

March 6, 2020 (REVISED March 12, 2020) 2020 Earth and Space Science Talks

Library to Host NASA Goddard Annual Lecture Series

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***NOTE:** The Library will be closed to the public, including researchers and others with reader identification cards, until Wednesday, April 1, 2020 at 8 a.m. to reduce the risk of transmitting COVID-19 coronavirus. During the closure, all Library-sponsored public programs (including “Understanding 99 Percent of the Universe,” scheduled for March 25) are postponed or cancelled.*

This month, the Library of Congress will kick off the annual Earth and Space Science lecture series. The series is presented in partnership with the NASA Goddard Space Flight Center and the Science, Technology and Business Division at the Library.

The first lecture will be held on **Wednesday, March 25**. All of the lectures are free and open to the public and take place at **noon in the Mary Pickford Theater** of the James Madison Memorial Building, 101 Independence Ave., S.E., Washington, D.C.

The currently scheduled lectures are:

Wednesday, March 25

CANCELLED

“Understanding 99 Percent of the Universe, One Particle at a Time” Daniel Gershman, Heliophysicist
Geospace Physics Laboratory, NASA Goddard Space Flight Center

Plasma, the fourth state of matter, consists of charged atomic nuclei in a sea of electrons and accounts for the vast majority of the observable universe. We know that plasma dynamics results in phenomena such as solar eruptions, aurorae and geomagnetic storms, but there is still much about how plasma mass and energy interact with celestial bodies we do not understand. In 2015, NASA launched its Magnetospheric Multiscale (MMS) Mission to study the fundamental physics of how the electrons and ions in plasmas interact with electromagnetic fields in near-Earth space. Gershman will discuss the unique look at plasmas that MMS offers — one that is not possible to achieve in laboratories on Earth and that reveals new insights into how to model matter throughout the universe.

Wednesday, April 15

“Meltwater on the Greenland Ice Sheet: Source, Path and Fate”

Lauren Andrews, Research Physical Scientist

Global Modeling and Assimilation Office, NASA Goddard Space Flight Center

The Greenland ice sheet annually loses enough mass to cover Maryland, Virginia and Washington, D.C., in nearly seven feet of water. On the way to the ocean, this meltwater interacts with the glacier in ways that can influence how ice flows, affecting sea-level rise. Understanding the path meltwater takes from its source on the ice-sheet surface to the ocean, along with the interface between the ice and the underlying bedrock, is critical to comprehending how Greenland and other glaciers and ice sheets are responding to a changing climate. Andrews will discuss the large-scale atmospheric patterns that trigger melt events and her research on how meltwater is stored, reaches the bottom of the ice sheet and moves along the ice-sheet bed.

Wednesday, May 6

“Earth’s Electric Field”

Robert F. Pfaff Jr., Research Astrophysicist
Space Weather Laboratory, NASA Goddard Space Flight Center

Many of us know that the Earth has a magnetic field, but our planet also has an electric field that is large and dynamic in the ionosphere and magnetosphere. Electric fields exist in the atmosphere and are vividly associated with thunderstorms and lightning. At high altitudes near the poles, they accelerate charged particles that spiral down magnetic field lines and interact with the upper atmosphere to create aurorae. Electric fields are created by many different processes in space, and they are important in the environments of all planets in the solar system and essential to astrophysics and particle acceleration in general. Pfaff will provide an overview of the Earth’s electric field, including examples of measurements gathered by NASA spacecraft.

Wednesday, June 10

“The Hubble Space Telescope: Unveiling an Incredible Universe”

Jennifer Wiseman, Senior Scientist, Hubble Space Telescope
Astrophysics Science Division, NASA Goddard Space Flight Center

In 2020, the Hubble Space Telescope achieves its 30th year in orbit. Thanks to multiple astronaut-servicing missions, the observatory continues at the forefront of scientific discovery. Wiseman will present Hubble's latest and greatest observations of galaxies, stars, planets and dark-matter mysteries.

Thursday, Sept. 17

“Big New Telescopes Mean Big Discoveries in Our Solar System”

Stefanie Milam, Research Physical Scientist
Astrochemistry Laboratory, NASA Goddard Space Flight Center

With the upcoming launch of the James Webb Space Telescope, with the Large Synoptic Survey Telescope in its final stages of construction, and with plans for additional extremely large ground-based and space telescopes underway, the next generation of telescopes is on the horizon. They are designed to peek into not only distant corners of the universe, but also the far reaches of our solar system. Milam will discuss how these new telescopes will reveal insights into the formation, history, evolution and composition of the solar system and the uncharted territories, new worlds, moons and interstellar interlopers within.

Thursday, Oct. 15

“Fire and Smoke: NASA’s Air and Ground Support for Firefighting”

Elizabeth Hoy, Senior Scientist
Global Science and Technology, Inc.,
Carbon Cycle and Ecosystems Office, NASA Goddard Space Flight Center

Each summer, wildfires burn millions of acres of land across North America, and smoke particles from them can travel hundreds of miles, leading to degraded air quality even far away from a fire. While wildfires can occur naturally, the hot summer temperatures seen globally this past year provide conditions ripe for burning — from the Arctic to the tropics. Hoy will discuss how NASA, through its combination of satellite and airborne sensors and ground-based field campaigns, can study fire and smoke to provide information to firefighters and forest managers.

Wednesday, Nov. 4

“Exploring the Surfaces of Icy Ocean Worlds in Our Solar System and Beyond”

Lynnae Quick, Ocean Worlds Geophysicist

Planetary Geology, Geophysics and Geochemistry Laboratory, NASA Goddard Space Flight Center

The moons that orbit our solar system’s giant planets are dynamic worlds whose surfaces have been shaped by icy volcanism and tectonics. On Jupiter’s moon, Europa, and Saturn’s moon, Enceladus, subsurface oceans may provide environments where life could thrive. Outside our solar system, water-rich ocean planets may be common throughout our galaxy. Quick will discuss the surface geology of our solar system’s icy moons and how our understanding of these worlds will help us characterize environments on recently discovered extrasolar planets.

Wednesday, Dec. 9

“Pulsars and X-rays: The NICER Mission on the International Space Station”

Keith Gendreau, Research Astrophysicist

X-ray Astrophysics Laboratory, NASA Goddard Space Flight Center

Neutron stars or pulsars are beacons made of the densest stuff in the universe. Spinning in space and giving off beams of radiation, they appear to detectors to pulse regularly. The Neutron Star Interior Composition Explorer (NICER) is both a demonstrator of autonomous pulsar-based navigation and a pointed X-ray timing and spectroscopy instrument mounted on the International Space Station. It provides precise measurements of the arrival times of X-ray photons to scientists researching that ultra-dense matter. Gendreau will discuss the scientific and technical results of the mission as well as operations on the space station.

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