

PHYS 495 | ARTS 499 FUTURE WEIRD: ART, PHYSICS & THE
STORIES WE TELL MACHINES

FALL 2025

T Th 9:30 am – 12:10 pm

Siebel Center for Design, room 1002

Instructors:

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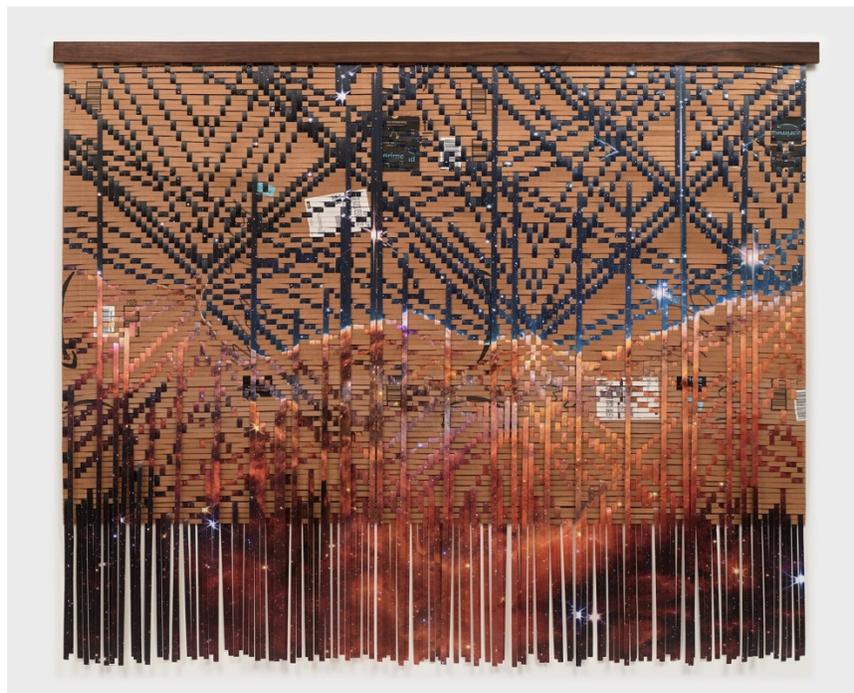
Mikael Owunna, *DeShaun*, 2017

(Light spectra, bioluminescence, energy fields, electromagnetism)

> COURSE DESCRIPTION

This interdisciplinary, studio-based course explores the dynamic intersection of visual art, physics, astronomy, communication, and artificial intelligence (AI) through the imaginative worlds of speculative fiction, including science fiction, fantasy, horror, comics, and Afrofuturism. Students will use narrative frameworks and rhetorical strategies to investigate scientific theories and ethical dilemmas, transforming complex concepts into interactive, visually, and verbally compelling works.

Topics such as quantum mechanics, relativity, entropy, resonance, astrophysics, and the ethics of AI will serve as both intellectual foundations and creative springboards. Through hands-on experimentation, critical reading, and reflective writing, students will integrate scientific inquiry with emerging AI tools, speculative world-building, and storytelling to produce artworks and communicative artifacts that challenge assumptions, envision alternative futures, and explore the evolving relationship between science, society, and the imagination.



Clarissa Tossin, *Future Geography*, 2019
(Thermodynamics, environmental physics, time-space continuity)

Course Objectives:

By the end of the course, students will:

1. **Translate** complex physics concepts (e.g., quantum mechanics, entropy, relativity) into visual, sculptural, or digital artworks using AI and speculative storytelling methods.
2. **Produce** and exhibit a portfolio of 3-5 interdisciplinary projects that integrate artistic media, AI tools, and scientific themes.
3. **Demonstrate** foundational competency with creative technologies including 3D modeling, generative AI, microcontrollers (e.g., Arduino), and interactive media.

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4. **Participate** constructively in critique sessions, providing and responding to feedback to iterate and refine their work.
5. **Articulate** the ethical, societal, and speculative implications of AI and scientific discovery through written and verbal artist statements.
6. **Develop** and publicly present a final project that effectively combines scientific accuracy, artistic creativity, and public engagement.



Tavares Strachan, *The Distance Between What We Have and What We Want*, 2005
(Thermodynamics, material states, invisibility, astronautics)

Tools for Success:

You don't need to be an expert in any one field to thrive in this course. Just come ready to learn, make, and explore across disciplines. Here's what will help:

- **Art:** Some experience with visual or cultural expression like painting, drawing, video, sculpture, or music is helpful but not required. You'll grow your creative skills as we go.
- **Physics:** A basic familiarity with physics or astronomy, whether from high school or popular media, can be useful. But we'll introduce key scientific concepts in accessible ways throughout the course.
- **AI Tools:** Prior experience with AI tools is a bonus but not required. We'll guide you through core technologies and how to use them creatively.
- **Mindset:** What matters most is your **curiosity**, **openness to new ideas**, and **willingness to experiment and put in the work**. That's what fuels successful projects and collaboration.



Sarah Sze, *Triple Point*, 2013

(Space-time, entropy, particle interactions, the instability of observation)

Course Format:

- **Lectures:** Weekly lectures on specific physics, astronomy and art concepts, AI tools, and ethical discussions.
- **Studio Time:** Most class time will be dedicated to hands-on studio work, where students will create projects and prototypes.
- **Critiques:** Regular critique sessions to discuss works in progress and provide feedback.
- **Guest Speakers/Workshops:** Collaborations with scientists, artists, and AI experts to discuss how AI can enhance both art and science.



Tomás Saraceno, *Aerocene*, ongoing
(String theory, multiverse, gravitational systems, aerodynamics)

> COURSE REQUIREMENTS

Attendance:

Attendance is required at **all class sessions**.

- Class meets **Tuesdays and Thursdays, 9:30 AM – 12:10 PM**, with a 10-minute break halfway through.
- You're expected to be **present, prepared, and ready to work by 9:30 AM**.
- Arriving late counts as a **tardy**.
→ **Three tardies = one absence**.
- You may have up to **3 absences** without penalty.
→ **Each additional absence lowers your final grade by one full letter** (e.g., A to B).

If you're running late or need to miss class, **email all three instructors** in advance. If you arrive late, it's your responsibility to follow up with us to have your absence marked as a tardy.

Public Events & Makeups

Some course events (like guest lectures or exhibitions) may happen outside of class time. These are important parts of the learning experience. If you can't attend, let us know. We'll offer an **alternative assignment**.

Time Commitment & Workflow

Creative work takes time and often unfolds differently than other academic tasks. Plan to spend at least **12 hours per week** on class-related work (in and out of class). Successful students:

- Start assignments early.
- Stay curious and open.
- Reach out to peers (and us!) when they need feedback or support.

Where You Can Work:

You're welcome to work on your projects outside of class time in **Flag Hall** (our assigned studio space) or in your own space, whether that's your apartment, bedroom, or another personal studio.

If you're using **Flag Hall facilities** (easels, palette tables, sinks, storage, etc.), please:

- **Leave everything in the studio** - don't remove any equipment or furniture.
- **Be respectful of shared space** by cleaning up after yourself.
- If anything needs to be **refilled, fixed, or replaced**, just send a quick message through [Lab/Studio/Classroom Support](#) - it's fast and easy.

This shared space is part of our creative community, so treat it like your own studio while respecting others who use it.



> CONTACT US

If you have questions or need support, feel free to contact us by email:

phammie@illinois.edu

jlraley@illinois.edu

nyunes@illinois.edu

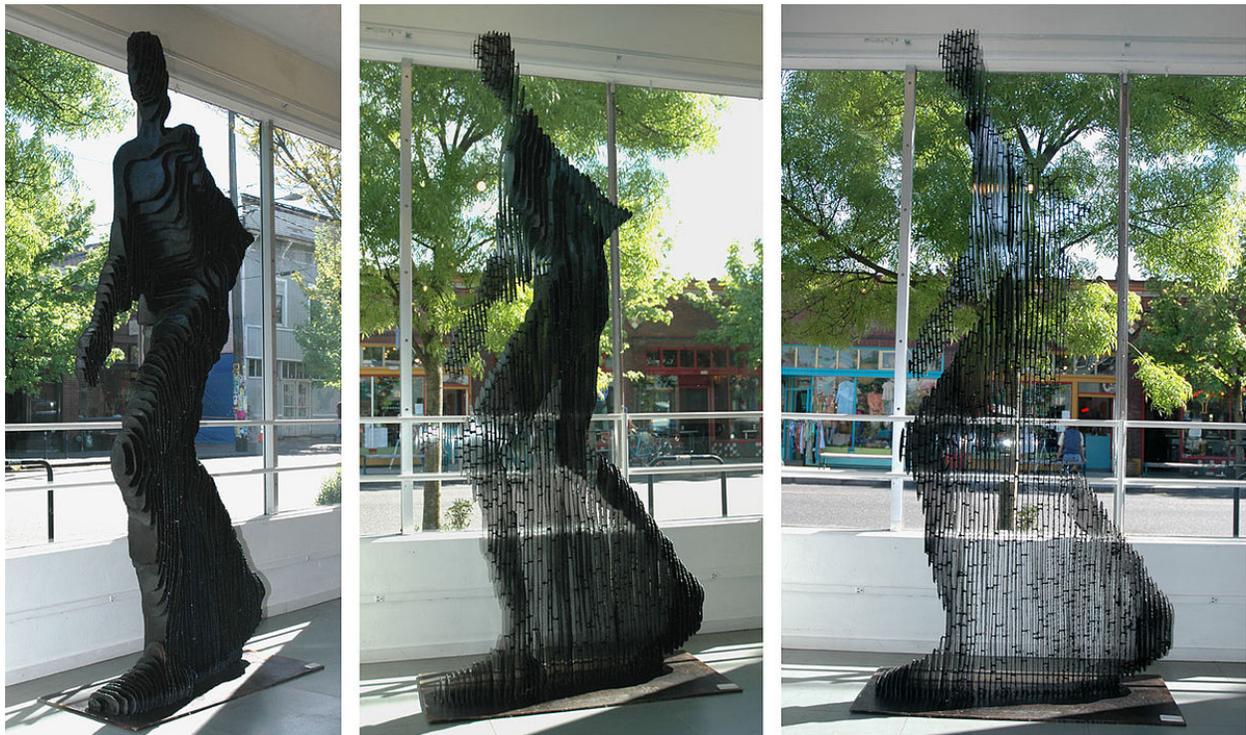
Please copy all three of us on every message so we can respond efficiently as a team.

We aim to reply within one business day if your message is sent **before noon on Friday**. If it's **urgent**, mark the subject line as **URGENT** so we can prioritize it.

Need help outside of class? We're happy to meet one-on-one by **Zoom or in person**, by appointment.

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For quick questions about assignments or class activities, we encourage you to **check Slack first or ask a classmate** before emailing.



Julian Voss-Andreae, *Quantum Man*, 2007
(Quantum physics, wave-particle duality, observer effect)

> GRADING AND EVALUATION

We use a holistic evaluation approach that emphasizes both creative process and final outcomes. Your final grade will be determined by the following components:

Grading Breakdown

Weekly Projects + Sketchbook (30%)

Ongoing creative work completed in and out of class, including weekly studio prompts, speculative writing, visual ideation, and sketchbook development. These assignments build the foundation for your final project.

Midterm Project Proposal (20%)

A formal proposal for your final project, including a written concept statement, visual planning, and in-class presentation. Evaluated on clarity of concept, integration of physics themes, speculative vision, and feasibility.

Final Project + Exhibition (40%)

A completed artwork or interactive artifact presented in the public class exhibition. Evaluated on originality, execution, integration of scientific and speculative elements, and public engagement. Includes an artist statement and participation in installation and deinstallation.

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Participation + Critiques (10%)

Thoughtful contributions to group discussions and critiques, and respectful engagement with peers. Active participation is essential to the collaborative, studio-based nature of this course.

What Success Looks Like

Successful students:

- Attend all sessions and external events, arrive on time and prepared to work.
- Participate fully in studio work, feedback sessions, and group critiques.
- Demonstrate curiosity, risk-taking, and iteration in their creative process.
- Translate complex ideas into engaging, well-crafted works.
- Clearly communicate their concepts in writing and discussion.
- Produce a final project that is visually and conceptually compelling, scientifically informed, and thoughtfully presented to a public audience.

Grade Definitions

A = Excellent

Ambitious investigation of ideas and excellent execution. All work is completed on time, with strong craft, originality, and thoughtful integration of feedback. Active, insightful contributor to the class community.

B = Good

Strong ideas and good execution. All work is completed on time with solid craftsmanship and contribution to class discussions. Meets all expectations and shows growth.

C = Fair (Average)

Work meets minimum requirements but may lack depth, refinement, or originality. Some assignments may be late or underdeveloped. Limited engagement with critique or revision.

D = Passing

Incomplete or weak work. Poor craftsmanship, minimal development of ideas, and lack of participation. Fails to meet expectations in multiple areas.

F = Failure

Work is consistently missing, underdeveloped, or off-topic. Little or no participation. Course failure due to lack of effort or engagement.



Ryoji Ikeda, *supersymmetry*, 2015
(Particle physics, quantum mechanics, signal theory)

> CALENDER AND COURSE STRUCTURE

WEEKLY STRUCTURE PATTERN (Approximate)

- **Tuesdays:** Conceptual intro (physics + speculative method), genre/media analysis, guest lecture or demo, ideation
- **Thursdays:** Studio workshop, prototyping, feedback sessions, tool integration (AI, sensors, etc.)

DELIVERABLES AT A GLANCE

- **Wk 2–6:** Weekly projects (ideation + prototyping)
- **Wk 7:** Midterm Final Project Proposal
- **Wk 8–12:** Final project development + build
- **Wk 13:** Final Exhibition
- **Wk 14–15:** Reflection + documentation deliverables

WEEK 1, AUG 26 + AUG 28: OPENING THE PORTAL

Course intro + syllabus walkthrough

Themes: Introduction to Speculative Frameworks + Scientific Imagination

Physics + Art Focus: What is Science? What is not Science? What is Speculation?

Creative Methodologies: Ways of Seeing, Ways of Making: How Artists Generate Ideas

- [Leilah Babirye](#)
- [Olafur Eliasson](#)
- [Cécile B. Evans](#)
- [Ludwig Göransson](#)

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Activity (5 mins): Draw a world using only sound, texture, and metaphor

Short in-class film screening: *World of Tomorrow* by Don Hertzfeldt

Group Discussion: “What kind of weird are you interested in?”

Speculative Methods: Worldbuilding, Scientific Revolutions, Counterfactuals, Afrofuturism

Studio Prompt: “Design a world that defies one known law of physics.” (e.g. law of gravitation, law of inertia, law of action-reaction, law of conservation of energy, law of entropy, laws of planetary motion, laws of electromagnetism, law of special relativity)

Media: *Dirty Computer* (Janelle Monáe), *The Expanse*, *Kindred*

Sketchbook: Begin personal world sketchbook (ongoing through Wk 7)



Katie Paterson, *Timepieces (Solar System)*, 2014
(Time dilation, entropy, cosmic scale, quantum time)

WEEK 2, SEPT 2 + SEPT 4: TIME ISN'T REAL (OR IS IT?)

Physics Focus: Time travel + Einstein's relativity: Intro to Relativity and Spacetime

Speculative Method: Nonlinear Narratives, Multiverse Thinking

Genre Focus: Sci-Fi, Magical Realism, Dreamcore

Group discussion: How do physics and emotion intersect?

Studio Prompt: Time + Narrative Structures

- Create a visual timeline that loops, fractures, or folds
- Write a “*Letter from a Future Self (or Ancestor)*” as a one-page narrative or monologue

Media: *Interstellar*, *Eternal Sunshine*, *Pan's Labyrinth*

Tool: Midjourney prompt writing for time distortions

Guest: Ben Grosser – AI Ethics, System Aesthetics, and Resistance

Sketchbook: Sketch three “time glitches” from your personal life as storyboards

WEEK 3, SEPT 9 + SEPT 11: THE MYTH OF GRAVITY + GROUNDLESSNESS

Physics Focus: Gravity, Orbits, Black Holes

Speculative Methods: Mythopoesis, Metaphor as Physics

Genre: Mythpunk, Epic Fantasy, Afrofuturism

Creative Methodologies: Creative Constraints as Innovation Tools

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Material, scale, concept, physics law, time) are *generative* in creative practice e.g.

- [Sol LeWitt's instruction pieces](#)
- [Yayoi Kusama's obsessive dots](#)
- [Janelle Monáe's alter-egos](#)

Activity: Invent a myth for a black hole. Create a representation of your myth or black hole using only one material / one emotion / one motion

Studio Prompt: Create a Mythology for a Physical Phenomenon

- Sculpt or draw a myth-based astronomical object
- Write a 250–300-word speculative myth that personifies a black hole or gravitational event

Media: *The Fountain, Circe, Black Panther*

Workshop: Storyboarding physical laws as metaphor

Guest: Jena Marble – Helping students explore generative AI as a creative partner, sparking ideas, making connections, and reinforcing the human role in shaping outcomes.

Sketchbook: Create three “cosmic symbols” in sketchbook

WEEK 4, SEPT 16 + SEPT 18: QUANTUM WEIRDNESS

Physics Focus: Quantum Mechanics, Binary (spin) States & Entanglement, Superposition

Speculative Method: Magical Realism, Nonbinary Logics

Genre: Cyberpunk, Queer Futurism

Activity: Design a world with no binary states

Studio Prompt: Quantum Confession

- “Both/And” object: an artwork in a state of ambiguity
- Write a short first-person poem where the narrator exists in a superposition (i.e., two truths, two bodies, or two worlds at once)

Media: [“Introduction to Quantum Theory,”](#) *Everything Everywhere All At Once, The Left Hand of Darkness*

Event: PYGMALION, Sept 18 – 20

Tool: RunwayML or DALL-E for generative ideation

Guest: Elizabeth Goldschmidt (quantum physicist) to explain core concepts accessibly

Sketchbook: Doodle a quantum creature based on uncertainty

WEEK 5, SEPT 23 + SEPT 25: IDENTITY, BODIES, MACHINES

Physics Focus: Energy/Mass, Electromagnetism and special relativity

Speculative Method: Speculative Personas, Queer Futurity

Genre: Biopunk, Superhero Mythology, Transhumanism

Writing workshop:

- Walk students through effective writing tones (blend of academic, narrative, poetic, speculative)
- Example text: W.H. Auden [“The Unknown Citizen”](#)
- Share past examples or templates of creative proposals

Studio Prompt:

- Design a speculative version of yourself
- Write a museum wall label describing yourself (or your avatar) as if you were a discovered relic from the future, 150–200 words, written in third person

Media: *Ms. Marvel, Akira, Venus as a Boy, “Relativity”*

Workshop: AI-generated avatars / face & voice tools (w/ ethical framing)

Sketchbook: Collect “nonhuman” materials from your daily life

WEEK 6, SEPT 30 + OCT 2: SYSTEMS + ENTROPY

Physics Focus: Thermodynamics, Entropy/Disorder and Chaos

Speculative Method: Utopia/Dystopia, Systems Thinking

Genre: Solarpunk / Climate Fiction / Hopepunk

Ideation activity: Design for collapse or survival

Creative Methodologies: Mapping Your World: Systems, Relationships, and Flows

- Mind-mapping
- Spider-diagramming
- Journey mapping

Activity (30 mins): Visually map the **scientific, narrative, aesthetic, and ethical systems** in your proposed world

Writing activity: Freewrite for 15-20 minutes on your emerging final project idea: What world are you building? What scientific concept does it engage? What medium will you use?

Workshop: Small peer groups give initial feedback and edits

Studio Prompt: Sketch or prototype a device/system that reflects order and/or chaos

Peer review: Does your system preserve or break order?

Media: *Station Eleven*, *The Ministry for the Future*, *The Road*

Proposal: Draft Due

WEEK 7, OCT 7 + OCT 9: MIDTERM PROPOSALS + IN-PROGRESS CRITS

Focus: Final Project Proposal

Activity: Student presentations of their speculative concept + physics focus (5 mins each)

Workshop: Collaborative feedback, worldbuilding peer groups, revision

Studio Time: Begin building/iterating individual final projects

Tool: Conceptual sketching and low-fidelity prototyping

MID-SEMESTER TRANSITION

From here, the focus shifts toward **final project development**, deeper **tool integration**, and **exhibition planning**.



Alicia Kwade, *WeltenLinie*, 2017
(Relativity, time, mass, parallel realities)

WEEK 8, OCT 14 + OCT 16: PARALLEL UNIVERSES + NONHUMAN MINDS

Physics Focus: A Parallel Universe, the Multiverse, and Complexity

Speculative Method: Allegory, Transhumanism, Posthuman

Genre: AI Storytelling, Speculative Horror

Activity: Write speculative headlines from alternate worlds

Activity: Read and discuss “Can you tell which story ChatGPT wrote” by Curtis Sittenfeld

Studio Prompt: “Design what an AI’s dream look like” or “create visual diptychs of two universes”

Media: *Sunspring*, *Annihilation*, *Love, Death & Robots*, “Understand” from *Stories of Your Life and Others*

Tool: ChatGPT, AIVA (music), RunwayML

Guest: Sharath Chandra Ramakrishnan – Intro to Arduino / LED / sensors

Guest: Gautham Naryan – the use of AI in astronomy and astrophysics

WEEK 9, OCT 21 + OCT 23: SENSORS + SIGNALS

Physics Focus: Waves, Particles and Duality

Speculative Method: Techno-Dystopia, Glitch Aesthetics

Studio Prompt: Make a responsive artwork; integrate light/sound/motion into artwork

Workshop: Intro to Arduino / LED / sensors w/ campus collaborator

Research: One artist working with biofeedback, glitch, or sensors

Media: *The Matrix*, *Ghost in the Shell*, *Infinite Conversation*

WEEK 10, OCT 28 + NOV 30: LIMINALITY + HORROR

Physics Focus: Time paradoxes + haunted systems: Uncertainty, Entanglement, Tachyons

Speculative Method: Liminal Horror, Surrealism

Genre: Analog Horror, Dreamcore

Studio Prompt: “Storyboard a short speculative horror idea”

Media: *Skinamarink*, *Twin Peaks*, *The Backrooms*, “What’s Expected of Us” from *Exhalation*, “Story of your Life” from *Stories of Your Life and Others*

Artist Statement Activity: Walk & Talk: Say Your Statement Out Loud

Answer these three questions in your sketchbooks (5 mins):

- What question or curiosity drove this project?
- What science or speculative lens shaped it?
- What do you hope someone *feels* or *wonders* when they experience it?

Partner Walk & Talk (15 min):

- Pair up.
- One person “interviews” the other using their notes, drawing out deeper reflections.
- Switch roles.

Silent Write (15 min):

- Now, write a first-person “spoken” version of your artist statement, as if narrating a short documentary about your own process.
- This draft becomes a foundation—you can revise tone and structure later.

Sketchbook: Record sound from an ambiguous or uncanny place

WEEK 11, NOV 4 + NOV 6: FINAL PROJECT STUDIO SPRINT

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Focus: Instructor one-on-one mentoring, troubleshooting, test installations

Studio Time: Build + refine

Check-in: Progress presentations, peer critiques, show planning

Creative Methodologies (30 mins): Patrick Earl Hammie Artist Process Talk, How I Build Worlds: Art, Research, & Speculation

Activity (15 mins): Group discussion/Q&A

Artist Statement Activity (30 mins): Three-Way Rewrite

Rewrite your statement in three mini-paragraphs, one per voice:

- *Paragraph 1:* What's the core concept or question?
 - "This project began with a question about..."
 - "I was drawn to the concept of ___ in physics because..."
- *Paragraph 2:* What methods, tools, or materials did you use?
 - "To materialize this world, I used..."
- *Paragraph 3:* What emotional or sensory experience do you want to provoke?
 - "I hope the viewer feels..."

Order materials / finalize any code or tech components!

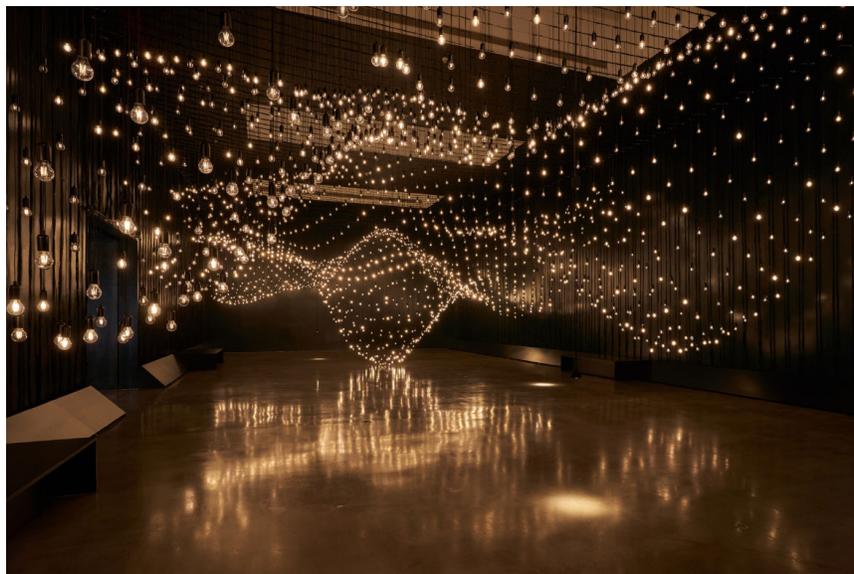
WEEK 12, NOV 11 + NOV 13: FINAL BUILD + EXHIBITION PREP

Studio: Fabrication, installation tests, space planning for gallery

Deliverable: Finished artwork ready to install

Team roles: Curatorial layout, signage, digital documentation

Artist Statement: Final Statement Due



Rafael Lozano-Hemmer, *Pulse Room*, ongoing
(Waveforms, electromagnetism, human-machine interfaces)

WEEK 13, NOV 17 + NOV 19: PUBLIC EXHIBITION NOVEMBER 17 – DECEMBER 4

Location: Link Gallery, School of Art & Design

Activities: Final install, lighting, tech setup, press preview

Installation: Nov 17 – 19

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Event: Opening Reception, December 2

Title “PLACEHOLDERS”:

- *“Futures Entangled: Art, Science & Speculative Worlds”*
- *“ART Official Intelligence”*
- *“Art Ificial Futures”*
- *“The Future Isn’t What It Used to Be”*

WEEK 14, NOV 25 + NOV 27: FALL BREAK – NO CLASS

WEEK 15, DEC 2 + DEC 4: REFLECTION + CRITIQUE

Gallery Walkthrough: Peer and public feedback

Activity: Artist talks, critique sessions, documentation

De-install: December 4

Prompt: Reflective essay or zine: “What physics taught my imagination”

WEEK 16, DEC 9: WRAP-UP + ARCHIVING

Final roundtable: Portfolio share, digital archiving, what comes next (grad school, publications, etc.), evaluations, celebration!



Siebel Center for Design

> GOOD CITIZENSHIP, ACCOMMODATIONS, AND SUPPORT

Academic Integrity

The University of Illinois at Urbana-Champaign *Student Code* should also be considered as a part of this syllabus. Students should pay particular attention to Article 1, Part 4: Academic Integrity. Read the Code at the following URL: <http://studentcode.illinois.edu/>.

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Academic dishonesty may result in a failing grade. Every student is expected to review and abide by the Academic Integrity Policy: <http://studentcode.illinois.edu/>. Ignorance is not an excuse for any academic dishonesty. It is your responsibility to read this policy to avoid any misunderstanding. Do not hesitate to ask the instructor(s) if you are ever in doubt about what constitutes plagiarism, cheating, or any other breach of academic integrity.

Students with Disabilities

To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course instructor and the Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES, you may visit 1207 S. Oak St., Champaign, call 333-4603 (V/TDD), or e-mail a message to disability@uiuc.edu. <http://www.disability.illinois.edu/>.

Emergency Response Recommendations

Emergency response recommendations can be found at the following website: <http://police.illinois.edu/emergency-preparedness/>. I encourage you to review this website and the campus building floor plans website within the first 10 days of class. <http://police.illinois.edu/emergency-preparedness/building-emergency-action-plans/>.

Family Educational Rights and Privacy Act (FERPA)

Any student who has suppressed their directory information pursuant to *Family Educational Rights and Privacy Act* (FERPA) should self-identify to the instructor to ensure protection of the privacy of their attendance in this course. See <https://registrar.illinois.edu/academic-records/ferpa/> for more information on FERPA.

Sexual Misconduct Policy and Reporting

The University of Illinois is committed to combating sexual misconduct. Faculty and staff members are required to report any instances of sexual misconduct to the University's Title IX and Disability Office. In turn, an individual with the Title IX and Disability Office will provide information about rights and options, including accommodations, support services, the campus disciplinary process, and law enforcement options.

A list of the designated University employees who, as counselors, confidential advisors, and medical professionals, do not have this reporting responsibility and can maintain confidentiality, can be found here: wecare.illinois.edu/resources/students/#confidential.

Other information about resources and reporting is available here: wecare.illinois.edu.