M254 Arts & Engineering Research

Fall 2014, Studio 2611, Elings Hall
Tues-Thurs 12:00 to 1:50pm

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Experimental Visualization Lab
Media Arts & Technology Program
UC Santa Barbara

M254 Course

Address methodologies in art production and engineering/scientific research.

Tuesdays: Discuss artistic methods

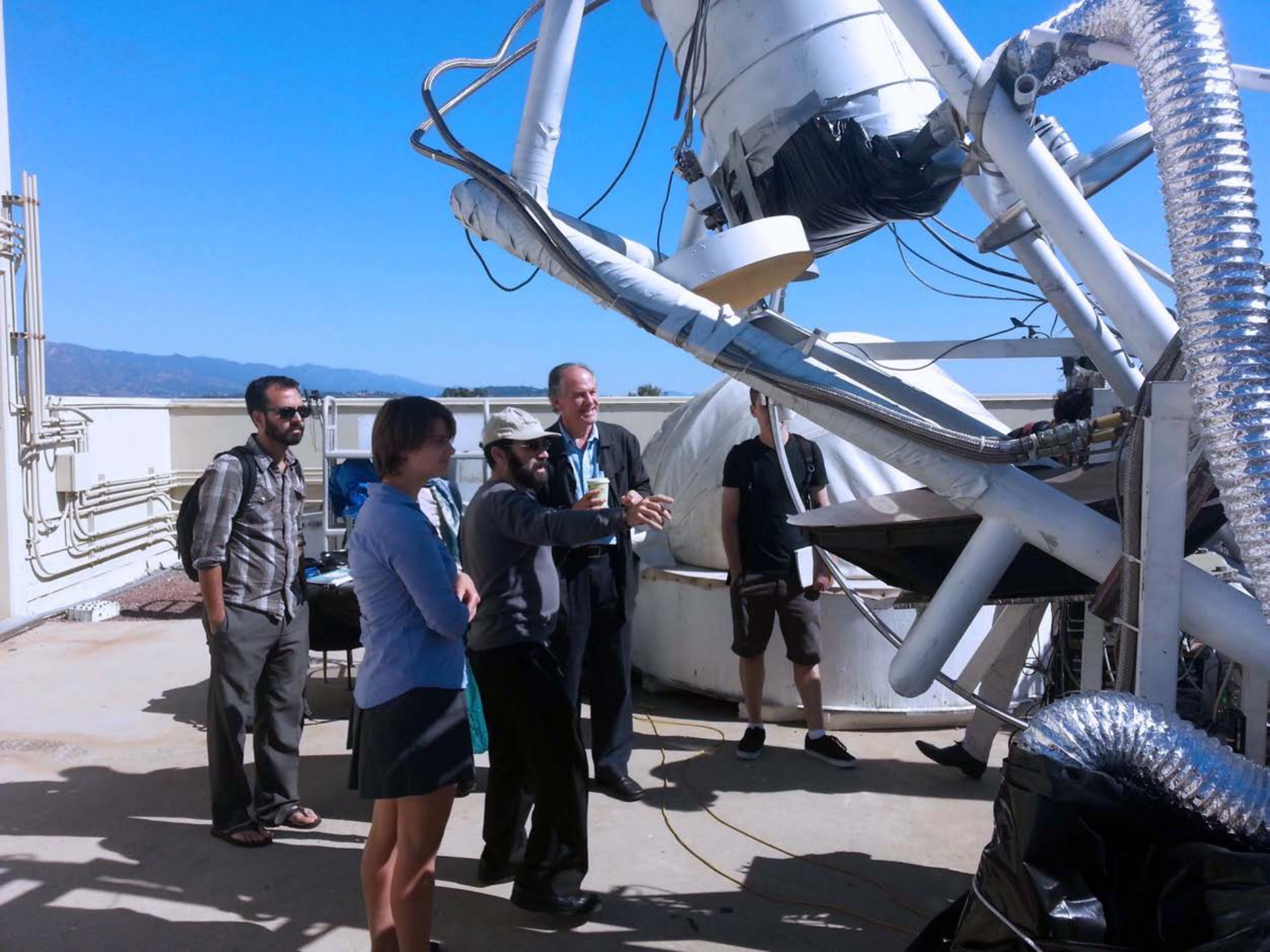
Thursdays: Visits to Engineering or Science Labs

Student Work: Do some research, create a project where you will address your methodologies

Research Definitions

Any gathering of data for the advancement of knowledge

- **Basic Research:** Driven by interest to increase understanding about fundamental principles
- **Applied Research**: A form of systematic inquiry involving literature study, methodologies, with the goal of solving practical problems



Scientific Research

Information and theories about the properties of the world

- **Hypothesis**: A testable prediction
- **Conceptual definition**: Description of a concept
- **Gathering Data**: Selecting samples (with instruments)
- **Analysis of Data**: To draw conclusions
- **Verification of Hypothesis**
- **Communication of Results**


Popular Science
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Science
Science


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Lab Visits:

A mixed selection of research labs on campus. The big questions to ask:

- How do scientists get from analysis of data to discovery?
- What is the methodology and what is the process by which that happens?
- Do artists proceed in a similar or different way?
- What are the methods of representation?
- To what degree does aesthetics play a role in the process of scientific discovery and representation?


Paul


A3

First Lab Visits & Syllabus URL:

- Yasamin Mostofi Mobile Sensors Lab | X-Ray Vision
- Doyle Systems Biology Lab | Circadian Rhythms
- Francesco Bullo: robotics

- http://www.mat.ucsb.edu/~g.legrady/academic/courses/14f254/14f254.html

Artistic Research

- **Creative works** are considered both the research and the object of research
- **Usually practice based** but some artists bring analytical methods (semantics, semiotics, etc.)
- **Methodologies** can be individually defined rather then discipline prescribed -
- **Value**: To what degree does the artistic approach create meaning that could not have been addressed otherwise?

Humanities Research

- **Interpretation is determined by Context:** Social, historical, cultural, political, etc.
- **Argue that data is never neutral**. Its meaning is always determined by interpretation
- Focus is on the process of interpretation
- **Culture and ideology** determine the meaning of data

Some Basic Definitions

- Science relies on methodology: A set of methods, principles, rules for regulating a discipline
- Aesthetics: Perception, the senses, what feels coherent, insightful, etc.
- Metaphor: Something is like something else. Learn from *Nature*
- Indexicality: Points to something else
- Serendipity in Science: To what degree does aesthetics and chance have a role in decision-making?

Questions to explore:

- Science is a procedural process so what are the methods by which **data becomes discovery?**
- The artistic process is an open system. Flexibility in exploration.
- What are the metrics for evaluation in each?

Project inspiration: Calder Mobile for Kavli Center for Theoretical Physics

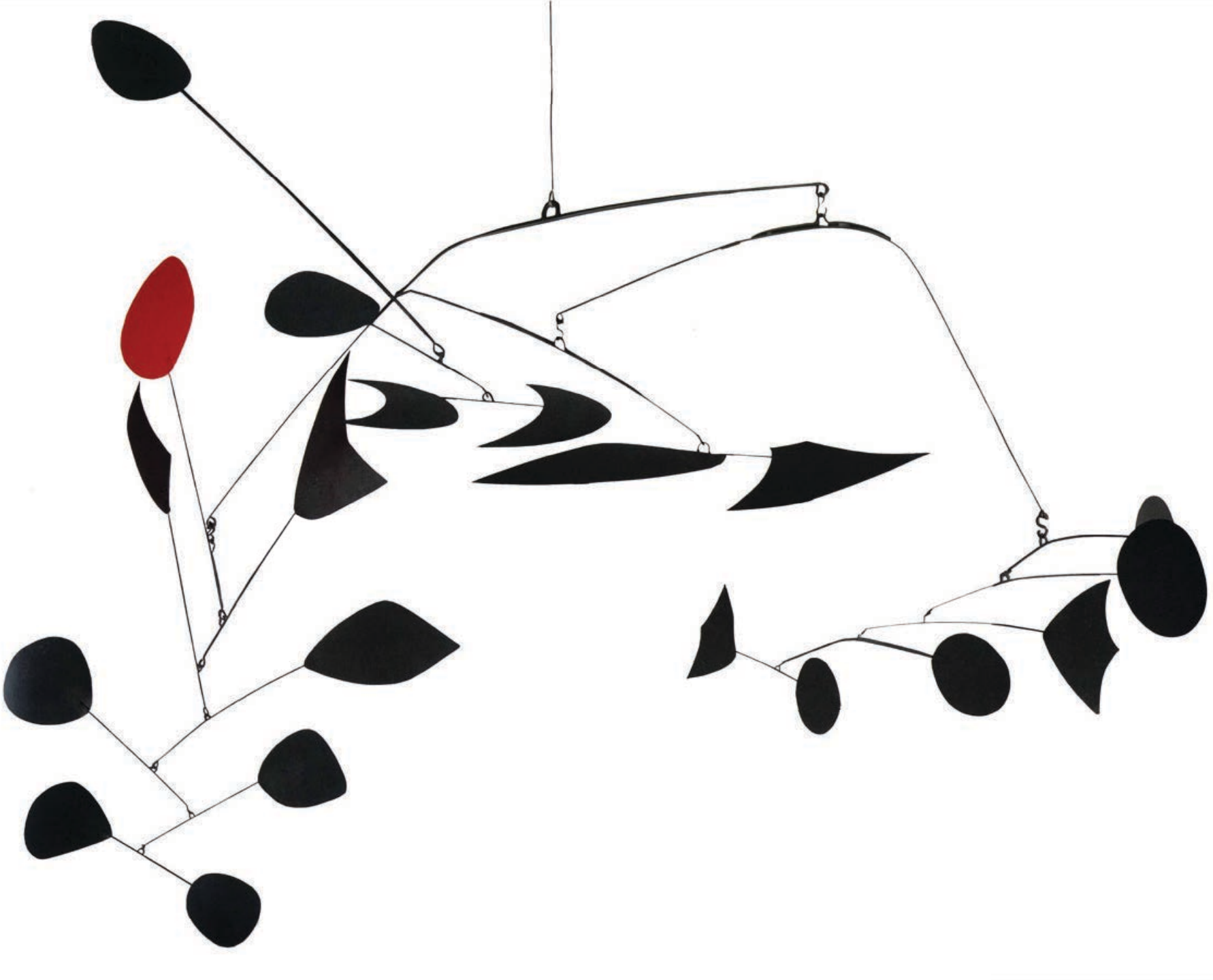
Alexander Calder (1898-1976)

Artist trained as mechanical engineer

Artwork integrates movement based on physics, sub-division of elements, interplay of elements

What is a site-specific work?

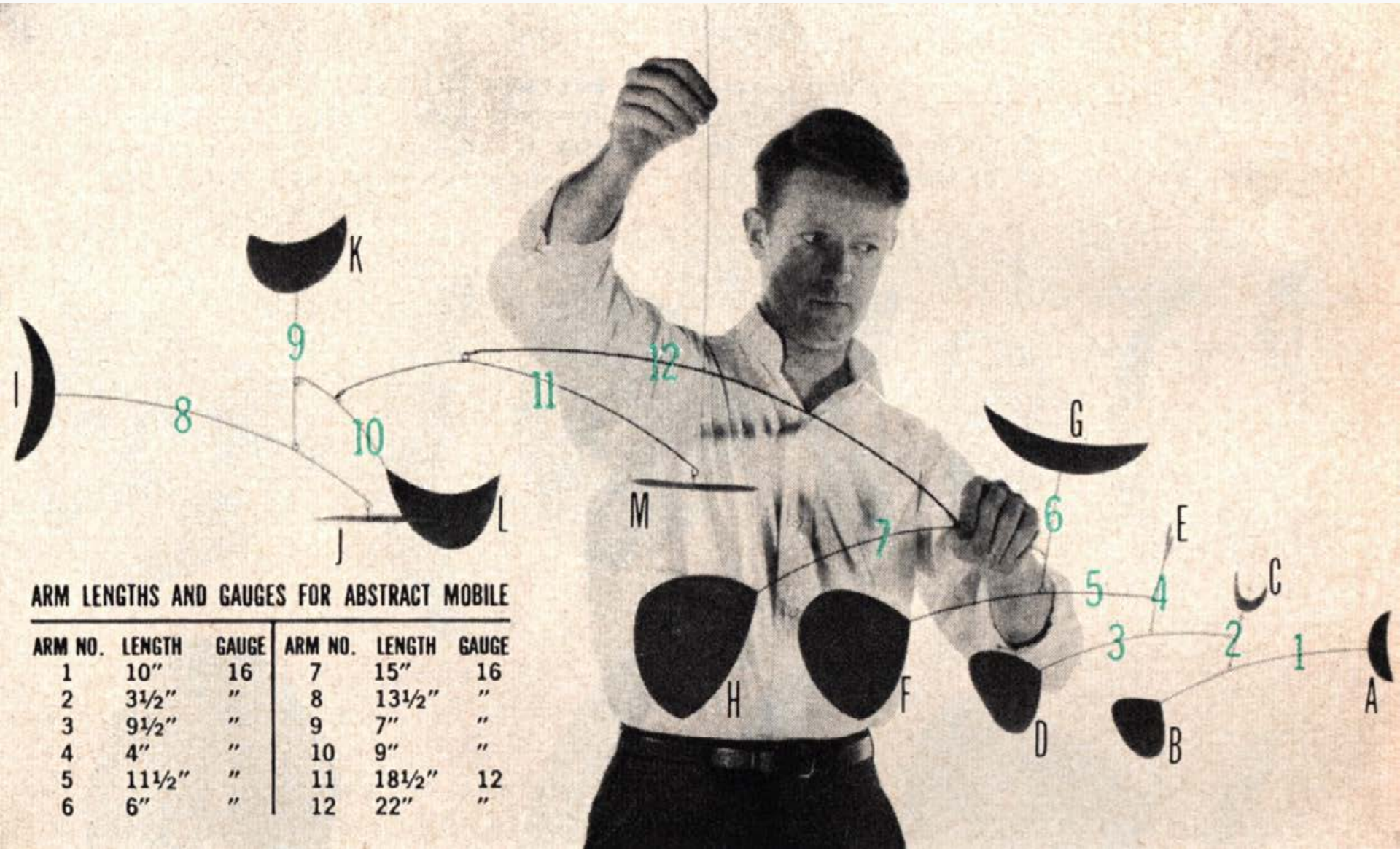
Several mobiles by Alexander Calder hang in the Museum of Contemporary Art's, Alexander Calder and Contemporary Art: Form, Balance, Joy exhibit in Chicago's MCA. The exhibit features 60 works by the noted sculptor. - AP Photo/Charles Rex Arbogast



Frank Zappa Quote:

- In my compositions, I employ a system of weights, balances, measured tensions and releases–in some ways similar to Varèse's aesthetic.
- The similarities are best illustrated by comparison to a *Calder mobile*
- I say: "*A large mass of any material will "balance" a smaller, denser mass of any material, according to the length of the gizmo it's dangling on, and the "balance point" chosen to facilitate the danglement*"

Components in a Calder Mobile:



ARM LENGTHS AND GAUGES FOR ABSTRACT MOBILE

ARM NO.	LENGTH	GAUGE	ARM NO.	LENGTH	GAUGE
1	10″	16	7	15″	16
2	3½″	″	8	13½″	″
3	9½″	″	9	7″	″
4	4″	″	10	9″	″
5	11½″	″	11	18½″	12
6	6″	″	12	22″	″

Calder PhotoBiography

Art Methodologies Topics:

- Proportion, Balance, Symmetry/ Asymmetry (Rudolf Arnheim)
- The Design Process
- Physics / Simulation
- Modularity, patterns, simplicity/ complexity
- Attraction/Repulsion
- Motion/Time/Delay
- Sequence / InterRelationship
- Site-Specificity

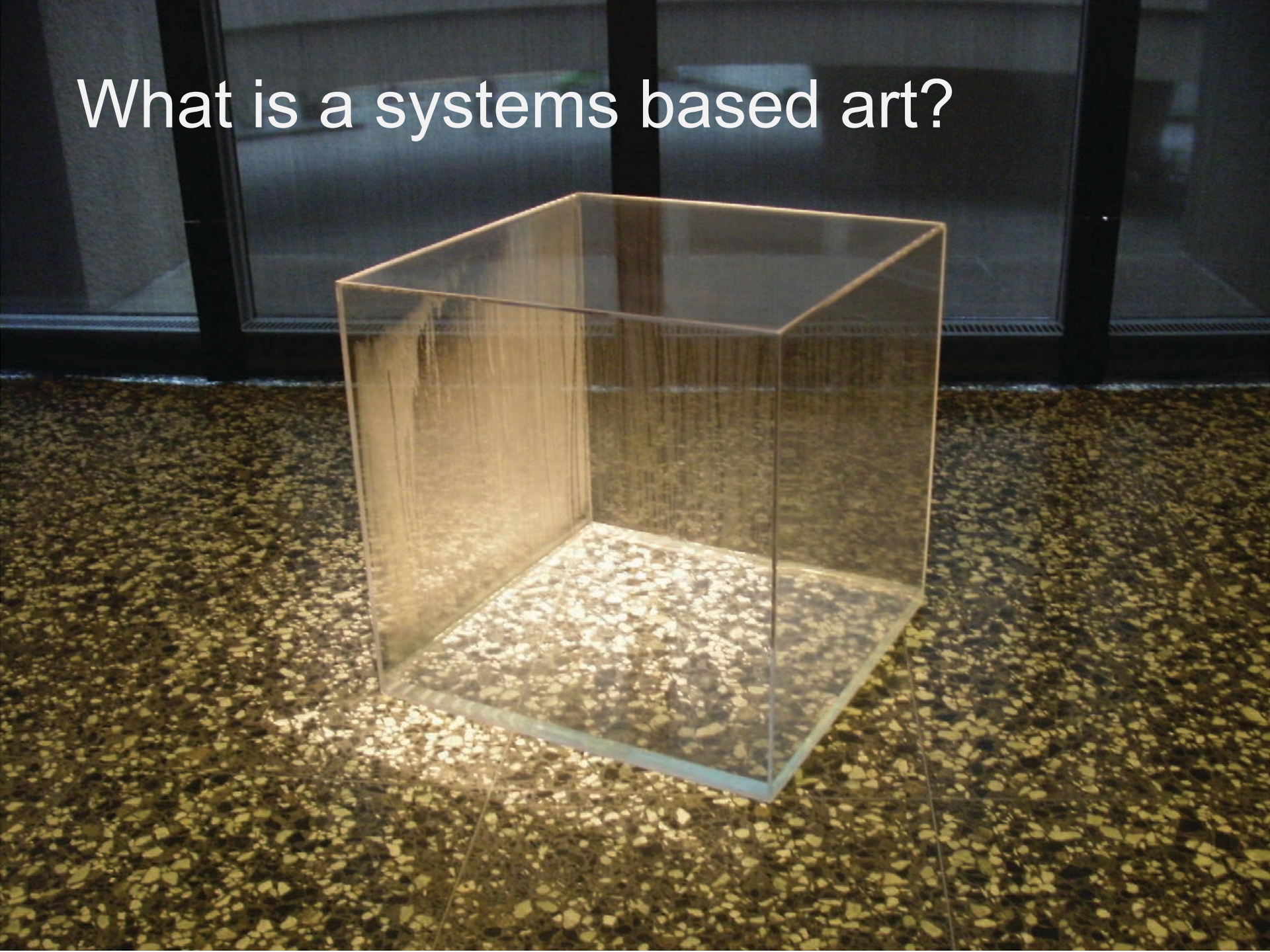
Course Questions: Research to Discovery

- To map out the process by which research results in discovery
- To study the role of tools, technologies as means of discovery expressions
- Once discovery occurs,
  - how is it expressed,
  - what are the conditions of how it is represented,
  - is the representation a neutral process?

What is a site-specific project?

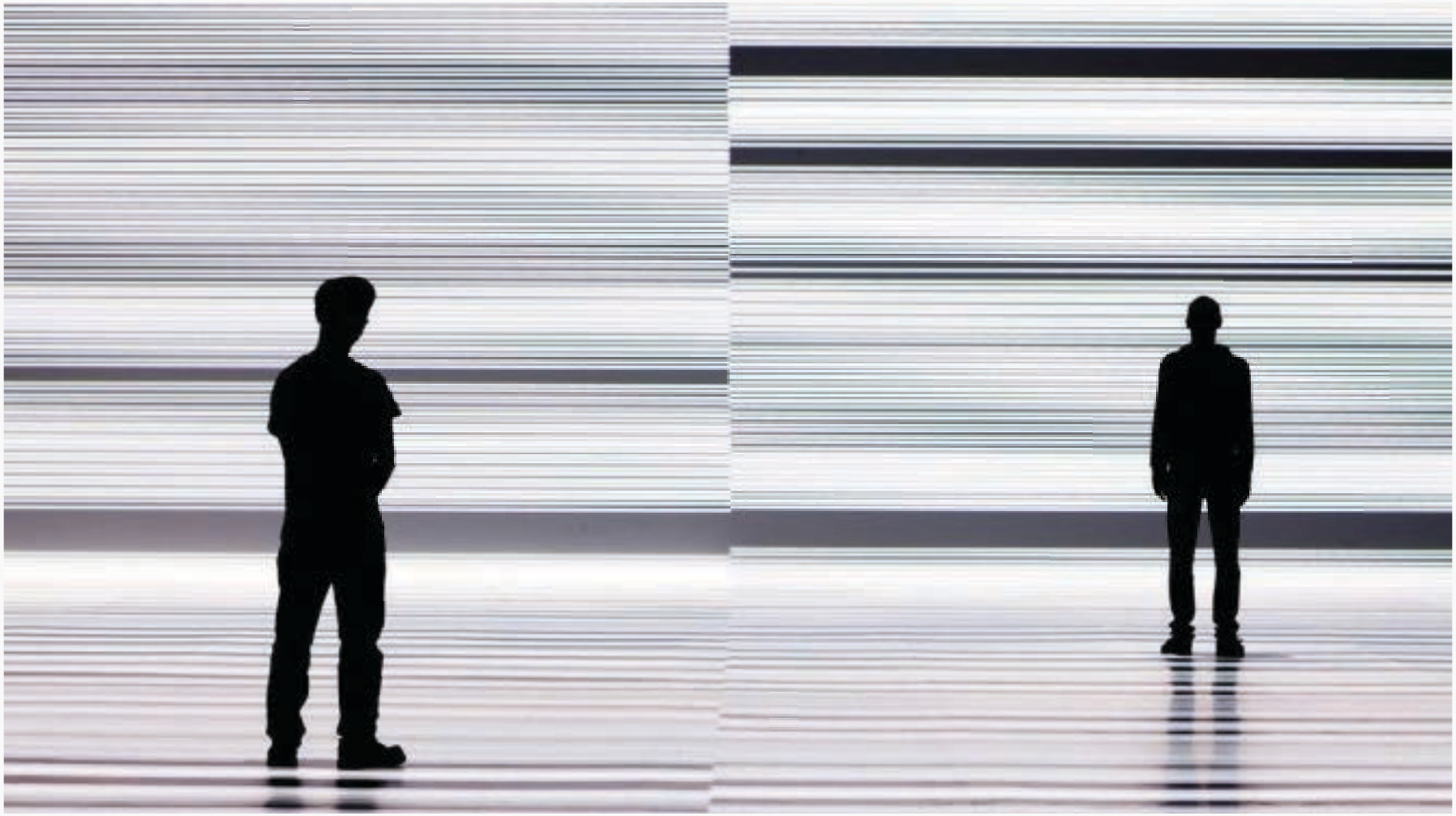
- **Site-specific art** is an artwork created to exist in a specific place. The artist takes into consideration the conditions of the site while planning the work

What is a systems based art?



The artwork as proposition or analysis or definition (Joseph Kossuth):

Ryoji Ikeda: SyperSymmetry



Research Questions to ask at the end: (from Prof. J.Gibson, ECE)

- Define what you did and why was it worth it?
- What is the state-of-the art and where does your work fit in?
- What were the key decisions that you made and why did you make those choices?
- What are the results and how does your work compare with others in the field?
- How did the decisions that you made impact your results and performance?
- What future research should be pursued to build on your work?

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