

NWS18-2018-000015

Abstract for an Invited Paper
for the NWS18 Meeting of
the American Physical Society

Alien Worlds

BRIAN JACKSON, Dept. of Physics, Boise State University

Can we find another Earth? Is there life elsewhere in the Universe? How can we find another Earth and decide whether it hosts life? If it's advanced life, could we communicate with it? With the rapid pace of discovery, within our solar system and without, scientists are developing new and exciting answers to these questions. In this presentation, I will discuss a little of the history and science behind planetary exploration and the search for extraterrestrial life. I will also focus on my own group's research into ultra-short-period planets, roughly Earth-sized bodies but some with orbital periods of only hours, shorter than feature-length films. So close to their host stars that some of them are actively disintegrating, these objects' origins remain unclear. Some are members of multi-planet systems and may have been driven inward via secular excitation and tidal damping by their sibling planets. Others may be the fossil cores of former gas giants whose atmospheres were stripped by tides. Our research group is currently sifting data from the reincarnated Kepler Mission, K2, to find additional short-period planets and applying sophisticated astrophysical model to explore the effects of tidal decay and disruption. Whatever their origins, short-period planets are particularly amenable to discovery and detailed follow-up by ongoing and future surveys, including the TESS mission, and to assess the natures and potential habitability of Earth-like planets, we need a fuller understanding of the origins and evolution of even these strange and unexpected planetary systems.