PLENARY PROGRAM: SCIENCE AND AEROSPACE FRONTIERS

**SUN 05:50 PM PACIFIC TIME**

Is Spacetime Pixelated?

Kathryn Zurek

California Institute of Technology, Pasadena, California

Kathryn Zurek's talk covers the evolution of general relativity, quantum mechanics, and their unique merger; the study of gravity as a weak interaction; and what leads to the study of space, time, and gravity. And all this has a form. It is a determination of classical and quantum mechanics to their respective rules. On the inside, space and time, we have explored space and time, determining how the classical mechanics of space and time work with each other. This talk will describe how new and emerging worlds are changing the way we understand how spacetime architecture affects the local and interaction of quantum gravity may be much larger than scientists have previously imagined.

**SUN 08:05 PM PACIFIC TIME**

Neutralizing Antibodies Against Coronavirus

Pamela Bjorkman

California Institute of Technology, Pasadena, California

The SARS-CoV-2 virus that causes COVID-19 pneumonia is a major cause of death. We are using structural biology to unravel the mysteries of SARS-CoV-2 and to advance rational vaccine design. In silico modeling of the spike protein reveals an array of potential vaccine targets. We discuss the current state of vaccine development and the challenges that remain.

**MON 05:50 PM PACIFIC TIME**

A Mars Helicopter?

J (Bob) Balaram

Jet Propulsion Laboratory / California Institute of Technology, Pasadena, California

If you’ve ever wondered how a small flying device, like a helicopter, would work on Mars, this discussion is for you! There are no helicopters on Mars. Several companies have developed small flying devices to explore the Red Planet, and NASA is planning to send a small helicopter to Mars in 2022. The helicopter will be part of the Perseverance rover mission and will have the unique challenge of operating in the thin Martian atmosphere. This talk will cover the technical challenges of flying on Mars and the potential applications of a Mars helicopter.

**MON 08:05 PM PACIFIC TIME**

Origin: How the Americas were peopled

Jennifer Raff

The University of Kansas, Lawrence, Kansas

How and when did people come to the Americas? For every thousand scientists that have poked into this question, there are at least 100,000 questions left. Dr. Raff leads an international team of researchers that have made major advances in understanding the peopling of the Americas. In this talk, she will discuss her team’s latest findings and share some of the surprising discoveries they have made.

**WED 05:50 PM PACIFIC TIME**

Storm Chasing from Space: Detecting severe weather phenomena from satellite platforms

Sarah Bang

NASA Marshall Space Flight Center, Huntsville, Alabama

Severe weather is an ever-changing phenomenon that affects the entire globe. Lightning, hail, storms, and hurricanes are just a few examples of the severe weather phenomena that can cause significant damage. Satellite platforms offer a highly accurate approach to observing weather phenomena in remote or inaccessible areas, making it possible to detect and monitor severe weather events. This talk will discuss how satellites can detect severe weather and provide a method of detection for storms that are too large for traditional ground-based sensors.

**WED 08:05 PM PACIFIC TIME**

The Grand Challenge for Greater Yellowstone

Cathy Whitlock

Metcalf Center for Science, Environment, and History

Yellowstone’s importance goes beyond its boundaries - it is the largest intact natural system in the world. This complex ecosystem is home to over 100 species and is one of the most biodiverse areas in the world. The Grand Challenge for Greater Yellowstone is a joint initiative that aims to conserve and protect this unique ecosystem. In this talk, Cathy Whitlock will discuss the grand challenge and the importance of protecting Yellowstone and its surrounding areas.

**THU 05:50 PM PACIFIC TIME**

The James Webb Space Telescope Mission

Matt Greenhouse

Distant Space Pregnancy, Greenbelt, Maryland

The James Webb Space Telescope is the successor to the Hubble Space Telescope. It is the largest, most powerful, and most expensive space observatory ever built. The telescope will explore the early universe, study the formation and evolution of galaxies, and investigate the nature of black holes. In this talk, Matt Greenhouse will discuss the mission's goals and the challenges of building the telescope.

**THU 08:05 PM PACIFIC TIME**

Studying the Dark Universe with the Dark Energy Survey

Aaron Goudfrooij

University of Chicago, Chicago, Illinois

The Dark Energy Survey is a major international project that will chart the structure of the universe and measure the effects of dark energy. In this talk, Aaron Goudfrooij will present the latest results from the survey and discuss the implications for our understanding of the universe.

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