

GUSTAVUS ADOLPHUS COLLEGE OCTOBER 3 & 4, 2023

TO NOBEL CONFERENCE 59



I have always been fascinated by the natural world. As a child, I chased fireflies in the summer twilight and curated an impressive insect collection for a middle school

biology project. As an engineer and a mother, I marveled with my children at the intricate structures built by ants. Even today, I often pause while walking outdoors to simply watch in thoughtful silence as a butterfly floats on the breeze or stops to rest on a flower blossom.

Insects, like all of God's creations and many things in life, can be stunningly beautiful and sometimes bothersome. They work together to build, nurture, and create. Occasionally, they sting. Insects are a vital and too-often misunderstood component of our world.

This year's Nobel Conference calls for us to reflect on the big impact of little things. Thank you for joining me on this journey of learning as we hear from world experts about the incredible world of insects and the intersections of science and ethics.

Sincerely,

Riber m Beg

Rebecca M. Bergman *President, Gustavus Adolphus College*

The insect approach to life is clearly a highly successful one. There are more than 10,000,000,000,000,000 (10 quintillion!) insects—that is, approximately 1.4 billion insects per person—running, flying, scurrying, and creeping in nearly every terrestrial habitat on earth. In the words of entomologist E.O. Wilson, insects are "**the little things that run the world**."

Insects are stewards, of sorts, to nearly all terrestrial communities. For us, insects are a critical, sustainable source of nutrition to a growing human population. Today, approximately 200 different insect species are parts of typical human diets in more than 100 countries. Insects also play key roles as pollinators. One species alone, the introduced European honey bee (*Apis mellifera*), contributes billions of dollars to the U.S. economy by pollinating almonds, apples, and melons, along with other crops. Insects also clean up our messes. From freshwater streams to animal carcasses to dead plants, insects consume and recycle nutrients, releasing them to provide space and resources for other organisms to live.

And yet we have a complicated relationship with insects. While we rely on them in ways you'll be able to explore during this Nobel Conference, they also challenge our way of life. Insects transmit several deadly diseases—mosquitoes, conveyors of many pathogens, are considered the deadliest animal for humans. They also eat plants that we want to eat—as much as 20% of U.S. crops each year. Crop and forest losses due to insects are estimated to be \$40 billion annually. They also annoy us: cockroaches in our homes, flies crawling on our skin, and hornets attracted to our picnic lunches. While we might appreciate services they provide, we don't necessarily want to share a living space with insects.

Trying to understand an insect perspective of the world is an invitation for us to imagine being another: an experiment in radical empathy. While humans rely on our sight, insects live in a world dominated by scents and tastes. If we observe, contemplate, and recreate facets of insects' ways in the world, we may find in their lives the inspiration to constructively and creatively address many of the challenges of our time: insects, protein and fat concentrated capsules, hold a partial answer to the global nutrition crisis. The small fruit fly, *Drosophila melanogaster*, is a powerful experimental model for understanding how, at the cellular level, our bodies function. Metamorphosis, the radical change that insects undergo from larval to adult forms, is literally routine for insects. Yet for us, metamorphosis serves as a powerful metaphor for personal change—something well represented in literature. We may also gain insight about ourselves and our places in the world.

The fate of insects is one of the pressing challenges of this time. Insect diversity and abundance are declining precipitously. Forty percent of insect species are dwindling while one-third of all insect species are endangered. Insect extinctions are eight times higher than for reptiles, birds, or mammals. For humans, loss of pollinators threatens agriculture and natural ecosystems. Loss of insect predators may allow higher populations of certain pest insects like mosquitoes. Loss of insect detritivores like termites and ants threatens savannah and prairie habitats. We also risk losing some of the wonder that insects bring to our lives: fireflies twinkling on a summer night; dragonflies darting, hovering, and dipping around freshwater ponds; and bumblebees appearing to defy gravity as they sink and rise among flowers in a garden. Insects can survive without us but we cannot survive without them.

We welcome you to this exploration of the insect way of life and how it intersects with ours. We hope that this Nobel Conference cultivates your wonder, questions, and respect for insects on their own terms.

Sincerely,

Margaret Bloch Qazi, Co-chair, Nobel Conference 59 Lisa Heldke, Director, The Nobel Conference







The Nobel Prize is a positive force that demonstrates the importance of seeking truth, <u>thinking critically</u>,

and engaging in a trust-based dialogue around human progress in science, culture, and peace. The ongoing work of the Nobel Foundation awakens curiosity, promotes discussion, instills hope and inspires action for the greatest benefit to humankind.

The Nobel Foundation is pleased that the tradition of the Nobel Conference at Gustavus Adolphus College continues because this Conference has a long-history of similar values and work.

Vidar Helgesen Executive Director, Nobel Foundation They're Not Like US. Insects make their way in the world in ways that differ profoundly from ours. These differences invite us to conceive the world in novel ways and challenge us to pay attention to the ways in which we interact with insects.

SESSION 1

8:30 a.m.

Doors Open to Lund Arena

9:15 a.m.

Musical Prelude

Jazz Bug Glow Worm Kissing Bug Just Wing It Gustavus Jazz Ensemble Dave Stamps, DMA, conductor Oliver Nelson Paul Lincke, Arr. Tom Kubis Billy Strayhorn, Arr. Bill Holman Kris Berg

9:30 a.m.

Academic Procession

Flash Patterns

Creators: Melissa Rolnick, Associate Professor of Theater and Dance; Dave Ryan, Media Artist; Dave Stamps, Associate Professor of Music, Gustavus Jazz Ensemble Student dancers: Sarah Carr '24, Elise Gahart '25, Mary Juelich '24, Katera Lampert '24, Dana Marquis '25, Karmen Peter '23, Ella Schwakopf '25

When we began envisioning the ways that the arts would figure into this year's conference on insects, co-chair Margaret Bloch Qazi wondered aloud whether some of the members of the Gustavus faculty could create an opening that evoked fireflies, which communicate with each other using light flashes they produce using special organs beneath their abdomens.

The result of Bloch Qazi's musings: a four-part composition, written by Gustavus faculty member Dave Stamps, in which independent creator Dave Ryan has programmed electronic instruments and LED lights to create a music-light digital interface. Into that music-and-light composition, faculty member Melissa Rolnick has introduced choreography that is inspired by the movement and qualitative patterns of various insects.

As you listen, see if you can pick out three familiar insect-inspired tunes, which are woven subtly into the composition.

Introduction

Phil Bryant Professor of English

Dave Stamps

9:30 a.m.

Conference Opening

Welcome

Invocation

Conference Introduction



Rebecca M. Bergman President of the College

> **Rev. Betsy Hoium** Chaplain of the College

Lisa Heldke, PhD Nobel Conference Director, Professor of Philosophy

Margaret Bloch Qazi, PhD Nobel Conference 59 Co-Chair, Professor of Philosophy

10 a.m.



Anne Sverdrup-Thygeson, PhD

Professor of Conservation Biology, Norwegian University of Life Sciences, and Scientific Advisor, Norwegian Institute for Nature Research (NINA)

First Lecture

Anne Sverdrup-Thygeson, PhD

Why We Should Love Insects

Can you be persuaded to love insects? Not just the lovely ones like butterflies, or the "helpful" ones like honeybees, but all of the insects on this planet? Anne Sverdrup-Thygeson thinks you can, and she's giving her best try. "If one has a friendly disposition, then the wish to care about them comes from the inside."

Conservation biologist Sverdrup-Thygeson does research on insect ecology and on forestry effects on biodiversity, carbon stocks, and ecological processes in mature boreal forests, and she teaches courses on conservation biology to both undergraduate and graduate students. But the work for which she is becoming known around the world is communicating about insects to the general public in a way that will make us stop wanting to kill them.

Two of Sverdrup-Thygeson's books for a mainstream audience have been translated to English: *Extraordinary Insects* (which was published in the United States with the name *Buzz, Sting, Bite: Why We Need Insects*), and *Tapestries of Life*. She has given a popular TED talk; she writes a blog; and she appears regularly on the Norwegian radio science program Ekko Abel's Tower. She is, in short, committed to doing everything in her power to convey to the public the fact that insects are "just the most amazing organisms around. They are incredibly species rich, and they're both fun and fascinating in many ways. They're also incredibly important. We completely depend on them for our lives and welfare."

One interviewer calls Sverdrup-Thygeson "Norway's foremost conveyor of enthusiasm for tiny critters." She suggests that one reason she is effective as a science communicator is that, prior to studying science, she also studied history and journalism. As she notes, "people have a different way of talking and thinking" in humanities and social science disciplines; having studied them gives her the capacity to appreciate and use these other ways of thinking.

Her Lecture

Why do I love insects? Well, shouldn't we all? Because these tiny creatures not only live amazing lives, with lots of fun, intrigue, and wonder, they also work tirelessly, 24/7, to uphold our ecosystems and help us humans survive. Insects have been here much longer than we, and they are essential to life as we know it. My research on insects has focused on the ecology of wood-living beetles and the interactions between beetles and fungi, but in my outreach, my main mission is to get people to know—and enjoy—our six-legged companions. Because through knowledge comes engagement, and the urge to care for insects and their habitats, and as a consequence, to care for us.

Introduction

Hagar Attia, PhD

Assistant Professor of Communication Studies

10:35 a.m.

Break

0:45 a.m.

Panel Discussion and Audience Q&A

11:45 a.m. Lunch

See lunch options on page 23.

Learning Lab

Head toward the Lund Forum (basketball court) for activities to learn more about this year's topic, including live insects!!

12:45 p.m.

Self-Guided Activities

Check out the full list of activities on page 22.

Breakout Sessions

No ticket required. These events will not be livestreamed.

Insects affect our lives in all sorts of ways. These breakout sessions give you a chance to explore some of them. Topics range from the expected and familiar (monarchs and wild bees in Minnesota) to the unusual and unexpected (the roles of insects in literature and film). Here also is your chance to learn about the insect-related music we're featuring in the Conference.

1. The Good, the Bad, and the Ugly: Insects in Literature and Film Location: Nobel Hall of Science Room 1412

Industrious ants and busy bees, a plague of locusts, and an infestation of cockroaches. For humans, insects have long served as a mirror and metaphor in literature and film. A panel of Gustavus faculty will share brief presentations on a few compelling examples of insects' roles, including bees in poetry, locusts in film, and metamorphosis, which (don't forget Kafka's cockroach!) does not always result in a butterfly. Audience members will be invited to contribute examples that will extend the conversation across cultures and time periods.

Presenters: Gustavus faculty members Yurie Hong, Department of Greek, Latin and Classical Studies; Martha Ndakalako, Department of English; and Nissa Parmer, Department of English

2. Insects and the Nobel Prize

Location: Saint Peter Banquet Room, Jackson Campus Center

How did ants in a bathtub contribute to quantum electrodynamics? How did a fly in a urinal become a prime example of an economic theory? In this session, Tom Annesley will discuss stories behind human-insect interactions that played important roles in the Nobel Prizes in Physics, Chemistry, Physiology/Medicine, Literature, Economics, and even Peace.

Presenter: Tom Annesley, Gustavus 1975 graduate, Active Emeritus Professor, Michigan Medicine, University of Michigan



Location: Cec Eckhoff Alumni Hall North, Johnson Student Union

Prior to surveys conducted in the last eight years by the Minnesota Department of Natural Resources and others, little was known about the bee species that inhabit the prairies, forests, and peatlands of Minnesota. Thanks to these surveys, we now know that the state is home to approximately 500 bee species–a figure that provides a baseline upon which to base future conservation actions. This presentation will showcase Minnesota's diversity by highlighting various groups of bees, including the "specialists" that feed their brood pollen from a single plant type, and the "cuckoo bees," so called because they lay their eggs in the nests of other species.

Presenter: Jessica Petersen, Invertebrate Ecologist, Minnesota Biological Survey, Minnesota DNR

4. Monarch Butterfly Conservation: Simple Steps to Make a Big Difference Location: Cec Eckhoff Alumni Hall South, Johnson Student Union Breakout session will be livestreamed.

Monarchs are one of Minnesota's most beloved and recognizable insects. The monarch is even our state insect! They have captured the hearts of many and inspire action for conservation, which in turn benefits countless other organisms. This presentation will provide an overview of the complexities of the monarch life cycle, migration and conservation, and provide simple starting steps for anyone interested in helping this iconic insect recover from population decline.

Presenter: Katie-Lyn Bunney, *Education Coordinator*, *Monarch Joint Venture*

5. Vector-borne Disease Concerns in Minnesota

Location: Wallenberg Auditorium, Nobel Hall of Science

In Minnesota, mosquito bites are a generally tolerated inconvenience. Occasionally, these bites transmit pathogens, including West Nile Virus and several types of encephalitis, to human hosts. Ticks are not insects, but these eight-legged arthropods transmit pathogens for Lyme Disease, which is endemic in Minnesota. Climate change may expand the ranges of other such transmitted diseases. In this session you will learn about the risks of mosquito- and tick-transmitted diseases and what you can do to protect your health.

Presenter: Elizabeth Schiffman, Infectious Disease Epidemiology, Prevention, and Control Division at the Minnesota Department of Health

6. Insects in the Arts: Behind the Scenes of the Nobel Conference Opening Performance Location: Hillstrom Museum, Jackson Campus Center

For this year's Nobel Conference, three artists collaborated to develop our unique conference opening, which uses music, light, and dance to explore insect communication, a central theme in the study of insects. The fireflies' light shows attract mates, ants' chemical trails help them build multi-story nests, and honeybees dance to indicate the best sources of food. All these activities involve communication among individuals. Join the creators of the opening performance to learn about how their dialogues led to the development of their program.

Presenter: David Stamps, Department of Music and Melissa Rolnick, Department of Theater and Dance, Gustavus; Dave Ryan, Media Artist, St. Paul

Breakout Sessions continued on next page

7. Insects and the Liberal Arts: The Legacy of Charles Hamrum and Entomology at Gustavus

Location: Heritage Banquet Room, Jackson Campus Center

We know that insects thrive in nearly every habitat on the planet, including the Gustavus campus, but what about within the liberal arts? In this session, a panel of former Gustavus entomology students with vocations about or related to insects will reflect on insects and the liberal arts. After sharing their thoughts, there will be time for group reflections and questions.

Presenters: Anthony Adams '11, Small Farms/Local Foods Extension Educator, University of Minnesota; Neil Bentley '97, Vice President, Market Management Agricultural Solutions NA; Ethan Degner '12, Assistant Professor of Biology, Wisconsin Lutheran College; Mike Howe '14, ORISE Fellow Juneau Forestry Sciences Laboratory, United States Forest Service; Elizabeth Murray '04, Telford Family Professor of Entomology, Washington State University; Gina Quiram '06, Strategic Planner, Minnesota Department of Natural Resources, Ryan Sklar '20, nursery supervisor, GDM Seeds; Carl Stenoien '11, Climate Change Research Scientist, Minnesota Pollution Control Agency

8. Monarch Migration: An Artistic Collaboration Location: Nobel Hall of Science Room 1413

So much of the conservation of wild things involves personal stories and our connections. Come hear how the natural history of one insect has inspired two artists—a writer and a composer—in a collaboration designed to connect our stories and ourselves to the monarch butterfly. The magnificent migration of monarchs across Canada and the United States to Mexico each fall and spring was brought to children by author Ann Hobbie's *Monarch Butterfly: Explore the Life Journey of One of the Winged Wonders of the World* (Hobbie and Baumert, Storey, 2021). In 2023, award-winning Mexican composer Nubia Jaime-Donjuan put this story onto a score with "*Monarch Migrations*", music for orchestra and symphonic band. Listen to the Gustavus Wind Symphony perform "*Monarch Migrations*" on Wednesday, October 4.

Presenters: Heidi Johanna Miller, *Gustavus Department of Music*; Ann Hobbie, *author of "Monarch Butterflies: Explore the Life Journey of One of the Winged Wonders of the World" from St. Paul*; and Nubia Jaime-Donjuan, *performer and composer of "Monarch Migrations" from Hermosilla, Sonora, Mexico*

9. Who Are the Insects In Our Neighborhood? An Insect Catch, Identify, and Release Experience

Location: Gustavus Arboretum, Interpretive Center | Group size limited to 18

Insects are everywhere on the Gustavus campus. This is an opportunity to appreciate them on their own turf. You will have a chance to safely catch insects, identify them and learn about their natural history, and then release them. Most insects are completely safe to humans and stings rarely occur. If you are allergic to insect stings, please bring appropriate safety measures. No experience needed. All equipment will be provided.

Presenter: Kirk Larsen, Department of Biology, and Luther College Entomology Students

SESSION 2 1:45 p.m.

Musical Prelude

The Gustavus Symphony Orchestra Justin Knoepfel, DMA, conductor

Die Meistersinger von Nürnburg

Richard Wagner (1813–1883)

Shannon Olsson, PhD

2 p.m.



Shannon Olsson, PhD

Global Director, the echo network; Special Scientific Envoy to ndia, Danish Academy of Technical Sciences

Second Lecture Fly Psychology 101

Flies have wings and at least 200,000 times fewer neurons than humans. Ants have antennae and are about 750 times shorter. Insects have four more legs than we do and two large compound eyes composed of many tiny eyes. How can we humans possibly understand beings so different from us? Many scientists study insects to learn about their bodies, behaviors, and environments. In their desire to produce objective and aperspectival findings, however, the knowledge they develop is often rooted in humans' experience and understanding of the world.

How else could we possibly learn about these tiny creatures that not only differ from humans so dramatically in physiology, but also outnumber us by the millions, if not billions? One way: through the methods employed by chemical ecologist and sustainability researcher Shannon Olsson.

Olsson uses an interdisciplinary, empathetic approach to understand insects' perspective and what drives their behavior. Whether in the laboratory or out in the environments in which insects actually live, Olsson is mindful that insects might not utilize and value sensory information in the same ways humans do. She uses this awareness to generate questions and develop methods of study that are sensitive to those differences. In one representative study, Olsson recorded fly movements as they navigated through a virtual reality environment, to learn more about how flies navigate and make decisions in response to what they see, smell, and feel. For another study, she planted carefully designed artificial flowers, to better understand pollinators' behavior in their own environment, especially as it changes in response to pollution, climate change, and other environmental impacts.

As Olsson explores the intersection of insect and human ecosystems, she also advocates for their preservation and sustainability in a changing world. To that end, she founded the echo network, an international group of public and private organizations that use social innovation to share knowledge, generate ideas, and employ strategies to realize sustainability goals. She currently serves as the organization's global director.

Her Lecture

Insects exist in nearly every known ecosystem, and we couldn't exist without them. For over two decades, I have walked in the footsteps of these tiny, six-legged "animal people" across three continents. I am fascinated by how their tiny brains perceive their world. My group has taken field trips, recorded neurons, generated models, and even built virtual worlds to understand how insects have evolved to detect their environment and make decisions. Our work has traversed Himalayan meadows, ecologically sustainable agriculture in the Western Ghats, and pollution in Bangalore. Conducting these experiments in the world's most populous country has also revealed the profound impact humans and insects have on each other. In my pursuit to see the world through their many eyes, I've found myself gaining deeper insights into my own role in this shared existence, and how intertwined our future is to theirs. This is a story of my personal journey, as my mentor once advised, to "think like a fly."

Introduction

Lauren Hecht, PhD

Associate Professor of Psychological Sciences

2:45 p.m.

Jonathan Birch, PhD

Professor of Philosophy, London School of Economics and Political Science

Third LectureJonathan Birch, PhDThe Minds of Insects and Why They Matter

When an ant or a bee defends its colony or hive, what is it doing? Can we explain its actions as "helping" its kin? If so, does "helping" imply that that an individual ant or bee possesses a sense of selfhood or of motivation? Textbook explanations of evolutionary theory would categorically demur from such a description. On this account, words like "decision," "choose," "act," "feel," and "want" have no place in the lexicon of evolutionary biology.

And that's where the work of philosopher Jonathan Birch's work begins. Can we, he asks, find a more subtle language for describing and explaining the actions of biological organisms, from the smallest multicellular beings through to the development of human culture, that lends to evolution a broader grammar of consciousness and selfhood—and therefore of cooperation and altruism?

A thread that weaves its way throughout Birch's thought is his interest in the ways we theorize and explain the actions and motivations of biological organisms. Since his days as an undergraduate, Birch has been interested in the "explanation gap" or "explanation paradox" in the biological sciences. When we attempt to explain a biological occurrence, we habitually use language (often quite unconsciously) that assigns motive to the agents being described. So, for instance, we describe the ant as "helping" its colony mates, as if the ant was actively choosing that action. But the principles underlying evolutionary theory preclude any such motivation. How then can we explain what animals are doing, and how they are interacting, if evolutionary theory seems to bar the ascription of motivation?

In attempting to develop an answer to this, Birch focuses his attention on the writings of biological theorist W.D. Hamilton (1936-2000), whose theories about animal social behavior created a language with which to discuss choice, relationship, and kinship across the animal world. Birch uses Hamilton's work to explore "relatedness": how do different biological organisms (from multicellular microbes to human beings) influence the selection pressures they face? And how, over time, will they respond to them?

In a sense, we could say that Birch's work points us to the most fundamental question in all philosophy and ethics: not, are we alone in the universe, but are we alone here on Earth? Emphatically, Birch thinks not. From patterns of social evolution and kinship to gradations of consciousness, humans live in and among a biological world teeming with relation, purpose, and motivation. What we need, he argues, are the right theories to help us recognize it, and an array escientific tools to help us measure and see it.

His Lecture

What is it like to be an insect? There are serious limitations on our ability to imagine what it's like, because an insect's sensory world is very different from ours (for example, they cannot see red, but they can see UV). However, we can gain some insight by studying their behavior in laboratory conditions. This talk will pick out some highlights from the last few decades of insect cognition research, focusing on bees and their capacities to learn, remember, solve puzzles, play, and (possibly) feel pain. I will then ask: what are the ethical implications of this research? One message seems to be that insects should not be ignored in discussions of animal welfare. We should err on the side of caution, taking steps to protect them where we realistically can.

Introduction

Samuel Kessler, PhD

Åke and Kristina Bonnier Chair in Jewish Studies and Associate Professor of Religion

3:30 p.m. Panel Discussion and Audience Q&A

4:30-5:30 p.m.

Bug Bites Reception

Location: Lund Center, 2nd Floor Hall of Champions This is a ticketed event that requires pre-registration and payment. Tickets are \$25 per person.

A selection of light nibbles that invite us to think about the relationships between insects and our food. Many of the foods will be familiar favorites, while others might challenge you! This event will include opportunities to consume actual insects, along with foods that insects make possible with their work, including fruits pollinated by insects, grass-fed cheese, and honey.

7:30 p.m.

Insects: A Live Storytelling Event, hosted by The Moth

Location: Björling Recital Hall | Separate Ticket Required This is a ticketed event. Tickets may be purchased at the door. Tickets are \$5 for the general public and free for Gustavus students and employees.

Join us for a live storytelling event with The Moth. The Moth aims to promote the art and craft of storytelling, and to honor and celebrate the diversity and commonality of human experience.

Relax and enjoy the show or plan to tell a story.

For this special one-off StorySLAM, prepare a story to share onstage, or simply join us to listen to the wonderful stories shared by members of our community. Three teams of judges will select one winner, who will progress toward a GrandSLAM Championship. The theme for the night is... insects. Stories about bugging out. Moments that got your spidey senses tingling. Jiminy Cricket, Beetlejuice, Queen Bey, and Ant-Man or Coleoptera, Diptera, Hymenoptera, and Lepidoptera. Making a beeline for someone, or dropping like flies. A caterpillar's metamorphosis from an inching, wriggling crawler into a majestic, flying butterfly. Dreaded encounters with those biting, bloodthirsty pests that lurk at dusk or an awe-filled reverence for those that pollinate, decompose, and make the world go round.

We'd Be Nowhere Without Them. Insects have a profound impact on our lives in basic and applied-foundational and practical-ways. In their roles as model organisms, insects enable researchers to explore common, underlying aspects of how life works. Practically, insects affect every aspect of our everyday lives, from what we eat, to what we wear, to how we construct our dwellings.

SESSION 3

8:30 a.m. Doors Open to Lund Arena

9:15 a.m.

The Gustavus Wind Symphony Heidi Johanna Miller, DMA, conductor

Dragonfly Earth Song Monarch Migration

Musical Prelude

Katahj Copley (b. 1998) Frank Ticheli (b. 1958) Nubia Jaime-Donjuan (b. 1984)

Segenet Kelemu, PhD

9:30 a.m.



Segenet Kelemu, PhD

Director, International Centre of Insect Physiology and Ecology (ICIPE), Nairobi, Kenya

Fourth Lecture Innovations in Insect Science

What roles can and do insects play in feeding a hungry world: as food for humans or for the animals we eat; as pollinators and sources of organic fertilizer; and also as devourers of crops and spreaders of disease in humans, animals, and crops? Since 2013, plant pathologist Segenet Kelemu has been addressing this multifaceted question in her role as Director of the International Centre of Insect Physiology and Ecology (icipe) in Nairobi, Kenya, the only international institution in Africa working primarily on arthropods, the phylum to which insects belong. icipe is a regional and global leader in research for development (R4D) through insects and related arthropods and their impacts on food and nutrition security, human health, environmental sustainability, and livelihoods. Since 1970, the Centre's achievements have reached many aspects of rural and urban life in Africa and beyond.

Under her leadership, the Center's "Insects for Food, Feed and Other Uses (INSEFF) Programme" has taken a holistic approach to the roles that insects can play in sustainably feeding the world, by studying technologies for sustainably harvesting edible insects, by developing high-protein insect oil and other novel products that can be used in the food and health sectors, by researching ways of utilizing byproducts of insect production as fertilizer, and by building the systems that will enable such projects to be expanded and exported to other regions around the world.



Kelemu spent the first 25 years of her career as a plant pathologist, studying the relationships between plants and the symbiotic and pathogenic organisms to which they play host. In 2007, she decided to return to Africa to devote her scientific expertise to addressing developmental issues facing the continent. Since then, she has led three major scientific research centers in Africa, and she is the first woman to hold the directorship of the icipe. Kelemu's work has been recognized with numerous international awards and honors, including the L'Oréal-UNESCO Women in Science Award; the Forbes Africa list of 100 most influential African women; and the Woman of the Decade by the Women Economic Forum, the largest global gathering of women leaders and entrepreneurs. She has been named a fellow of the World Academy of Sciences and the African Academy of Sciences. She holds a PhD in molecular biology and plant pathology from Kansas State University.

Her Lecture

Considering the enormous role insects play in food systems, ecosystem health, and many facets of livelihoods, this presentation will highlight and take stock of icipe's R4D efforts in three areas. First, in less than a decade, icipe's edible insects program has generated and disseminated ground-breaking knowledge and innovations on sustainable farming and harvesting of edible insects. Second, icipe is leading the field of arthropod symbiosis in Africa. One aim of this research is finding strategic entry points to reduce transmission of diseases such as malaria. Third, icipe researches "push-pull" technology that can simultaneously address a multitude of challenges such as stemborers, the fall armyworm, the parasitic weed Striga, mycotoxins, soil fertility, and livestock feed, among others, that affect cereal-livestock farming systems in Africa.

Introduction

Paschal Kyoore, PhD

Julie Lesnik, PhD

Professor of Modern Languages, Literatures and Cultures

10:05 a.m.

Break

10:15 a.m.



Julie Lesnik, PhD Associate Professor of Anthropology, Wayne State University

Fifth Lecture

Latitude and attitude: Environmental and cultural impacts on the perception of insects as food

We are currently facing a global food and nutrition crisis. In 2022, approximately 493 million people in 79 countries were food insecure, with inadequate nutrition and calories provided by precarious systems of food production and distribution. The reasons for this global food insecurity are numerous, but some of the major causes include exponential human population growth, civil war and international conflict, extreme poverty, the health and economic impacts of the Covid-19 pandemic, and extreme weather related to climate change, which is wreaking havoc on agricultural production, particularly in the Global South. Experts predict this food crisis will only get worse over the next ten years. Among the many solutions currently being pursued, one of the most promising is entomophagy, or the human consumption of insects.

Entomophagy is the focus of Dr. Julie Lesnik's research. Over the past 16 years, she has studied the global history and pre-history of insect consumption, the reasons why the Western world abandoned the practice, and what must be done to overcome our entomophobia (fear of insects) if we are to take advantage of insects as a food source. Her approach is multidisciplinary, combining primatology, sociocultural anthropology, paleoanthropology, and reproductive physiology. Her book, *Edible Insects and Human Evolution*, was published in 2018.



In addition to conducting research and teaching courses on biological anthropology, food and culture, and biology and culture, Lesnik has appeared on numerous radio talk shows, organized several edible insects events for the public, provided expert testimony for government policy relating to insects as safe food, and served on the board of directors for Little Herds, a nonprofit organization for edible insects education. She received her PhD in anthropology from the University of Michigan.

Her Lecture

Throughout human evolutionary history, insects have played a vital role in our diets. However, the consumption patterns observed today are influenced not only by local environments, but also by the lasting impacts of colonial history. This talk delves into the effects of these factors on our perceptions of insects as food, particularly within the United States. Colonial narratives portrayed insect consumption as animalistic or beast-like, which allowed colonizers to justify the exploitation and enslavement of colonized populations. There is still a sense that eating insects is "uncivilized," perpetuating a stereotype hundreds of years old. To understand insects as a food source, it is crucial to challenge these biased narratives and adopt a perspective that recognizes insects and humans as parts of the same ecosystem. By embracing a decolonized or anti-colonial viewpoint, we can appreciate the nutritional and environmental benefits that insect consumption offers and their potential contribution to solving global food challenges. This perspective also acknowledges that current sustainability practices often overlook the institutionalization of underlying problems. Embracing insects as food challenges these systems and fosters a vision of a transformative food future.

Introduction

Colin Smith, PhD

Visiting Assistant Professor of Sociology and Anthropology

10:45 a.m. Break

11 a.m. Panel Discussion and Audience Q&A

11:45 a.m.

Lunch

See lunch options on page 23.

Lunchtime Discussions

If you chose the buffet lunch in the Lund Forum (basketball court), you may also join a table discussion with other Conference attendees facilitated by Gustavus faculty and students. Tables will be labeled with discussion topics; pick a topic and pull up a chair. If you don't see a topic you're interested in, make a sign and start a new group!

Learning Lab

In the hall on the way to Lund Forum, visit the Learning Lab for activities to learn more about this year's topic, including live insects!

Self-Guided Activities

Check out the full list of activities on page 22.



12-2 p.m.

Schaefer Art Gallery Reception Gallery Talk by the Artist at 1:15 p.m.

Diminutive Messengers

Location: Art Gallery, Schaefer Fine Arts building on the south end of campus. *Open to the public free of charge, no ticket required.*

In creative conjunction with Nobel Conference 59, Twin Cities-based collage artist Eleanor McGough brings a blend of ephemeral hand-cut paper installations and acrylic paintings to the Schaefer Art Gallery. Working with a mixture of new and recycled materials, and inspired by insect forms, McGough articulates a sense of wonder for the astonishing variety and intricacy of these creatures, along with a sense of foreboding for the messages they convey about the issues at play in our ecosystem.

"The idea that insects are bio-indicators of ecosystem health fascinates me. Elaborating on the astonishing variety of documented insect forms with my own variations, my work seeks to articulate the critical role these diminutive and ephemeral messengers play in the structure of life, and how their once ubiquitous existence is under threat."

McGough received her Bachelor of Fine Arts in painting from the Kansas City Art Institute and studied in Brighton, England on scholarship. She is the recipient of two Minnesota State Arts Board grant awards, as well as a Bemis Foundation Residency.

12:30 p.m.

Gustavus Student Exclusive: Meet the speakers

Location: Beck Hall, first floor

Gustavus students: join a discussion with one or two of our presenters to learn more about their work and how they came to do it. How did they become interested in their field? What was the path they took? What are the questions they still haven't been able to answer? What challenges have they faced? No preparation required; bring your curiosity. The topics listed are starting points for the discussion.

DISCUSSION 1 | Shannon Olsson and Segenet Kelemu

Topic: Being from a small town and a first-generation college student and working outside your home country.

DISCUSSION 2 | Jessica Ware **Topic:** Working in a predominantly white field as a BIPOC person.

DISCUSSION 3 | Michael Young Topic: What is it like to win a Nobel Prize?

DISCUSSION 4 Anne Sverdrup-Thygeson

Topic: Engaging and communicating with the general public about science.

DISCUSSION 5 | Julie Lesnik and Jonathan Birch Topic: Should we farm insects for food? If so, how?

12:30-1:45 p.m.

"Go to the Ant, Thou Sluggard": Insects and Biblical Wisdom

Location: The campus Sukkah located on the South Mall between Christ Chapel, Anderson Hall, and Nobel Hall of Science

The Hebrew Bible (Christian Old Testament) contains many references to insects. Ancient sages accumulated considerable knowledge of insect behavior based on their observations of the natural world—think of it as an early version of "citizen science." For the biblical writers, insect behavior reflects the orderliness of God's good creation, and it offers lessons for humans about how to live a good, meaningful life. Join Blake Couey, Professor of Religion at Gustavus, for an overview and discussion of the Bible's perspectives on the insect world.

SESSION 4

1:45 p.m.

Musical Prelude

Festive Overture Magneticfireflies The Circus Bee March

The Gustavus Wind Orchcestra James Patrick Miller, DMA, conductor

Dmitri Shostakovich (1906–1975)

Augusta Read Thomas (b. 1964)

Henry Fillmore (1881–1956)

2 p.m.



Jessica Ware, PhD

Associate Curator of Invertebrate Zoology, American Museum of Natural History

Sixth Lecture

Jessica Ware, PhD

(Bio)Diversity

Insects are by far the most diverse group of animals on the planet. Scientists have identified more than 925,000 species, but somewhere between two and 30 million are still to be described! This means that the work of taxonomists—scientists who develop organizing schemes with which to identify, name, and group insects—is essential to the task of understanding just how big an impact insects have on our planet.

Entomologist Jessica Ware documents diversity in insect populations. Her work increases scientific understanding of the role diversity plays in each population and of the ways population diversity changes with time and location. Documenting diversity also enables scientists to measure how, when, and why insect populations change. This research can be important for understanding catastrophic declines in insect abundance and the impacts of such declines on whole ecosystems. Finally, Ware's work provides tangible evidence for evolution by creating valuable reference points for variations in populations and changes in traits over time. We may not regularly see or think about the role insects play in maintaining life as we know it, but they are essential players in the ecosystem, and Ware's research strives to uncover just how big that role is.

Jessica Ware is an entomological taxonomist and evolutionary biologist who works to identify, name, and group insects based on different characteristics and assess how they vary across time and geographical locations. She is particularly interested in the evolution of behavioral and physiological adaptations in insects, meaning how insects' external actions and internal biology change over time as they experience changing environmental conditions and different geographies. Ware's research focuses on insects from two different orders, which include dragonflies, damselflies, termites, cockroaches, and mantises. To conduct her research, she uses phylogenetics and phylogenomics, branches of science that reconstruct evolutionary history and relationships among organisms using molecular information such as genomic sequences.

Ware is actively engaged in encouraging people from under-represented groups to become entomologists. To further that aim, she co-founded Entomologists of Color and co-organizes #BlackInEnto week. She has also served as the president of the Worldwide Dragonfly Association and the Entomological Society of America.

She was awarded the Presidential Early Career Award for Scientists and Engineers, the highest honor bestowed by the U.S. government on outstanding scientists and engineers beginning their independent careers.

Her Lecture

Insects took to the skies over 400 million years ago and have persisted throughout this long period of geological time, through the rise of dinosaurs and birds, and into the age of mammals. These are incredibly diverse animals, with roughly 1.2 million insect species described and perhaps millions yet to be discovered. Our understanding of the evolution of this remarkable biodiversity has been advanced through innovated morphological data capture and genomic analyses. While we have begun to better grasp the insect tree of life, we lack fundamental information about insect populations, especially across space and time. Current studies looking across time series suggest insects are decreasing at an alarming rate. We need more entomologists from across the global population; we are working to remove barriers to participation and increase the diversity of those studying insects, the most diverse animals.

Introduction

Janie Frandsen, PhD

Assistant Professor of Biochemistry and Molecular Biology, Chemistry, and Biology

2:45 p.m.



Michael Young, PhD

Richard and Jeanne Fisher Professor, Rockefeller University; Nobel Prize in Physiology or Medicine, 2017

Seventh Lecture What Happens to a Lonely Fly

We tend to be aware that we eat and go to sleep at a usual time each day. We may be less aware that our body temperature rises and falls with a similar regularity, or that our endocrine system releases hormones at the time of day when they are most useful: cortisol in the morning to mobilize us into action and vasopressin in the evening to prolong the time between visits to the bathroom. The 24hour rhythm of many of life's essential processes is termed "circadian," from the Latin "circa diem," which means "around a day." The internal clocks that generate circadian rhythms are universal across every examined species and are present in most cellular tissues found within an individual.

Michael Young has been devoted to unraveling the molecular and biophysical mechanisms that organize the rhythms of daily life in the fruit fly, an organism widely used as a model system in the life sciences. He and his colleagues made the remarkable discovery that in cells housing circadian clocks, levels of key proteins wax and wane to the beat of a 24-hour period.

Most recently, Young's lab has taken an exciting turn to a topic of great contemporary concern: the impact of social isolation on physical and mental health. As it turns out, lonely flies tend to eat more and sleep less (behaviors which may sound familiar to many of us who experienced lockdown during the early days of the pandemic). The relatively small, stereotypically organized nervous system of the fruit fly has enabled Young to develop an elegant set of experiments to trace the circuits and identify the chemical signals that bridge the gap between social experience and behavior and physiology of the organism.

Young's laboratory has been supported by the NIH MERIT program and the Howard Hughes Medical Institute, each granted exclusively to experienced investigators who have a record of superior research. The preeminence of his contributions to the advancement of scientific inquiry have been honored by numerous prestigious awards that include the Louisa Gross Horwitz Prize, the Massry Prize, the Shaw Prize in Life Sciences and Medicine, and the 2017 Nobel Prize in Physiology or Medicine.

His Lecture

Loneliness is toxic and has been linked to various health issues, from increased blood pressure to elevated risk for depression, cognitive decline, and cancer. Under shelter-in-place orders connected to the coronavirus pandemic, Americans tended to be more anxious and depressed, had shoddier sleep quality, and according to some estimates, about a third of the population gained more than half a pound per person every 10 days. We have asked how behavior and physiology are perturbed by social isolation in the experimentally tractable insect, *Drosophila*. Our initial studies indicate that chronic, but not acute, social isolation affects sleep and appetite in these flies. We used behavioral analyses and transcriptome profiling to differentiate between brain states associated with acute and chronic social isolation. Although flies had uninterrupted access to food, chronic social isolation. Chronically isolated animals exhibit sleep loss accompanied by overconsumption of food, which resonates with anecdotal findings of loneliness-associated hyperphagia (extreme hunger) in humans. Chronic social isolation produces these changes through activities of a small group of neurons in the central brain. Genetically silencing these neurons restores normal sleep and appetite in chronically isolated animals.

Introduction

Mike Ferragamo, PhD

Michael Young, PhD

Emeritus Professor of Biology

Panel Discussion and Audience Q&A 3:30 p.m.

Nobel Conference 59 Closing Remarks 4:15 p.m.

ABOUT THE NOBEL CONFERENCE ARTWORK

N SEL S LITTLE BODY, BIG IMPACT

GUSTAVUS ADOLPHUS COLLEGE | OCTOBER 3 & 4, 2023

This year's poster, Nobel Conference 59: Insects Little Body, Big Impact was designed by Gustavus graphic designer Jennifer Kurth. Here's what she says about it: "Insects are a lot of things-beautiful, scary, helpful, and destructive, it all depends on which lens people view them under. I wanted to show an up-close image so you can really see the amazing color and detail in a way we typically don't see due to their small size. I chose the dragonfly because I've always been fascinated with them. The scale of the globe is meant to show that insects make a larger impact on us than we often realize, and the honeycomb shapes with various insects show connectivity. Dragonflies symbolize change, transformation, adaptability, and rebirth, so my hope is that this year's Conference will spark curiosity, inform, and inspire people to see insects in a new light."

2023 NOBEL CONFERENCE

PLANNING COMMITTEE

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WELCOME, HIGH SCHOOL STUDENTS

Welcome, high school students! We're glad you've joined us to learn about some of the many roles that insects play in Earth's ecosystems and some of the ways in which their lives have an impact on ours. Make the most of this opportunity to be active inquirers. Submit a question during a panel discussion. Visit the Learning Lab to investigate some topics in more interactive ways. Start a conversation on the bus ride home about something you don't understand or something you disagree with. The researchers you see on the stage started their careers by doing just these sorts of things. Imagine yourself in them!

Is Gustavus the place for you to take the next step in your academic career? If you are attending the conference in person, stop by the Admission Office, where a staff member will be happy to help you learn more about the College. Or learn more online at **gustavus.edu/admission**.



for BEST UNDERGRADUATE TEACHING in the nation (U.S. News and World Report)





2024 GUSTAVUS ACADEMY

SLEEP! YOUR WAY TO MENTAL HEALTH

June 15–21, 2024 Gustavus Adolphus College The Gustavus Academy for Faith, Science, and Ethics prepares leaders to build creative alliances between religion and science in order to address the world's most pressing challenges.

The Gustavus Academy summer program provides opportunities for high school students to explore their beliefs and to discover how scientists and people of faith are working together to address some of the world's most pressing problems. As an Academy Fellow, you will join with other outstanding high school students to grow in knowledge, develop leadership skills, and clarify your sense of purpose.

To nominate a student or for more information, please visit gustavus.edu/chaplain/academy.

NOBEL 59 TSHIRTS



20% OFF SELECT BOOKS AT THE BOOK MARK

Visit the campus store for conference t-shirts and books, gifts, cards, clothing, and supplies. Open 8 a.m. to 5 p.m.

bookmark.gustavus.edu



Present this at the time of purchase. Offer valid through 10/31/2023. Some exclusions apply.

> \$5 media mail shipping option for Nobel Conference books.

NOBEL CONFERENCE SPONSORS



Adeline and Drell Bernhardson

The Nobel Conference is the only education conference in the United States to be authorized by the Nobel Foundation in Stockholm, Sweden.

Core endowment funding for the conference was permanently secured

through the generosity of the late Reverend Drell and Adeline Bernhardson. The Bernhardsons recognized and celebrated the historic relationship between the Nobel Foundation and Gustavus Adolphus College. By establishing this endowment, they secured the core funding for the success of the conference and established a platform on which the conference can expand its reach and impact. The Nobel Conference Endowment Fund also includes gifts from Dawn and Ted Michaels; the late Russell and Rhoda Lund; the Mardag Foundation, in memory of Edgar B. Ober; and the UnitedHealth Group. Steve Sether, a friend of the Nobel Conference, is providing future endowed support for the Nobel Conference. His generosity will ensure new generations of high school students, the Gustavus community, and avid and longtime Nobel Conference attendees like himself can enjoy this renowned academic conference.

The Nobel Conference has been awarded a generous grant from the Riksbankens Jubileumsfond, an independent foundation with the goal of promoting and supporting research in the humanities and social sciences. This grant will enable the Nobel Conference to enhance its educational mission by developing its digital presence, making more of its materials available to a broader audience.

Special thanks to Heroic Productions for providing the sound, lighting, camera equipment, and staff.



ADDITIONAL OPPORTUNITIES!

Many special places on the Gustavus campus will be open to guests during the Conference. Take the opportunity to visit one or more of them during the lunch break or following the day's lectures. A campus map can be found online on page 24.

INSECT EXPLORATION

Visit these ten sites listed on the map on page 24 and look for the "Insects Exploration" sign with a fun fact. Find your way to the end and you'll carry away a packet of pollinator-friendly flower seeds.

GEOLOGY MUSEUM

Visit the Chester Johnson Geology Museum in Nobel Hall of Science.

GREENHOUSE

Visit the Nobel Hall Greenhouse, where biology students will be available to answer your questions about the plants and insects found there.

BONNIER MULTIFAITH CENTER IN ANDERSON HALL

A place for quiet reflection, prayer, meditation, or contemplation in Anderson Hall. Open from 8 a.m.–5 p.m. **SCHAEFFER GALLERY** in the Schaeffer Fine Arts Building, to see *Diminutive Messengers*, an exhibit inspired by insects.

GUSTAVUS ARBORETUM

Take a self-guided walk through Minnesota's biomes in the Gustavus Arboretum. Open dawn till dusk.

GRANLUND SCULPTURES

Take a self-guided tour of the Granlund sculptures on the Gustavus campus. Pick up the brochure at the Nobel Conference Information Desk in Lund Center.

ADMISSION OFFICE

Visit with an admission counselor or take a tour of campus with an admission tour guide. Go to the Admission Office in the Jackson Campus or sign up for a meeting at gustavus.edu/admission.



SCIENCEWHYS PODCAST

When big scientific questions meet big ethical questions, the waters can get pretty choppy. On *ScienceWhys*, a podcast produced in conjunction with the Nobel Conference, director Lisa Heldke explores the ways that science and ethics mingle, eddy, roil, and churn in individual researchers' work. Listen to the current season in which Lisa interviews the 2023 Conference speakers about their research and how they understand the role of ethics in it. Learn the sometimes surprising stories of how they have come to do the work they do.. Find the podcast on **Spotify**.

INFORMATION

INFORMATION & MESSAGE CENTER

Located in the lobby outside the southeast doors of Lund Center Arena, the Nobel Conference Information Desk may be reached during Conference sessions by calling 507-933-7520.

AUDIENCE QUESTIONS

Panel discussions including your questions are always a highlight of the Conference.

Questions may be submitted in the following forms:

- Emailed to nobelconference@gustavus.edu
- If you're in Lund Arena, submit them in writing to one of the ushers

We are only able to use a few of your always-interesting questions. Please take the opportunity to discuss them with other conference attendees or post them on social media using the hashtag **#Nobel59**.

ACCESSIBILITY ASSISTANCE

Lund Center is wheelchair accessible.

A limited supply of hearing assistance units will be available during the Conference on a first-come, first-served basis. They can be checked out at the registration table in the lobby of Lund Arena.

Open-captioning services is a text display of words spoken during the lecture and is happening during the Conference.

RESTROOMS

Restrooms are on both levels of Lund Center and in the Jackson Campus Center. Gender-neutral restrooms are on the upper level of the Jackson Campus Center by the Presidents' Dining Room and the main floor of the library.

MULTIFAITH SPACE

The Bonnier Multifaith Center is available for personal prayer and reflection during the Nobel Conference. It is located at the south end of Anderson Hall, on the main floor.

SOCIAL MEDIA

Use #Nobel59 when posting on social media. Follow the Nobel Conference on Facebook, Instagram, LinkedIn, and TikTok.

CERTIFICATION OF ATTENDANCE

Certificates of attendance for continuing education credits are available at the Nobel Conference Information Desk.

FOOD AND BEVERAGES

Pre-ordered Conference Buffet Lunches: Those who ordered the luncheon buffet should go to Lund Center Forum (basketball court). A limited number of buffet lunches may be available for purchase at the lunch entrance.

Bring Your Own Lunch: Tables will be available in the Lund Center Forum (basketball court) for those who wish to bring their own lunch. Join the Wednesday noontime organized discussions with your lunch.

Courtyard Café and the STEAMery: The Courtyard Cafe is located on the lower level of the Jackson Campus Center, and the STEAMery is in the Nobel Hall of Science, near Anderson Theater. Both are open during the Conference and serve coffee, pastries, sandwiches, and snacks.

Concession trailer is located in the Johns Family Courtyard supplying soft drinks, coffee, and snacks.

The Gustavus Market Place is the main College dining room located in the upper level of the Jackson Campus Center.

ZERO-WASTE CONFERENCE

We aim to make the Nobel Conference a zero-waste event. Whenever possible, we will use compostable, recyclable, or reusable materials. Please help the effort by selecting the appropriate bins in which to dispose of items you no longer need.

WEB ARCHIVES

Nobel Conference 59 main stage lectures and panel discussions will be archived on the Gustavus website at **gustavus.edu/nobelconference**. There you can also find all previously recorded lectures, beginning with the 1990 Conference, "Chaos: The New Science." Archived lectures provide you a snapshot history of some of the important scientific developments of the past 60 years.

CONFERENCE BOOKSTORE

Books written or edited by this year's Nobel lecturers (as well as other titles relating to the topic) are for sale in the Book Mark, located in the lower level of the Jackson Campus Center, open 8 a.m.–5 p.m. **20% off select books**. Visit the campus store for conference t-shirts and books, gifts, cards, clothing, and supplies.

INSECT EXPLORATION

Time to get buzzing around campus on an insect exploration. On this scavenger hunt activity, look for the "insect exploration" sign at each location to learn a new fact.

- In the Lund Center Lobby, discover the name of the Gustavus Women's Volleyball Team from 1970–1996.
- 2 Be a bookworm at the Folke
 Bernadotte Memorial
 Library
- **3** In the **Beck Hall** Atrium learn about a psychological phenomenon involving insects.
- 4 Outside the east entrance of Christ Chapel there lies a winged insect sculpted by a Gustie.
- Fly by the east side of
 Anderson Hall for a view of
 the valley and some beautiful
 bee food.
- 6 Go to the north lobby of the Nobel Hall of Science and find out what famous insects are being studied on campus.
- 7 See what is growing in the **Nobel Hall Greenhouse**.
- 8 I wonder what exhibit is in the Schaefer Art Gallery?
- Fly like a bumblebee to Björling Recital Hall.
- 10 There's something buzzing around the Arboretum Interpretive Center.







NOBEL CONFERENCE 60

Sleep, Unraveled October 1 & 2, 2024

Sleep is a universal human experience, and yet its importance is often overlooked. According to the National Institutes of Health, nearly 20% of Americans don't get enough sleep, and the CDC has reported that 70 million Americans suffer from some form of chronic sleep disorder that inhibits restful sleep. Nobel Conference 60: Sleep, Unraveled brings together an interdisciplinary panel of experts to explore the centrality of sleep in human health and mental wellbeing. In addition to its role in physical rejuvenation, sufficient high-quality sleep is crucial for cognition, memory, learning, and general health. Sleep loss—whether triggered by noise or light pollution, stress, overwork, or conflict with circadian rhythms-has been associated with high blood pressure, weight gain, diabetes, and a plethora of other medical conditions. The Conference will also delve into the neurological and psychological processes of sleep, the cultural evolution of sleep practices, and the social justice implications of a 24hour convenience society that condemns workers to permanent sleep deprivation.



OCTOBER 1 & 2, 2024 GUSTAVUS ADOLI





Confirmed Speakers

Marishka Brown, National Institutes of Health Mary Carskadon, Brown University Tricia Hersey, The Nap Ministry Maiken Nedergaard, University of Rochester Benjamin Reiss, Emory University Amita Sehgal, University of Pennsylvania Robert Stickgold, Harvard University



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