

## Microbial Futures Stream I SLSA 2019

Stream Chairs: Melissa Wills ([mawills@ucdavis.edu](mailto:mawills@ucdavis.edu)) and Kym Weed ([kweed@unc.edu](mailto:kweed@unc.edu))

How do microbes shape the future? Over the past decade, scholars across the humanities and social sciences have increasingly documented the interrelationships between human and microbial worlds, showing how micro- and macro-scale lives are entangled in human bodies, practices, and thought. In this context, we want to explore how the study of microbial life can do more than show us what is — not only what microbes do, where they occur, or how they interact with humans — but, especially, how they help us to imagine different futures.

### Roundtable: The Future of Microbe/Microbiome Scholarship

Thursday, November 7, 2:00-3:30pm | Doheny Beach D

Chairs: Melissa Wills & Kym Weed

Over the past decade, the cultural narratives surrounding microbial life have changed dramatically. Scientists have increasingly documented the expansive scope and variety of microorganisms associated with the human body—our microbiome—and their essential contributions to health. In parallel, journalists, artists, and writers have extensively and publicly explored the imaginative possibilities of what it means to be human in a body teeming with microorganisms. To many, the concept of the microbiome upends reductive, antagonistic views of the relationship between humans and microbes, instead revealing that we are superorganisms diversely constituted by the microbes that “make us who we are.”<sup>1</sup>

Early humanities and social science scholarship has provocatively tracked this shift. Anthropologists have asked how microbiome science shapes emergent cultural practices; philosophers have inquired into the nuances of biological individuality; feminist scholars have explored the gendered messages emerging from microbiome discourse. To date, these approaches have largely centered on the human microbiome as a new ontological entity, transforming human relationships to the material world. While these perspectives have been valuable and necessary, we argue that is time to move into a second wave of scholarship on the microbiome.

In this roundtable discussion, we begin from the recognition that the microbiome is no longer new; we are no longer shocked by the thought that “we have never been individuals.”<sup>2</sup> Scientists are shifting away from simply identifying microorganisms affiliated with the human body, toward the study of community dynamics amongst the microbiota. At the same time, the human microbiome is increasingly being put to work in science and culture, being instrumentalized in new therapies and practices that employ microbes as partners in human health. The humanistic study of microbiomes must respond to these shifts.

Our roundtable discussion is built around a single question: What is the future of our field? Participants will explore this question from a variety of disciplinary and methodological perspectives. Discussants include:

- **Adam Bencard:** Associate Professor, NNF Center for Basic Metabolic Research and Medical Museion, University of Copenhagen; trained in history, philosophy, and curation (video submission)

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<sup>1</sup> Knight, Rob. *How Our Microbes Make Us Who We Are*.

[https://www.ted.com/talks/rob\\_knight\\_how\\_our\\_microbes\\_make\\_us\\_who\\_we\\_are?language=en](https://www.ted.com/talks/rob_knight_how_our_microbes_make_us_who_we_are?language=en). TED2014.

<sup>2</sup> Gilbert, Scott F., Jan Sapp, and Alfred I. Tauber. “A Symbiotic View of Life: We Have Never Been Individuals,” *The Quarterly Review of Biology*, vol. 87, no. 4, 2012, pp. 325-341.

- **François-Joseph Lapointe:** Artscientist from Montréal; trained in biology, bioart, dance, and performance
- **Jennifer Saltmarsh:** PhD Candidate, Department of English Composition Program, University of Pittsburgh; trained in composition studies and rhetoric
- **Kym Weed:** Teaching Assistant Professor, Department of English, University of North Carolina at Chapel Hill; trained in literary studies and health humanities, with early training in microbiology
- **Melissa Wills:** PhD Candidate, Department of English, University of California, Davis; trained in literary studies and Science and Technology Studies, with early training in microbiology

Over the past five years, SLSA has been the primary venue driving scholarly conversation around the microbiome and its cultural dimensions. We hope that it will now be a catalyst driving new directions in this timely and rapidly changing field.

## **Microbial Futures 1: Speculative Interventions**

Friday, November 8, 8:00-9:30am | Doheny Beach A

Chair: Melissa Wills

### **Karen Leona Anderson: “‘Had Nature an Apostate--’: Emily Dickinson, Time, and the ‘Unruly Edges’ of Fungal Spores”**

I argue in this paper that Emily Dickinson’s poetry imagines an alternative way of seeing futurity through the fungal spore. Against the background of her frequent and vertiginous shifts between the micro and the macro, and framed by anthropologist Anna Tsing’s articulation of fungus as a wild companion species that challenges the human as “autonomously self-maintaining,” my argument will focus on a reading of Dickinson’s poem “The Mushroom is the Elf of Plants - ,” which locates fungal rebellion against “Nature” in the incredible speed of its growth from invisible “Germ” to fruiting body.

Within Dickinson’s larger project of personifying “Nature”—a form of anthropomorphism that I argue, using Jane Bennett and Timothy Morton’s discussions of personification, can work “against anthropocentrism”—the mushroom is unique. The fungal spore’s quicksilver scale-shifting characterizes an “Apostate” to the maternal and legislative functions, attached to 19th century sentimental figures of “Mother Nature,” and constitutes an act of what Tsing calls “noticing at the seams” or the “unruly edges” of a monocultural system of agriculture linked to state and capital control. If, following Dipesh Chakrabarty, climate change requires us to think of “human agency over multiple and incommensurable scales,” both as “geophysical force and as...political agent,” this paper will ask how Dickinson’s rebellious spores ask us to rethink human time and futurity through other scales and modes of being.

### **Mercedes Villalba, Anuj Vaidya, and Stephanie Maroney: “Mycelial Futures”**

This talk describes the ongoing collaborations of Mercedes Villalba, Anuj Vaidya, and Stephanie Maroney and our interdisciplinary engagements in radical futures with fungus. Inspired by the feminist speculative fiction of Octavia Butler, the anthropological experiments of Anna Tsing, and the playful interderminacies of artist John Cage and many others, we present our process of creating a storytelling game of mycelial futures. The game is situated in an earthly future after bioremediation efforts to repair the planet have gone awry. It asks myco-bards and myco-tects to collaboratively create characters and objects in a speculative world of human and fungal co-mingling. Players then tell a story with these characters and objects, which over time, coalesce to tell the history of this future present. In this talk, we will share experiences of creating the game, playing it with different audiences, and further developing it with a class of UC Davis undergraduates. Through this example, we illustrate how the

magical world of mushrooms provides generative inspiration and substrate to shape our present entanglements and imagine different futures.

### **Melissa Wills: “Restoring the Future: Natural Childbirth Advocacy and the Maternal Microbiome”**

This talk examines how the practices and rhetoric of natural childbirth advocates are changing in response to human microbiome research, as scientists increasingly recognize the diversity of symbiotic microorganisms essential to human life. Through a close textual analysis of birth blogs, handbooks, and the 2014 documentary *Microbirth*, I show how the natural birth community recruits microbiome research into arguments against the use of antibiotics and Cesarean delivery in labor. I focus in particular on this community’s emphasis on the nascent practice of vaginal seeding, in which C-section-delivered babies are swabbed with their mothers’ vaginal fluids in an effort to “restore” the microbial diversity not acquired in transit through the birth canal. Vaginal swabbing remains a controversial and scientifically-unproven procedure. Nevertheless, natural childbirth advocates frequently insist upon it as a mother’s moral obligation, often using strongly normative framings that equate C-section with maternal failure or inattention—sins that can only be atoned for through the baptism of vaginal seeding.

My talk outlines the rhetorical maneuvers through which natural childbirth advocates misrepresent and exaggerate the risks of surgical birth. I show how these embody a speculative intervention in bringing projected future threats or promises to bear on decisions made in the moment of birth. In doing so, it constrains women’s reproductive choices by saddling them with the obligation to inoculate and to safeguard their newborns’ as-yet-undeveloped microbiomes.

### **Joel Ong & Mick Lorusso: “Microbial Myth Making”**

In the ongoing creative research project *Umwelt Microbiana*, we approach the multitudes of microbes that inhabit our world as key participants in the unfolding of planetary life. Thanks to recent developments in metagenomics and information technologies that have given researchers insight and appreciation for complex ecological networks of microbes, our project joins others in viewing the microbial world through a lens of affective bonds and appreciation, in two phases. In the first phase, we encourage a perspectival shift to microbes as sentient individuals in hypothesized scenarios of historical significance in which we feature microbes as the agents of perception. In a series of cabinet of curiosity styled installations, elements including microbial spray, documentation of experiments, and printed stories build a microbial worldview. These cabinets also exhibit our journeys to sites where microbial life is held sacred or as repository of environmental memory. In the next phase, we hunt for the microbial ‘sage’ - a ‘totemic’ microbe who may influence planetary systems such as the formation of clouds, precipitation, and ice. In workshops done across Canada, the United States, and Mexico, we invited participants to join in the search for an Aeolian microbe by helping to build payloads for weather balloons and kites. We conducted metagenomic sequencing of collected samples to catalog the constituents of the microbial communities in these various locations. While searching for transitional microbes that may transfer across biomes, we suggested sites of exchange and modes of transport that microbes use to access these sites, while encompassing metaphors of environmental disruptions and microbial solutions on a global scale.

## Microbial Futures 2: Boundaries, Collisions, and the In-Between

Friday, November 8, 9:45-11:15am | Doheny Beach A

Chair: Kym Weed

### Dennis Summers: “The Human Microbiome as Collage: Symbiosis and *Videodrome*”

Collage is a powerful mode of creation in many media, and also a productive theoretical lens with which to view all sorts of things. I’ve developed a comprehensive theory of collage that depends on three specific concepts. They are the gap, the seam and contested space. The first collage, on this planet at least, was likely the creation of a new type of single-celled organism about 3.5 billion years ago called eukaryotes. The currently accepted theory of Lynn Margulis from the 1960's, posited that organelles in eukaryotes such as mitochondria exists because one cell was engulfed by a larger one, or was invaded by a smaller one. Both cells then together survived and thrived in the challenging environment of that period. This theory is called symbiogenesis, and it has all the hallmarks of the three criteria of collage: gaps, seams and contested space.

As biologist Jan Sapp writes “Symbiosis is at the core of all eukaryotic life. The DNA in our cell nucleus is also chimeric.” He adds: “A new understanding of life is emerging today, one in which organisms are conceived of as multigenomic entities, comprising many species living together. We are genetic and physiological chimeras. We did not just evolve from bacteria, we have evolved with them....”

After reviewing research on the human microbiome and its relevance to collage I turn to the 1982 film *Videodrome* written and directed by David Cronenberg, and discuss the concepts of embodied cognition and embodied psychology.

### Jennifer Saltmarsh: “Lynn Margulis: Of Spirochetes and Speculation”

“All I suggest is that we compare consciousness with spirochete microbial ecology.” Thus ends Lynn Margulis’s essay “Speculation on Speculation” (1980). Spirochetes are the corkscrew-shaped phylum that thrive in cow rumen, mudflats, and in the human body as syphilis and Lyme disease. Margulis speculates that our neurons descended from spirochetes and that our synapses are the gaps between neurons (née spirochetes) reaching for one another. This still-unsanctioned theory is part of Margulis’s broader (sanctioned) endosymbiotic theory, which explains that eukaryotic cells developed when one bacterium ingested, but did not digest a smaller bacterium—which evolved into the organelles (chloroplasts, mitochondria) of eukaryotic cells. Margulis explains that “symbiotic partnerships merge sensibilities and metabolisms...” (225).

She began accruing evidence for her spirochete theory before she passed away, but decades before then she invited readers to participate in world-building. I place her work in the context of Indigenous cosmology and the Buddhist theory of the no-self, which similarly challenge idealized notions of self. Rhetoric and persuasion in these traditions are not just cultural and linguistic processes, but environmental processes. Margulis makes little distinction between human society and cell theory: “Whether we are discussing the disappearing membranes of endosymbiotic bacteria on their way to becoming organelles or the breakdown within the global human socius of the Berlin Wall, we must revise the rectilinear notion of self, of the bounded I. Alan Watts pejoratively referred to it as ‘the skin-encapsulated ego’...”(17). And: “Much of our would-be agency, which we perceive to issue smoothly from the ego, will, or ‘I’ [...] appears to owe much to heretofore-undetected symbiogenetic actors” (218). Gabriela Rios argues that western culture relies upon a “dichotomous philosophy that [separates] environment/human/ mind,” but that “Indigenous philosophies and rhetorics have always resisted such dichotomies”

## **Lily Randall: “Change Me”**

I am interested in presenting bacteria as an inherently social substance that transforms bodies through sharing. Sharing here is understood as an intentional act of exchange that moves bacteria from one person to another, with attention to their respective states of lacking and having. "change me" is a performance where I ask friends to give me samples of their nose, ear, mouth and/or vaginal bacteria, which I then insert into my own nose, ear, etc., as we sit together in front of an audience. This performance opens my body to sickness, relief, slight physical shifts, and also the uneventfulness of not knowing or feeling internal change. I am interested in how performance art can use the language of “modeling” or demonstration, while simultaneously challenging our desire for bodies to “show up” both medically and performatively. The viewer can watch, but they can’t see. Bacterial sharing in this non-medical context denies the usual modes of knowing through seeing like logs, records, explanation, certainty, conviction, or event. Performance is uniquely suited to addressing the fears and projections evoked by both the hygiene, anti-germ philosophy and the current increased interest in probiotics and “good bacteria.” Both rely on a sterilization of bacteria and microorganisms, by killing the “bad” or isolating and ingesting the “good.” The potential for transformation through damage is denied, and replaced with a focus on a good/bad dichotomy. This attempt to master the risk of interacting with bacteria seems linked to the difficulty of bearing sociality in general. Performance offers a chance to re-socialize bacteria. I am chronically sick, and chronic illness is rapidly increasing. We are all experiencing the disintegration of our climate, as is reflected in the alteration of our internal body ecosystem, leading to illness and also slightly altered states of normal health. Sharing bacteria may be a way forward.

## **Vanya Rachel Gnaniah: “Probing the Invisible: Microbes and the Call to Eat Well” (video submission)**

Food borne diseases caused by bacteria and viruses have become the plague of the modern food industry. Despite multiple food recall warnings, the World Health Organization has estimated that 1 in 10 people fall ill from food-borne diseases and 420,000 die every year. The growth of food supply chains beyond national borders has merely aggravated the problem. Most organizations and government efforts have revolved around recommending hygienic practices both in the production of meat, dairy and seafood in particular, but also in the preparation and consumption of food. But what can be said about the fact that nearly all the deaths through food-borne diseases affect the most vulnerable populations with compromised immunity? On the one hand, the economical, mechanical and social apparatus of the industry at large produces spaces for the bacteria to fester and on the other, creates an endless loop of mechanisms and technologies to mitigate the problems it has created. This calls for a critical intervention.

This paper suggests that the machines of the slaughter house, the spaces where bacteria fester, provides a critical entry-point into unravelling the condition of the food industry. I will explore how the economic and structural invisibility that the industry strives toward is brought into question by the seemingly “invisible” bacteria. Although such a structural invisibility has become a necessary condition of being “situated in a technological universe” (Ellul 312), it is precisely the invisible world of micro-organisms that lays bare the frailty of our systems. Finally, this paper will suggest alternative ways of consumption that micro-organisms have prompted us toward. Working with Derrida’s notion of “eating well”, I argue that microbes have called us to question our current constructions of “carnophallogocentric” (Derrida) subjectivity at a fundamental level.

## **Microbial Futures 3: Duke's Speculative Sensation Lab, Part 1**

Friday, November 8, 11:30am-1:00pm | Doheny Beach A

Chair: David Rambo

### **Alexander Strecker: "Gut Reactions: On Experimental Engagements, Collaboration, and Love"**

Since 2012, there has been a well-chronicled (even overhyped) explosion of interest in the promises of machine learning and, in particular, neural nets. But counter to this effervescence, a small, yet vocal chorus of computer scientists are advocating that we must open "the black box" at the heart of neural networks and pursue methods of explainable and transparent artificial intelligence. Yet long before we were worried about the black boxes inside our computational machines, we were confronted by a very different kind of black box: our own bodies. In the intervening centuries, medical research has revealed much about our innermost workings, but for all these insights, further mysteries abound. One such frontier—which has lately received almost as much attention as advances in AI—are the microbiome communities in our guts: complex, interlocked systems of bacteria that live within us and influence almost every aspect of our health and well-being. In the spirit of this year's theme, I would like to share my interdisciplinary, artistic research into the microbiotic "black box" that lies deep within our own bodies. I will detail my semester-long collaboration with a bioethicist and data visualization specialist and the ways in which we endeavored to make legible the hard-won data captured at a cutting-edge microbiome lab at Duke University. Much in the spirit of those working towards explainable AI, the project aimed to render the invisible internal operations of human digestion into an accessible (even interactive) format. At the same time, our work thematizes the vast swathes of terra incognita, the continued extent of our own ignorance. Thus, our creative, intellectual output was its own form of experimental engagement, spanning the margins and overlapping edges of a range of disciplines while simultaneously peering into the core of some of science's most pressing questions.

### **Quran Karriem: "Toward An Energy Theory of Value"**

In the 'knowledge economies' of the twenty-first century, the apparent supersession of the factory by the so-called 'immaterial' algorithm has resulted in a crisis of conceptual modeling such that alternatives to Marx's labor theory of value have been proposed which are not easily distinguishable from subjective notions of price or affect. These affective theories correctly observe that human labor power, considered through Marx's frameworks of absolute and relative surplus, can no longer fully represent contemporary value production; we must accept that non-human forms can also produce value. If the labor theory needs a replacement, however, we should be attentive to the utility of its groundedness in materiality, which provided the basis for a critique from outside the subjectivities produced by capital. I argue that any theory hoping to assume the analytic function the labor theory once provided should have continuity with its commitment to material conditions. This talk considers the extent to which digital and microbiological assemblages' production of effects that are abstracted or differentiated from human labor trouble, on the one hand, the applicability of the labor theory, and on the other, the validity of the 'immaterial' or 'affective' theories that have sought to replace it. Special consideration is given to a comparison of 'generative' machine-learning operations to effects produced by microbial forms, each of which, I contend, constitutes value production beyond what is describable as 'general intellect' or 'dead labor'. At the same time, the techno-utopic rhetoric surrounding such algorithms largely ignores their continuous reliance on material extraction. Fundamentally, the talk seeks to challenge the characterization of algorithms as 'immaterial' and recast them as 'energetic' in order to bring them into conceptual commensurability with value production by human and non-human lifeforms, and to situate computation within a framework of environmental cost.

### **Rebecca Uliasz: "Seeing Like a Computer: From Probability to Pattern"**

This paper argues that the digital image has come into a new relationship with power with the advance of machine learning techniques of organizing time and space. A new economy of digital

images gives rise to sovereign techniques that function through automating the signification of the human subject through its inclusion in big data sets. Here, digital images themselves become a productive technique for governing the future. These images are not apprehended visually, but rather organize our logics of perception, structuring what can and cannot be seen through the preemption of patterns. The digital image, ironically, authorizes techniques to make things disappear, or make you see things that quite literally do not exist-- it is often written off for excluding the human altogether. This talk will trouble the polarizing discourse on the opacity of machine learning and its assumed exclusion of the “human in the loop”. I will consider recent controversies around open source data sets ImageNet and DukeMTMC (Multi-Target Multi-Camera) through a technical analysis of Convolutional Neural Networks to extend a critique of what Louise Amoore calls a “politics of possibility,” a decisively financial logic of risk calculation that is concretized in machine learning algorithms. This is to nuance the shortcomings of arguments that emphasize the effects of bias within datasets, and to put forth the claim that machine learning exhibits patterning techniques that are incompatible with human reason.

### **Rebecca Uliasz and Quran Karriem: “Noise Performance as Knowledge Production: A Speculative Database Aesthetics of ImageNet”**

SOMA is the performance project of the speculative audio-visual-bio-mimetic platform agency, GOVERNANCE INC, that uses custom electronic tools, signals, digital DNA, speculative philosophy, and genome sequencing to create hybrid soma-cyborgs. Anabolic performance machines sequence genomes in order to propose more robust possible cell structures for digital organic life moving forward. SOMA mines ImageNet, a large-scale image database used for machine learning processes, to find its genomic origin and biosynthetic emergent forms. These cyborg cells all present different windows onto an unfolding future. SOMA is an engagement with performative knowledge production. It seeks to “shift the frame” away from the norms of scientific discourse to question the conditions of the production of knowledge itself. How does performing a discourse-- engaging with it visually, experimentally, or narratively-- allow new readings of the taxonomies contained within? How can performance, as a form of knowledge making, decode or change these taxonomies? We suggest that noise performance can stand in as a “proxy” for the performativity of knowledge production within computational machine learning and image recognition databases. Through rearranging, selecting and manipulating the material that machine learning systems metabolize to produce “truths”, we seek to produce different affective relationships with the archive. We suggest that the archive might be reproduced differently through experimental engagement. SOMA considers performance as proxy, or stand-in, for the computational algorithms that typically automate the processing of machine learning databases. It is suggested that engaging the body and activating the framework of experimental noise performance might allow a different expression of the database logic that increasingly undergirds and orders our aesthetic regime, visual culture, and social norms. What bioforms might emerge from the flesh of ImageNet when it becomes a performed object?

### **Microbial Futures 4: Duke’s Speculative Sensation Lab, Part 2**

Friday, November 8, 2:00-13:30pm | Doheny Beach A

Chair: Rebecca Uliasz

### **Mark Olson: “‘Putting the Microbiome to Work for You’: Labor, Platform Biocapitalism, and Human Gut Microbiota”**

A growing body of microbiome research reveals a “world out of balance” in the gut ecologies of many living and laboring under conditions of late capitalism. Diets high in fat and low in fiber wreak havoc on the gut’s microbial species diversity, resulting in a myriad of health concerns, from obesity to heart disease to depression. The specialized labor of gut microbes, we are learning, is crucial to human health and vitality. This recognition not only fuels a new speculative sector of the bioeconomy, the so-

called “global human biome market,” it also opens a new frontier in the governmentality of wellness. This paper traces the mobilization of the human gut microbiome as an emergent form of platform (bio)capitalism articulated to the biopolitical production of health, where technologies of responsabilization enjoin humans to actively participate in the maintenance, hacking, and rewilding of their “own” gut microbiomes. In particular, I seek to understand the forms of labor that coalesce under the bid to “put the microbiome to work.” Here labor operates at different scales, from what Les Beldo calls the “metabolic labor” of the gut microbiota itself to what Melinda Cooper and Catherine Waldby theorize as “clinical labor,” carried out by research subjects who contribute their fecal matter (ripe with data) for laboratory experimentation and who consent to randomized controlled clinical trials aimed at producing translational knowledge and other forms of biocapital. Finally, living labor commingles with the machinic in this context; I conclude by considering the implications of efforts to automate the experimental production process with technologies such as digital microfluidics: a microbiome “lab-on-a-chip.”

### **David Rambo: “Fecal Froths and Sourdough Starters: A Non-phenomenology of Alimentation”**

Hegel, in his *Philosophy of Nature*, refers to alimentation (i.e. ingestion, digestion, and excretion) as the first instance of externality going inward and returning—in a word, the “diremption” that makes appearance possible. Meditating on this philosophical interpretation of nourishment, my talk considers how the digestive capacities of microbiota afford a multiscale and multi-species conception of phenomenology. Specifically, I look at two intentionally cultivated microbiomes at opposite ends of the gut: yeast in a sourdough starter and the microbes sustained in a scientific laboratory’s fecal froth. In order to investigate the black box of the human gut microbiome (made all the more difficult because there is no all-encompassing human gut microbiome), researchers in the David Lab at Duke University have been creating many more black boxes from fecal samples. By monitoring how these sampled ecologies metabolize prebiotics—as opposed to identifying them via genetic sequencing techniques—the researchers establish an epistemic community à la Rheinberger’s “epistemic thing” out of these isolated microbiomes. Similarly, cultivating yeast in one’s own sourdough starter positions the little fungi as supports for building communities (through meal preparation and consumption) and other microbiomes (in the gut and kitchen air). As with the fecal froths, the domesticated microbes of a sourdough starter exist for humans in terms of inputs (flour, water, and mixing) and outputs (tang and carbon dioxide), while the communities they contribute to encompass the yeast colony from outside. Following Bachelard’s naming convention, what I call non-phenomenology rebases a classical phenomenology of consciousness on an always provisional understanding of cosmogenesis. Fecal froths and sourdough starters illustrate the fluctuating and variegated becoming of appearance, which spans irreducible yet dependent beings. Constituting process thereby manifests as a constituted relation such that the grounds of experience become open to experimentation.

### **Mark B N Hansen: “Response: The Human Body as Sensing and as Sensed”**

My contribution is a response to the two panels entitled *Microbe Futures 3-4: Duke's Speculative Sensation Lab, Part 1 and 2*. In my response, I will take up broad strands that cross through the 5 papers and that explore the double function of the human body as a sensing, productive organism and as a site for other sensing and productive processes. In particular, I shall explore how the 5 papers engage the gut microbiome as a site for data-intensive computation, and shall compare the various ways in which the authors see such engagement as an opportunity for data to become creative. The response is intended to initiate a general discussion of the 5 papers and the central issues they cumulatively engage concerning the human body and the extensions of sensibility afforded by data-intensive computation.

## **Social Hour**

Friday, November 8, 7:30pm

Meet in the lobby of the UC Irvine Student Center at the conclusion of the Plenary Session and walk together to nearby bar/restaurant. More details to come!