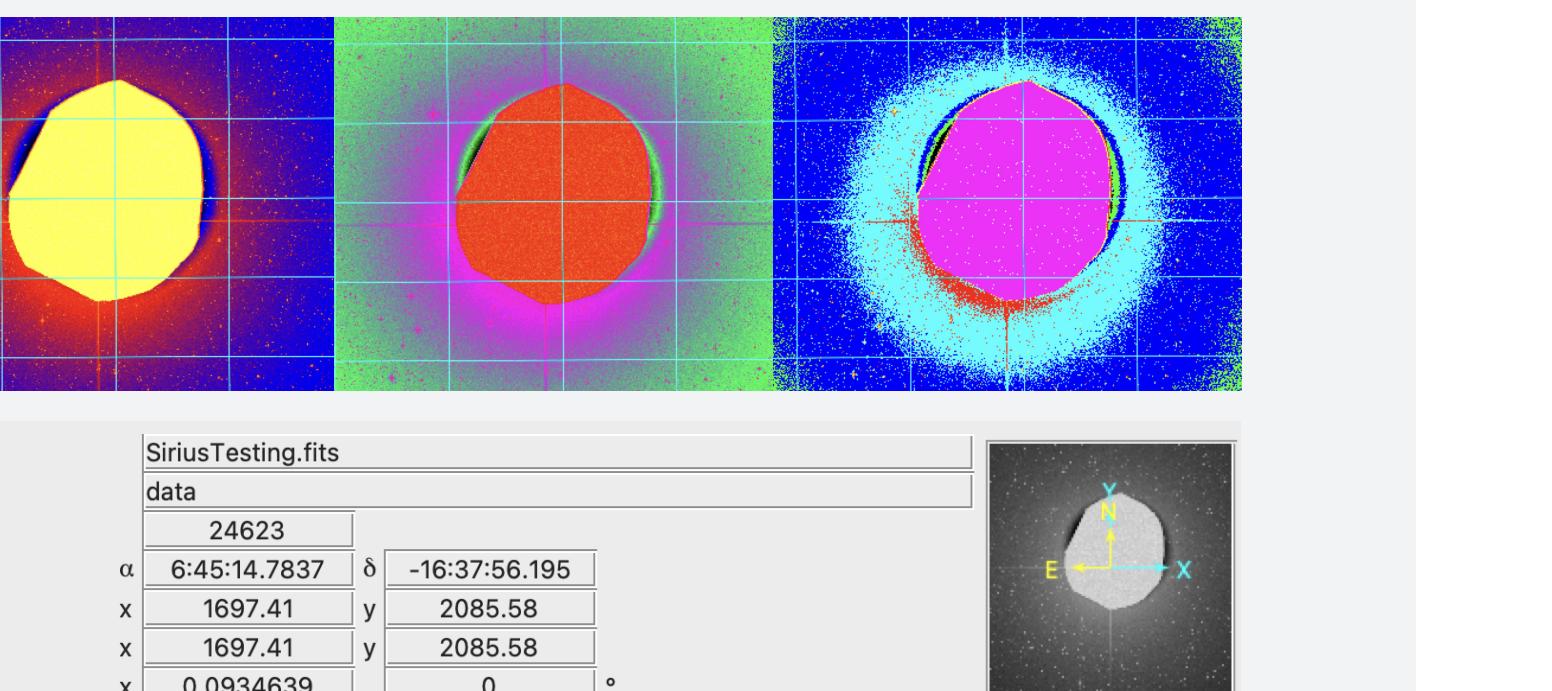
I tried to draw a graph to visualize the data having a first look over the vibration with Jupyter Notebook.



Sirius photometry data, from SAODS9



Sirius Magnitude Graph: drew based on data above



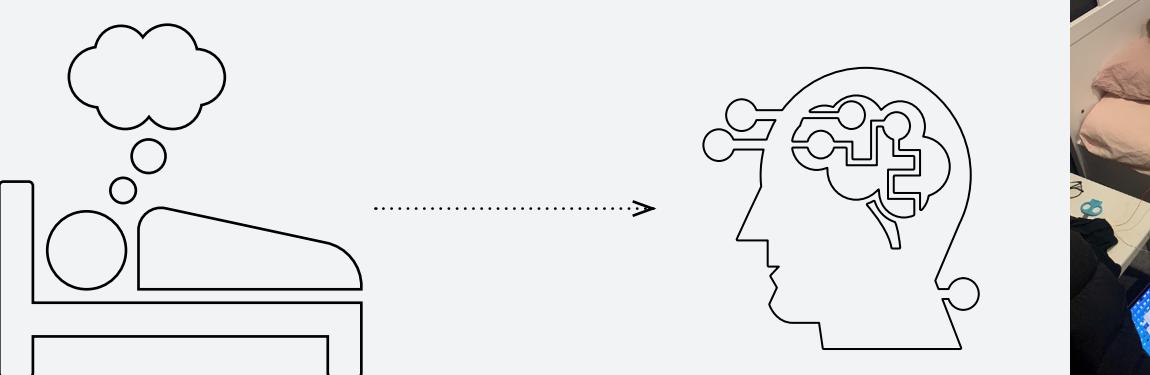
SAODS9 Output: Sirius A & Magnitude Graph (Oct.15th.2022)

## EXPERIMENT: The Sound of Dreams

I tried my best to gain access to BCI.

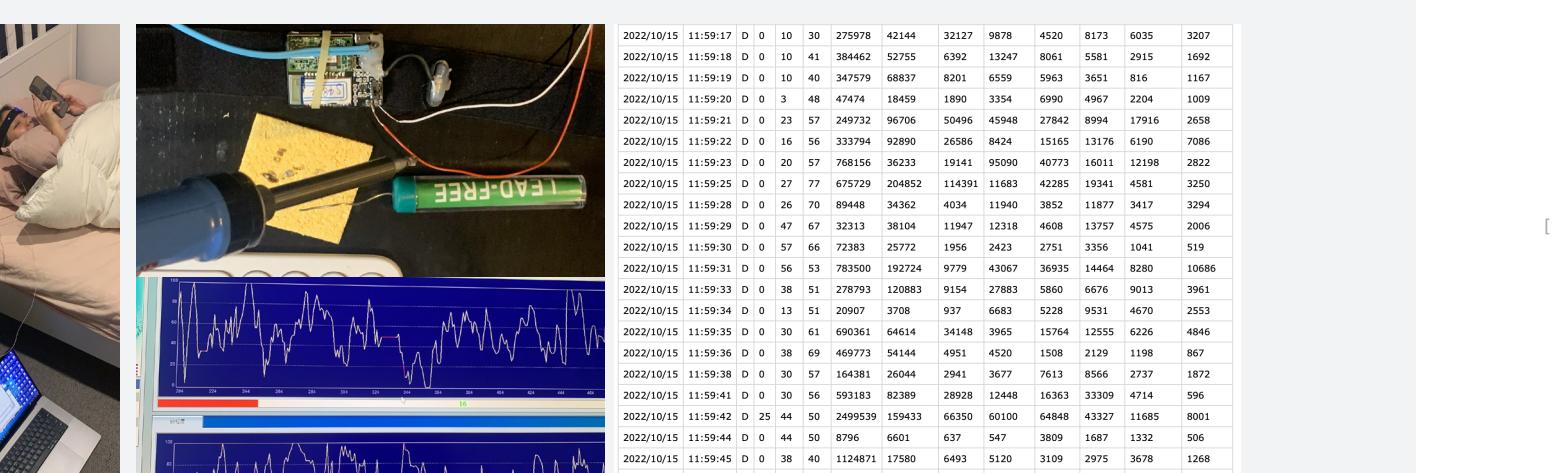
Eventually, I purchased TGAM BCI from Neurosky.

Although the device is not ideal for EEG, this is my first step to experiment with BCI and brain waves. I at least feel proud of the spirit of dancing without disciplines.



Eventually, I obtained Qi's theta waves of her dreams on 2022/10/15.

The csv data can be automatically saved by Mind XP which only requires a few simple code.



Testing

Sample data

## EXPERIMENT: Data Sonification

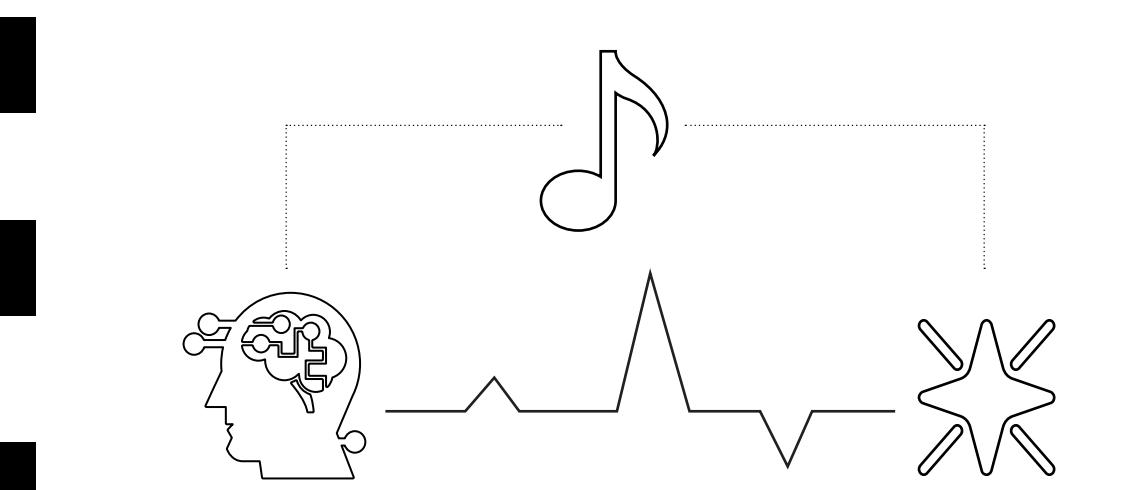
Turn magnitude into music

Jupyter Notebook  
Python3.10

Midi Library:Midiutil

GarageBand

More Testing soundtracks:  
[https://drive.google.com/drive/folders/1Q78s5NuIs6572a9ktmMqzB\\_gA4QH8wU?usp=sharing](https://drive.google.com/drive/folders/1Q78s5NuIs6572a9ktmMqzB_gA4QH8wU?usp=sharing)



Data filtering

```
[1]: df = df[(df['Value'] >= 200000)] #filter data if you like (for example, only craters
x = df['Time'].values #this is a numpy array (not a list), you can do mathematical
y = df['Value'].values
y = y.astype(int)

plt.scatter(x, y, s=y)
plt.xlabel('x')
plt.ylabel('y')
plt.show()
```

```
times_myrs = max(x) - x #measure time
plt.scatter(times_myrs, y, s=y*100000)
plt.xlabel('time since impact 11:00:00')
plt.ylabel('Theta')
plt.show()
```

```
def map_value(value,min_value,max_value,min_result,max_result): #mapping principle
    '''maps value (or array of values) from one range to another'''
    result = min_result + (value - min_value)/(max_value-min_value)*(max_result - min_result)
    return result
```

```
map_value(1,200000,900000,100,300)
```

```
[198]: 42.85742857142857
```

```
[1]: myrs_per_beat = 100 #number of Myrs for each beat of music
times_myrs = times_myrs.total_seconds()
t_data = times_myrs/myrs_per_beat

duration_beats = max(t_data) #duration in beats
print('Duration:', duration_beats, 'beats')

Duration: 222.08 beats
```

```
[1]: #calculate duration in seconds
bpm = 60 #if bpm = 60, 1 beat = 1 sec
```

```
duration_sec = int(duration_beats*100)/bpm #duration in seconds (actually, onset of
print('Duration:', duration_sec, 'seconds')
```

```
plt.scatter(t_data, midi_data, s=10*y_data)
plt.xlabel('time [beats]')
plt.ylabel('midi note numbers')
plt.show()
```

```
[1]: vel_min,vel_max = 35,127 #minimum and maximum note velocity
```

```
vel_data = []
for i in range(2040):
    note_velocity = round(map_value(y_data[i], 0, 1, vel_min, vel_max)) #bigger crater
    vel_data.append(note_velocity)
```

```
plt.scatter(t_data, midi_data, s=vel_data)
plt.xlabel('time [beats]')
plt.ylabel('midi note numbers')
plt.show()
```

```
[1]: y_data = map_value(y, min(y), max(y), 0, 1)*0.5 #normalize data, so it runs from 0
```

```
plt.scatter(times_myrs, y, s=50*y_data)
plt.xlabel('time since impact 11:00:00')
plt.ylabel('Theta')
plt.show()
```

```
[1]: pip install midiutil
from midiutil import MIDIFile #import library to make midi file
```

```
#create midi file object, add tempo
my_midi_file = MIDIFile(1) #one track
```

```
my_midi_file.addTempo(track=0, time=0, tempo=bpm)
```

```
n_midi = len(midi_data)
```

```
t_data = t_data.astype(int)
```

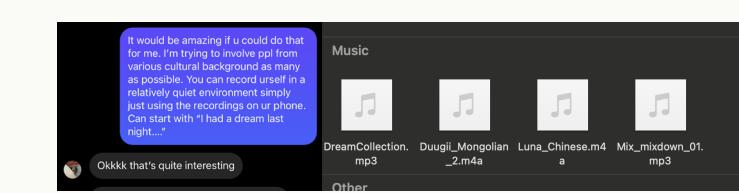
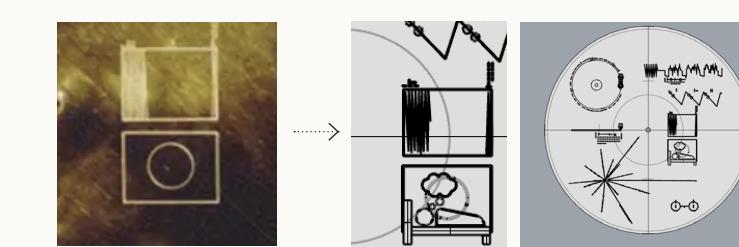
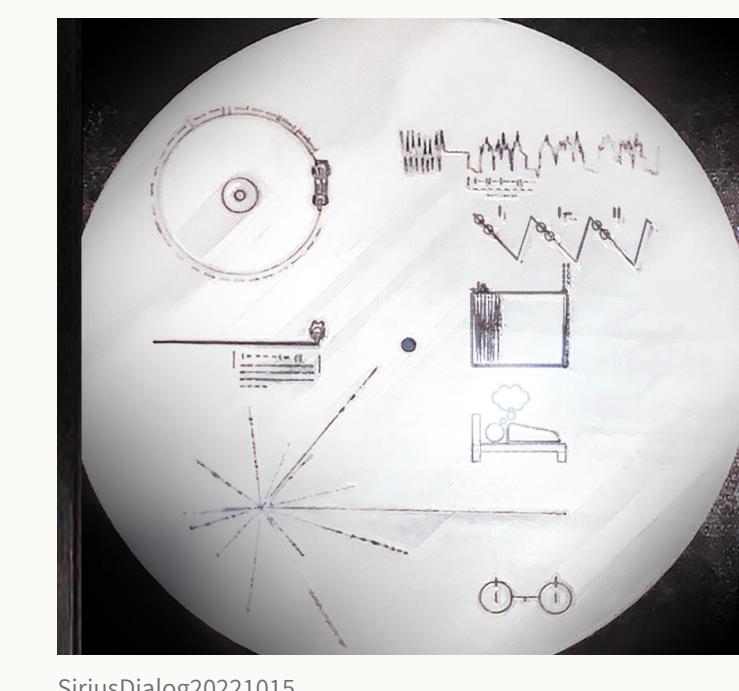
```
#add midi notes
for i in range(2040):
    my_midi_file.addNote(track=0, channel=0, pitch=midi_data[i], time=t_data[i], dur
```

```
#create and save the midi file itself
with open(filename + '.mid', 'wb') as f:
    my_midi_file.writeFile(f)
```

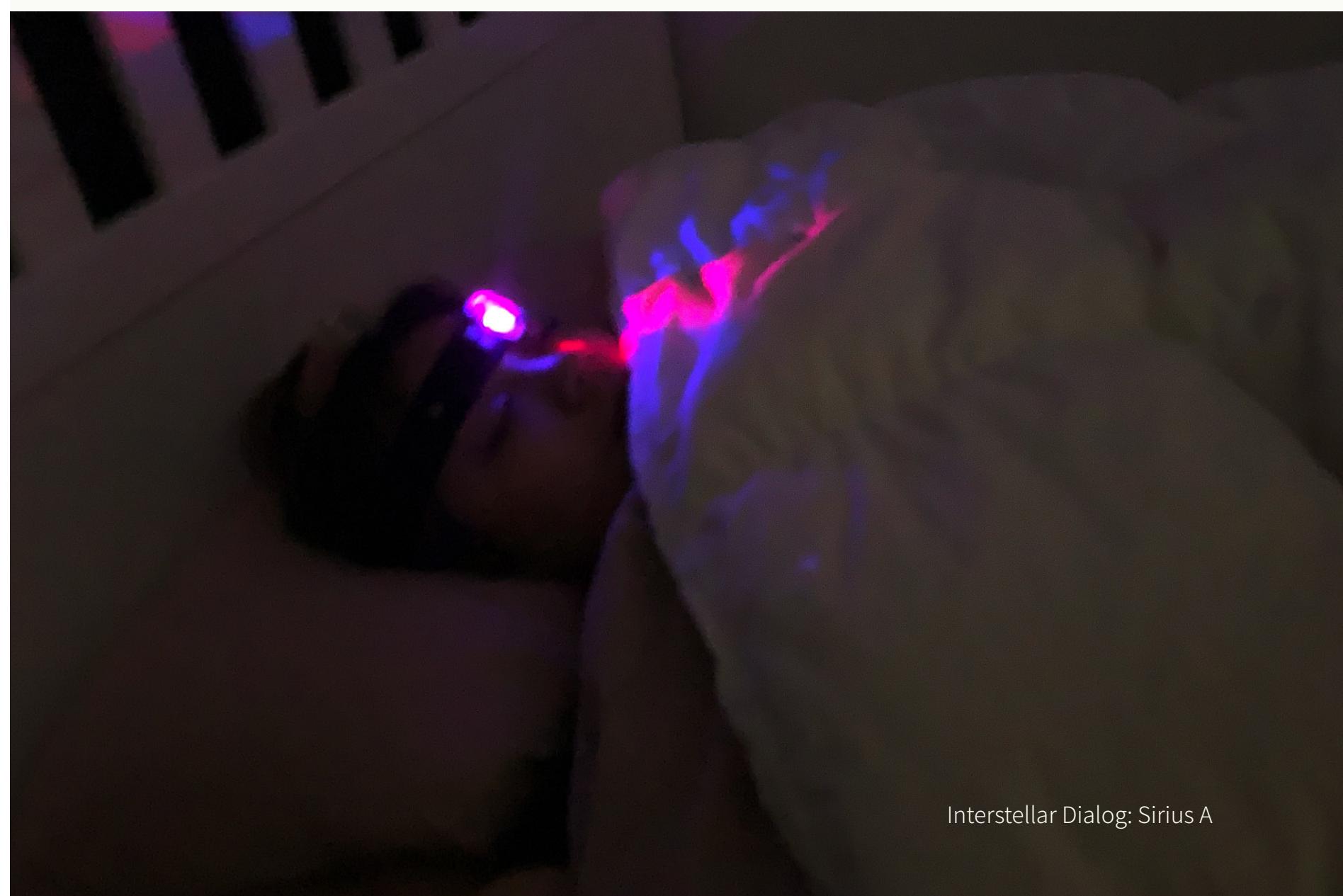
## DESIGN: SiriusDialog20221015

This vinyl collects people's dreams spoken with 6 different languages (for now). Those dreams occurred on the same night when I collected Sirius A magnitude and theta waves from Qi's dream (2022.Oct.15th).

The vinyl which is inspired by 'The Golden Record' was displayed on the exhibition in RMIT University, 2022.



Dream Collection



Interstellar Dialog: Sirius A

## DESIGN: Website & Filming

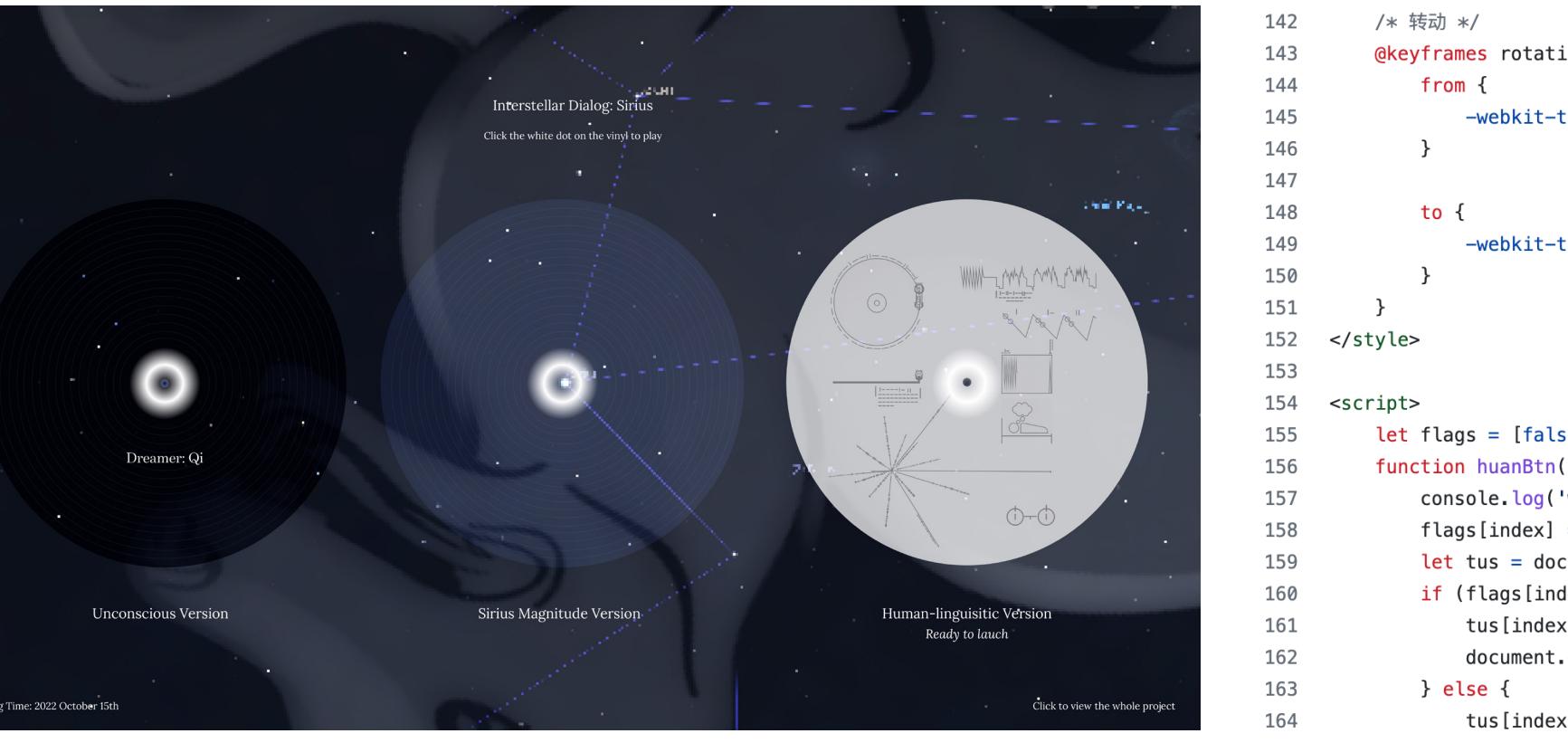
### Interactive Website

I created a website with 3 virtual vinyls playing soundtracks of Sirius, Qi's dreams and dream collection.

This website is a window opened for humankind about the content of this vinyl.

Web:  
<https://christywn.github.io/InterstellarDialog-SiriusA/1.html>

Code:  
<https://github.com/Christywn/InterstellarDialog-SiriusA.git>



Website

```
142 /* 转动 */
143 @keyframes rotation {
144   from {
145     -webkit-transform: rotate(0deg);
146   }
147   to {
148     -webkit-transform: rotate(360deg);
149   }
150 }
151 </style>
152 <script>
153   let flags = [false, false, false]
154   function huanBtn(index) {
155     console.log('wodiu');
156     flags[index] = !flags[index]
157     let tus = document.getElementsByClassName('tu')
158     if (flags[index]) {
159       tus[index].className += ' tuz'
160       document.getElementsByClassName('music')[index].play()
161     } else {
162       tus[index].classList.remove('tuz')
163     }
164 }
```

HTML (Rotation of Vinyl when being played)

### Conceptual film

Video is a powerful tool to communicate a conceptual idea telling the whole story.

I invited Qi (the dreamer) to participate to in the filming for a more cohesive presentation.

To make the video visually fruitful, visuals from 'Stellarium' a open source virtual telescope is used.

Inspired by the concept of string, spectrum, particle, I used TouchDesigner to generate interactive visuals.

Video:  
<https://vimeo.com/762456467>



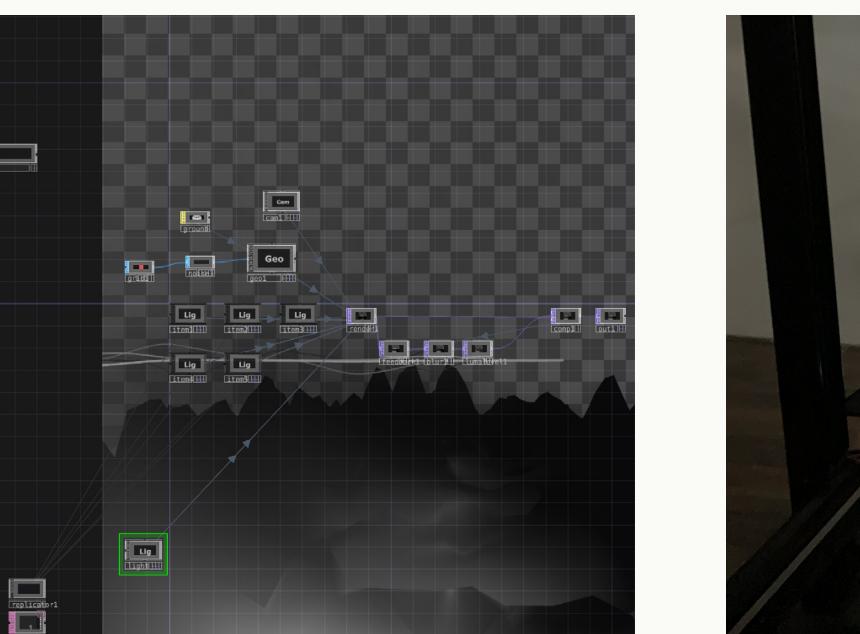
Me tracing Sirius



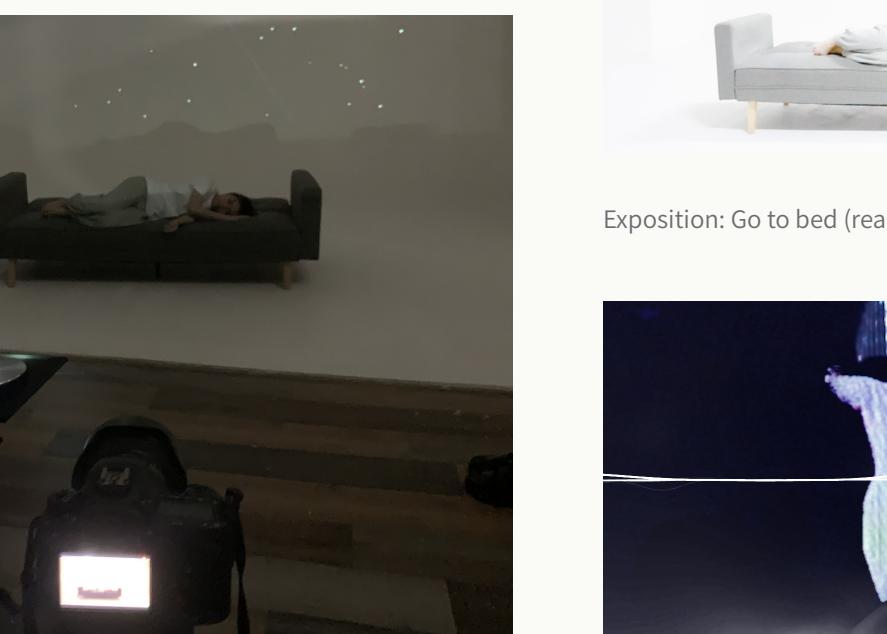
Storyboard



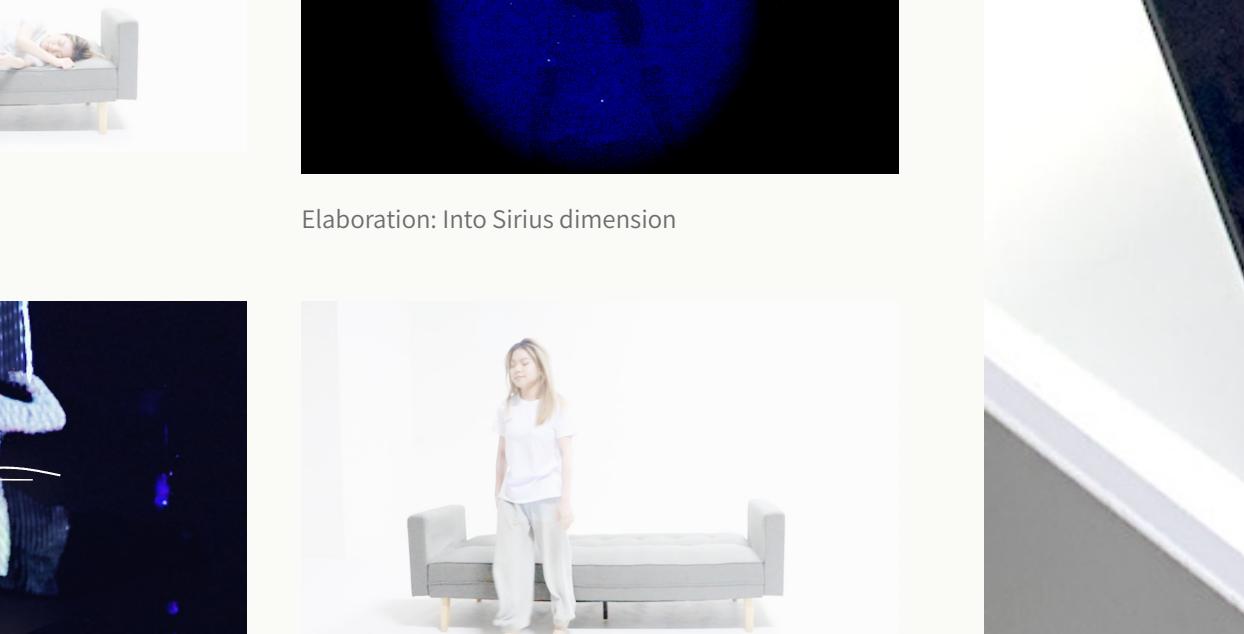
My Film



TouchDesigner Workdesk



Shooting



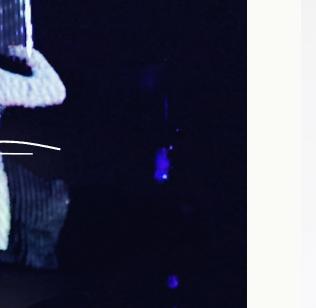
Exposition: Go to bed (real life)



Climax: Dialog with Sirius



Elaboration: Into Sirius dimension



Denouement: Wake up (real life)



Interstellar Dialog: Sirius A