



MARCH 19, 2014

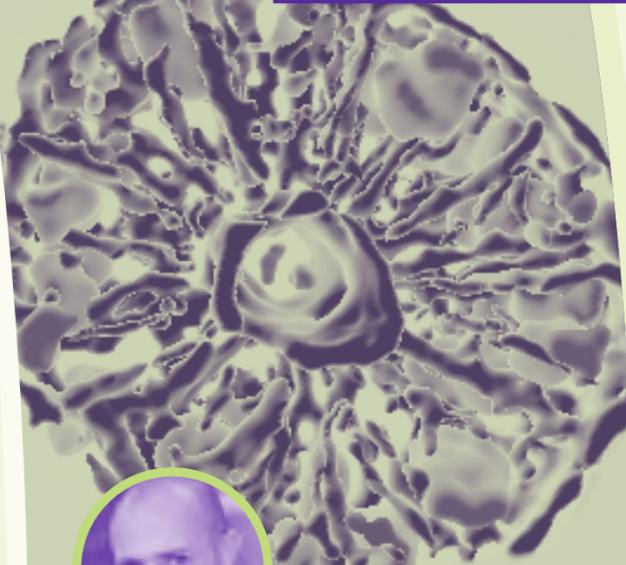


Michael P. Lamb
Assistant Professor of Geology

When Rocks Roll: How Sediment Transport Shapes Planetary Surfaces

From mountain valleys to river deltas, flowing water and grains of sand conspire to create Earth's dramatic landscapes. Earth is not alone; megafloods have cut vast canyons into the surface of Mars, and rivers of liquid methane actively carve the icy surface of Titan. This talk will explore new insights into the mechanics of landscape evolution with implications for debris-flow hazards in the San Gabriel Mountains, land-use sustainability on the Mississippi Delta and water on Mars.

APRIL 2, 2014

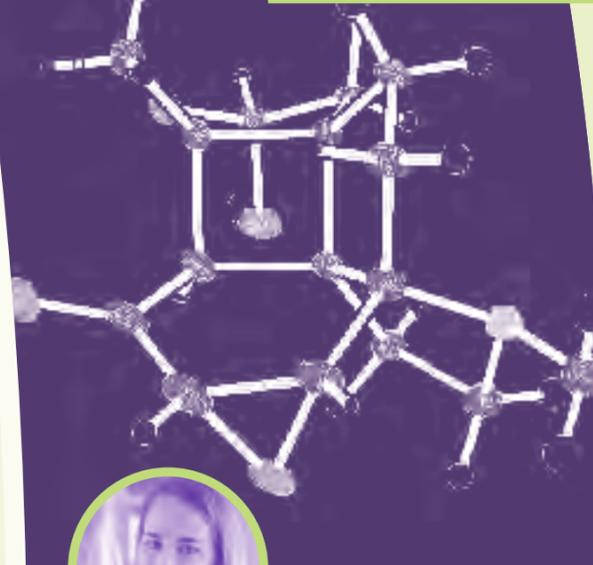


Sarkis Mazmanian
Professor of Biology

Say Hello to Your Little Friends: How Gut Bacteria Can Be Harnessed as Novel Therapies for Disease

Microbes dominate as the most abundant life form on Earth, occupying almost every terrestrial, aquatic and biological ecosystem on our planet. Humans are no exception. Throughout our lives, we provide residence to symbiotic bacteria, known as the microbiome, on virtually all environmentally exposed surfaces, the vast majority of which are harbored in the gastrointestinal tract. Mazmanian's laboratory has been interested in the connections between gut bacteria and the immune system. This lecture will explore the fascinating connections between gut bacteria and the two organ systems that are "educated" by environmental cues throughout life: the immune and nervous systems; and describe revolutionary approaches to uncover potentially novel therapies for complex human diseases.

MAY 7, 2014



Sarah E. Reisman
Assistant Professor of Chemistry

From Nature to the Pharmacy: The Chemistry Behind Modern Medicines

The origins of many modern drugs are small, organic molecules (known as "natural products") compounds that are isolated from bacteria, fungi, plants and other natural sources. Although some natural products are isolated and used without modification – think penicillin! – others require careful reengineering in order to be suitable medicines. Key to this endeavor is organic chemistry, and understanding how to build molecules atom by atom with precise positional and spatial control. This lecture will describe our research on the chemistry of natural products, building from an atomistic description of molecular structure to a description of chemical discovery and synthesis.



CALTECH
 PRESENTS

The EARNEST C. WATSON LECTURE SERIES

THE WATSON LECTURE SERIES, featuring prominent Caltech researchers, is named for the late EARNEST C. WATSON, who founded the series in 1922. He presented one of his most popular lectures, "Liquid Air," as one of the first programs at the new Beckman Auditorium, a gift of Arnold O. and Mabel Beckman, in October 1964.

All lectures are held on Wednesdays at 8:00 p.m. in Beckman Auditorium, which is located near Michigan Ave., south of Del Mar Blvd.

Through a gift from the estate of Richard C. Biedeback, the Watson Lecture Series has expanded to nine lectures annually.

ADMISSION IS FREE.

SEATING INFORMATION

A minimum of 700 seats is available on a free, no-ticket-required, first-come, first-served basis, beginning at 7:30 p.m. each lecture evening.

PARKING IS FREE

Parking is available in the lots south of Del Mar Boulevard between Wilson and Chester Avenues, as well as in the parking structures at 341 and 405 South Wilson Avenue, and 370 South Holliston Avenue. Parking is free, with no permit required, after 5:00 p.m. on weekdays and all day on weekends.

FOR INFORMATION

Phone: (626) 395-4652 • Web: www.events.caltech.edu • E-mail: events@caltech.edu

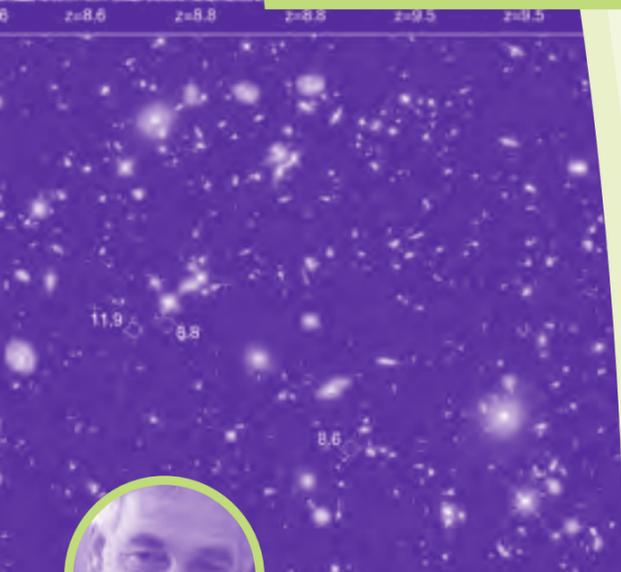
OUR COMMITMENT TO PATRONS WITH DISABILITIES

For information about our services, which include wheelchair seating and large-print programs, please call us at (626) 395-4652 or send an e-mail to events@caltech.edu for information and assistance.

MAILING ADDRESS

Ticket Office, Caltech (101-51), 101 Winnett Center, Pasadena, CA 91125-9200

OCTOBER 16, 2013

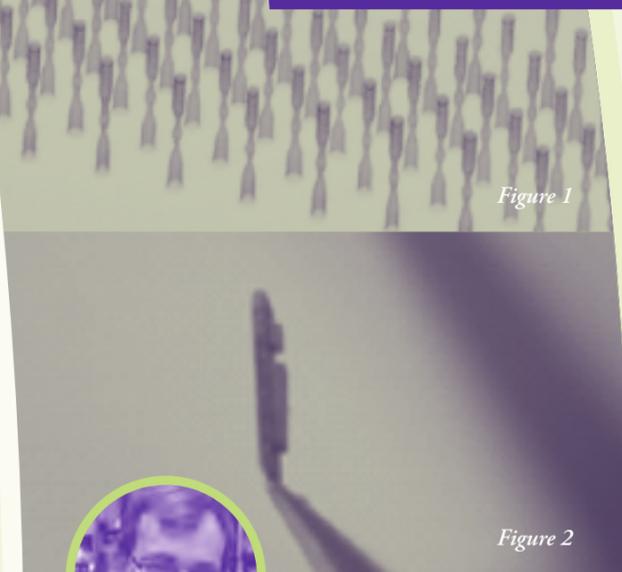


Richard S. Ellis
Steele Family Professor of Astronomy

Let There Be Light: Finding the Earliest Galaxies

Following the initial glow that emerged from the hot Big Bang, the Universe entered a period astronomers call the "Dark Ages," when clouds of hydrogen assembled under gravity and eventually collapsed to ignite as the first stellar systems. Can powerful telescopes look back and witness such a remarkable event? Deep imaging with the Hubble and Spitzer Space Telescopes, coupled with ambitious surveys undertaken with the Keck telescopes is providing our first exciting glimpse of this early period of cosmic history. Professor Ellis will address the challenges of this fundamental quest for the origin of galaxies, as well as the future prospects with the Thirty Meter Telescope and the James Webb Space Telescope.

NOVEMBER 6, 2013



Axel Scherer
Bernard Neches Professor of
Electrical Engineering, Applied
Physics and Physics

From Lab-on-a-Chip to Lab-in-the-Body: The Role of Nanotechnology in the Miniaturization of Medical Diagnostic Tools

Miniaturization of devices has fueled the rapid evolution of microelectronic systems over the past decades. We describe the opportunities of reducing the sizes of silicon structures below 10nm (Figure 1) to control the mechanical, optical and electronic properties of silicon. As the size of devices is reduced, it is possible to integrate these within complex and compact systems, such as integrated spectroscopy and data communications systems for continuous health monitoring (Figure 2).

DECEMBER 4, 2013



Fiona A. Harrison
Benjamin M. Rosen Professor
of Physics and Astronomy

From Spinning Black Holes to Exploding Stars: A New View of the Energetic Universe

The result of technological advances made over the last decades, NASA's newest astrophysics mission, NuSTAR, is peering far deeper into the high-energy X-ray sky than ever before possible. NuSTAR is exploring the densest, hottest regions in the Universe, helping us to understand how black holes grow, to study the bizarre physics that happens near the strongest known cosmic magnets, and to observe the radioactive glow of debris left over from exploded stars. This talk will share the story of this novel mission, which launched from underneath the wing of an airplane, and unfolded to 10 times its original length in orbit, as well as the scientific discoveries it is making during its first years in space.

JANUARY 15, 2014



Jean E. Ensminger
Edie and Lew Wasserman
Professor of Social Sciences

Aiding and Abetting a Culture of Corruption

How do we study corruption? Follow the money. Penetrate the networks. Model the system. In this talk we examine a large World Bank project right down to the village level. We learn how an African cartel is born, nurtured and propagated. Through this case study we can see the process by which individuals, institutions and ultimately entire states, get tipped into the vortex of systemic corruption. What role does aid money play in this process, and what does forensic economics have to offer in both the diagnosis and the cure?

JANUARY 29, 2014

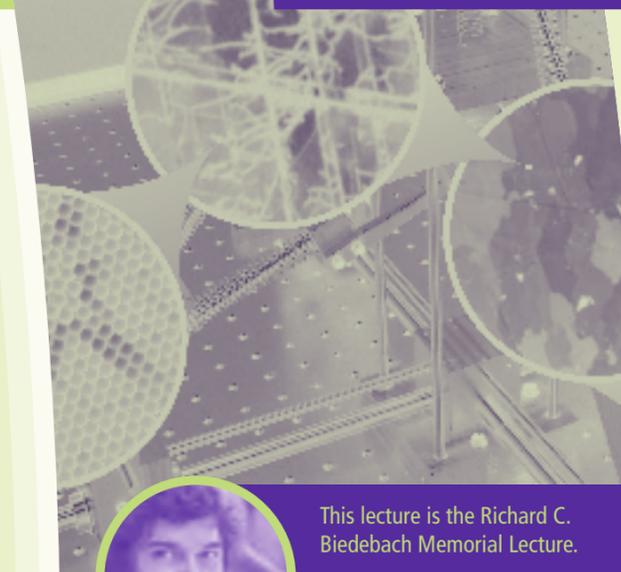


S.A. (Ali) Hajimiri
Thomas G. Myers Professor of
Electrical Engineering

1+1=3 or How I Learned to Stop Worrying and Love Holistic Circuits

Most of the modern day's technological marvels have come from putting apparently unrelated things together and creating something more than the sum of its parts. Silicon chips have come a long way from the days of first transistors. Today we can place billions of transistors operating at extremely high frequencies on a single chip. This has created a plethora of new opportunities in many areas that silicon chips could not address. In this talk, we will discuss a holistic approach to integrated circuits leading to yet further proliferation of such technologies into our daily lives. We will show you some of the exciting results ranging from self-healing circuits that repair themselves, to low-cost tera-hertz imagers that can give your cell-phone X-ray (or T-ray) vision. We will also talk about additional applications for low-cost diagnostic devices that fit in your pocket and offer early detection of various medical conditions, such as cancer, wherever you are.

FEBRUARY 12, 2014



This lecture is the Richard C. Biedebach Memorial Lecture.

Dennis M. Kochmann
Assistant Professor of Aerospace

Everyone Starts Small: How Metals Learn to Behave

Ever wondered where metallic materials get their unique properties from? Why are some materials strong and others fail quickly? Why can we deform some easily while others are hard to change? Why do some damp vibrations and others seem to swing forever? To understand why materials behave the way they do, we need to zoom deep into the lower length scales, deep into what is invisible to the naked eye. Our journey into the micro- and nano-scales of materials reveals billions of tiny defects, which in turn are made up of billions of atoms. It is this complex structure from the atomic scale all the way up to the macroscale that gives rise to the mechanical material behavior we experience in everyday life. And our journey won't stop there: understanding the link between structure and properties allows us to create new materials for today's and tomorrow's challenges in science, technology and society, which involve increasingly complex applications and extreme environments.