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To See a World in a Point of Light: The Past,
Present, and Future of Exoplanet Detection

PROF. JOSHUA WINN *Princeton, USA*



Searching for Alien Earths

PROF. LISA KALTENEGGER *Carl Sagan Institute, USA*

Volcanic Outgassing Across Time and Space

PROF. MARIE EDMONDS *Cambridge, UK*



The First Minerals and Rocks of the Solar System

PROF. MARC CHAUSSIDON *IPGP, Paris, France*

Bridging Stars to Planets: Geoastronomy with Brown Dwarfs

PROF. ADAM BURGASSER *UC San Diego, USA*





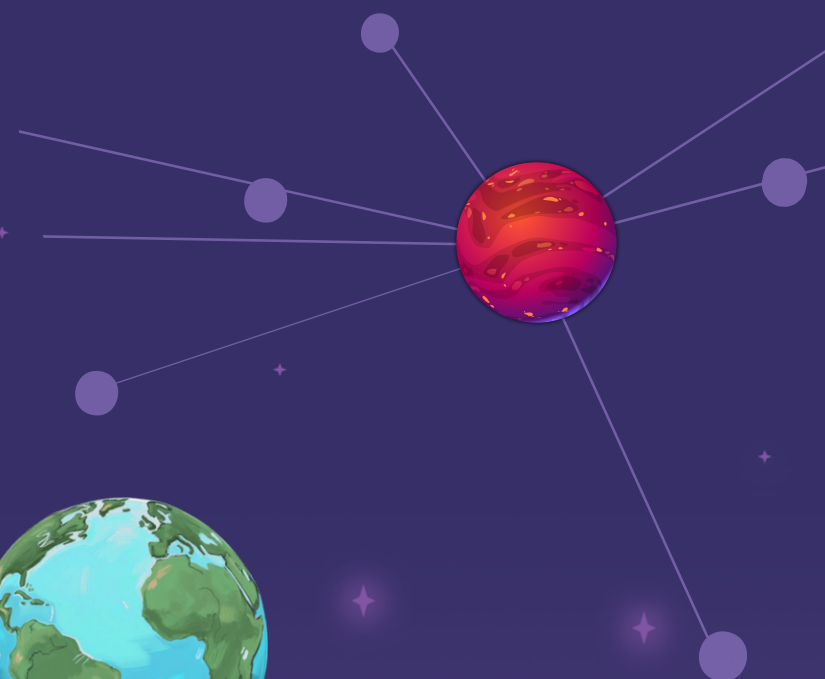
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PROF. JOSHUA WINN *Princeton University, USA*



To See a World in a Point of Light: The Past, Present, and Future of Exoplanet Detection

A distant star appears as a single point of light - yet hidden within that light can be the signatures of an entire planetary system, if you know how to look. Astronomers have found thousands of planets by measuring tiny shifts, dips, and blips in the light from distant stars, using techniques that range from simple geometry and optics to Einstein's general theory of relativity. This lecture will explain the main detection methods, describe some of the surprising planetary systems they have revealed, and look ahead to the next phase of discovery.



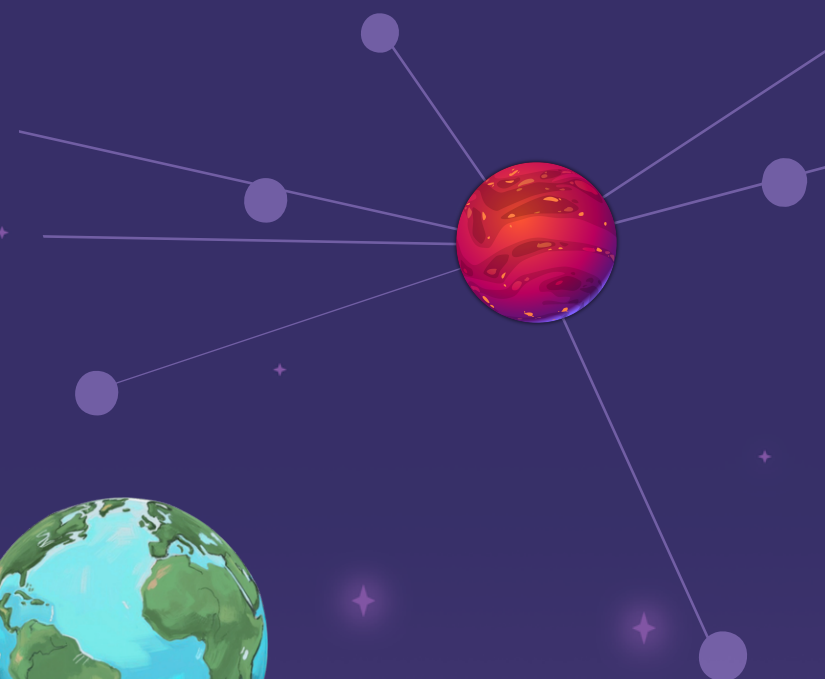
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PROF. MARIE EDMONDS *Cambridge University, UK*



Volcanic Outgassing Across Time and Space

Volcanic degassing is the principal mechanism for the transfer of volatiles from the interior of a planet to its surface. In this talk I will discuss the role that volcanoes play, over geological time and across our solar system, in the development of atmospheres, in regulating climate and in the delivery of elements to the planetary surface that are critical for life.



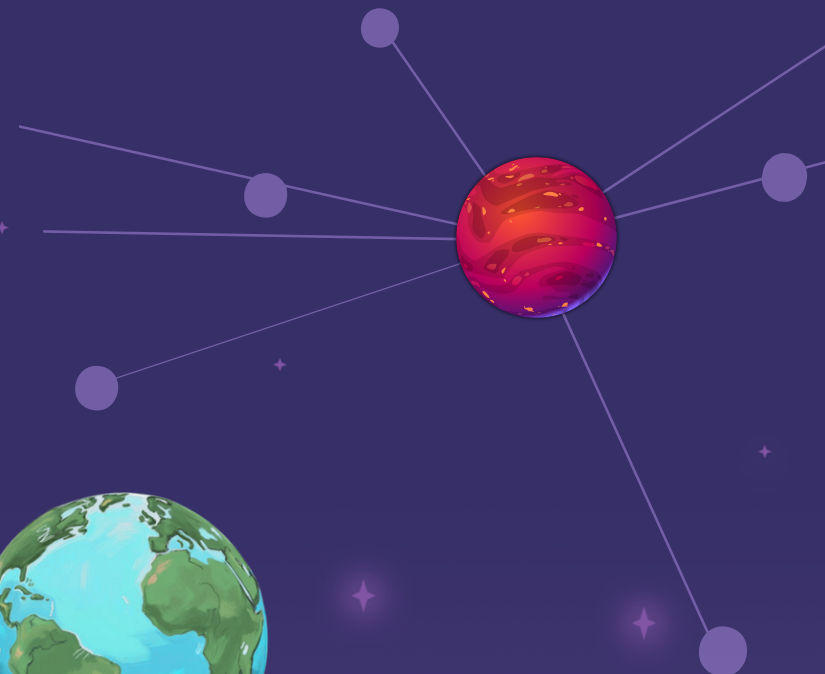
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PROF. LISA KALTENEGGER *Carl Sagan Institute, USA*



Searching for Alien Earths

For thousands of years, humans have wondered whether we're alone in the cosmos. Now, for the first time, we have the technology to investigate. But once you look for life elsewhere, you realize it is not so simple. How do you find it over cosmic distances? What actually is life?

Using our homeworld as a Rosetta Stone, the biggest space telescopes, creatively analyzing Earth's history and its astonishing biosphere to inform this search we discover not merely new continents, like the explorers of old, but whole new worlds circling other stars and how we could spot life there. Worlds from where aliens may even be gazing back at us. What if we're not alone?



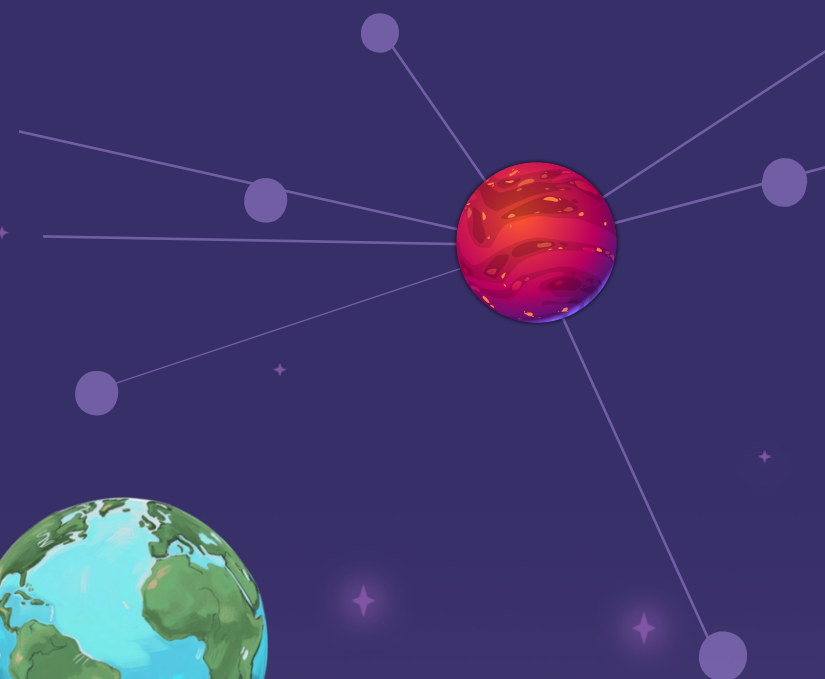
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PROF. MARC CHAUSSIDON *IPGP, Paris, France*



The First Minerals and Rocks of the Solar System

One of the major unknowns regarding the early evolution of the solar system is how the first solids and rocks formed from the initial mixture of gas and dust inherited from the parent molecular cloud. Clues are provided by combining observations of the mineralogical, chemical, and isotopic composition of the components of primitive meteorites with astrophysical models of the accretion disk.



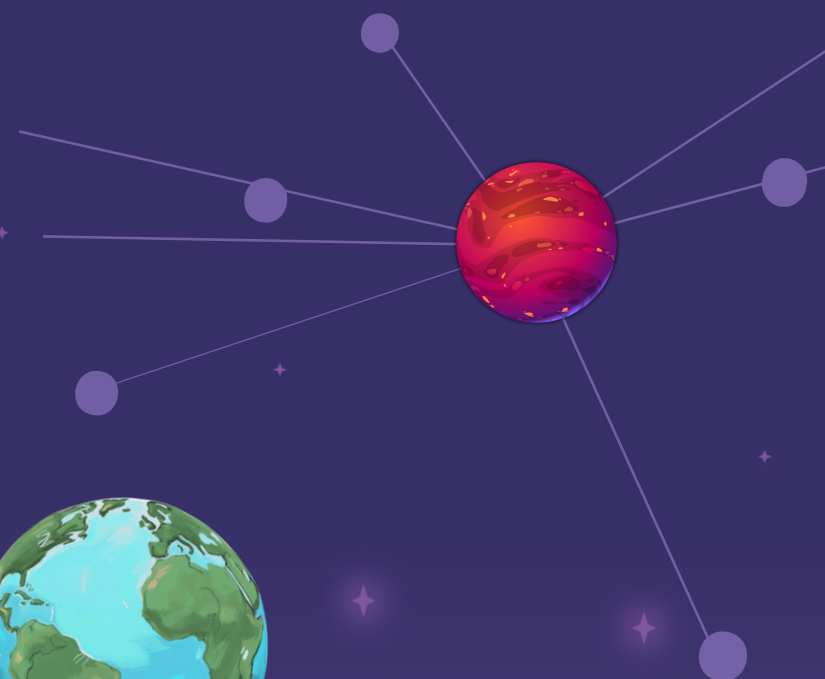
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PROF. ADAM BURGASSER *UC San Diego, USA*



Bridging Stars to Planets: Geoastronomy with Brown Dwarfs

Between the highest-mass planets and lowest-mass stars, there exists a liminal population of brown dwarfs. Co-discovered with the first extrasolar planets, these objects have diverse formation channels and planetary-like atmospheres. In this talk, I describe how modern studies of brown dwarfs require deep connections between stellar and planetary science, from formation to evolution to atmospheric processes; and discuss how this science will help us to better understand the origin and evolution of our broader Milky Way.