

About the Stuart A. Northrop Distinguished Lecture Series



Launched in 2016 through a generous donation by **Bill Lovejoy** (UNM Alumnus and former student of Dr. Northrop), the Stuart A. Northrop Distinguished Lecture Series honors former EPS professor and Chair Dr. Stuart 'Stu' Alvord Northrop. Dr. Northrop's contributions to the UNM Department of Geology during his long tenure as Chairman (1929-1961) were profound. He laid the foundation of the present department, including the creation of the MS and PhD programs and the construction of the department's building, which now bears his name. He was a kind and generous scholar and teacher, always ready to share his vast knowledge of New Mexico geology. The legacy he has left his students, colleagues, and the State of New Mexico is a large one. We look forward to using this newly-created lecture series as a venue to showcase the type of research and enthusiasm for seeking knowledge that was emblematic of Dr. Northrop himself.

About Bill Lovejoy (UNM MS)

Dr. Bill P. Lovejoy is Professor Emeritus of Biology at Georgia Southern University who influenced generations of students with his own teaching and research. Lovejoy was born in a small Ohio town coming from four generations of coal miners and became a first generation college graduate. After serving in the Navy, he attended Muskingum College in New Concord, Ohio, where he majored in geology. A month later he boarded a bus for Albuquerque and UNM where he earned a master's degree in geology. Lovejoy worked as a geologist for Shell Oil Company in Midland Texas, then after six years enrolled at OSU to pursue a Ph.D. in zoology. Lovejoy has had three interesting and satisfying careers: geologist, biologist, and teacher.



DEPARTMENT OF
EARTH & PLANETARY
SCIENCES

PRESENTS THE

2ND ANNUAL STUART A. NORTHROP

DISTINGUISHED LECTURER:

DR. SUSANNAH PORTER
DEPARTMENT OF EARTH SCIENCE
UNIVERSITY OF CALIFORNIA AT
SANTA BARBARA

TITLE

"TINY VAMPIRES AND LIVING FOSSILS:
THE RECORD OF EARLY LIFE IN THE
GRAND CANYON"

FRIDAY APRIL 6, 2018
3:00 P.M.

NORTHROP HALL ROOM 122

**RECEPTION TO FOLLOW IN SILVER FAMILY GEOLOGY
MUSEUM**

DR. SUSANNAH PORTER

DEPARTMENT OF EARTH SCIENCE,
UNIVERSITY OF CALIFORNIA AT SANTA BARBARA

Speaker Biography



Susannah received her bachelor's degree in Mathematics from Yale University in 1995 and her Ph.D. in Biology at Harvard University in 2002. After completing a one-year NASA Astrobiology Post-Doctoral Fellowship at UCLA, she moved to the University of California at Santa

Barbara, where she is a Professor and Vice Chair in the Department of Earth Science. She studies the early fossil record of animals and their protistan relatives and has worked on problems relating to the evolution of skeletal biomineralization, the influence of snowball Earth glaciations on the biosphere, the early evolution of eukaryotes, and the Cambrian diversification of animals. She lives in Carpinteria, California, with her husband, Jamie, and her two sons, Willie and Sam.

"TINY VAMPIRES AND LIVING FOSSILS: THE RECORD OF EARLY LIFE IN THE GRAND CANYON"

Abstract

For most of its >3.5 billion year history on Earth, life has been microbial, dominated by Bacteria and Archaea (i.e. the "prokaryotes", cells that lack nuclei). Our own ancestors, the first eukaryotes (cells characterized by a nucleus and organelles such as mitochondria), appeared only ca. 1600 million years ago (Ma), and large, multicellular forms, including animals and seaweed, diversified only very recently, beginning around 600 Ma. My research focuses on the early diversification and ecological expansion of eukaryotes during the Mesoproterozoic (1600–1000 Ma) and Neoproterozoic eras (1000–541 Ma), when we see evidence for an increase in protistan diversity, the first appearance of mineralized skeletons, an increase in the relative contribution of eukaryotic algae to primary productivity, and the first few 'experiments' in eukaryotic multicellularity. It has recently been hypothesized that the appearance of microbial eukaryovory—protists preying on other protists—may have played an important role in the early diversification of eukaryotes, just as the appearance of carnivory is thought to have driven the Cambrian diversification of animals. In this talk I will discuss evidence from my work on microfossils from the ~770–730 Ma Chuar Group of the Grand Canyon that supports this view. Upper Chuar rocks preserve an incredible abundance of diverse vase-shaped microfossils that are in some cases indistinguishable from modern testate amoebae; lower Chuar shales and siltstones host beautifully preserved organic-walled remains of eukaryotic cells and cysts. About 10% of both vase-shaped and organic-walled microfossils exhibit perfectly circular or half-moon-shaped holes in their walls, which are interpreted to be perforations made by vampire-like amoebae. Together with hydrocarbon biomarker molecules from upper Chuar rocks that provide evidence for the presence of toxins capable of lysing eukaryotic cells, these fossils indicate that a diversity of microbial predators lived in the Chuar sea.