

Contact: Diana Gonzalez

**RESEARCH FACULTY PRESENTATION AT THE UNIVERSITY OF NORTHERN IOWA:
“LABORATORY SIMULATIONS OF PRIMORDIAL ATMOSPHERE - UNDERSTANDING THE
EARTH OF THE PAST BY STUDYING PLANETS OF TODAY”**

Action Requested: Receive the presentation.

Executive Summary: Joshua Sebree will discuss Titan, Saturn’s largest moon, and Pluto, both of which are unique in the solar system. With atmospheres consisting of around 95% nitrogen and 5% methane, with trace amount of larger compounds, they are the only bodies in the solar system aside from the Earth with a predominantly nitrogen atmosphere. Titan’s atmosphere has often been compared to that of the primordial Earth in a deep freeze and has been the focus of much attention in trying to learn about how biomolecule molecules could have formed during the Hadean and Archaean periods of Earth, prior to the beginning of life. Given the similarities of these atmospheres to that of the pre-biological Earth, an understanding of the chemistry that may lead to large molecules in the atmosphere, particularly biologically important compounds, such as amino acids and nucleobases, can shine light on the mysteries that surround the early Earth.

Dr. Sebree is an Assistant Professor in the Department of Chemistry and Biochemistry at the University of Northern Iowa (UNI). He received his Bachelor of Science degree in Chemistry from the University of Kansas in 2006 and received his Ph.D. in Physical Chemistry in 2011 from Purdue University. From 2011-2013, Dr. Sebree worked as a Postdoctoral Fellow at NASA Goddard Space Flight. While at NASA, Dr. Sebree continued his studies on the atmospheres of other planets and moons while building strong connections within the NASA community. In 2013, Dr. Sebree began work at UNI where his primary research focus is in the fields of Astrobiology and Astrochemistry in the characterization of primordial environments.

Dr. Sebree has advised over 20 undergraduate students in research, eight of which successfully wrote undergraduate research grants that received funding during their time in the lab. In 2014, Dr. Sebree was awarded the Junior Faculty Award from UNI Research and Sponsored Programs. Dr. Sebree is currently the Principal Investigator (PI) of UNI’s Base program awarded by the Iowa Space Grant Consortium entitled “Biogeochemical Evolution of The Atmosphere: The BETA Project.” The project, now in its second year, is focused on how the Earth and the atmosphere have evolved together over three geological epochs of time: the primordial Earth (~4 billion years ago), the Devonian (~400 million years ago), and the present day. In addition to the BETA project, he has received other grants from the Iowa Space Grant Consortium and is currently Science-PI on a grant shared with NASA Goddard Space Flight Center, for which a portion of the funding is set aside for UNI students to intern at NASA during the summer.