

Founded in Pasadena in 1904, **THE CARNEGIE OBSERVATORIES IS A WORLD CENTER OF ASTRONOMICAL RESEARCH**, and has had a tremendous impact on the course of astronomy. From George Ellery Hale's landmark achievements through the most recent research, virtually every major discovery about the origins, size, shape, and structure of the Universe has been led by Carnegie scientists.



As part of the Carnegie Institution for Science in Washington, DC, the Observatories represents a unique model for unfettered, collaborative research and discovery on an international scale. The Observatories' headquarters are in Pasadena, California.



The landmark building, designed by Myron Hunt in 1912.



Its large telescopes are at Las Campanas, high in the clear atmosphere of Chile's Atacama Desert. Las Campanas is also the future home of the Giant Magellan Telescope (GMT), which will be the most powerful telescope ever built.

To be completed in 2021, the GMT will help yield new answers to many of the most fundamental questions in astrophysics.

Once again, **CARNEGIE ASTRONOMY WILL BE AT THE FOREFRONT OF THESE DISCOVERIES.**

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SCIENCE**

THE OBSERVATORIES

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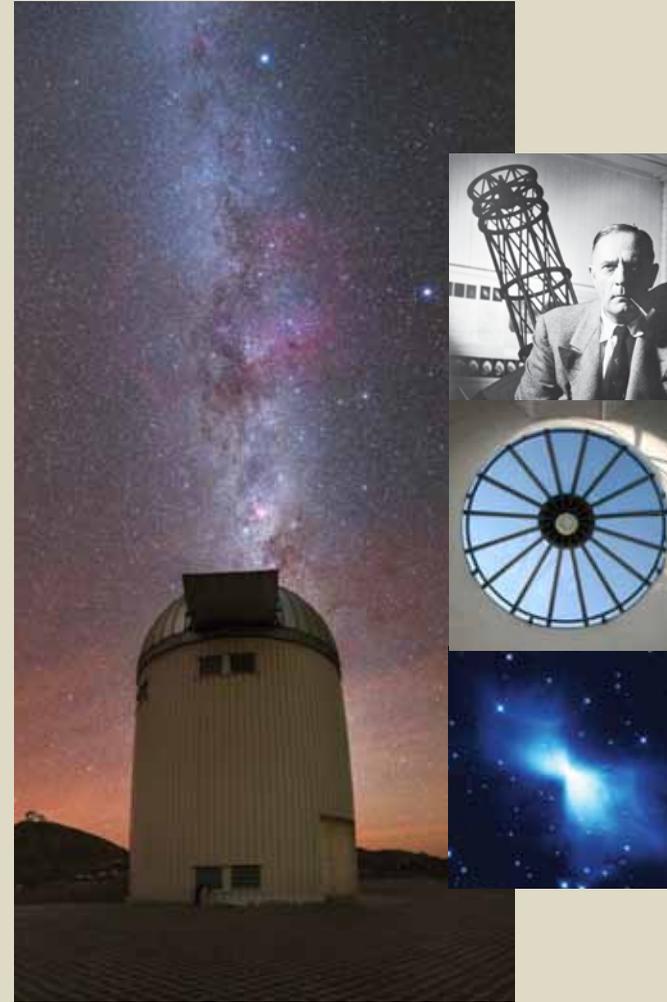
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2015 LECTURE SERIES

THIRTEENTH SEASON



**CARNEGIE
SCIENCE**

THE OBSERVATORIES

2015 LECTURE SERIES

THIRTEENTH SEASON

ALL LECTURES ARE AT **A NOISE WITHIN**

The Theatre is located at
3352 East Foothill Boulevard
Pasadena CA 91107
(just north of 210 Freeway via Madre Street exit)
Free parking on site
Directions: www.anoisewithin.org

THE LECTURES ARE FREE AND OPEN TO THE PUBLIC.
SEATING IS LIMITED, SO PLEASE ARRIVE EARLY.

DOORS OPEN AT 6:45 PM. Each Lecture will be preceded by a brief musical performance by students from the Pasadena Conservatory of Music or The Colburn School.

LECTURES START AT 7:30 PM.
Light refreshments are served before each Lecture.

More information: 626.304.0250 or
www.obs.carnegiescience.edu

The Carnegie Observatories is pleased to hold these Lectures at **A NOISE WITHIN**, Southern California's only classical repertory theater. The current season includes *The Threepenny Opera*, *Figaro*, and *Julius Caesar*. For more information and a **10% discount for Lecture Series audiences**, visit www.anoisewithin.org and use code **Carnegie10**.

MONDAY, MARCH 30, 2015

THE MULTIWAVELENGTH UNIVERSE



DR. JOHN MULCHAEY
Staff Scientist
Carnegie Astronomy

The light we see with our eyes only tells a small part of the Universe's story. To get a complete picture of how the Universe works, astronomers must study objects over the full range of light, the electromagnetic spectrum. This includes gamma rays, X-rays, ultraviolet, visible, infrared, micro-waves and radio waves. Each type of light requires different instruments, and provides unique information about the source that emitted it. Dr. Mulchaey will explain how Carnegie astronomers and their colleagues are combining observations across the electromagnetic spectrum to help solve the mysteries of the Universe.

THE CARNEGIE OBSERVATORIES LECTURE SERIES IS ORGANIZED BY DR. JOHN MULCHAEY.

For more than 20 years, Dr. Mulchaey has made seminal contributions to understanding galaxy systems and the processes associated with galaxy formation and evolution.

MONDAY, APRIL 13, 2015

THE GENES THAT BUILT YOU



DR. MATTHEW P. SCOTT
President, Carnegie
Institution for Science

Carnegie Astronomy is also part of Carnegie Science and the study of all living species. From ancient single-celled organisms evolved multicellular animals whose immense numbers of specialized cell types—skin, muscle, nerve—allow division of labor. Each cell type forms in the right place, is suited to its task, and activates certain genes. Powerful cell-to-cell communication systems organize structured tissues such as lungs, limbs and brain. Dr. Scott will discuss half-billion-year-old genes that have been gradually modified to give rise to the vast diversity of animals.

MONDAY, APRIL 27, 2015

AT THE EDGE OF REASON: THE BLACK HOLES IN THE UNIVERSE



DR. JUNA KOLLMEIER
Staff Scientist
Carnegie Observatories

Black holes remain among the most enigmatic objects in the universe. Using both computer simulations and traditional analytic theory, Dr. Kollmeier is making major discoveries showing how tiny fluctuations in density in the early universe have become the galaxies and black holes that we see after 14 billion years of cosmic evolution. In this Lecture, Dr. Kollmeier will review our basic knowledge of black holes and explore outstanding mysteries regarding their formation and structure.



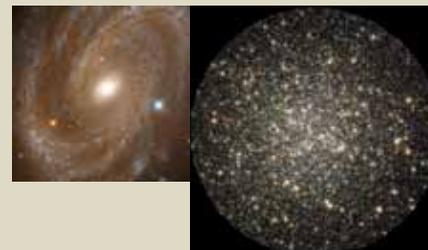
MONDAY, MAY 11, 2015

THE ACCELERATING UNIVERSE



DR. ROBERT P. KIRSHNER
Clowes Professor
of Science
Harvard University

The expanding universe was discovered at Mount Wilson almost 100 years ago. But there is something new! In the past 20 years, astronomers have found that cosmic expansion is speeding up, driven by a mysterious "dark energy" whose nature we do not understand. Dr. Kirshner, one of today's preeminent astrophysicists, is the recipient of many prestigious awards, including the 2014 Breakthrough Prize in Fundamental Physics (sponsored by Google, among others), as well as the 2014 James Craig Watson Medal of the National Academy of Sciences for "service to astronomy."



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