



# Free and Open to the Public

Carnegie Capital Science Evenings

# Carnegie Capital Science Evenings



Carnegie Institution, 1530 P Street, NW  
(corner of 16th and P Streets)

Lectures can be sign interpreted for the hearing-impaired  
Call 202.939.1121 to request an interpreter  
(Two weeks notice required)

For information on the 2010–2011 Capital Science Evenings, please call 202.328.6988,  
email: [CapitalScienceInfo@carnegiescience.edu](mailto:CapitalScienceInfo@carnegiescience.edu),  
or visit our website: [carnegiescience.edu](http://carnegiescience.edu)

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Throughout history, many of the most remarkable strides in science have been made by men and women trying to answer simple questions. Basic research has often answered these questions by helping us understand fundamental principles about the world around us.

For more than 100 years, Carnegie Institution researchers have been at the forefront of fundamental discoveries, making important contributions to astronomy, biology, and the physical sciences.

Unfortunately, many people regard scientific research as unfathomable. To make modern science more accessible to the general public, the Carnegie Institution began its Capital Science lecture series in 1990. These free, public talks are designed to help non-scientists understand scientific thinking and to appreciate the importance of basic research in our lives today.

In addition to operating six laboratories across the U.S. and an observatory in Chile, the Carnegie Institution is a leader in science education at all levels, training post-doctoral fellows, presenting Capital Science Evenings, offering science education for school teachers, and sponsoring hands-on science instruction for school children.

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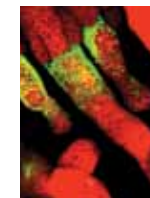
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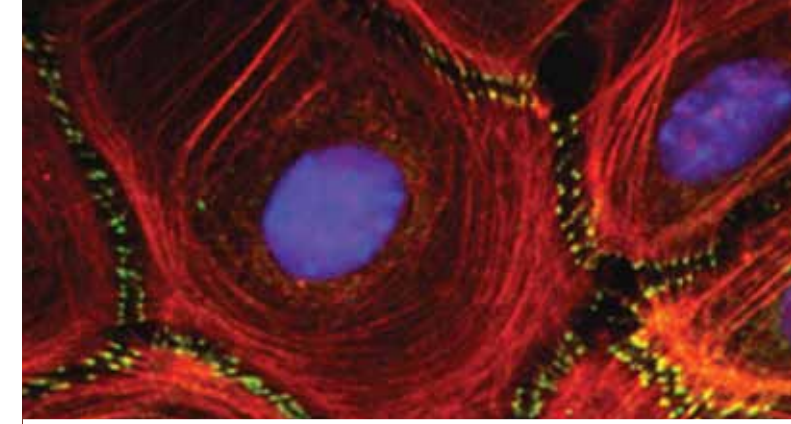


Can green plants and algae be used to manufacture batteries?

Does the fountain of youth exist in nature?

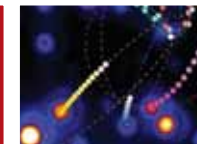
How can telescopes be used to create cost-efficient energy?

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# Carnegie Capital Science Evenings

Twenty First Season  
2010–2011



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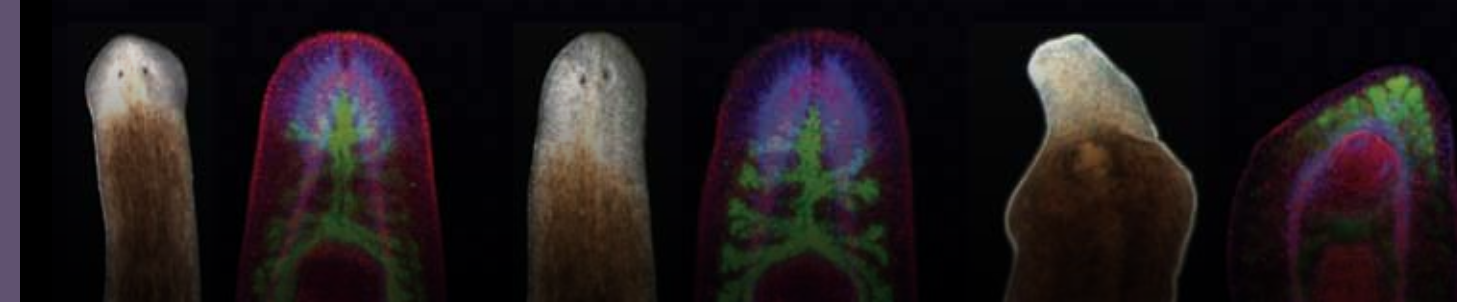
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# Carnegie Capital Science Evenings

Twenty First Season • 2010–2011



KAVLI LECTURE  
Thursday • October 21, 2010 • 6:45PM

## A New Job for Telescopes: Making Solar Electricity



**Dr. J. Roger P. Angel**  
University of Arizona,  
Department of Astronomy

Winner of the 2010 Kavli Prize in Astrophysics, Dr. Angel is being honored for innovations in the field of telescope design that have illuminated ancient objects and events in the distant reaches of the universe.

Roger Angel has developed concepts and technology for some of the most powerful astronomical telescopes, including the Large Binocular Telescope and the planned Giant Magellan Telescope. Today he is working on a novel telescope that harvests solar energy by focusing sunlight onto small but powerful photovoltaic cells. These “energy telescopes” are designed for mass-production in huge volume for solar farms, at a cost low enough to make unsubsidized solar electricity highly competitive.

Co-hosted by the Carnegie Institution for Science with the Royal Norwegian Embassy, the Norwegian Academy of Science and Letters and The Kavli Foundation.

BALZAN LECTURE  
Wednesday • November 3, 2010 • 6:45PM

## Light and Energy, Mimicking Natural Photosynthesis



**Dr. Michael Grätzel**  
Swiss Federal Institute of Technology,  
Institute of Chemical Sciences and Engineering,  
Laboratory of Photonics and Interfaces

Winner of the 2009 Balzan Prize, Dr. Grätzel was honored for his many contributions to the science of new materials, in particular for his invention of a new type of photovoltaic solar cell.

Learning from the techniques used by green plants and algae to harvest sunlight and convert it to fuels, Dr. Grätzel has developed a new solar cell that converts ambient light very efficiently into electric power and can drive electric power-producing windows and glass facades. The concepts behind these cells have also been applied to the production of hydrogen from sunlight and water, and to battery manufacturing—critical components of future energy systems.

Co-hosted by the Carnegie Institution for Science with the Embassies of Italy and Switzerland, and the Balzan Foundation.

CARNEGIE LECTURE  
Thursday • December 9, 2010 • 6:45PM

## The Galactic Center: Uncovering the Pulse of our Galaxy



**Dr. Andrea Ghez**  
University of California, Los Angeles,  
Department of Physics and Astronomy

Lurking at the center of our galaxy is its most massive object—a supermassive black hole.

More than a quarter century ago, astronomers first imagined that galaxies such as our own Milky Way might harbor massive, though possibly dormant, central black holes. Definitive proof lay in assessing the distribution and motion of matter at the center of the galaxy. Based on 15 years of high-resolution imaging, Dr. Ghez’s team has moved the case for a supermassive black hole at the galactic center from a possibility to a certainty. Although the stars orbiting close to the black hole appear to be massive and young, their origins are difficult to explain. Understanding them may provide key insights into the black hole’s evolution.

NATIONAL SCIENCE & TECHNOLOGY  
MEDALS LECTURE  
Thursday • January 20, 2011 • 6:45PM

## Stem Cells: Their Biology and Promise for Regenerative Medicine



**Dr. Elaine Fuchs**  
The Rockefeller University,  
Laboratory of Mammalian Cell Biology  
and Development

Winner of the 2009 National Medal of Science, Dr. Fuchs was honored for her contributions to the biological sciences and for her studies of mammalian skin and skin diseases.

Elaine Fuchs is internationally known for her research in skin biology and associated human genetic disorders, which include skin cancers and life-threatening genetic syndromes such as blistering skin disorders. Her pioneering work on stem cells of the skin has been useful in identifying stem cells in other tissues of the body. Her research holds promise for regenerative medicine, such as burn therapy, blindness and baldness.

Co-hosted by the Carnegie Institution for Science with the National Science & Technology Medals Foundation and the Biotechnology Institute.

CARNEGIE LECTURE  
Thursday • February 3, 2011 • 6:45PM

## Three Arrangements: Exploring our Grand Universe



**Dr. James Gates**  
University of Maryland,  
Department of Physics



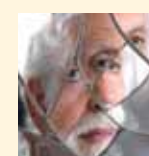
**Dr. Larry Gladney**  
University of Pennsylvania,  
Department of Physics  
and Astronomy



**Dr. Herman White, Jr.**  
Fermi National  
Accelerator  
Laboratory

Stunning new discoveries at the frontiers of physics, including the discovery that dark energy and dark matter constitute 95% of the universe, have profoundly challenged our understanding of fundamental physics. Either our view of empty space at the very smallest scales is wrong or our view that Einstein’s theory of gravitation works on large distance scales is incorrect. The Three Cosmic Tenors will touch on string theory, particle physics and mathematical astrophysics to illuminate what the universe is made of and how it is evolving.

WASHINGTON FILM PREMIERE  
Thursday • March 10, 2011 • 6:45PM



## Carl Djerassi—My Life

Join us for a screening of the documentary film “Carl Djerassi—My Life,” a portrait of the brilliant scientist turned science-in-fiction writer Carl Djerassi. After the screening,

Dr. Djerassi, inventor of the first oral contraceptive pill, will engage in a conversation with Madeleine Jacobs, Executive Director and CEO of the American Chemical Society.

Co-hosted by the Carnegie Institution for Science with the Office of Science & Technology at the Embassy of Austria, the Austrian Cultural Forum Washington, and the American Chemical Society.

CARNEGIE LECTURE  
Thursday • April 21, 2011 • 6:45PM

## Dying Young as Late in Life as Possible: Stem Cells, Tissue Renewal and Regeneration



**Dr. Alejandro Sánchez Alvarado**  
Howard Hughes Medical Institute and  
The University of Utah School of Medicine,  
Department of Neurobiology & Anatomy

What good is long life without youthful vigor? When the goddess Eos fell in love with

Tithonus, a mere mortal, Zeus granted him the imperfect gift of immortality: Tithonus lived forever but did not stop aging, thus condemning his existence to one of eternal decrepitude. In nature, organisms exist that can be said to remain perennially youthful, and consequently die young as late in life as possible. Learn what fundamental lessons such an organism is teaching us about our own biology.

SPECIAL EVENT  
Friday • October 22, 2010 • 6:00 PM

## Glowing Embryos, Genes and Development

A USA Science and Engineering Festival event at the Carnegie Institution for Science, in partnership with the Society for Developmental Biology:

A public lecture featuring Martin Chalfie (2008 Nobel Prize in Chemistry), Mary Dickinson (Baylor College of Medicine), Eric Wieschaus (1995 Nobel Prize in Physiology or Medicine), and Alexandra Joyner (2010–2011 President of the Society for Developmental Biology). The session will highlight seminal discoveries made by developmental biologists and their contributions to our understanding of basic biological principles. These studies provide insights for understanding and ultimately devising treatments for developmental diseases, such as birth defects and cancer.

For more information please visit:  
[www.sdbonline.org/SciFest\\_Nobel.htm](http://www.sdbonline.org/SciFest_Nobel.htm)

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