

CU Science Sampler

Lectures from the Cutting Edge

Part 1

5 Wednesdays, February 24–March 31
(No class March 24)
10 am–12 noon

Astrophysical and Planetary Sciences

February 24

Formation of stars and planetary systems, by John Bally, professor of astrophysics, who is currently exploring a hypothesis of “cosmic natural selection” in which black holes produce universes. The theory may explain why the universe appears to be hospitable to life.

Supernovae and the life of the universe, by Richard McCray, George Gamow Distinguished Professor of Astrophysics, Emeritus, who has conducted important research on supernovae, those explosions that mark the death of massive stars and trigger the birth of new ones.

Geological Sciences and Atmospheric/Oceanic Sciences 1

March 3

Earthquakes: Far away and close to home, by Anne Sheehan, professor of geophysics. Her current field campaign in Colorado and New Mexico seeks to learn whether the Rocky Mountains and Rio Grande Rift are tectonically active.

Using rockets to engineer climate without harming the ozone layer, by Darin Toohey, professor, atmospheric/oceanic sciences, who is working on laser-based laboratory studies to assess whether putting particles into the stratosphere could offset global warming.

Psychology and Neuroscience

March 10

Inflammation in the nervous system: From pain to cognitive decline with aging, by Steven Maier, distinguished professor and director of the Center for Neuroscience; and Linda Watkins, distinguished professor. Professor Maier’s research falls into two broad areas: one centers on interactions between the brain and the immune system, the other on variables that modulate the impact of stressors on brain chemistry and the neurochemical mechanisms by which stressors alter behavior, mood, and reactions to drugs of abuse. Professor Watkins has pioneered the concept that non-neuronal cells called glia are key to the control of pathological pain. Her ground-breaking research has led to a new state-of-the-art DNA therapy.

Geography 1 and Atmospheric/Oceanic Sciences 2

March 17

Recent changes in polar ice: Are we waking sleeping giants? by Waleed Abdalati, associate professor of geography, who has been involved in the development of NASA’s Ice Cloud and Land Elevation Satellite (ICESat) and its successor (ICESat-II) in research focusing on the roles of ice sheets and high-latitude glaciers in sea level rise and climate change.

Climate change in the middle atmosphere, by Cora Randall, associate professor, atmospheric/oceanic sciences, and principal investigator on the Cloud Imaging and Particle Size experiment on NASA’s Aeronomy of Ice in the Mesosphere satellite mission.

No lecture

March 24

Integrative Physiology

March 31

Optimal health across the lifespan, by Doug Seals, Monika Fleshner, and Kenneth Wright. Doug Seals is professor of integrative physiology. His broad research interest is the integrative physiology and pathophysiology of aging with a special focus on “arterial aging.” Professor Fleshner,

who is funded by the National Institutes of Health, is director of the Neuroimmunophysiology Laboratory. Her research program focuses on the impact of acute and chronic stressor exposure on behavior, neural, hormonal, and immunological function; how these systems interact; and the mechanisms by which exercise increases stress resilience. Kenneth Wright is assistant professor in the department of kinesiology and applied physiology. His research attempts to understand the neurophysiology of sleep-wake homeostasis and the internal circadian clock and to apply that knowledge to public health and safety.

Part 2

4 Thursdays, April 8–April 29

10 am–12 noon

Geography 2 and Environmental Studies

April 8

Balancing science and policy in the management of river flows for endangered species, by John Pitlick, professor of geography, who has directed several studies sponsored by the US Fish and Wildlife Service to determine the effect of hydrologic changes in the Colorado River basin on native fish habitats.

Climate change, sea level rise, and responsibility, by Jim White, professor, environmental studies program/geological sciences; director, Institute of Arctic and Alpine Research; and chair, Polar Research Board of the National Academy of Sciences. His broad research interests all revolve around human impacts on the environment.

Molecular, Cellular, and Developmental Biology 1

April 15

Exploring how cells work: A driver for long range progress in cancer therapy, by Mark Winey, professor, and Dick McIntosh, distinguished professor, who are both interested in the behavior of microtubules, the cables in cells that are organized into complex machines called mitotic spindles in order to move chromosomes when cells divide to produce new cells. Cancer cells have defective mitotic spindles that contribute to their disease state. Professor McIntosh's work on mitosis is supported by the National Institutes of Health, and he is writing a book for nonscientists on the biology of cancer.

Molecular, Cellular, and Developmental Biology 2

April 22

Type 2 diabetes: A modern epidemic, by Gretchen Stein, professor. Her interest revolves around the cellular basis of disease and how factors such as obesity, inflammation, and oxidative stress contribute to its development. Specifically, her current research addresses questions relating to the maturation of insulin-secretion in pancreatic beta cells and the toxicity of the amyloid-beta peptide in Alzheimer's Disease.

Chemistry and Biochemistry

April 29

New Approaches to Discovering Catalysts for Alternative Energy and The Challenges Facing Drug Discovery Today, by Bruce Eaton, professor and department chair. Professor Eaton's career in both academia and industry has led to the development of numerous new technologies and commercial products. He is named as inventor or co-inventor on over 30 US patents relating to diverse topics in polymer science, organometallic catalysis, and nucleic acid invitro selection, and he is currently active on two biotechnology scientific advisory boards.

Each lecture stands alone, so you won't fall behind if you have to miss a class. All lectures take place at Wellshire Presbyterian Church, 2999 South Colorado Boulevard, Denver.

Registration information: 303-770-0786, Info@AcademyLL.org