

# Keck Institute for Space Studies

## List of Short Courses

### 2023

- [Extrasolar Space Weather: The Hidden Hand in Exoplanet Evolution](#)  
(Monday, November 6, 2023)
- [What Do We Know About Uranus's Interior? Preparing for a Mission to Uranus](#)  
(Monday, September 11, 2023)
- [Understanding and Empowering Soil Management as a Climate Mitigation Option](#)  
(Monday, August 28, 2023)
- [Parameters of Biological Validation](#)  
(Monday, July 17, 2023)

### 2022

- [Exoplanet Science Meets Interferometry](#)  
(Monday, November 28, 2022)
- [Enabling Fast Response Missions to NEOs, ISOs, and LPCs](#)  
(Monday, October 24, 2022)
- [Ocean World Microhabitats: Targeting and Life Detection Techniques](#)  
(Monday, September 19, 2022)

### 2021

- [Planetary Science of Venus and the Promise of In Situ Sampling Techniques](#)  
(Monday, June 24, 2021)
- [Planetary Geodesy – Past Discoveries and Future Possibilities](#)  
(Wednesday, June 2, 2021)
- [Revolutionizing Access to the Martian Surface](#)  
(Thursday, March 25, 2021)

## 2019

- [Forest Water Dynamics and the Earth System Responses to Droughts](#)  
(Monday, October 14, 2019)
- [Approaching the Event Horizon - Black Holes and Their Effect on the Universe](#)  
(Monday, September 16, 2019)
- [A World of Data – The Scale of Space Science Data Processing](#)  
(Monday, August 26, 2019)
- [Data Driven Approaches to Searches for Technosignatures](#)  
(Monday, May 20, 2019)

## 2018

- [Exploring Once-in-a-Lifetime Targets](#)  
(Monday, October 29, 2018)
- [Tidal Heating on Solar System Worlds](#)  
(Monday, October 15, 2018)
- [Biodiversity Science and Remote Sensing Fundamentals](#)  
(Monday, October 1, 2018)
- [The Whys and Hows of Future Cosmic Microwave Background \(CMB\) Exploration](#)  
(Monday, March 19, 2018)
- [Mars Subsurface Exploration - Life and Resources in the Martian Subsurface](#)  
(Monday, February 12, 2018)
- [Science, Source Modeling, and Data Analysis for the Space-Based Gravitational-Wave Observatory LISA](#)  
(Tuesday, January 16, 2018)

## 2017

- [Accessing the Subsurface Oceans of Icy Worlds](#)  
(Monday, October 9, 2017)
- [Next-Generation Approach for Detecting Climate-Carbon Feedbacks](#)  
(Monday, September 18, 2017)
- [The Polar Ice Caps and Climate of Mars](#)  
(Tuesday, August 8, 2017)
- [Comets - Connecting the Origins of Solar Systems to the Origins of Life](#)

(Monday, June 5, 2017)

## 2016

- [What is Exploration Telepresence - and How Can it Help Us Explore Planetary Surfaces of the Solar System?](#)  
(Monday, October 3, 2016)
- [Mastering the Wave - The Whys and Hows of Exoplanet Imaging](#)  
(Monday, August 22, 2016)
- [Satellite Communication with Laser Beams – The Next Wave](#)  
(Monday, July 11, 2016)
- [In-Situ Resource Utilization \(ISRU\) on Mars](#)  
(June 28, 2016)

## 2015

- [Methane on Mars](#)  
(December 7, 2015)
- [Fundamentals of Optical Frequency Comb Technology and Applications](#)  
(November 2, 2015)
- [Exploring New Multi-Instrument Approaches to Observing Terrestrial Ecosystems and the Carbon Cycle from Space](#)  
(October 5, 2015)
- [Using In-Situ Resources for 3D Additive Construction in Space](#)  
(August 24, 2015)
- [The Search for Non-Aqueous Life](#)  
(July 6-10, 2015)

## 2014

- [Star Formation \(top to bottom\)](#)  
(November 3, 2014)
- [Exploring in the Interstellar Medium](#)  
(September 8, 2014)
- [Near-Earth Asteroids: The Next Critical Stepping Stones For Humanity In Space](#)  
(August 11, 2014)
- [Probing the Interior of Venus with Innovative Seismological Techniques](#)  
(June 2, 2014)
- [Multifunctional Energy Projecting Systems for Planetary Exploration](#)  
(May 19, 2014)

## 2013

- [Satellites, Ocean Robots and the Marine Carbon Cycle](#)  
October 7, 2013
- [The Sleeping Giant: Measuring Ocean Ice Interactions in Antarctica](#)  
September 9, 2013
- [Magnetic Fields: A Window to a Planet's Interior and Habitability](#)  
August 12, 2013
- [Lunar Volatiles](#)  
July 22, 2013
- [Airships: A New Horizon for Science](#)  
April 30, 2013

## 2012

- [Measuring Photosynthesis From Space](#)  
August 26, 2012
- [Engineering Resilient Space Systems: Leveraging Novel System Engineering Techniques and Software Architectures](#)  
July 30, 2012
- [Small Satellites: A Revolution in Space Science](#)  
July 16, 2012

- [Quantum Communication, Sensing and Measurement in Space](#)  
June 25, 2012
- [Primitive Bodies: Unlocking the Secrets of Solar System Origins](#)  
April 30, 2012

## **2011**

- [Asteroid Retrieval Mission Study](#)  
September 27, 2011
- [Next Generation UV Instrument Technologies: Overview of Science, Technology Key Points, New Horizons](#)  
August 29, 2011
- [Measurements and Models at the Surface of Mars](#)  
June 20, 2011
- [Looking for Nuggets in Massive Data Streams](#)  
June 7, 2011
- [Climate Physics and Geoengineering](#)  
May 23, 2011

## **2010**

- [Cosmic Microwave Background Spectral Distortions from the Early Universe](#)  
August 16, 2010
- [Planetary Science of Titan](#)  
May 25, 2010