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# Quand la physique s'invite sur scène : une chorégraphie de gouttes

Baudouin Saintyves, Severine Atis

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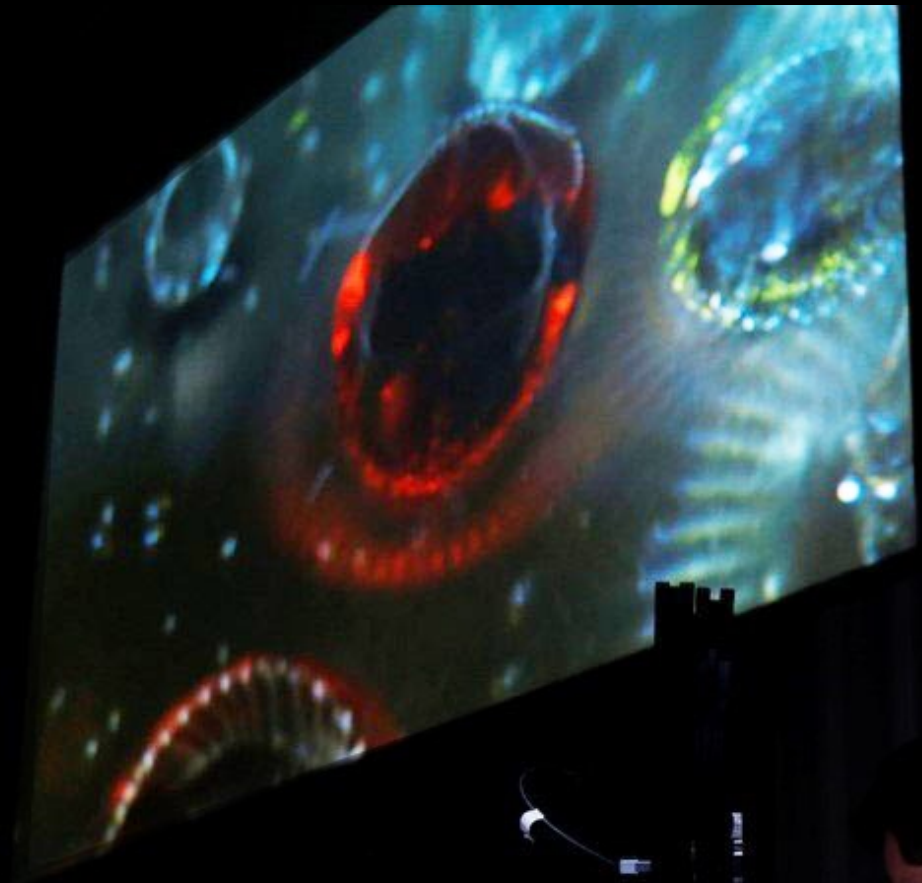
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QUAND LA PHYSIQUE  
S'INVITE SUR SCENE

*UNE CHOREGRAPHIE DE  
GOUTTES*

Baudouin Saintyves et Severine Atis

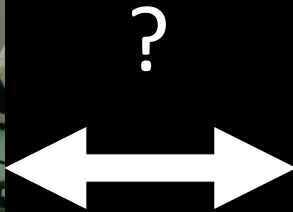






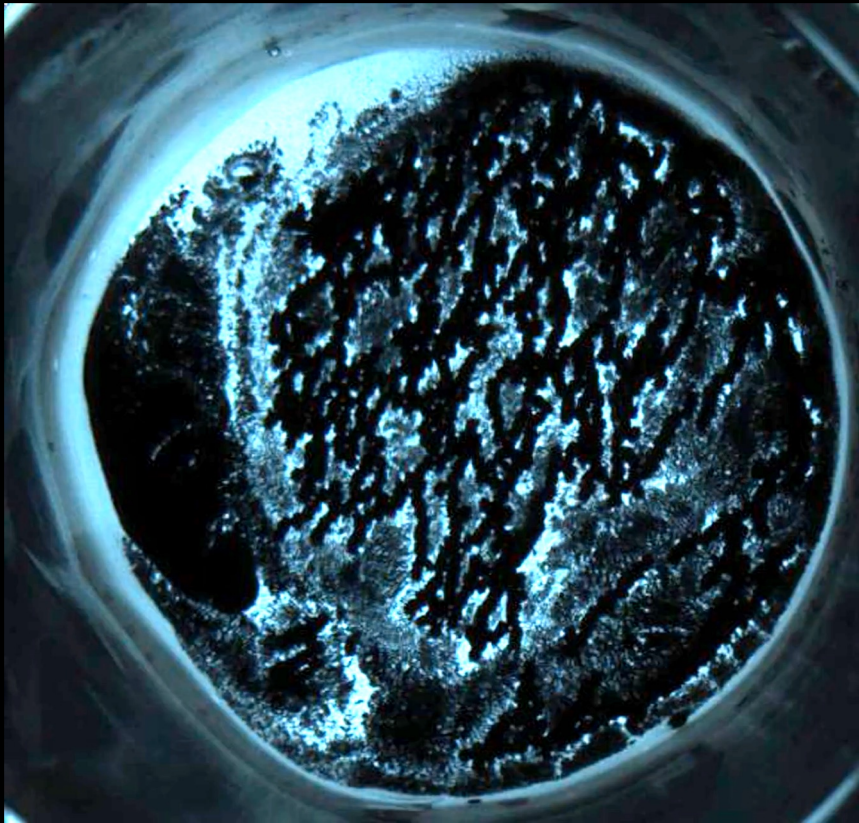




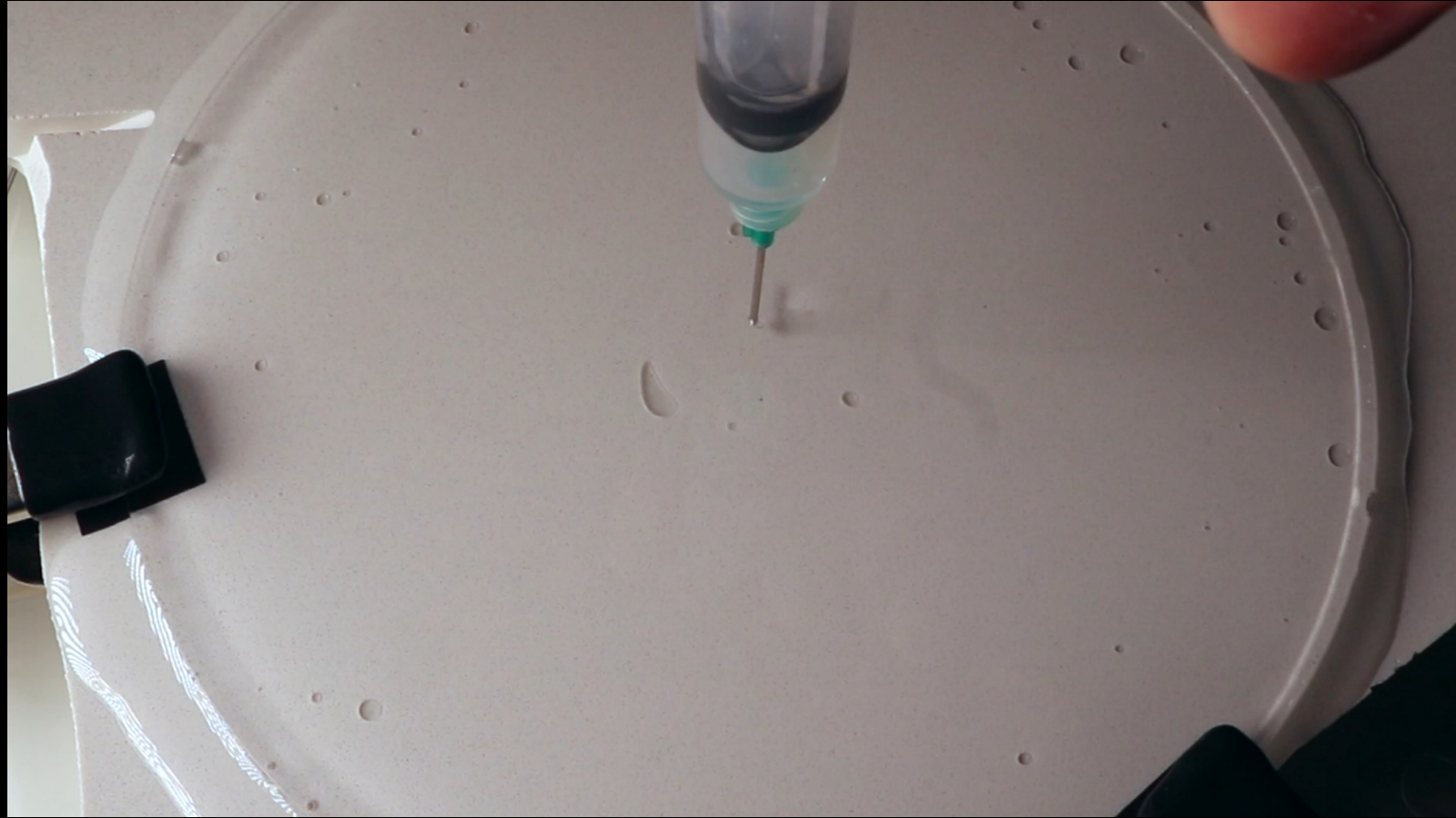
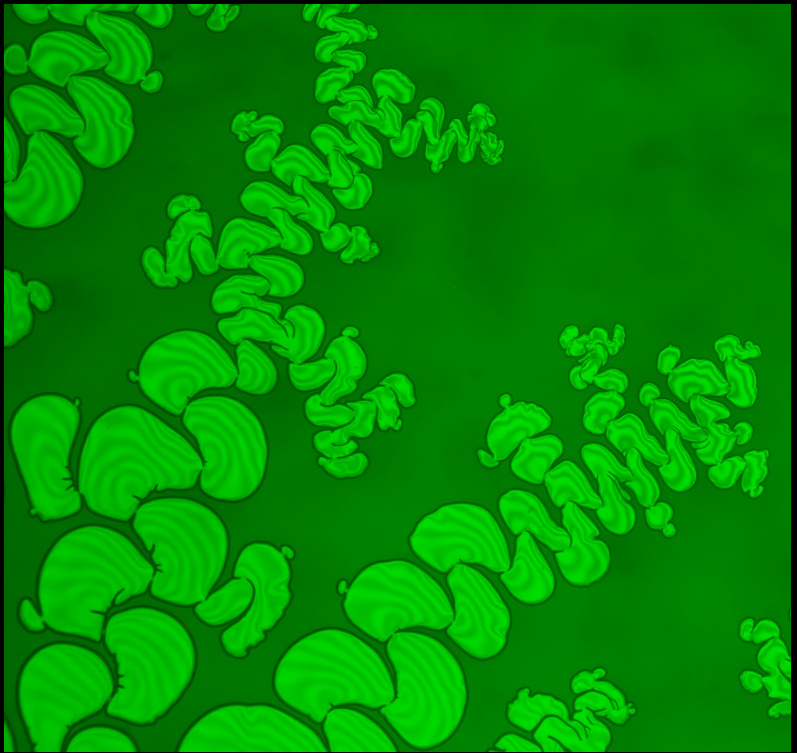
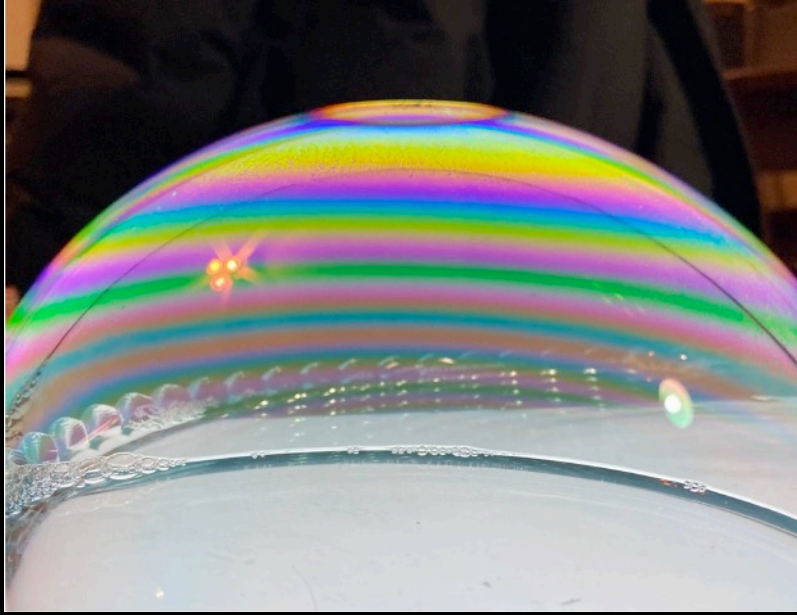


Atelier de Francis Bacon





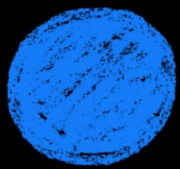




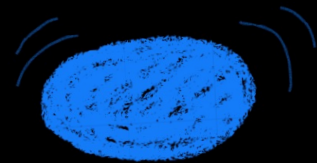




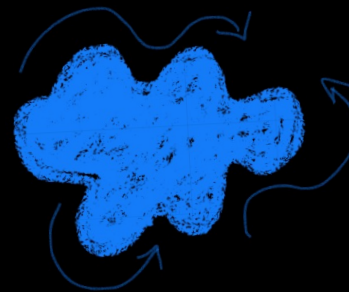
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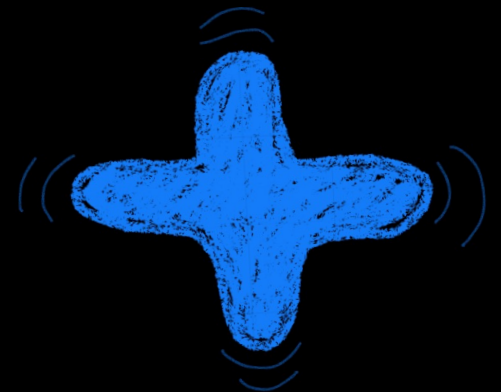
II- Déformer: vibrations



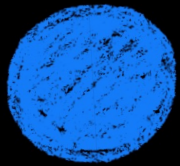
III- Sculpter: ondes



IV- Former: modes

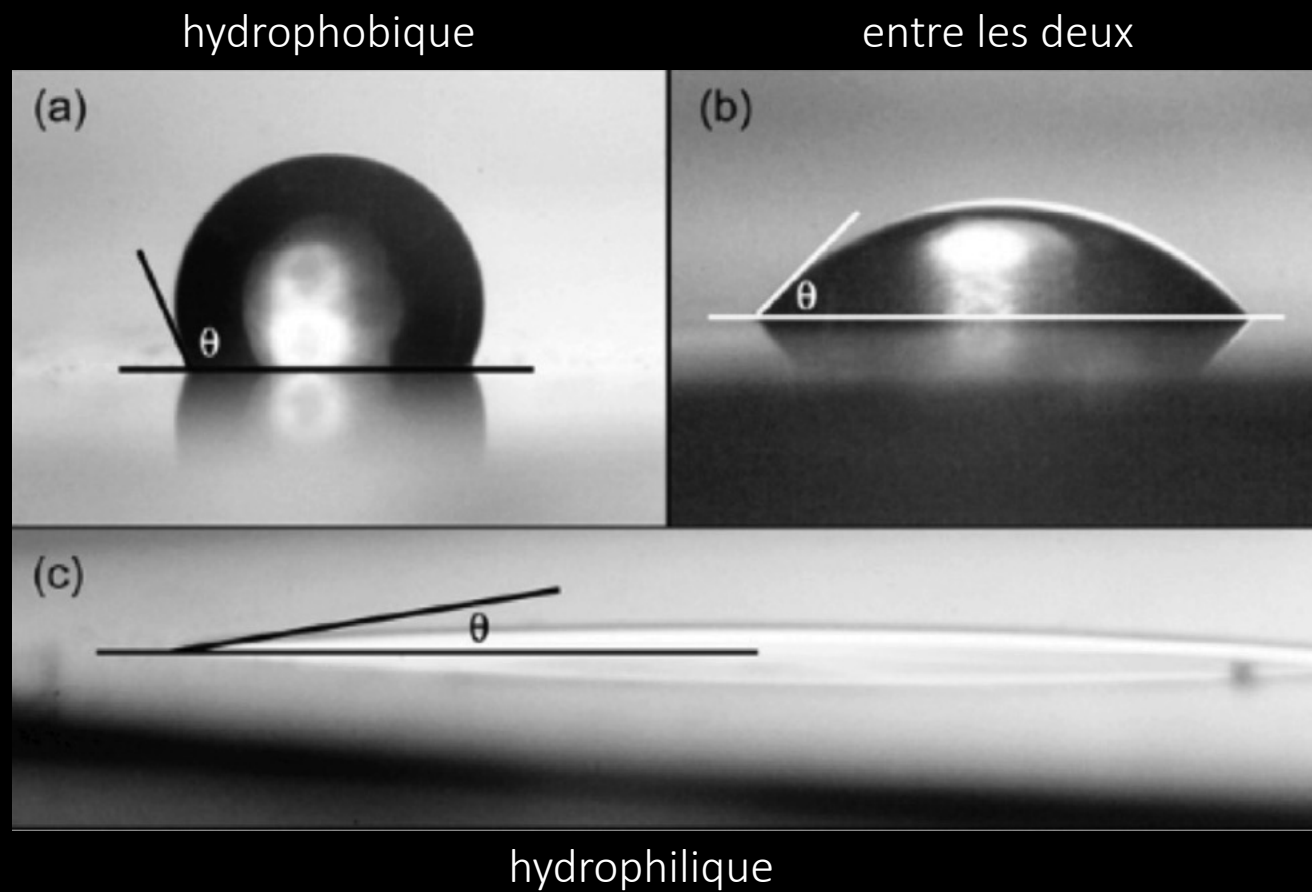


I- Créer: mouillage

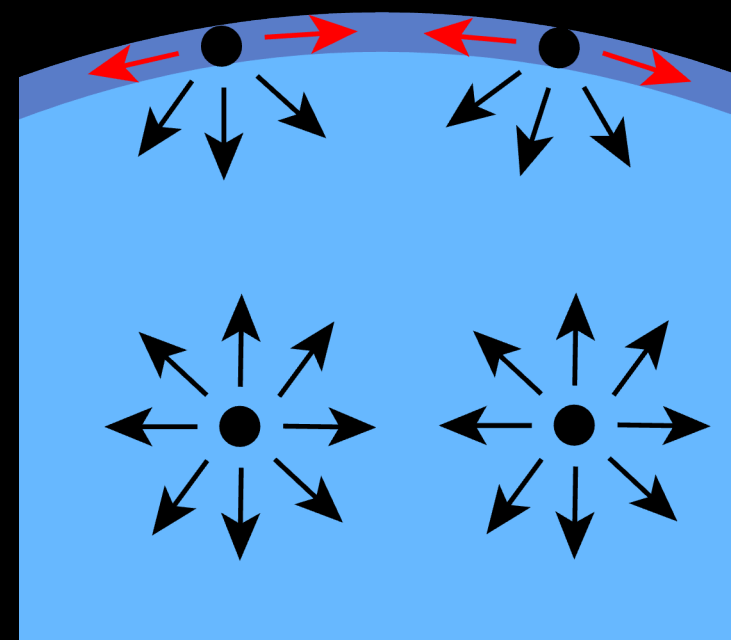




# I - Mouillage



tension de surface

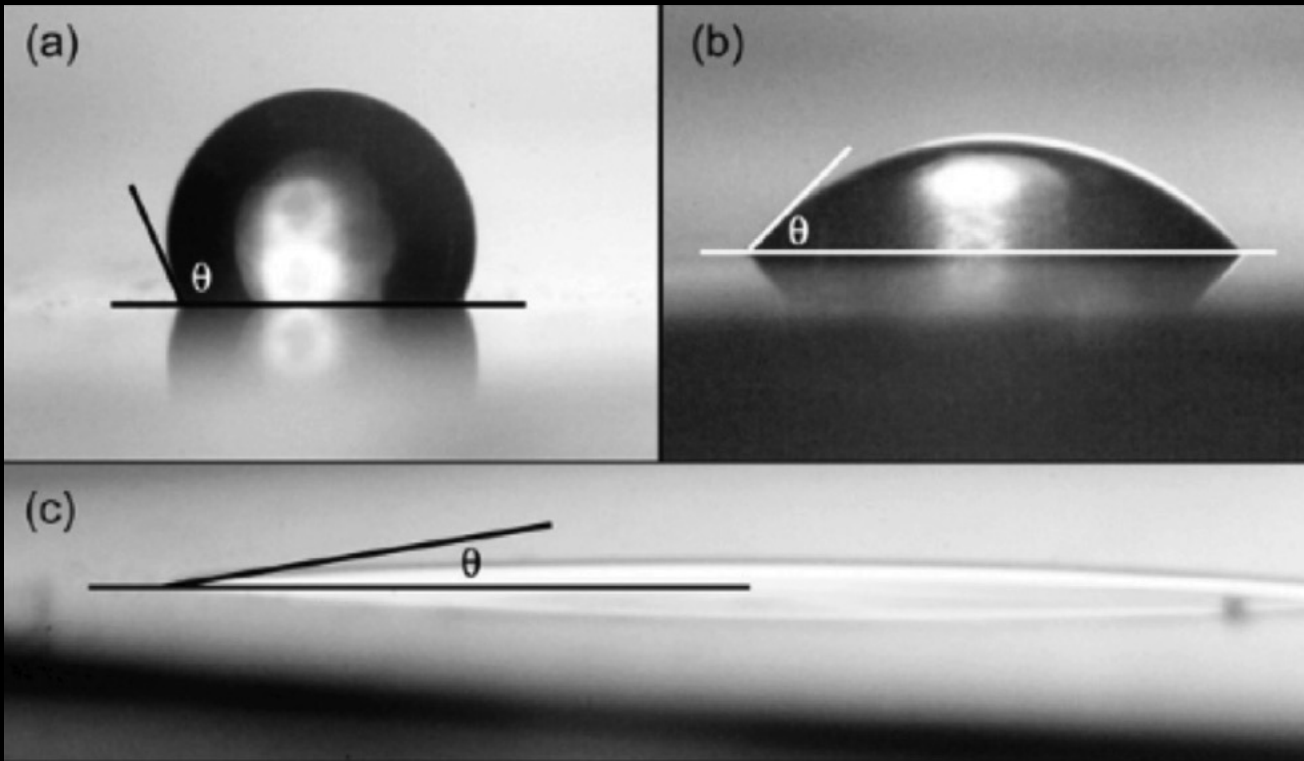


[wikipedia](#)

# I - Mouillage

hydrophobique

entre les deux



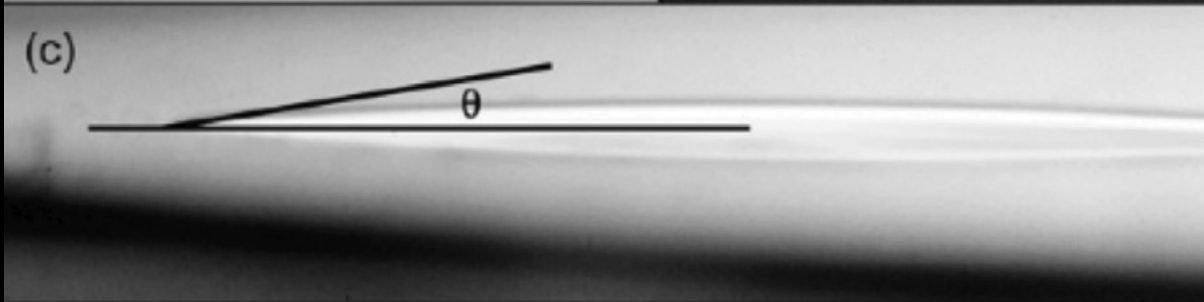
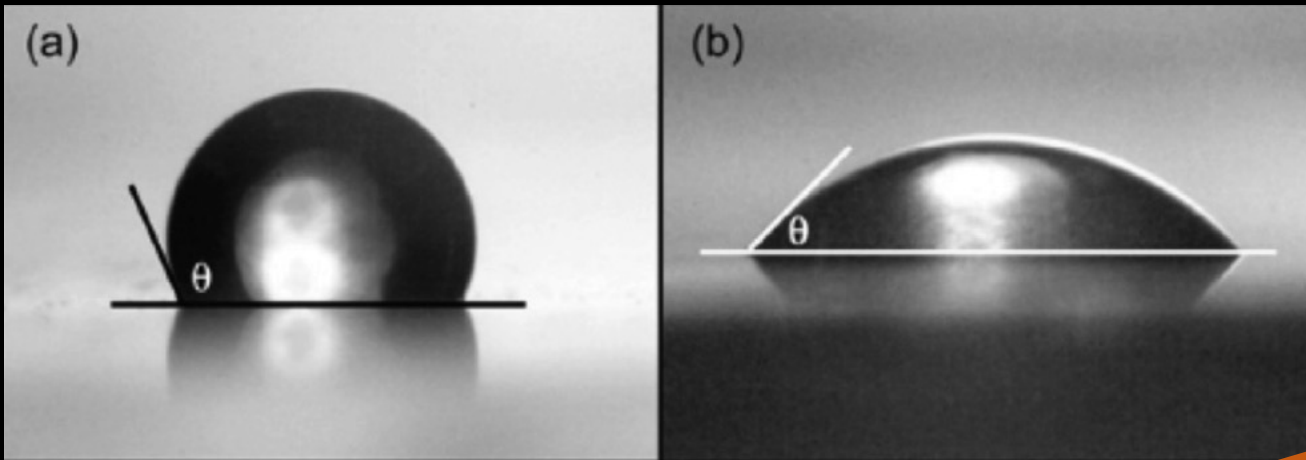
hydrophilique



# I - Mouillage

hydrophobique

entre les deux

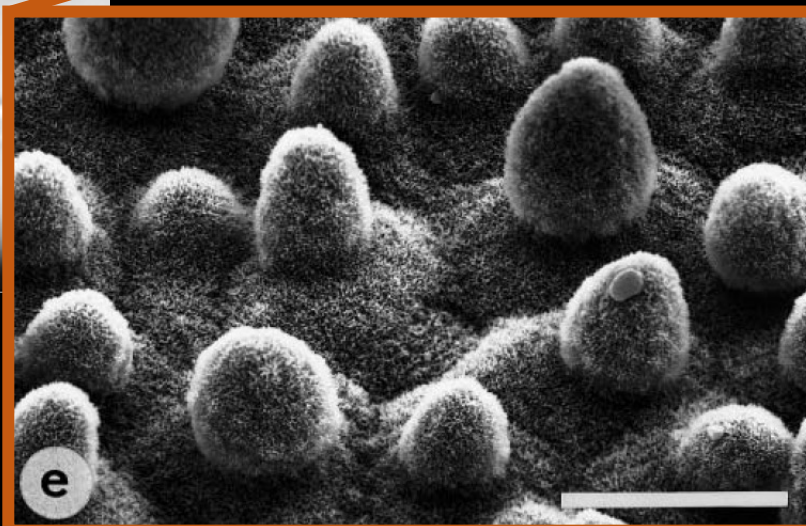
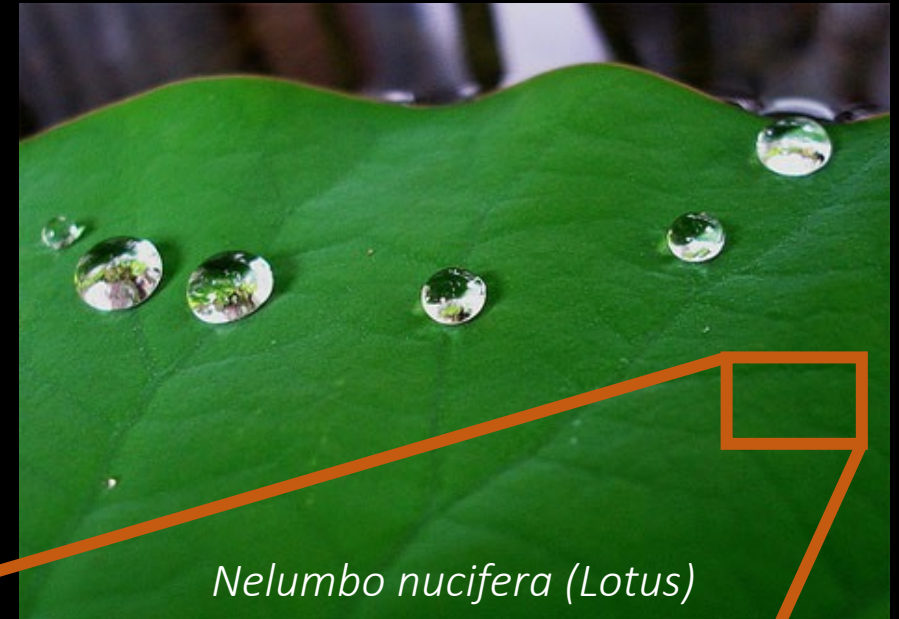


hydrophilique

[Sumner et al. \(2004\)](#)

[Barthlott and Neinhuis \(1996\)](#)

super-hydrophobique

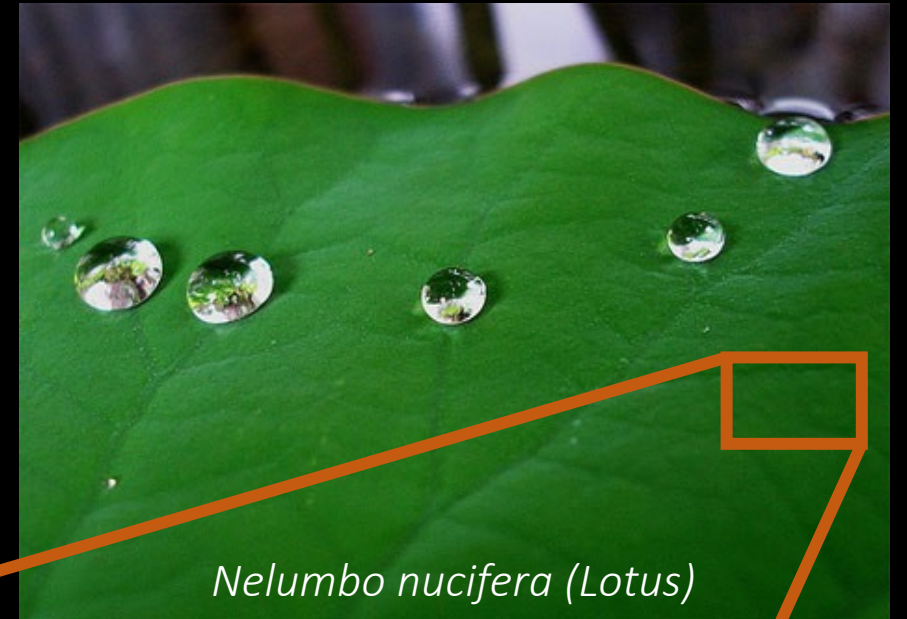




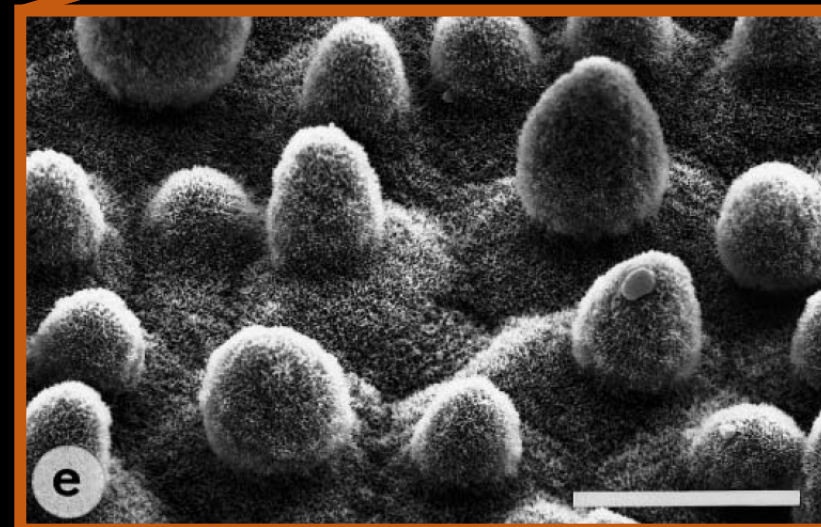
# I - Mouillage



super-hydrophobique

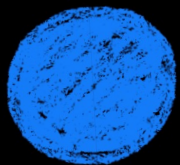


*Nelumbo nucifera* (Lotus)

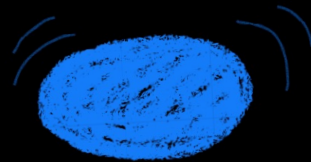


[Barthlott and Neinhuis \(1996\)](#)

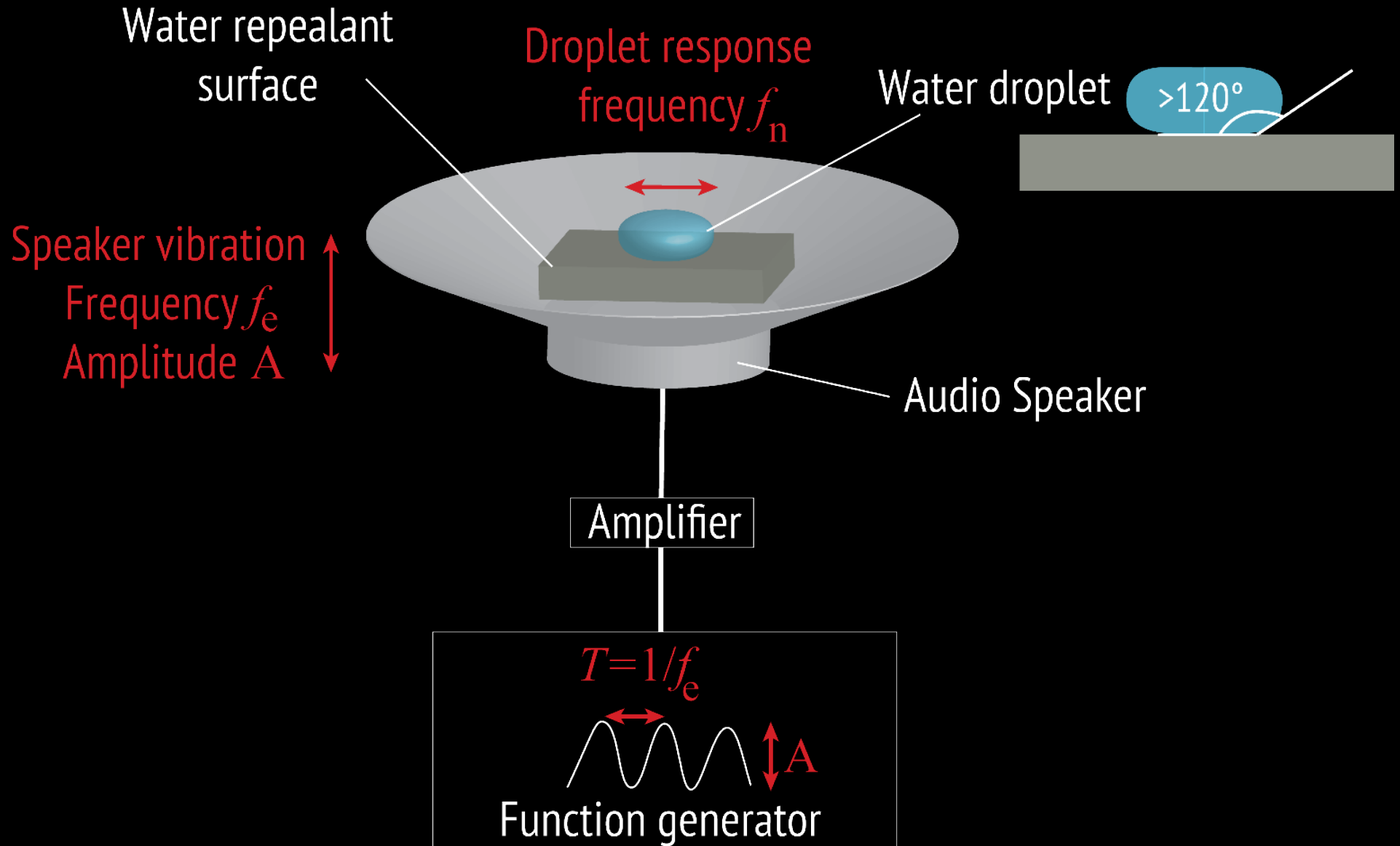
I- Créer: mouillage



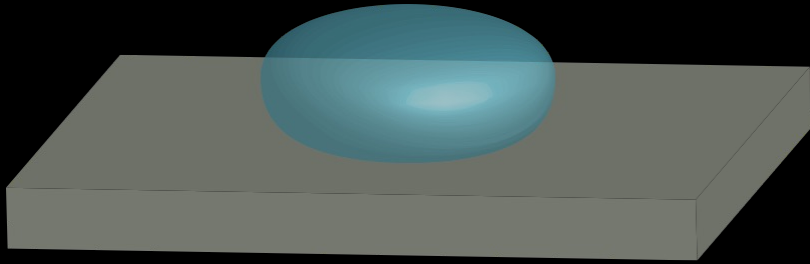
II- Déformer: vibrations



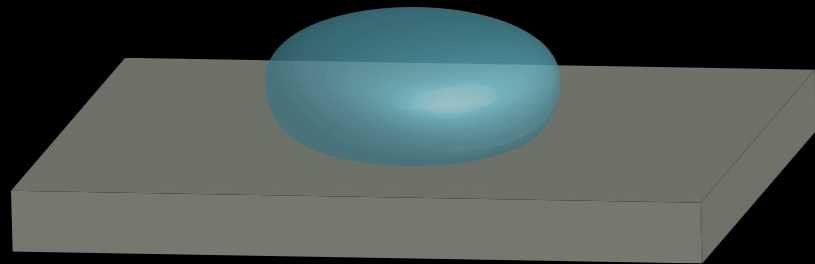
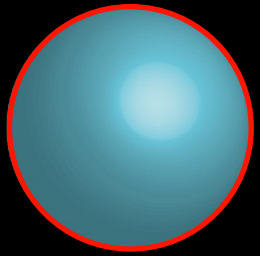
# II - Deformation



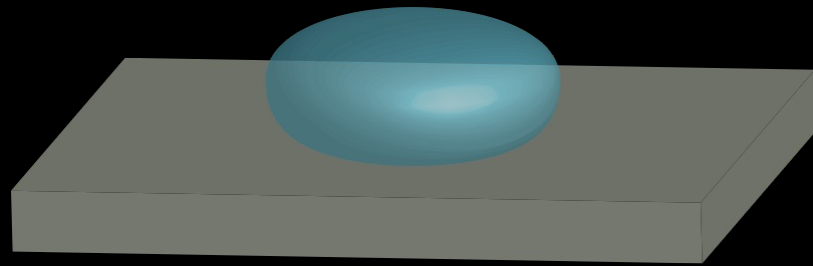
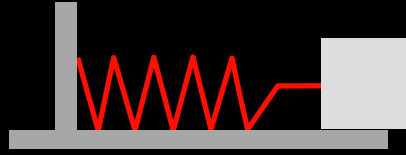
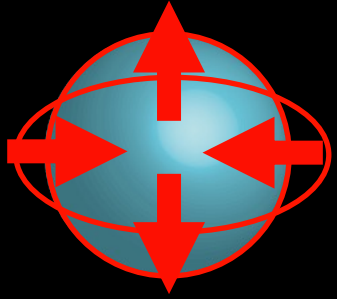




tension de surface

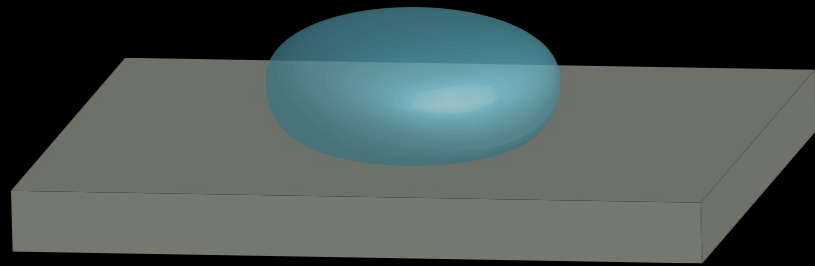
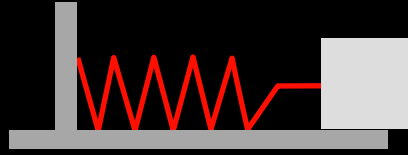
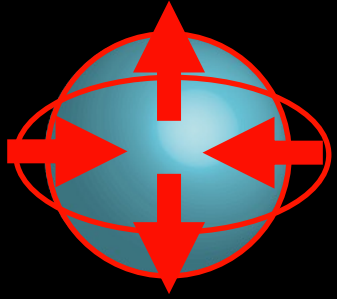


tension de surface

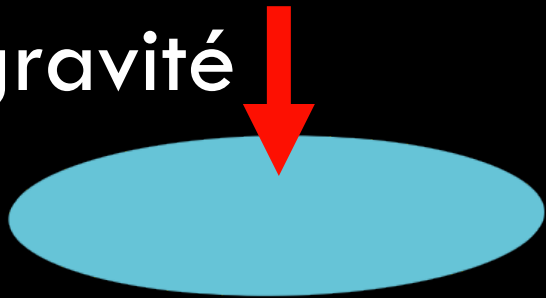




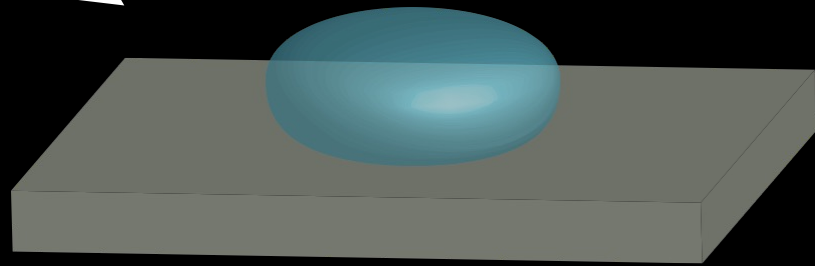
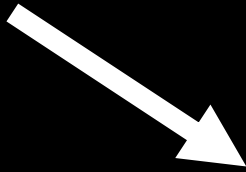
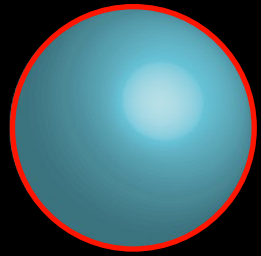
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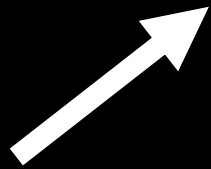
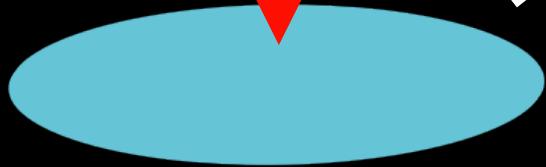
gravité



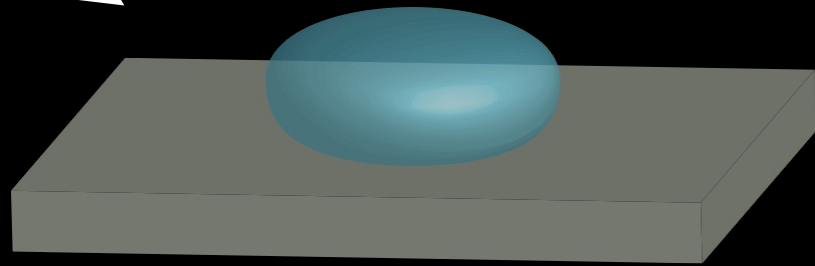
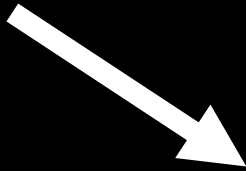
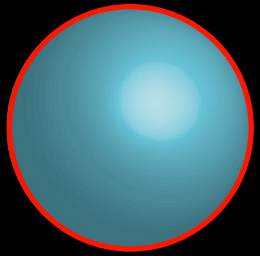
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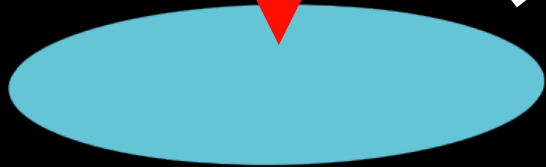
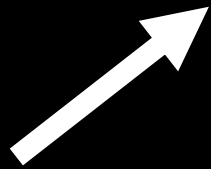
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tension de surface



gravité



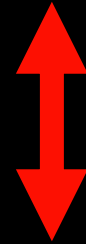
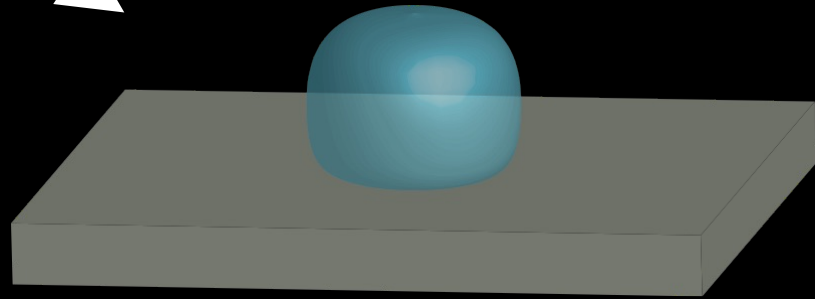
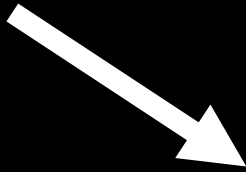
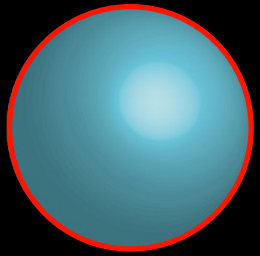
Vibration

=

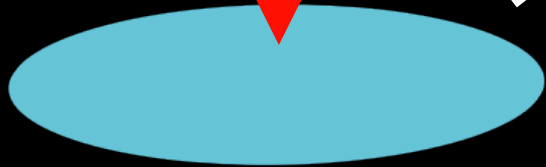
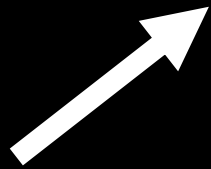
modulation de la gravité



tension de surface



gravité

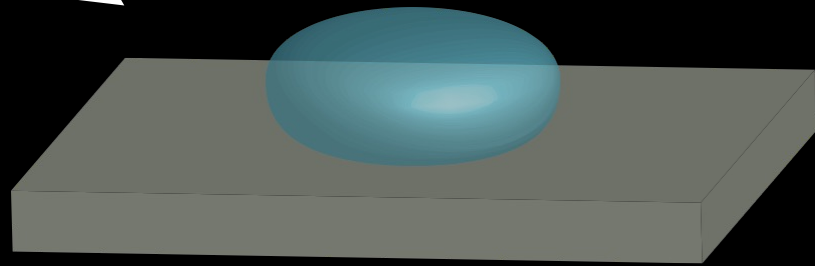
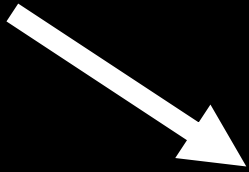
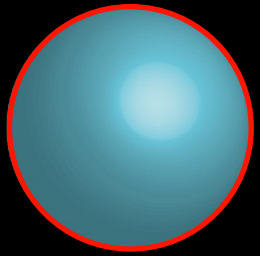


Vibration

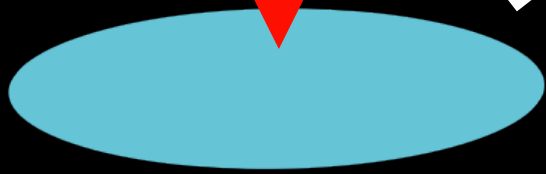
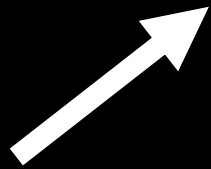
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modulation de la gravité

tension de surface



gravité

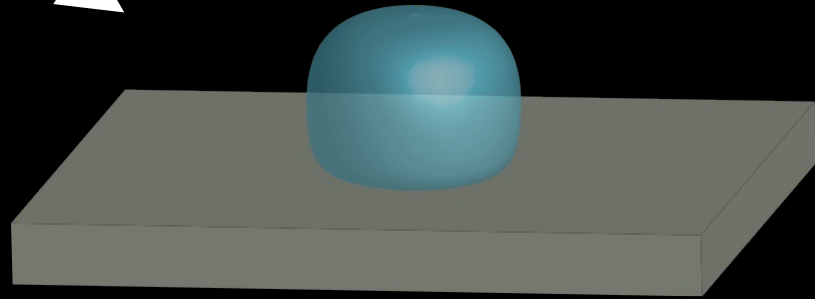
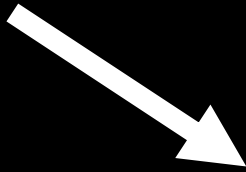
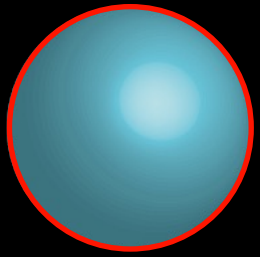


Vibration

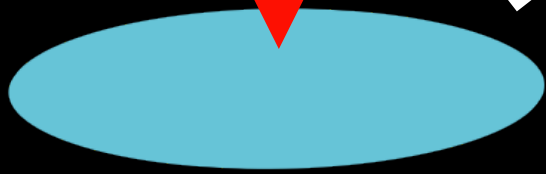
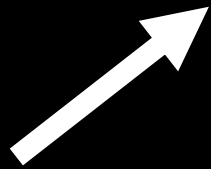
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modulation de la gravité

tension de surface



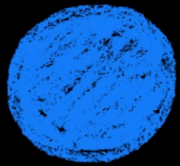
gravité



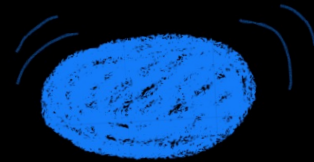
Vibration  
=

modulation de la gravité

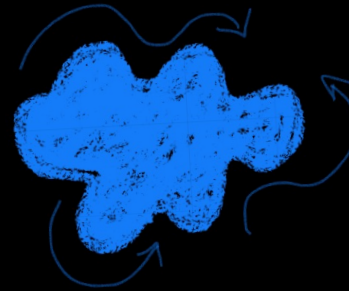
I- Créer: mouillage



II- Déformer: vibrations

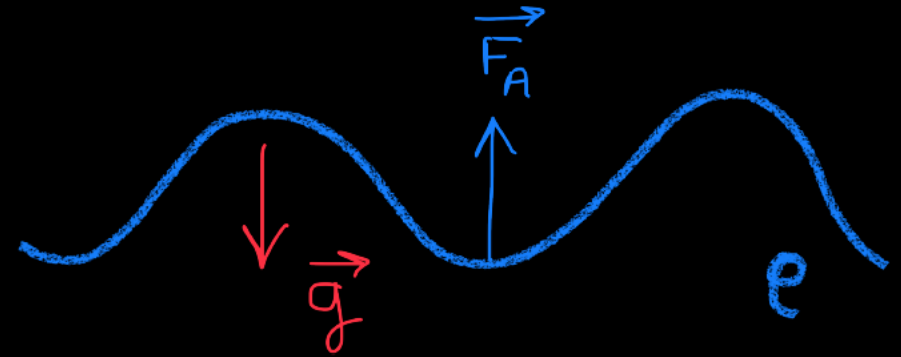


III- Sculpter: ondes



# III - Ondes

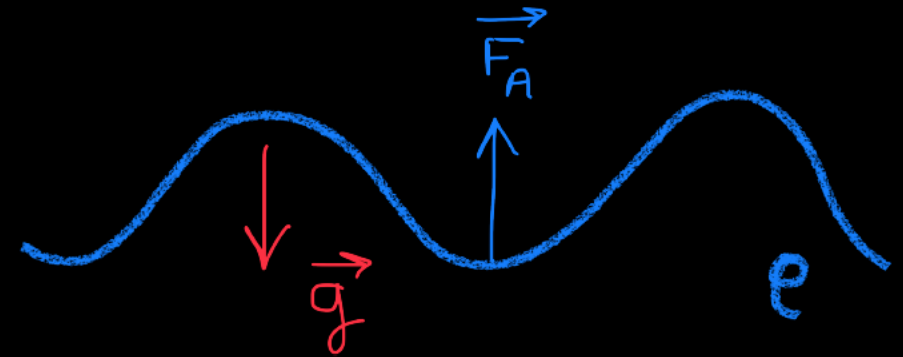
ondes de gravité



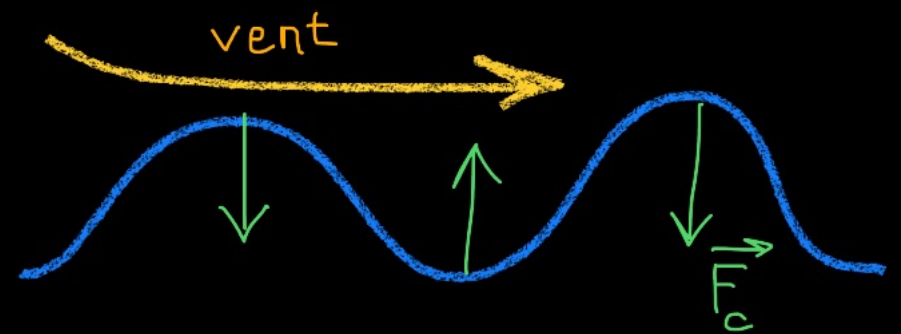


# III - Ondes

ondes de gravité



ondes capillaires

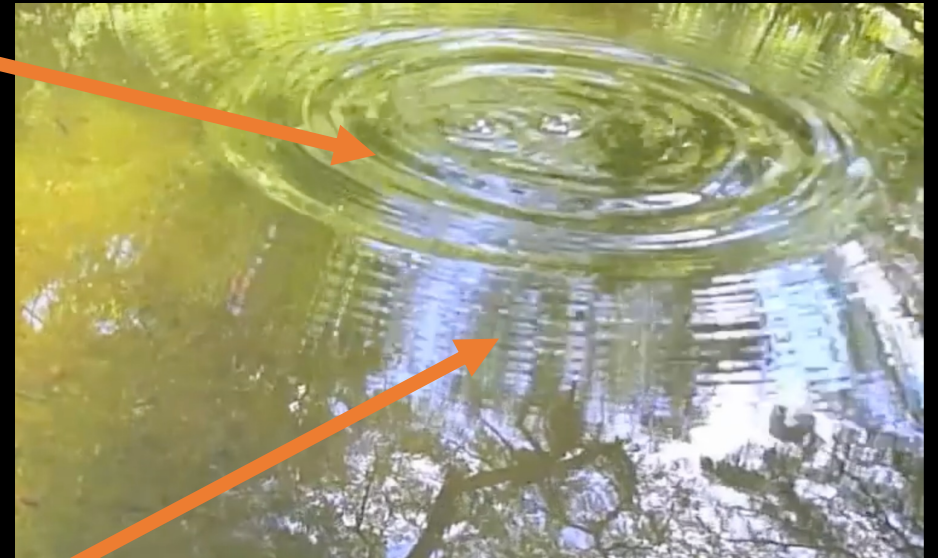


# III - Ondes

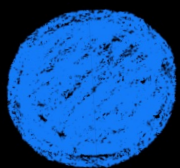
ondes de gravité



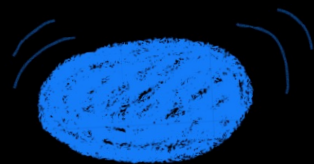
ondes capillaires



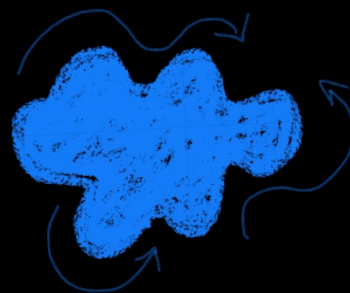
I- Créer: mouillage



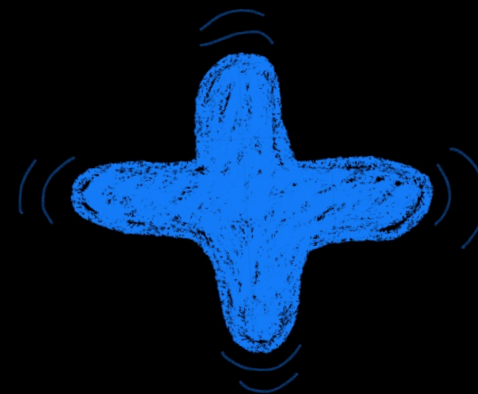
II- Déformer: vibrations



III- Sculpter: ondes



IV- Former: modes





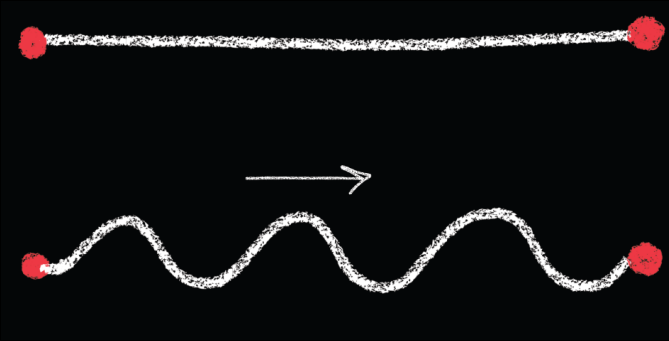
# IV – Modes de résonance

corde vibrante : 1-dimension



# IV – Modes de résonance

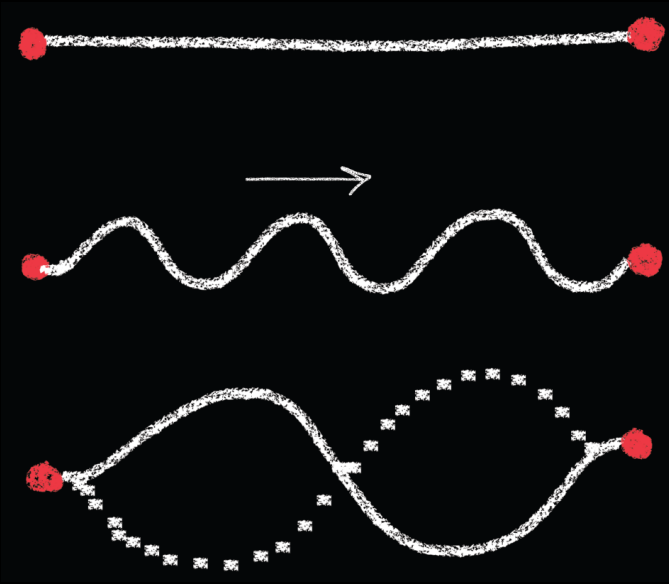
corde vibrante : 1-dimension





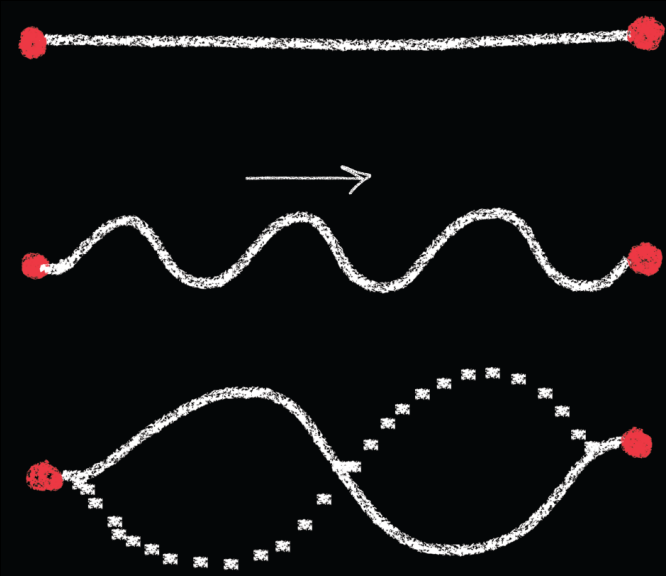
# IV – Modes de résonance

corde vibrante : 1-dimension

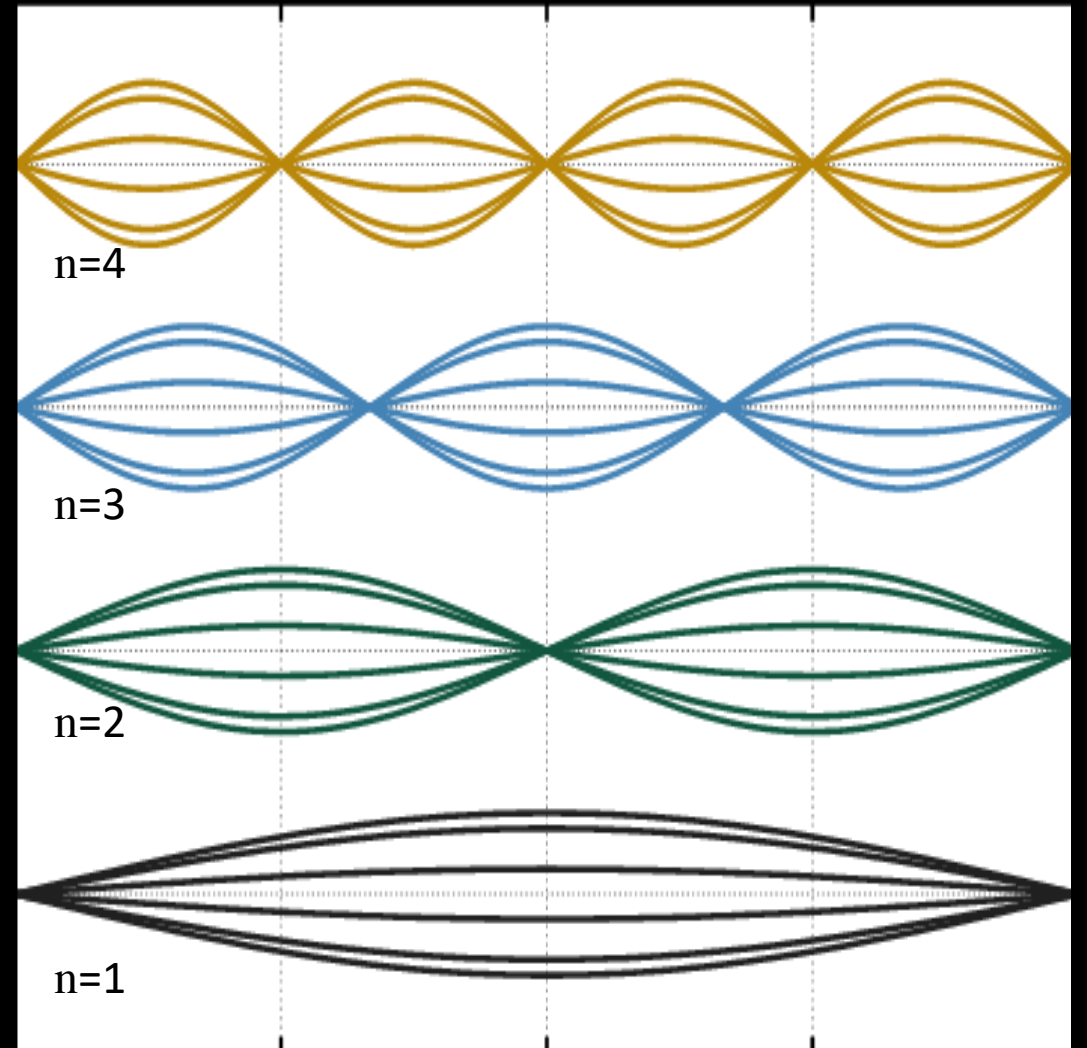


# IV – Modes de résonance

corde vibrante : 1-dimension

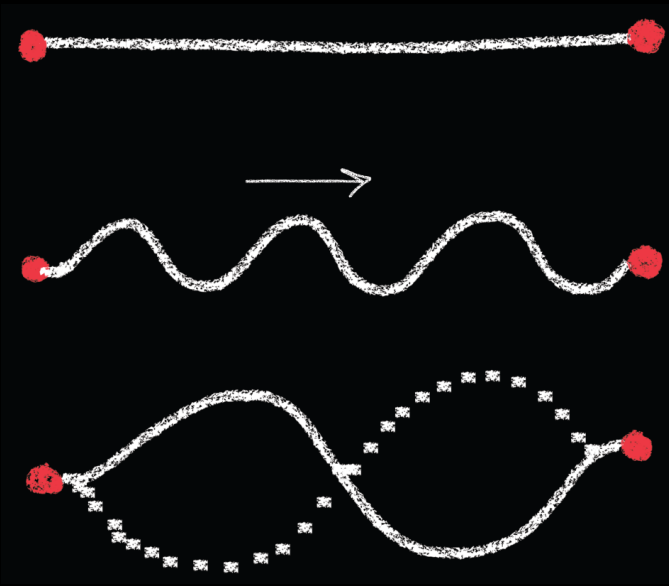


Modes: ondes stationnaires

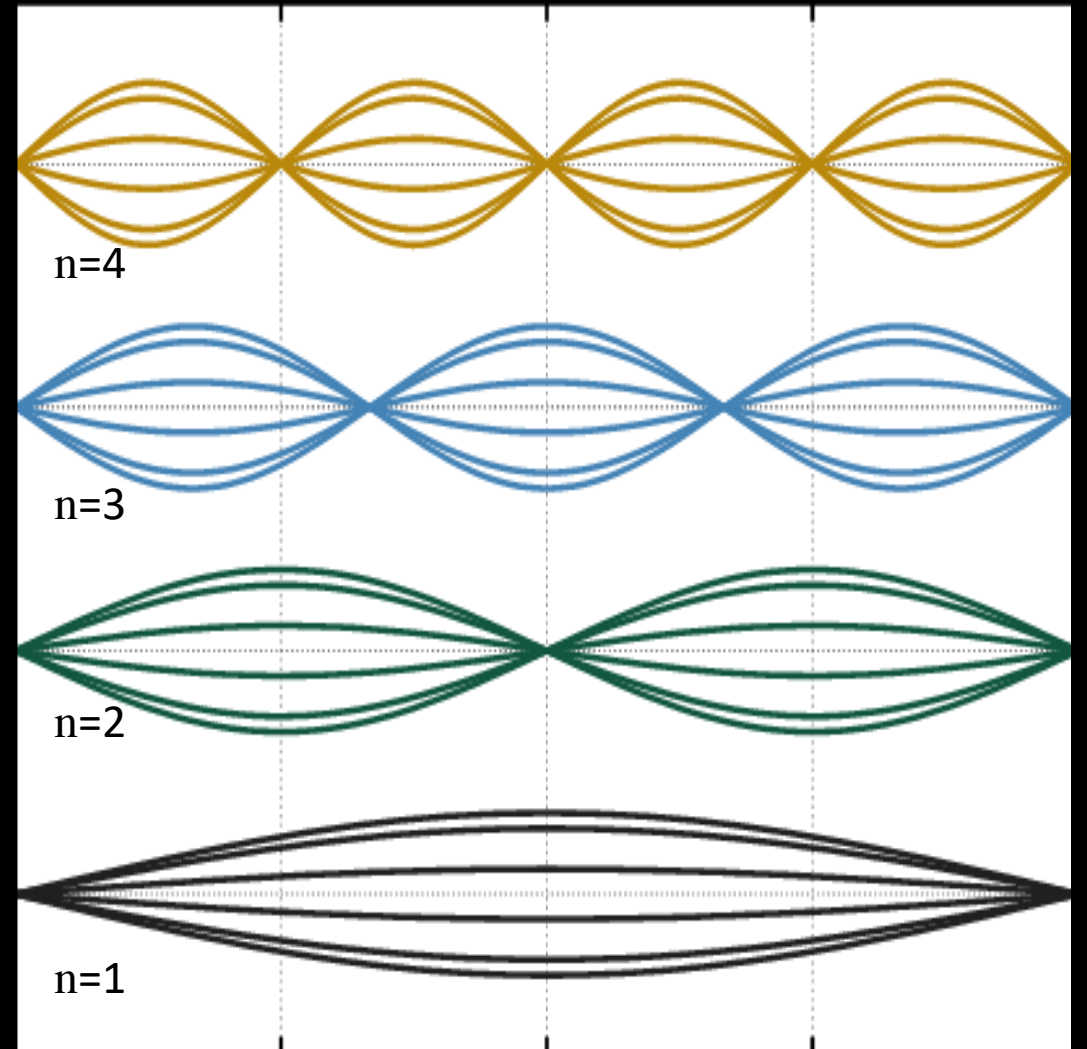


# IV – Modes de résonance

corde vibrante : 1-dimension



Modes: ondes stationnaires

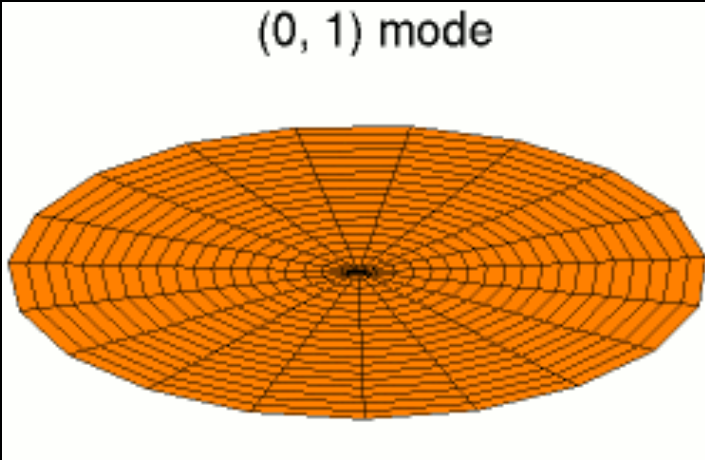


fréquence de vibration

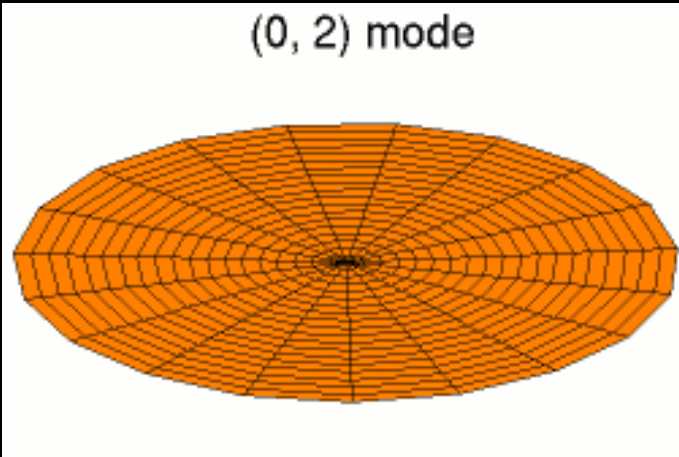
# IV – Modes de résonance

plaque vibrante : 2-dimensions

(0, 1) mode



(0, 2) mode

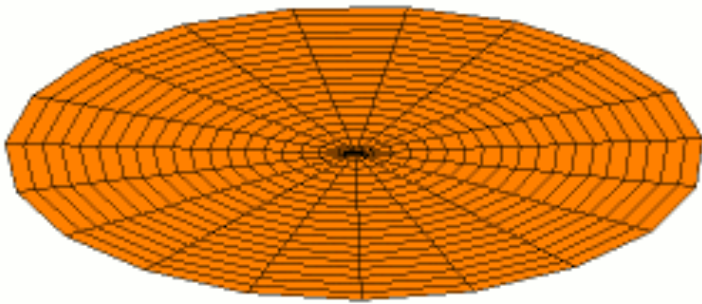


# IV – Modes de résonance

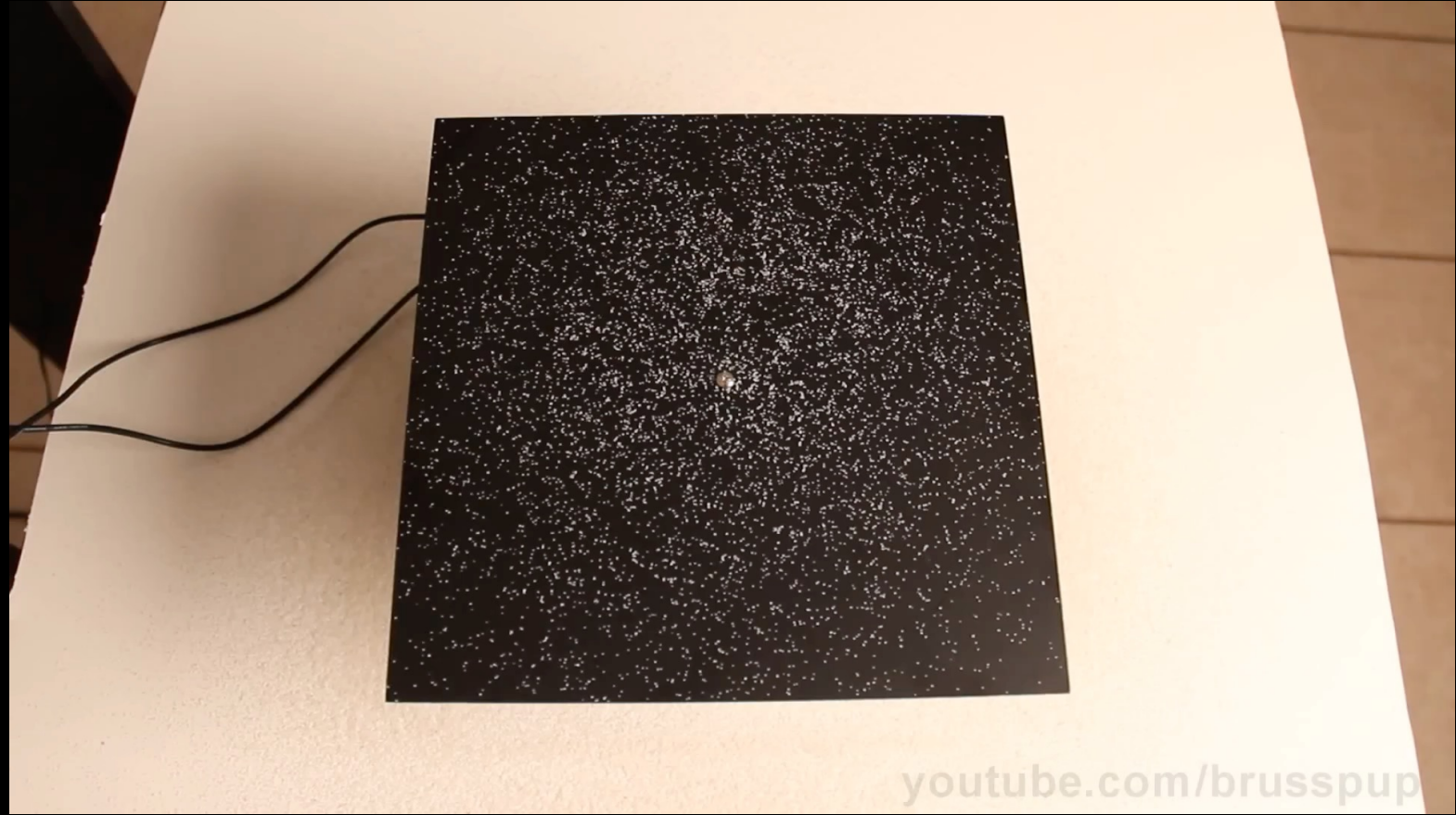
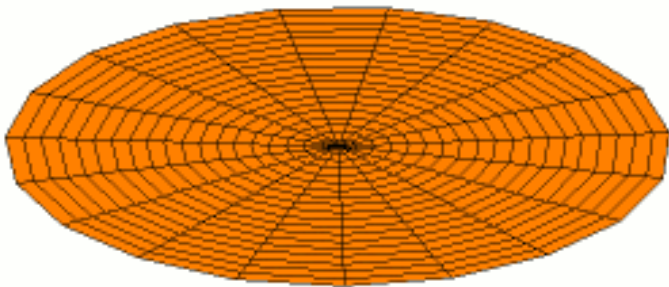
plaque vibrante : 2-dimensions

Figures de Chladni

(0, 1) mode



(0, 2) mode





# IV – Modes de résonance

[Yoshiyasu et al. \(1996\)](#)

Mode

n=2

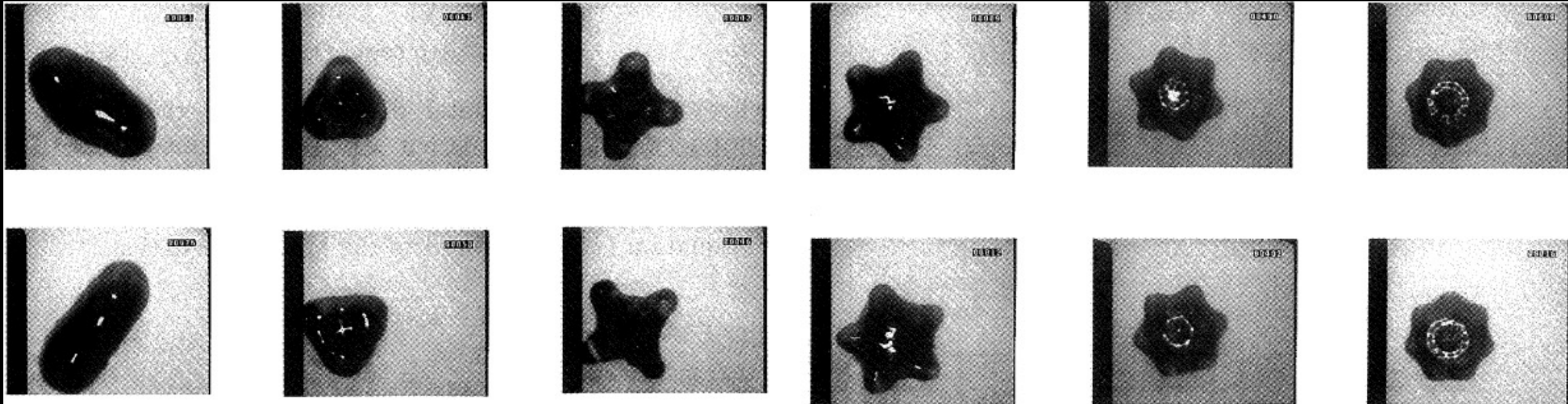
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n=4

n=5

n=6

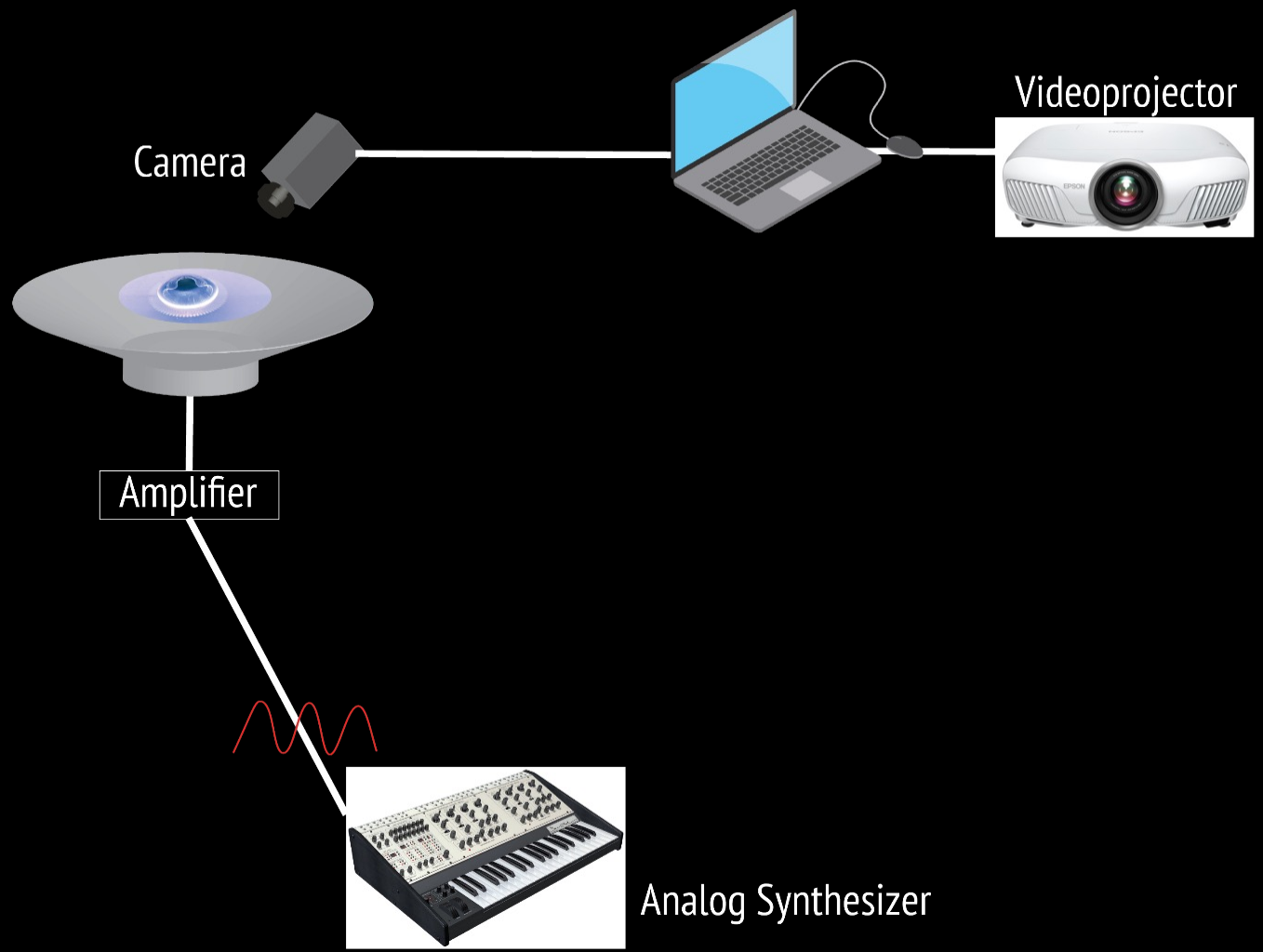
n=7

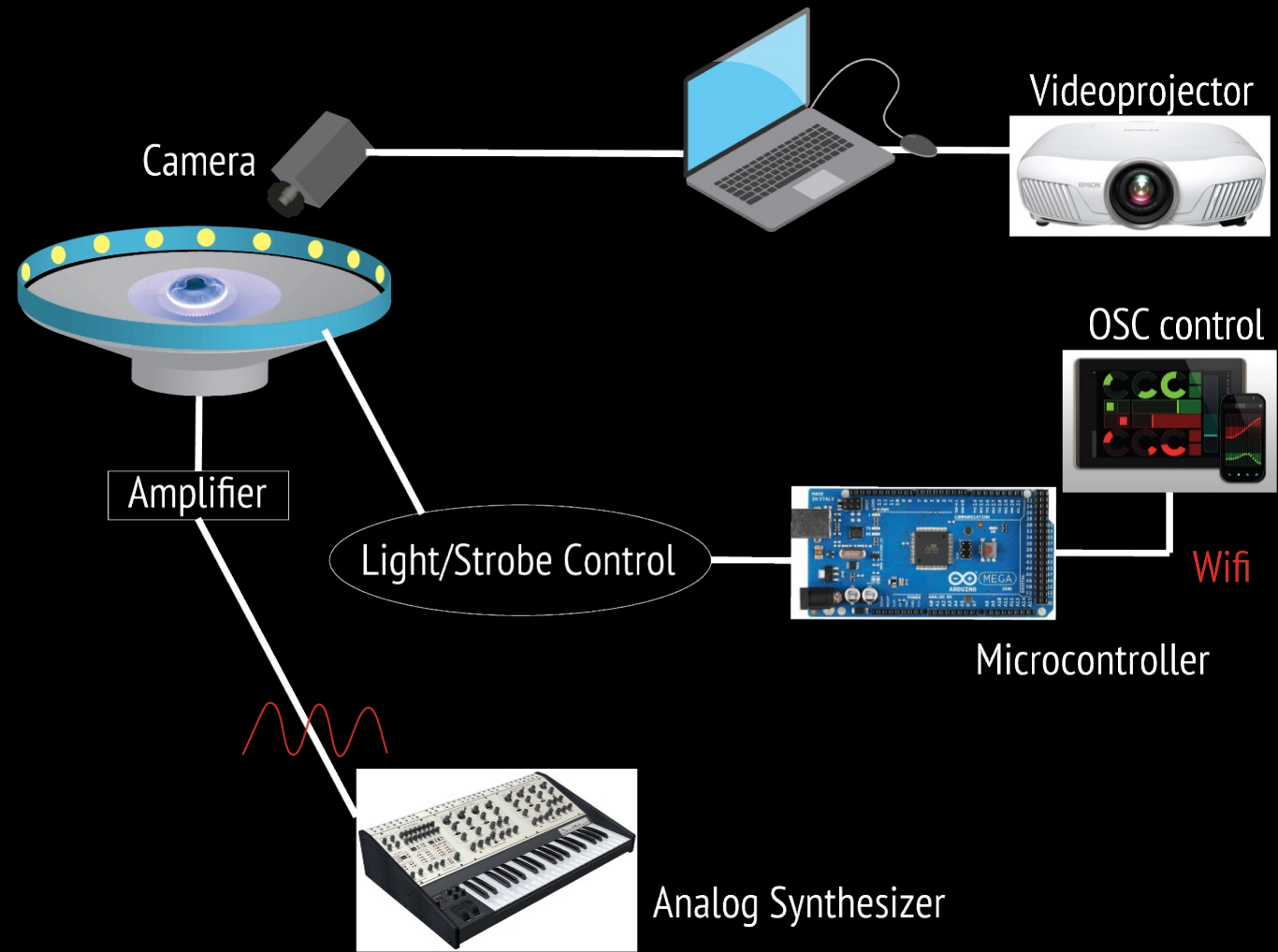


fréquence de vibration

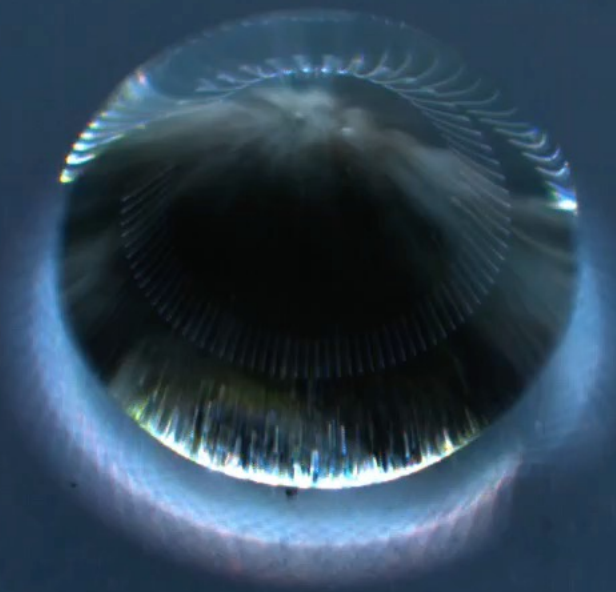




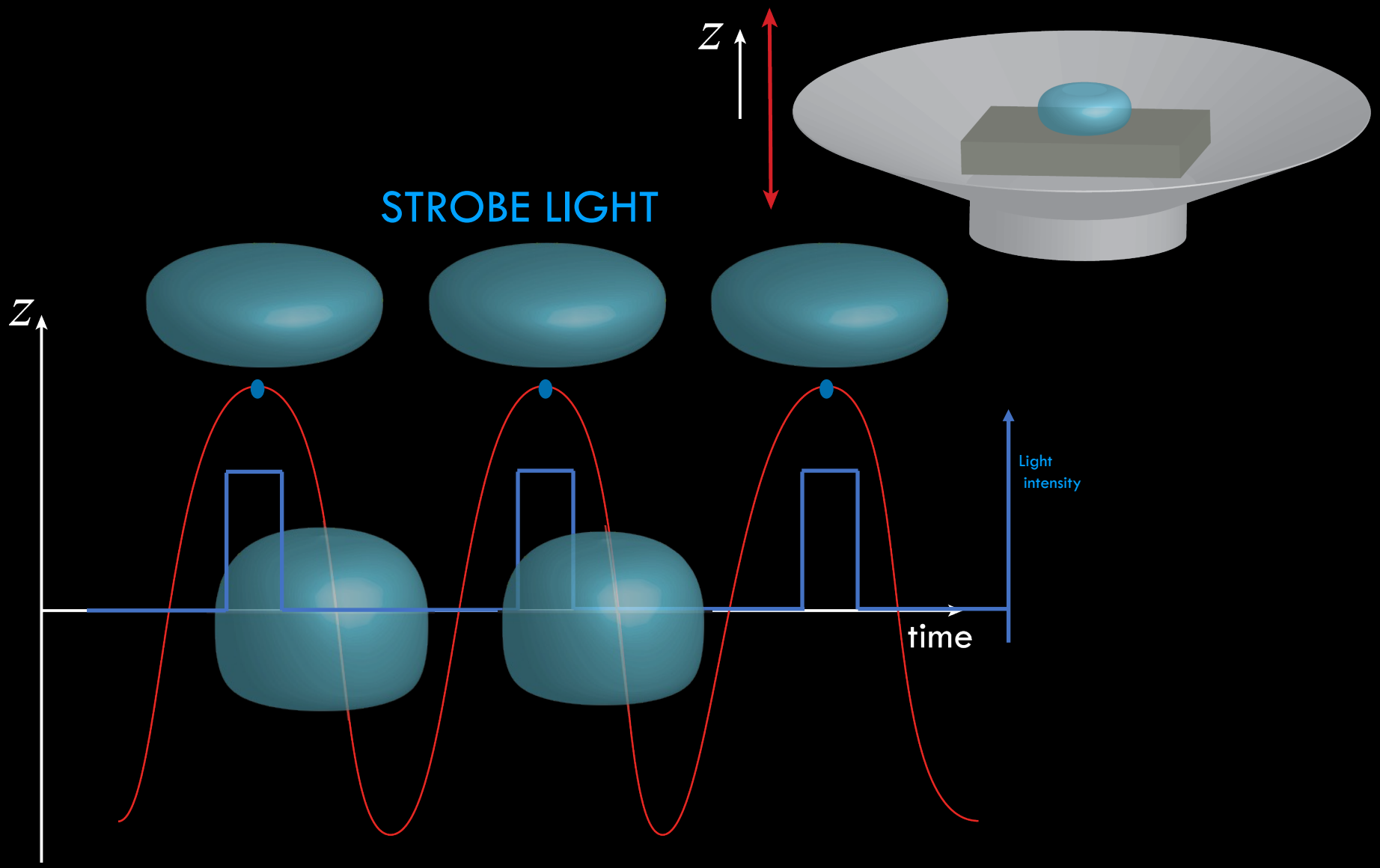


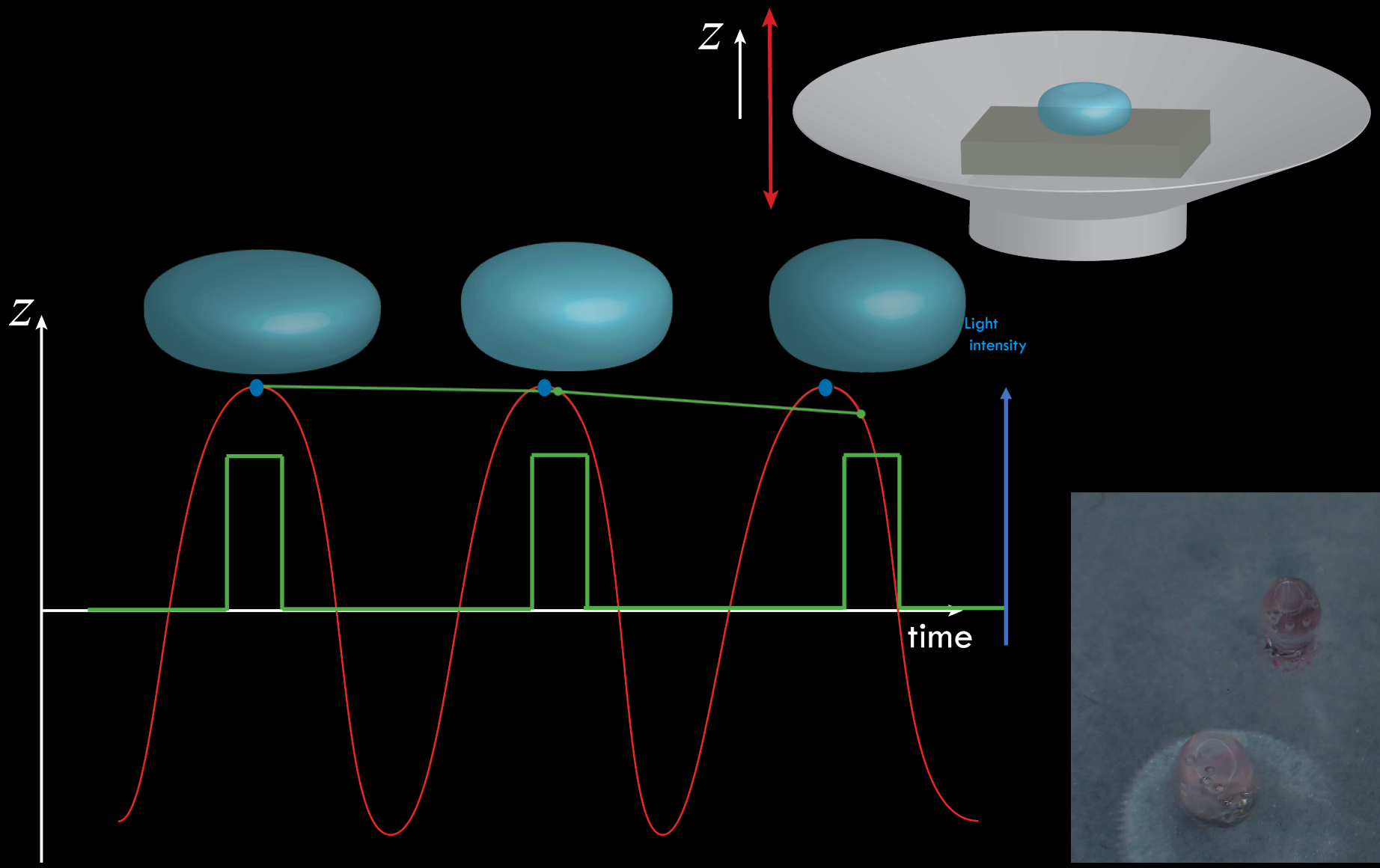


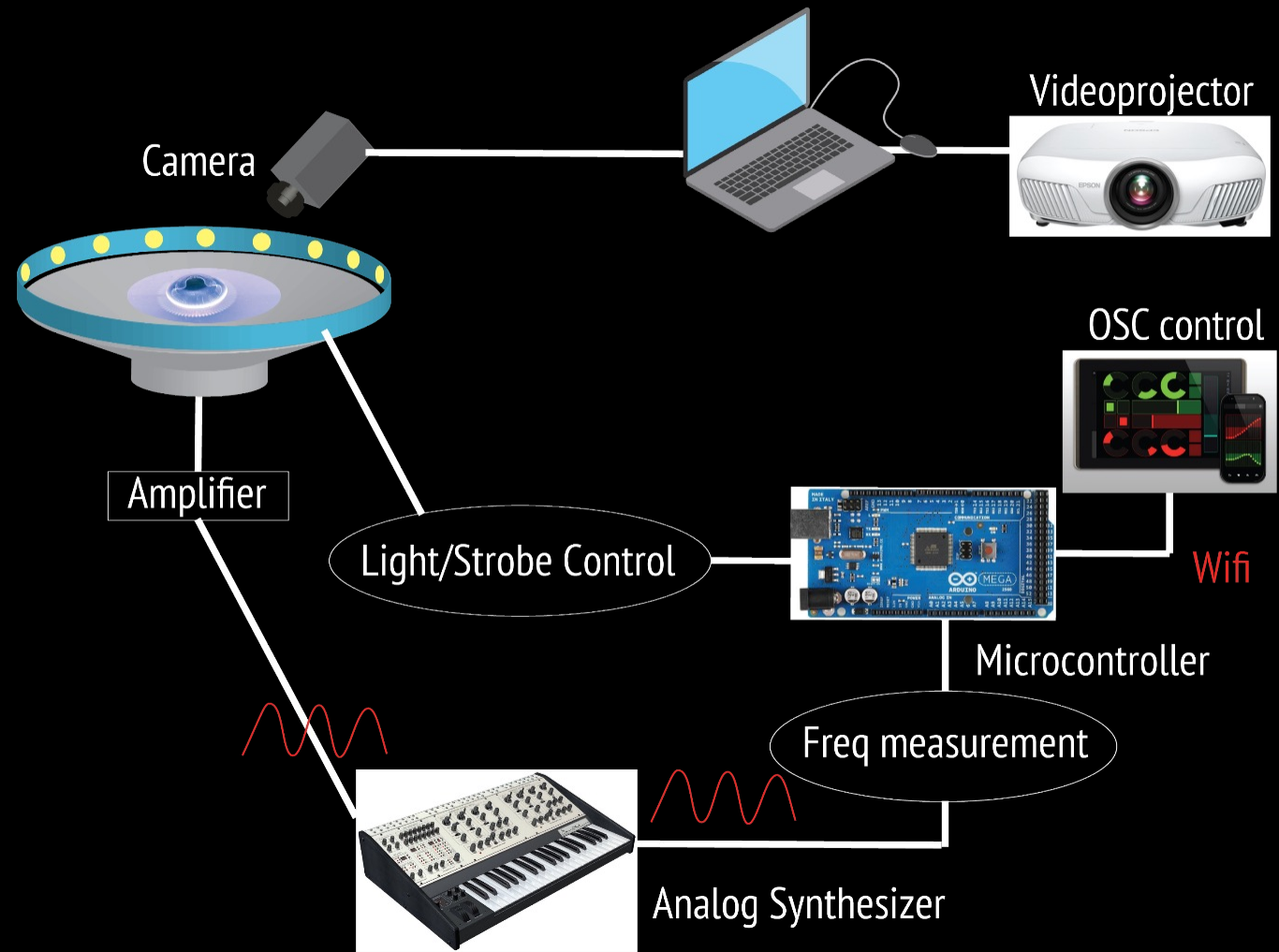




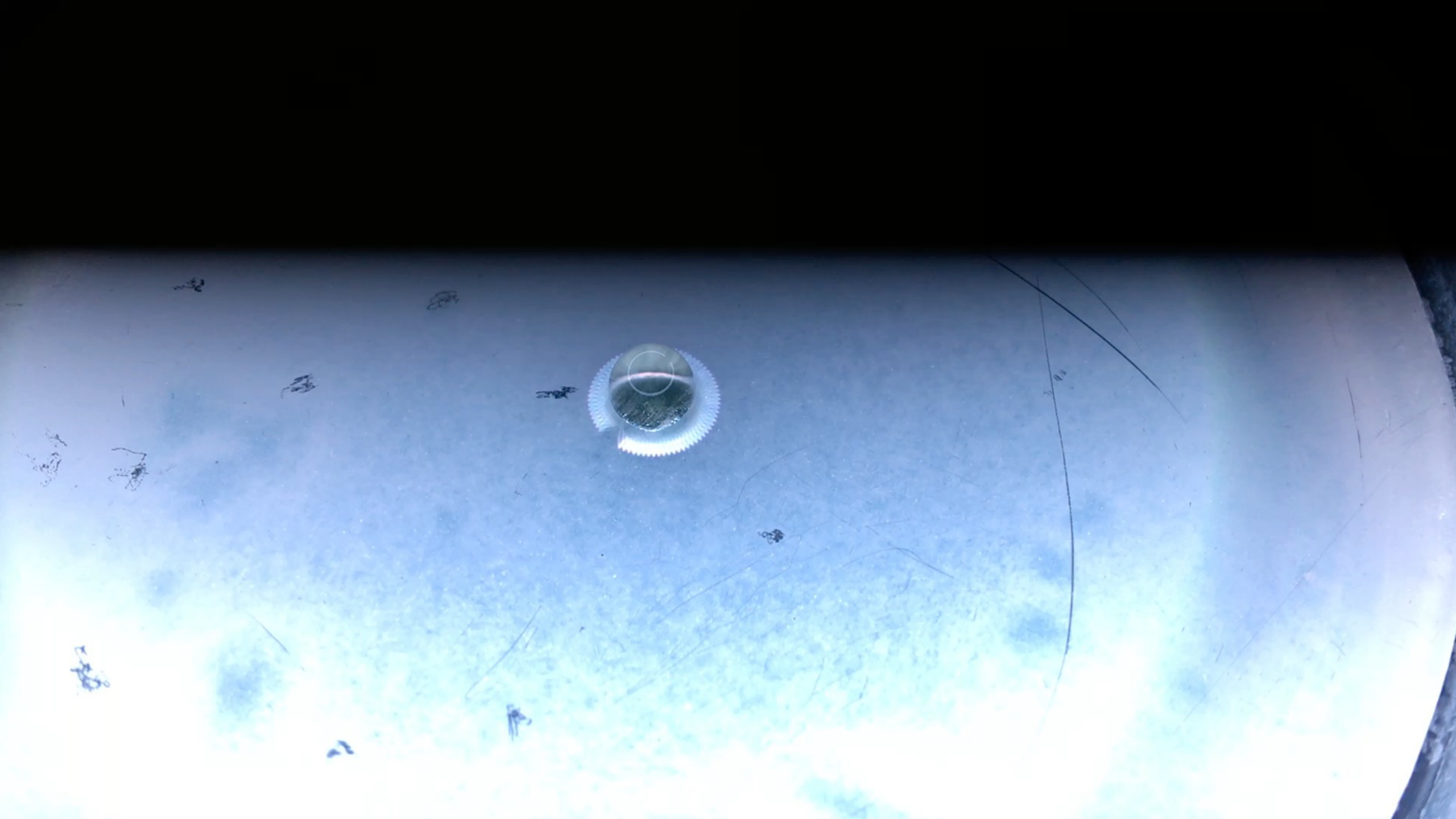




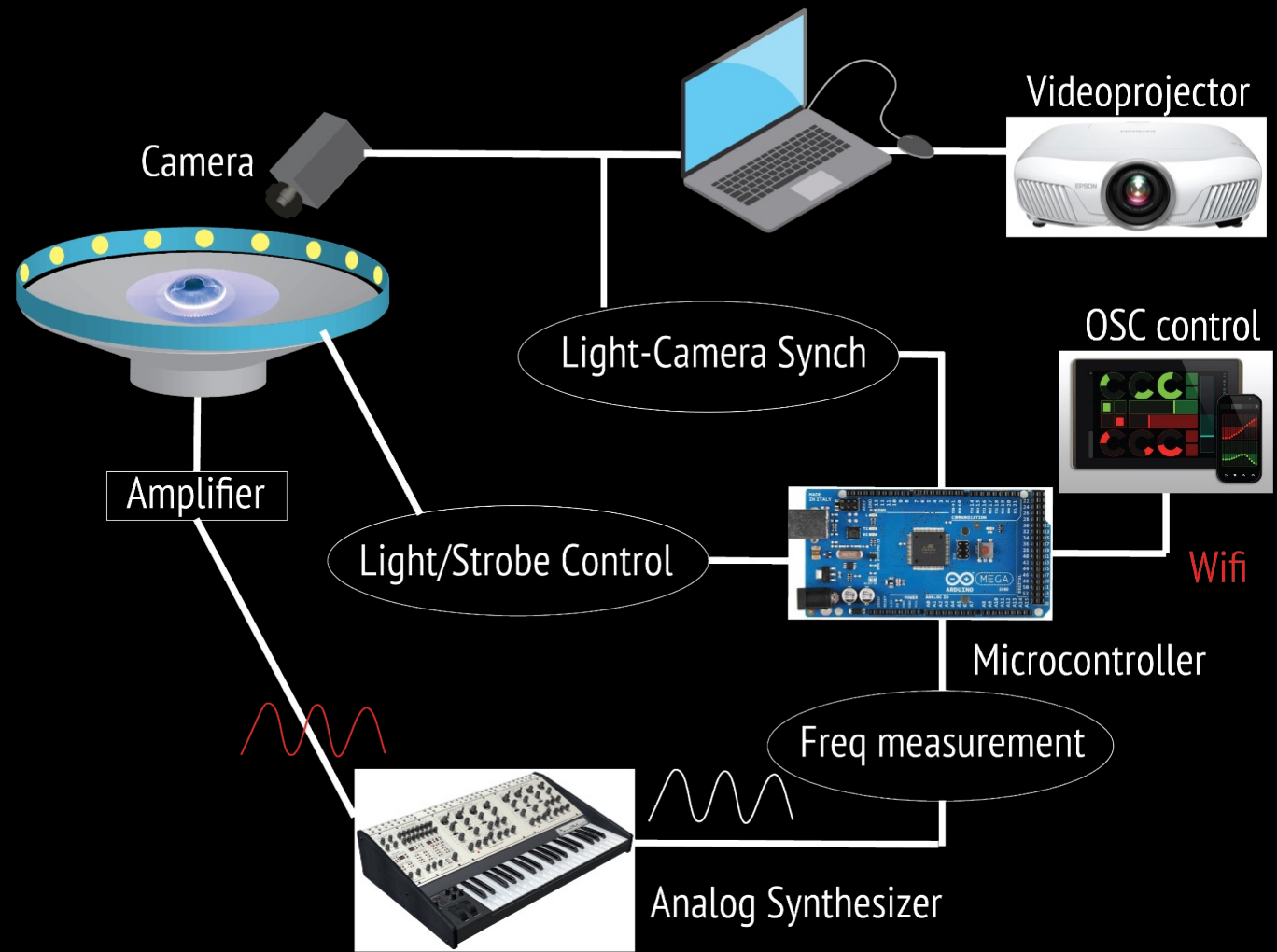


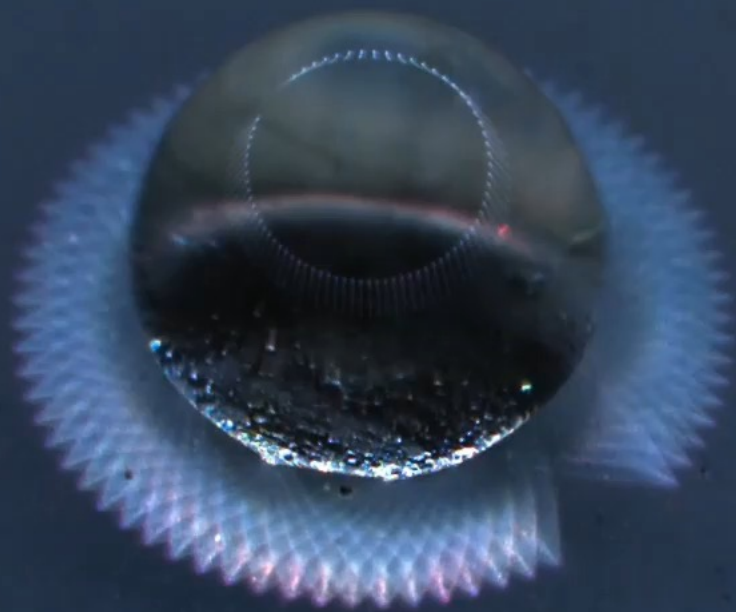


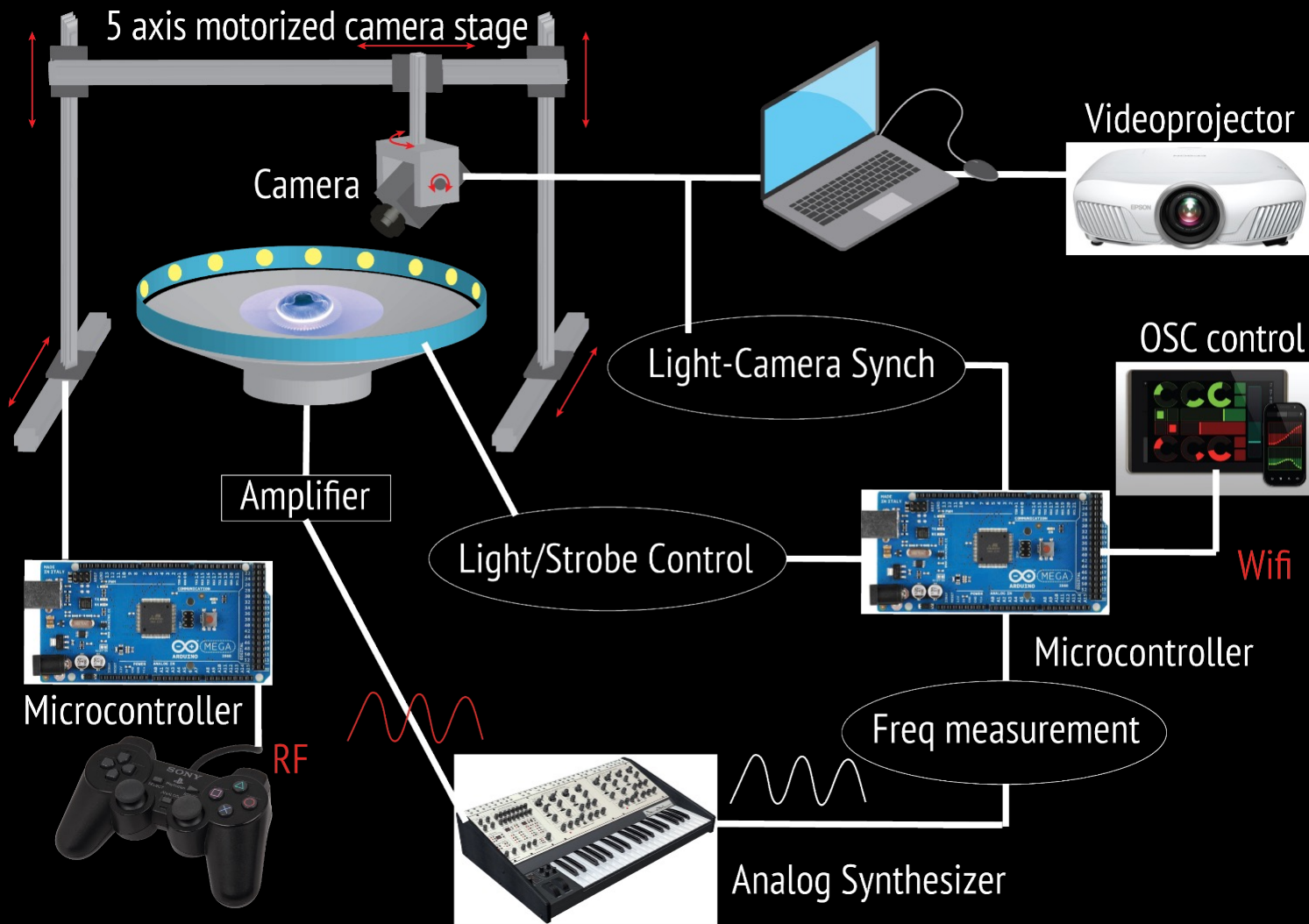












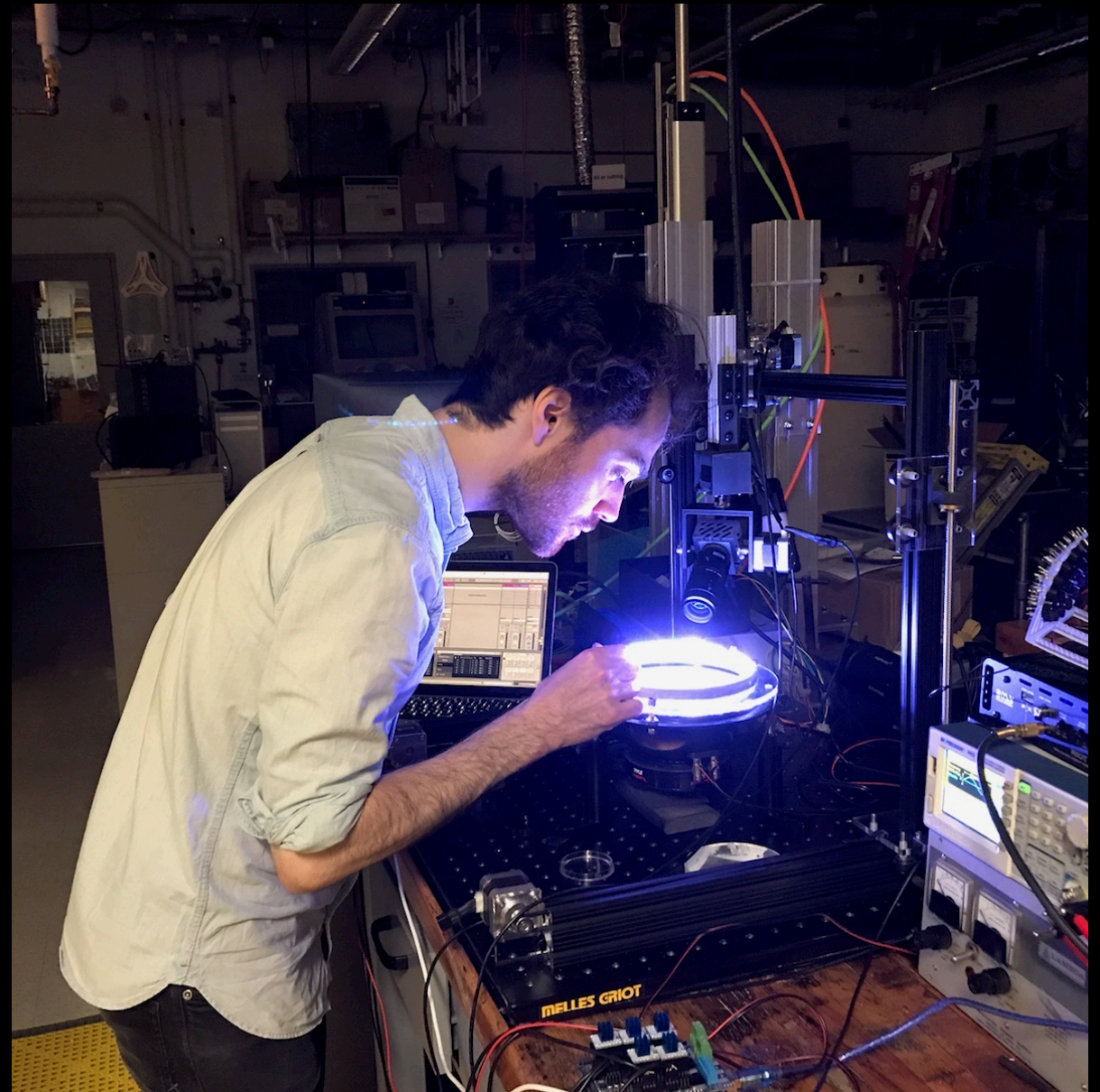
# SOAP FILMS EXPERIMENTS





Making off



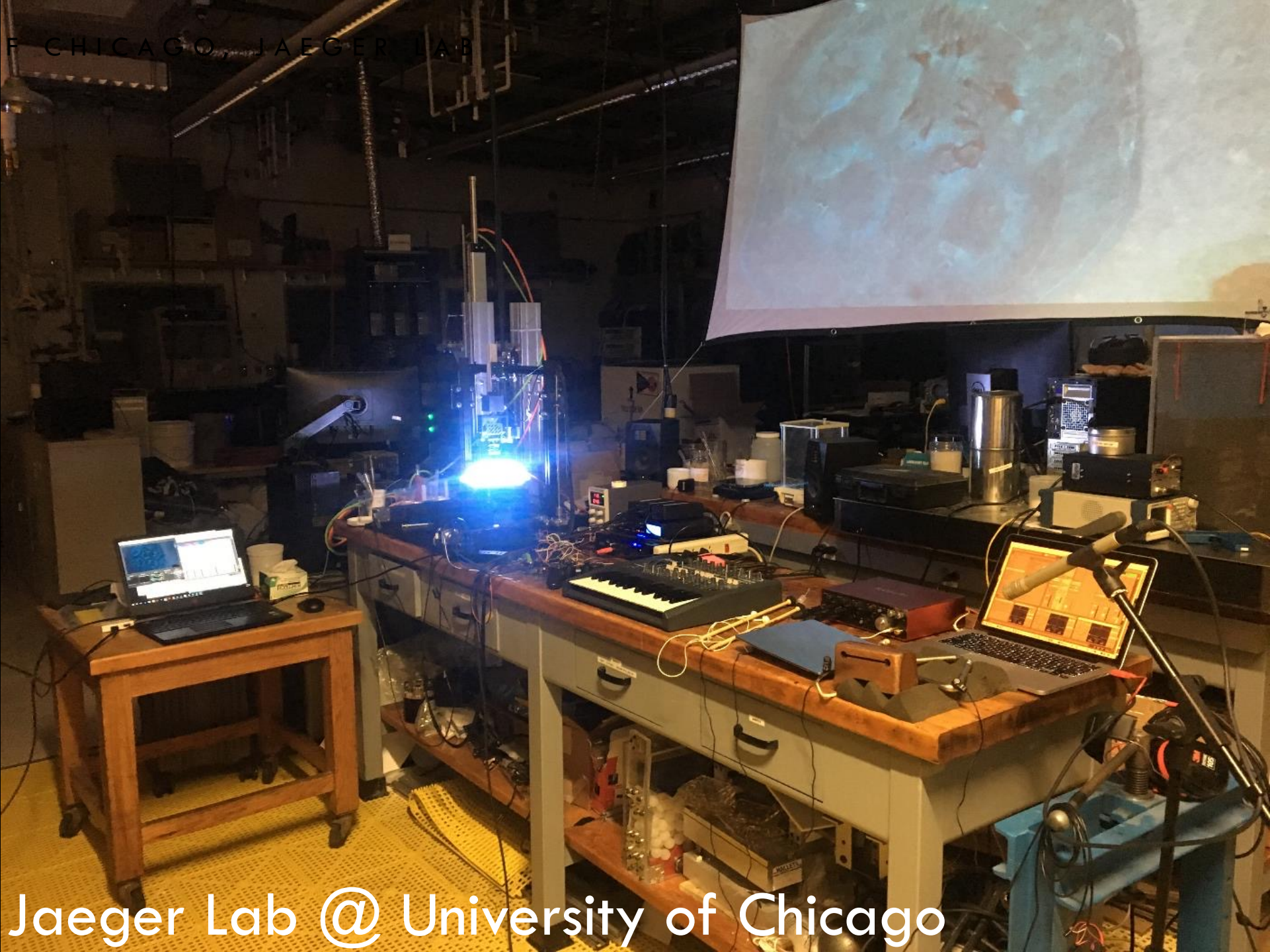


Jaeger Lab @ University of Chicago



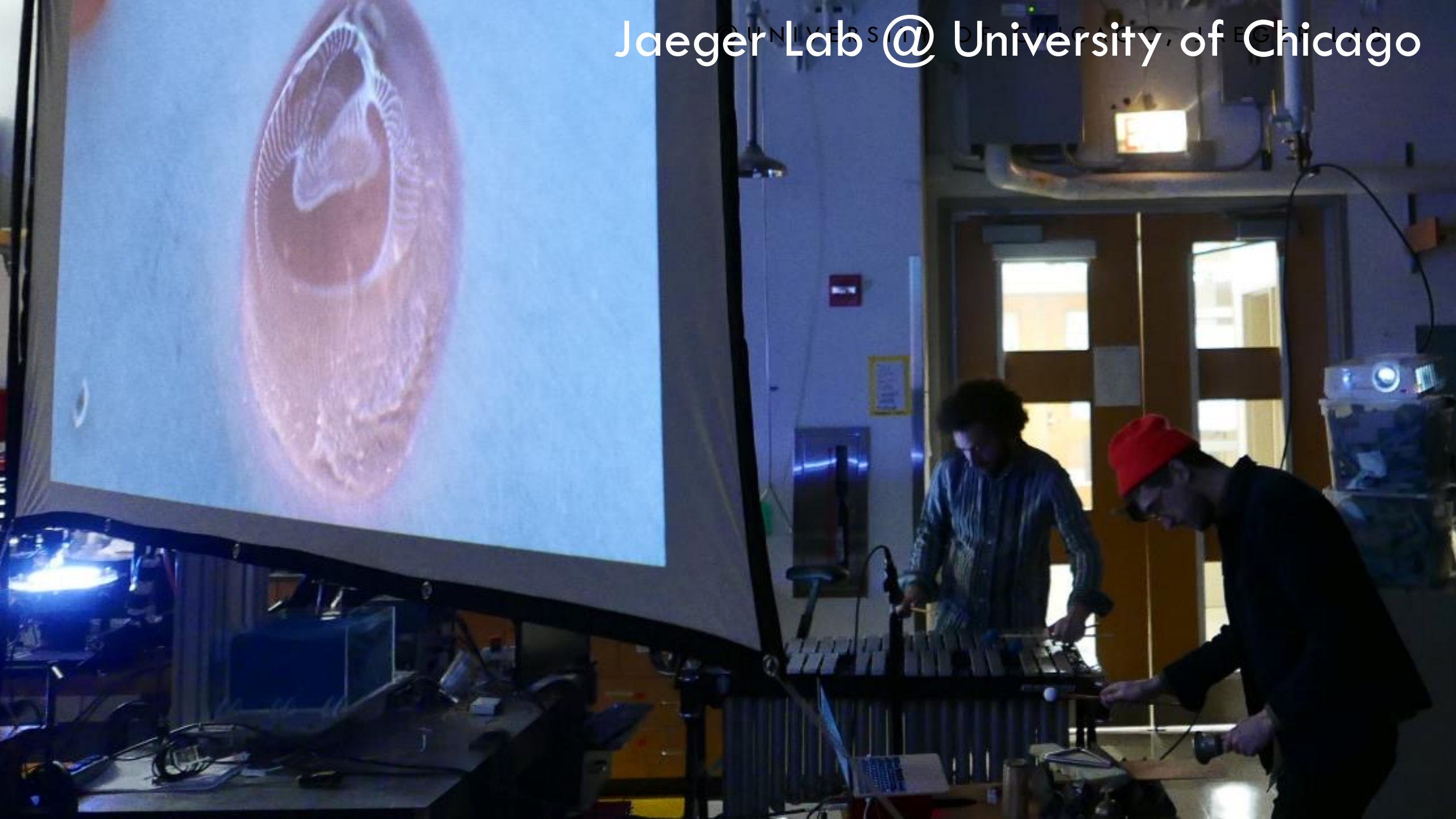
F CHICAGO JAEGER LAB

Jaeger Lab @ University of Chicago





# Jaeger Lab @ University of Chicago

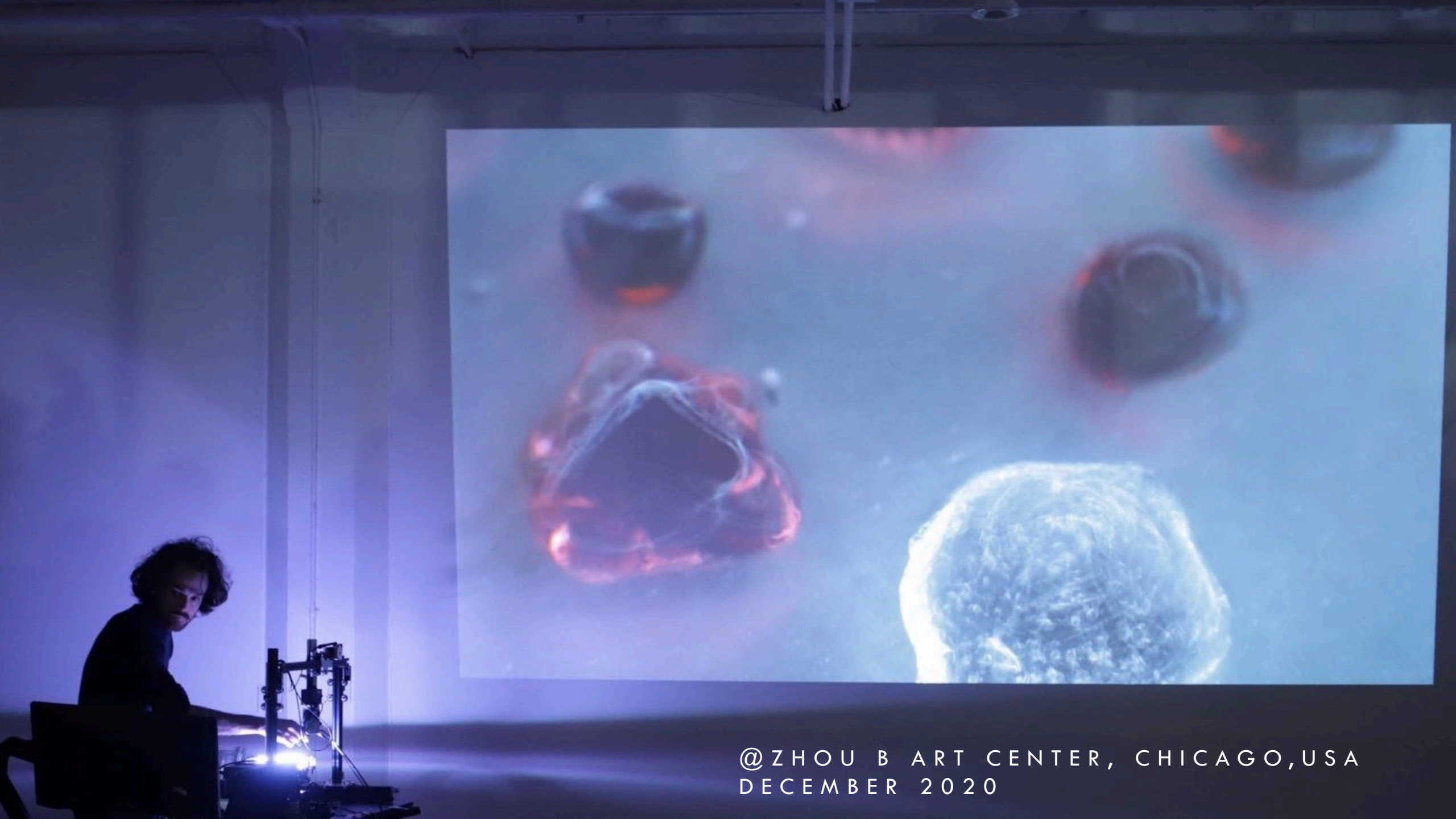






@ZHOU B ART CENTER, CHICAGO, USA  
DECEMBER 2020





@ZHOU B ART CENTER, CHICAGO, USA  
DECEMBER 2020

# Live musicians



KIKU HIBINO



OTTO BRINER



BEN ZUCKER  
(NORTHWESTERN  
UNIVERSITY)



SAM SCRANTON  
(NORTHWESTERN  
UNIVERSITY)



XIAO XIAO



ROIEL BENITEZ



ANDREW  
BREGMAN  
(MOTU, IZOTOPE)



RYAN PACKARD

# SUPPORT



COUNCIL  
FOR THE  
ARTS AT MIT



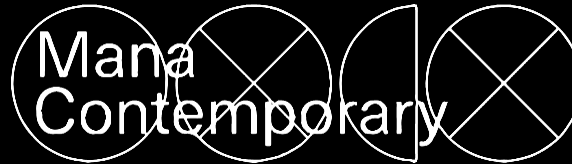
THE UNIVERSITY OF  
CHICAGO



UNIVERSITÉ PARIS  
Partage des savoirs



HIGH CONCEPT LABS



Jaeger Lab

THORLABS

Pixelink®  
A NANITAR COMPANY





## Events program

# Water Organoids

### PERFORMANCE

*Water Organoids* is a performance that uses an "immersive microscope" to film and project an invisible reality of self-organizing water structures. Emerging artistic and natural forms are indiscernible in experiments executed in front of the audience using pipettes, syringes, tweezers, and motors.

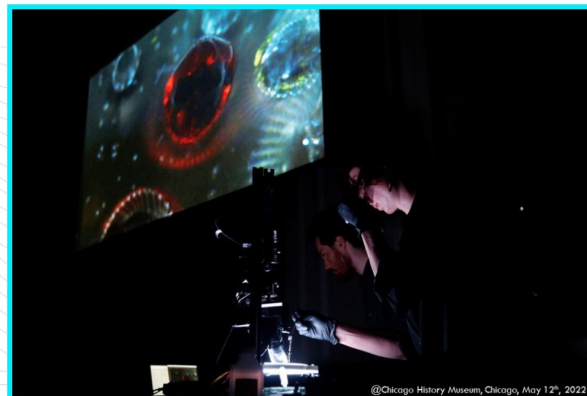
*Water Organoids* is presented with the support of the Outreach Program @PSL University, in collaboration with the CNRS researcher Etienne Reyssat from PMMH, ESPCI Paris – PSL University. It is part of the Shapes of Emergence project, which develops performances, videos, robotic installations and research at the crossroads of art, technology and science. This project has benefited from the support of CAMIT (Council of the Art at MIT), High Concept Lab @MANA Contemporary in Chicago, the University of Chicago and private companies Thorlabs and Pixelink.

### ARTISTS

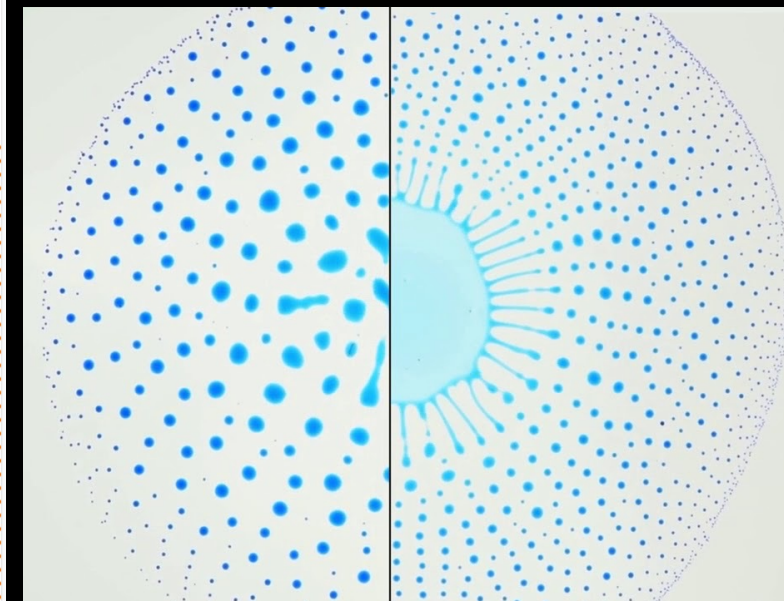
Performed by **Baudouin Saintyves** and **Severine Atis**, ISEA2023 laureates artists  
Sound by **Roiel Benitez**, **Ben Kinsinger** and **Otto Brinner**

### MORE INFORMATION

Maison du Geste et de l'Image  
20 May 2023 - 13:30



Shapes of Emergence, Performed by Baudouin Saintyves and Severine Atis. Photography credits: Yousif Alzayed



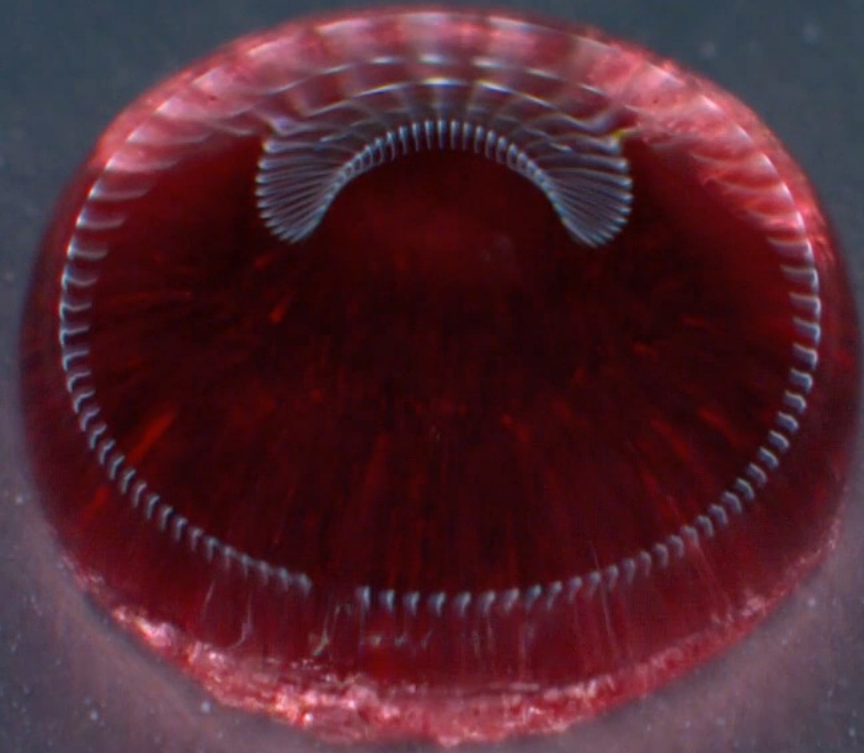
En collaboration avec  
Etienne Reyssat



samedi 20 Mai à 13h30 et 14h30  
@ Maison du geste et de l'image



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