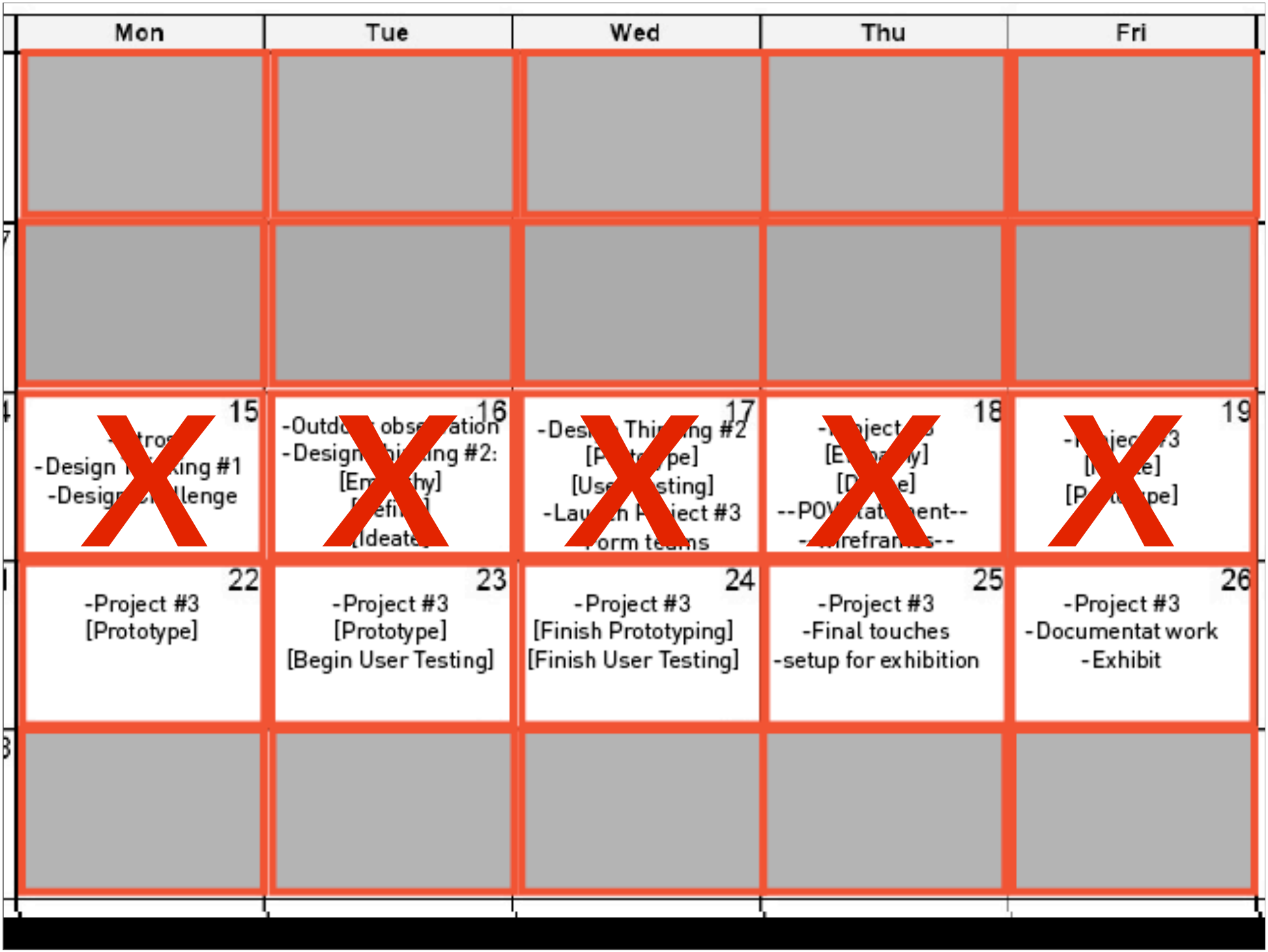
EXPLORING BIOMIMETIC INTERFACES

city pulse
meta data
ant hill
symbiotic station
the ants project
Biike

EXPLORING BIOMIMETIC INTERFACES

Monday July 22

CIID 2013 July 14 - 26
Exploring Biomimetic Interfaces
Gabriella Levine + Genevieve Hoffman


Mon
Tue
Wed
Thu
Fri
15
-Design
-Design
16
-Design
[Ideate]
17
-Design Thinking #2
[Prototype]
[User Testing]
-Launch Project #3
Form teams
18
--POV statement--
19
[Prototype]
22
-Project #3
[Prototype]
23
-Project #3
[Prototype]
[Begin User Testing]
24
-Project #3
[Finish Prototyping]
[Finish User Testing]
25
-Project #3
-Final touches
-setup for exhibition
26
-Project #3
-Documentat work
-Exhibit

SCHEDULE

10:00 - 11:15 : Lecture

11:15 - 17:00 :
Group Work time
1 on 1 consulting

17:00 - 18:00 : Tech Demo & Debrief

REFRAMING BIOMIMICRY

-Biomimicry vs. Bionics vs. Bio-design
-Artificial Intelligence vs. Cybernetics vs. Cyborgs
-Energy Generation

Tomorrow:
-Living Design & Biosensors
-Agent - based systems
-Representing biology & physics in software & on-screen

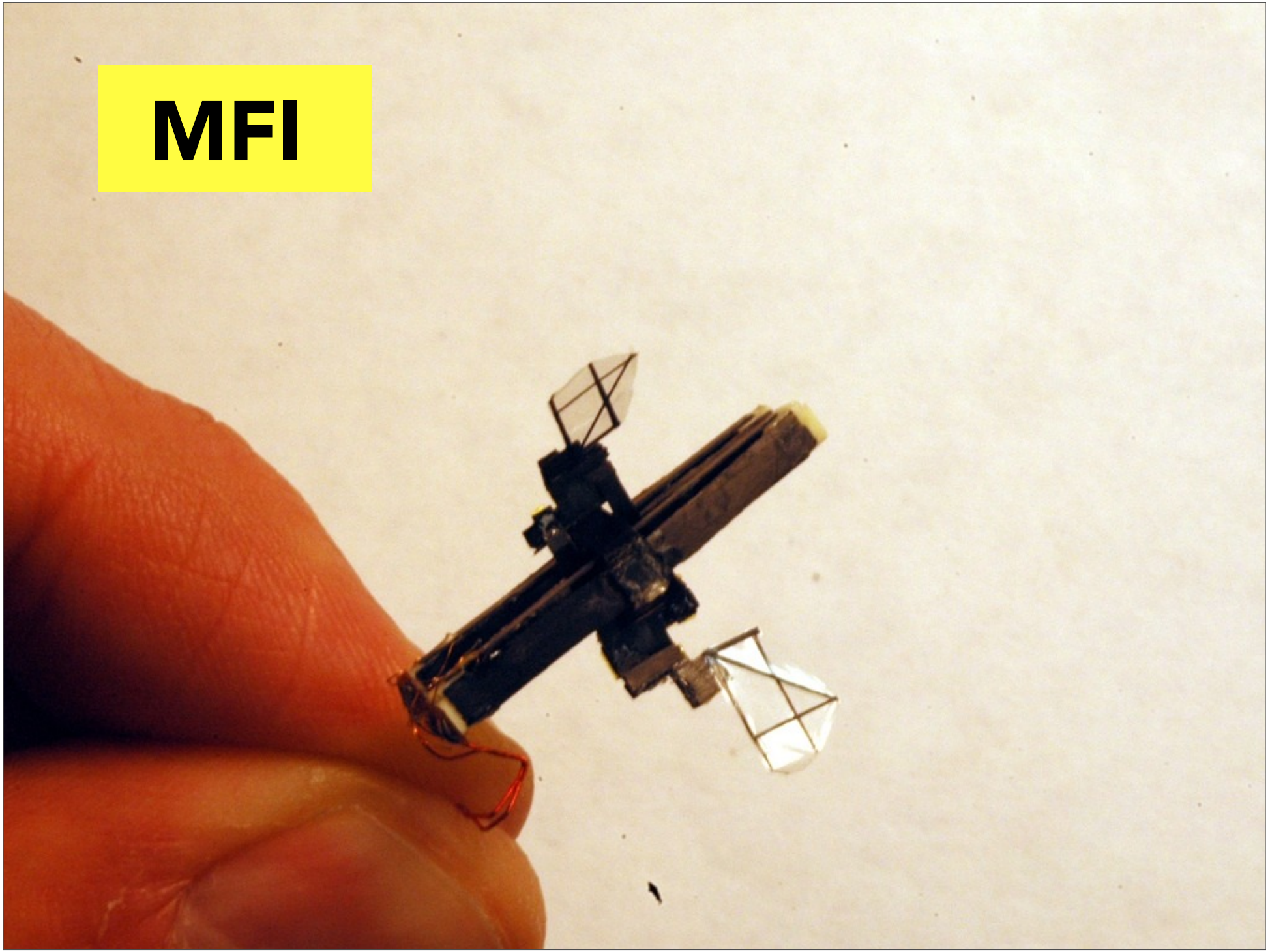
TARA DONOVAN

THE RAIN ROOM

THE SPERM BIKE

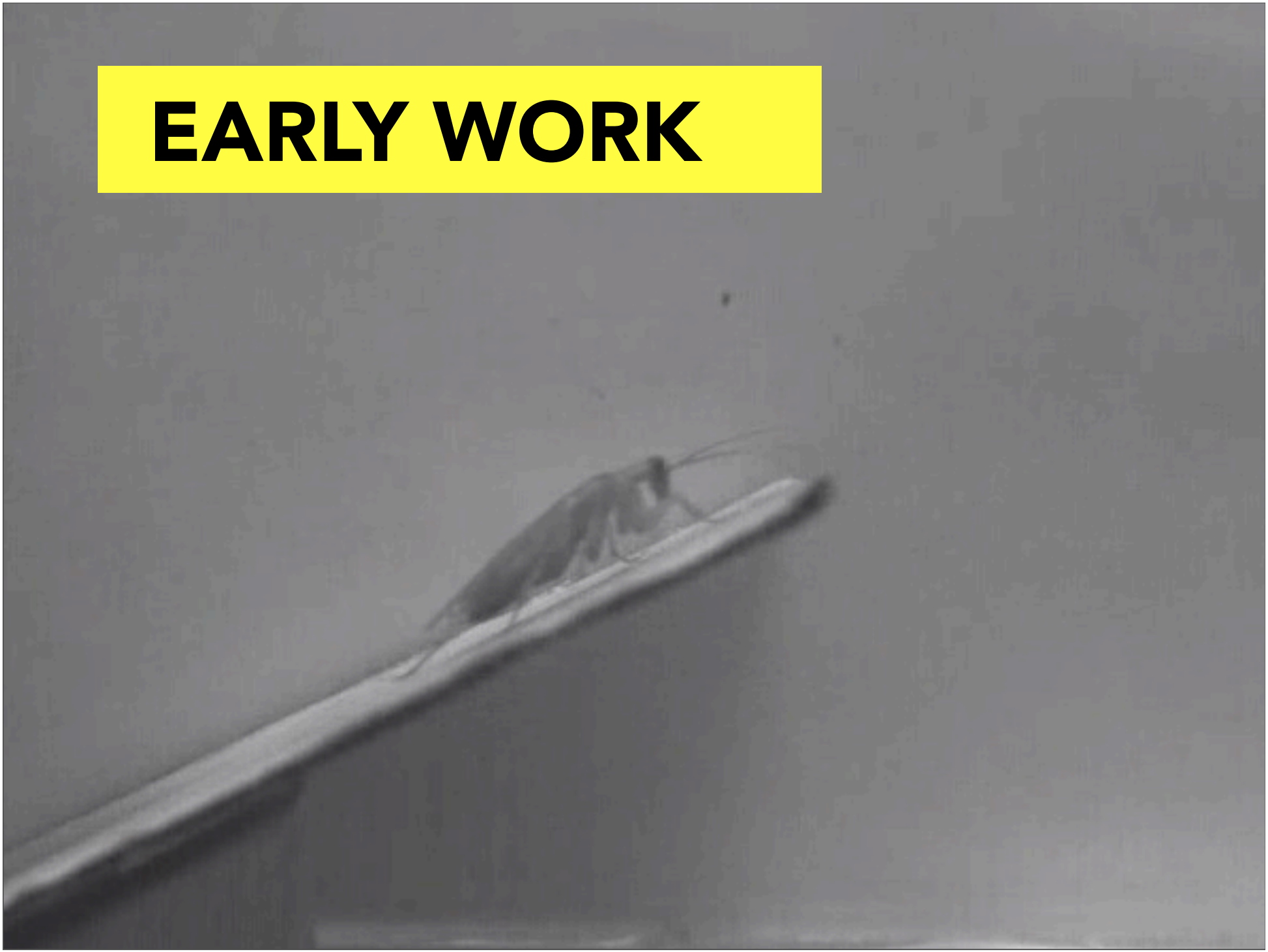
BIOMIMETICS

- *flight*
- *adhesion*
- *adaptation & reconfiguration*
- *process complex three-dimensional (3D)*
- *recycle power*
- *self-replicate, self-grow*
- *generate and store energy*
- *optimization of search algorithms*
- *artificial intelligence*


MFI


MFI

EARLY WORK



CLOACA

mimicking human digestion

BIOMIMICRY vs. BIONICS

Bionics : learning from nature as an inspiration for independent technical design

Biological Design : ecologically informed design for sustainability

Biomimicry : nature as a mentor, measure and model

PROPERTIES of BIOMIMICRY

FORM & MOTION (robotic snakes)

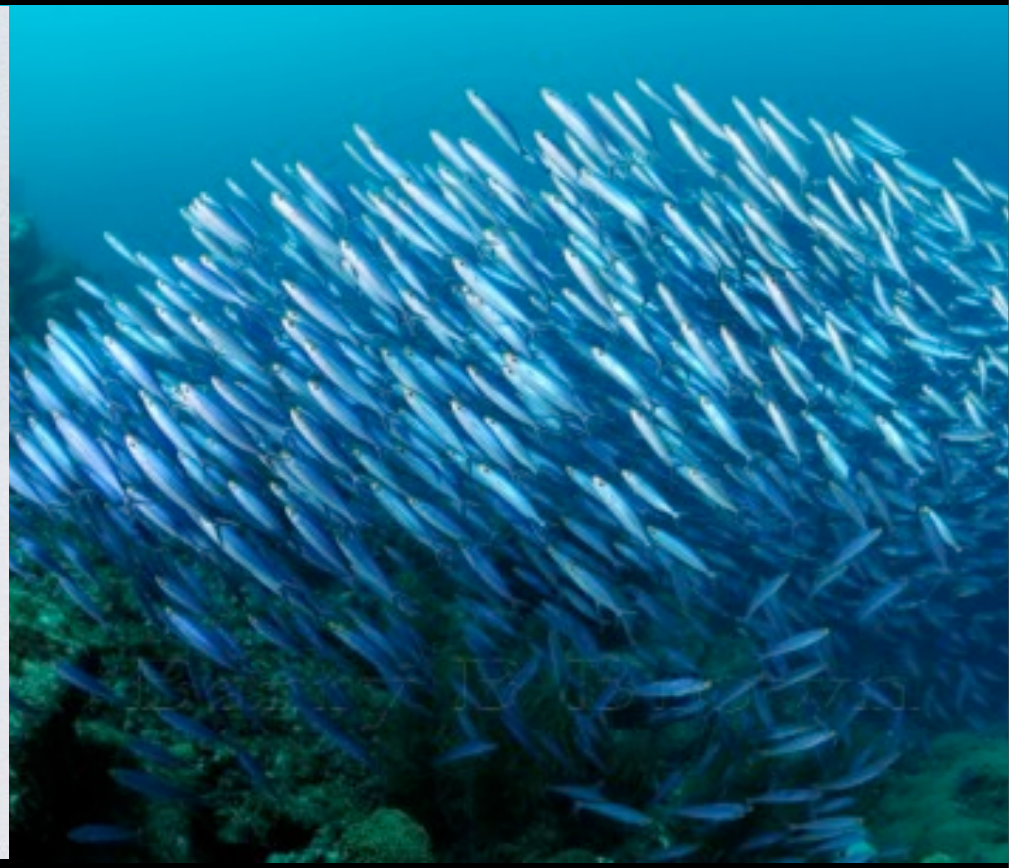
MATERIALITY (waterproofing)

METHODS OF MANUFACTURE (spiderwebs)

MECHANISMS (velcro, sonar)

ORGANIZATIONAL PRINCIPLES (bird flocking, swarm intelligence of fish)

ORGANIZATIONAL SYSTEMS



CYBERNETICS & A.I.

Implementing a function found in nature rather than imitating biological structures

Cybernetics : Model the feedback and control systems [how it is achieved]

AI : Model the intelligent function of a system [regardless of how it can be achieved]

ARTIFICIAL INTELLIGENCE

- *Autonomous systems*
- *Identifying credit card fraud*
- *Pricing airline tickets*
- *Corporate knowledge management*
- *Intelligent devices*
- *Objects that enhance human abilities*

CYBERNETICS & A.I.

Table 1. Characteristic similarities of biology and engineering systems.

Biology	Engineering	Bioengineering, biomimetics, bionics and biomechanics
Body	System	Systems with multifunctional materials and structures are developed emulating the capability of biological systems
Skeleton and bones	Structure and support struts	Support structures are part of every man-made system
Brain	Computer	Advances in computers are being made emulating the operation of the human brain
Intelligence	Artificial intelligence	There are numerous aspects of artificial intelligence that have been inspired by biology including augmented reality, autonomous systems, computational intelligence, expert systems, fuzzy logic, etc
Senses	Sensors	Computer vision, artificial vision, radar, and other proximity detectors all have direct biological analogies. However, at their best, the capability of the man-made sensors is nowhere near as good as biosensors
Muscles	Actuators	Electroactive polymers are actuators with functional similarity to natural muscles
Electrochemical power generation	Rechargeable batteries	The use of biological materials to produce power will offer mechanical systems enormous advantages

CYBERNETICS

http://asimo.honda.com/

CYBORGS

cybernetic + organism

BODY HACKING

A Sixth Sense

BIOMIMICRY in BIOLOGY

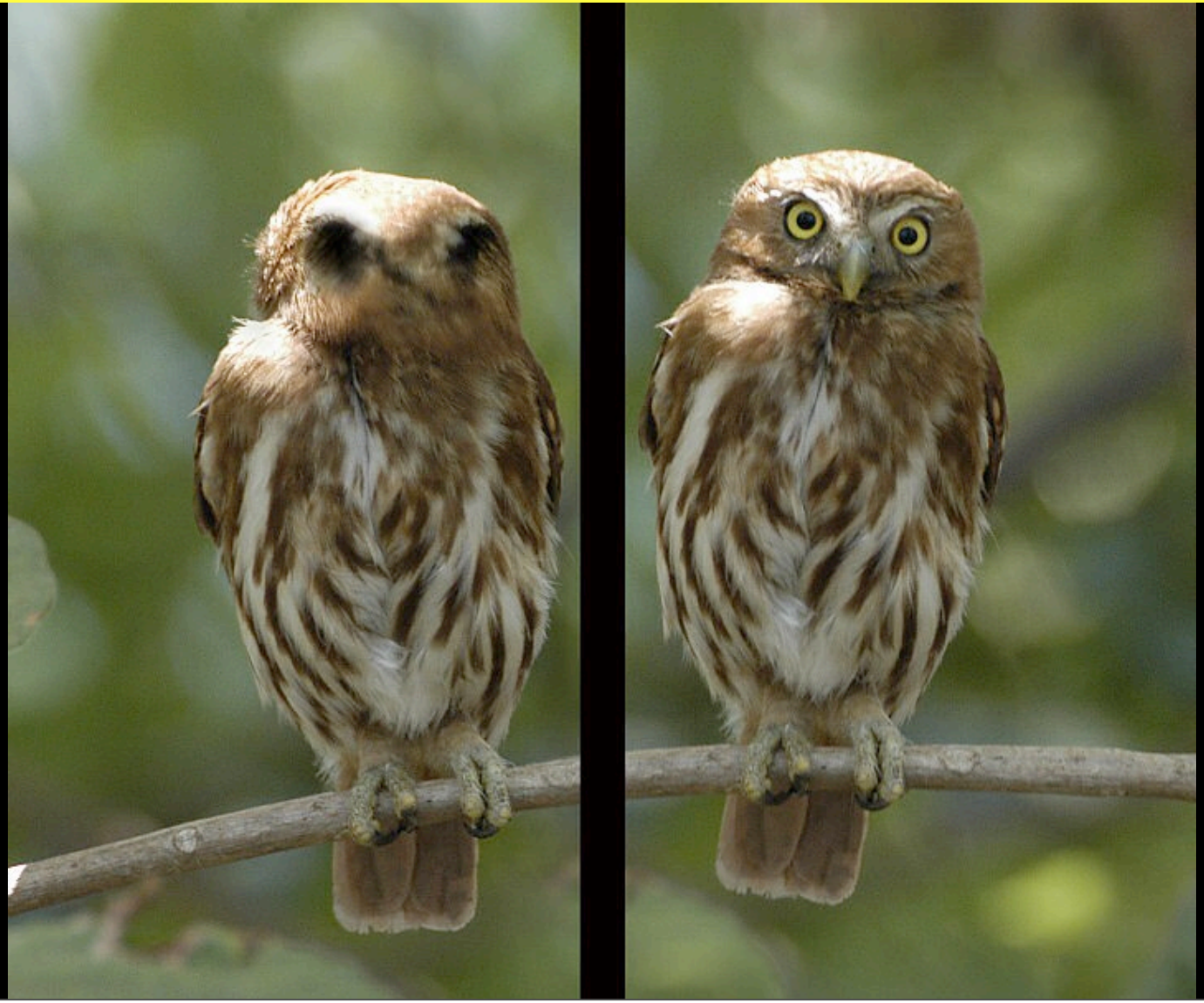
- *DEFENSIVE*
- *AGGRESSIVE*
- *AUTOMIMICRY*

BIOMIMICRY in BIOLOGY

BIOMIMICRY in BIOLOGY

BIOMIMICRY in BIOLOGY

BIOMIMICRY in BIOLOGY



WASTE & SUSTAINABILITY

PLASTIKI

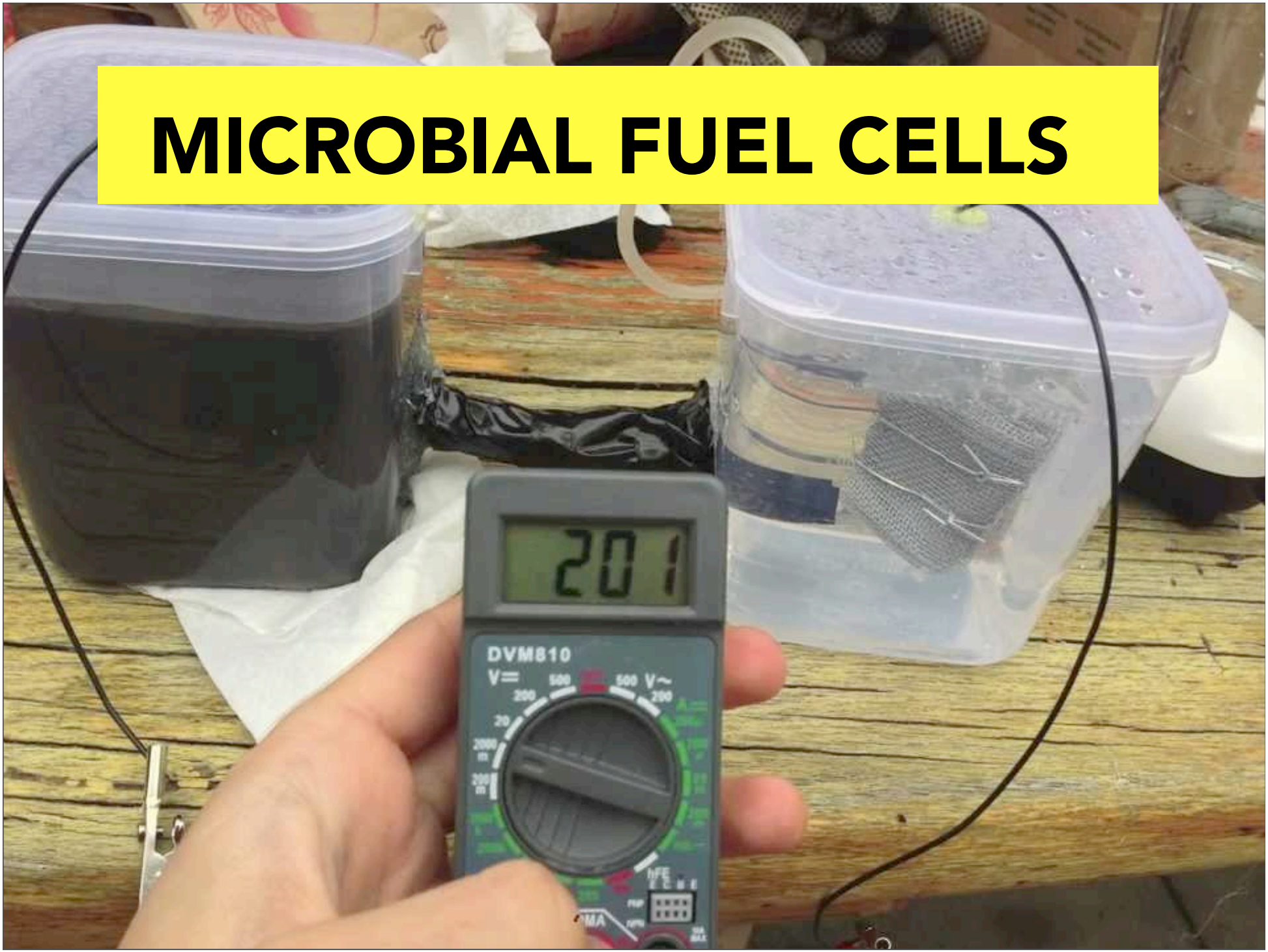
http://theplastiki.com/

HOME APPLICATIONS

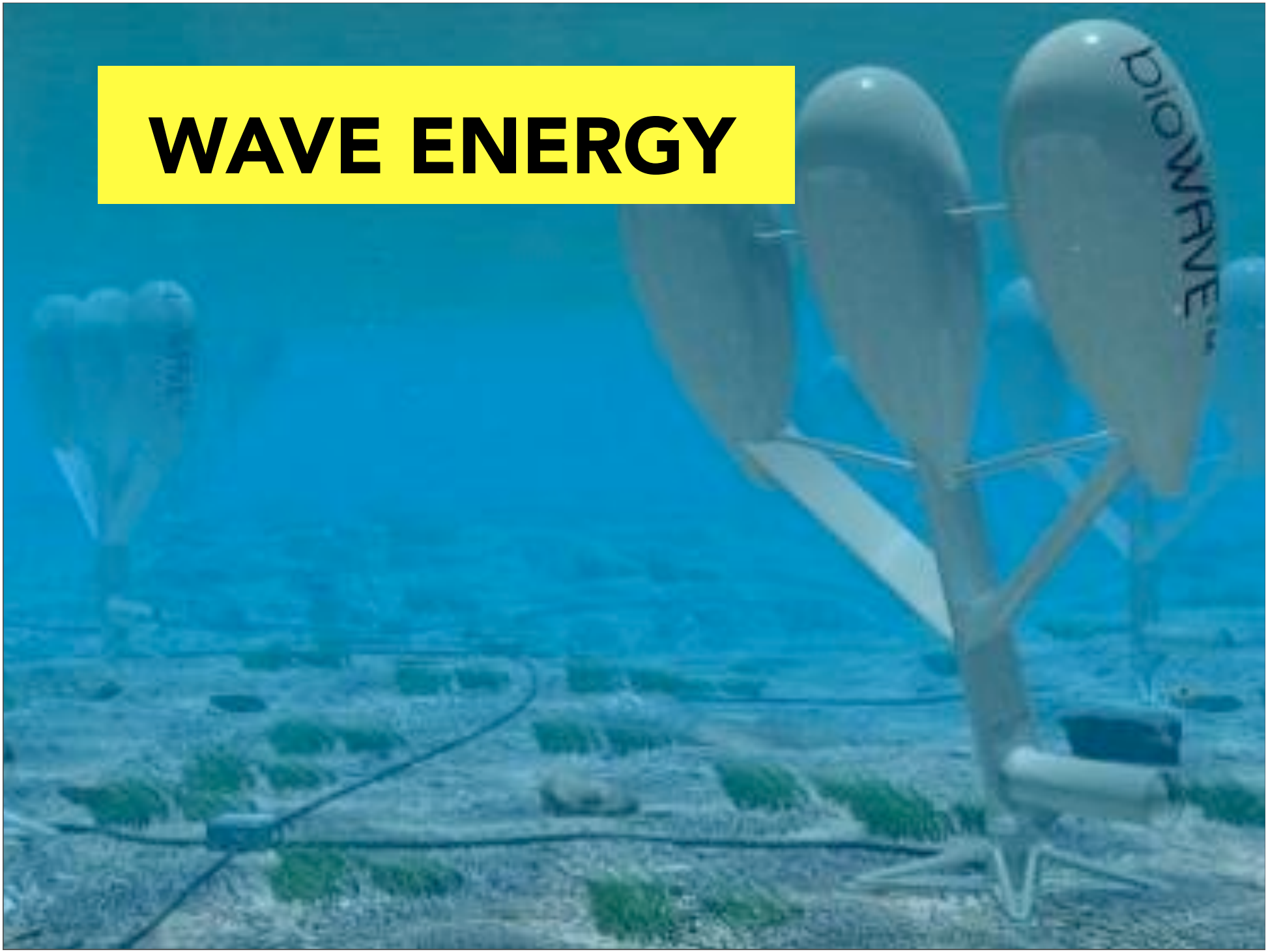
iRobot's ROOMBA vacuum cleaner


HOME APPLICATIONS
iRobot's ROOMBA vacuum cleaner

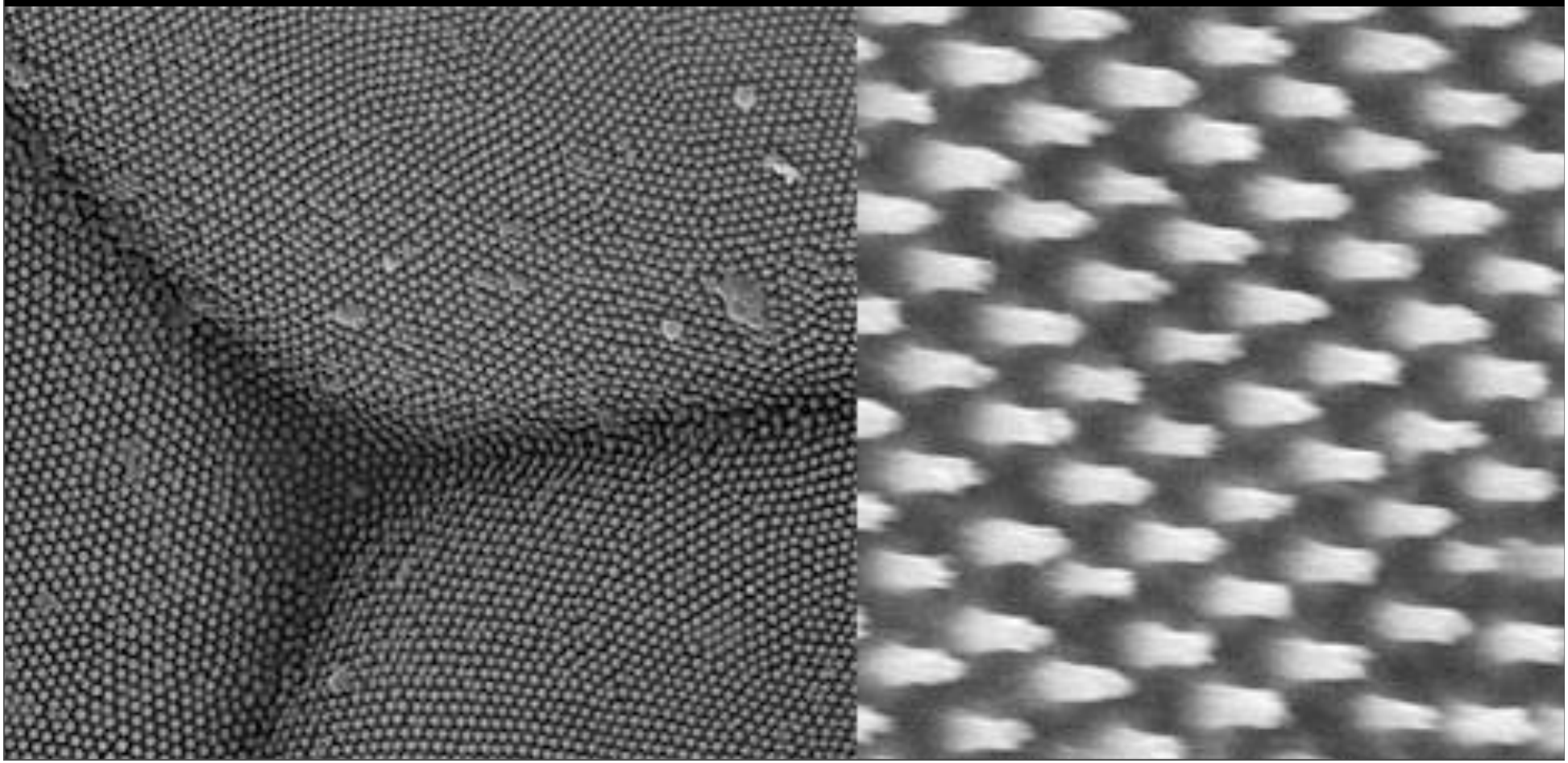
MICROBIAL FUEL CELLS



WAVE ENERGY

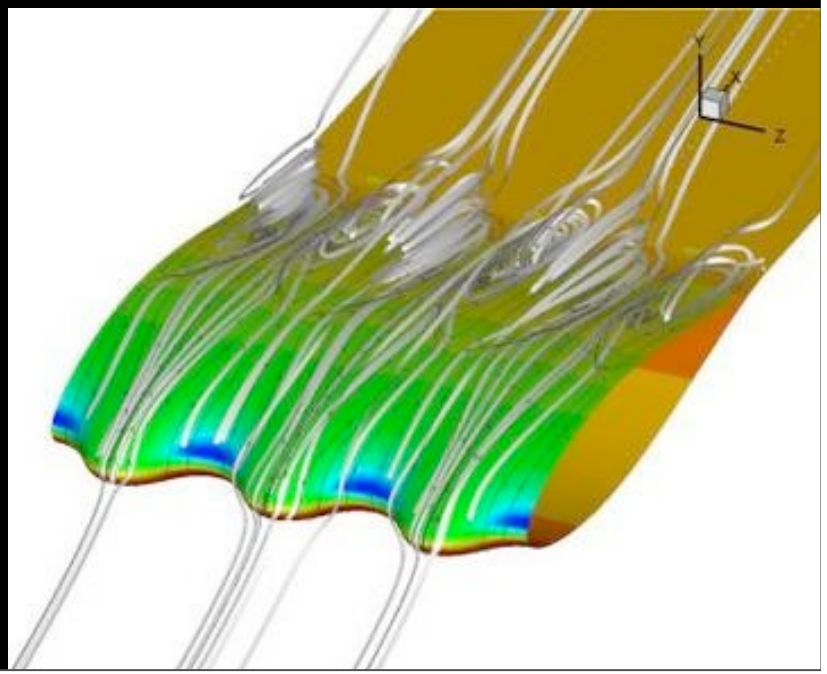


SOLAR PANELS | MOTH EYES



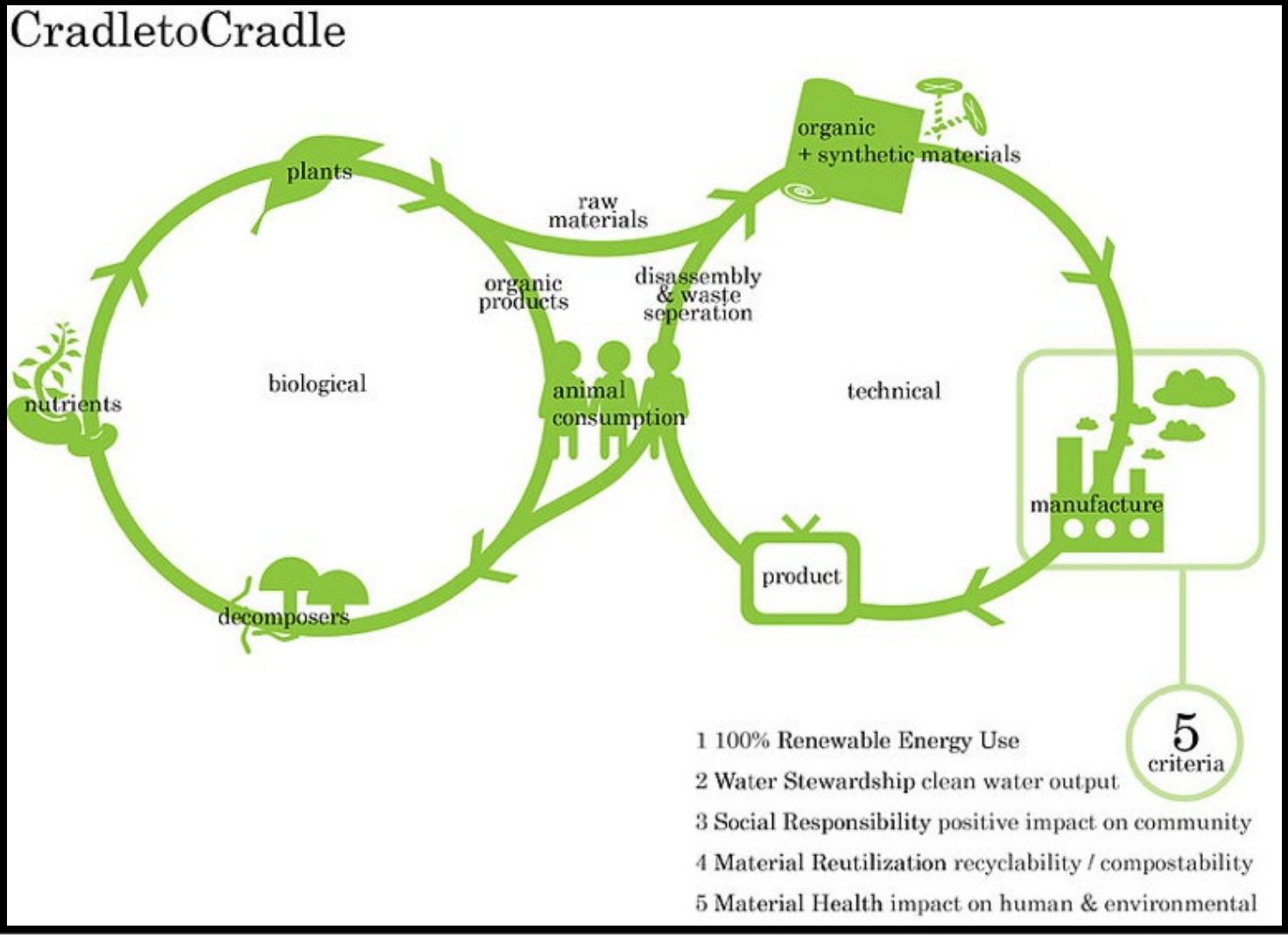
SOLAR PANELS | MOTH EYES

WIND TURBINES | HUMPBACK WHALES




Solar Sinter

CRADLE TO CRADLE



QUESTIONS??

~~12:15 - 12:35 : city pulse~~
~~12:35 - 12:55 Biike~~
~~14:00 - 14:20 ants project~~
~~14:20 - 14:40 ant hill~~
~~14:40 - 15:00 symbiotic station~~
15:00 - 15:20 meta data

15:30 - 10:00 AM tomorrow : individual group work
See you at 10:00 tomorrow