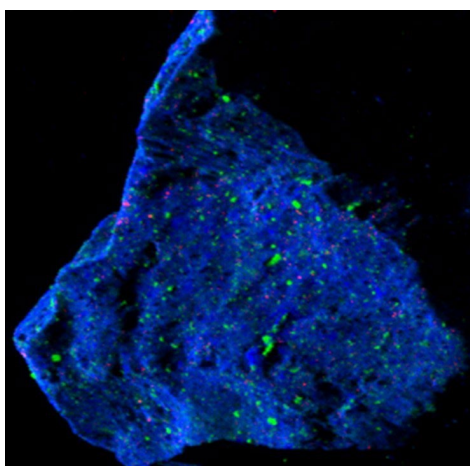


## EXTRATERRESTRIAL MATERIALS ARE OUT OF THIS WORLD

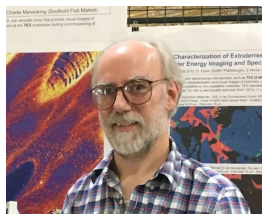
**DR. PAUL NORTHRUP**

Professor, Department of Geosciences



March 28, 7:30pm, Earth & Space Sciences 001

This talk will explore extraterrestrial materials: meteorites, interplanetary dust, comet tails, and samples retrieved by space missions. I will describe the X-ray microscope beamline at the National Synchrotron light Source II at Brookhaven Lab, which I used to probe these materials. Then I will show results of analyzing meteorites including Seymchan, believed to be from the core/mantle of a protoplanet destroyed in a collision; carbonaceous chondrite meteorites, ancient material from the early Solar System that includes pre-biotic organic compounds; Martian meteorites (pieces of Mars blasted all the way to Earth by an asteroid impact), and Lunar meteorites from the Moon. Interplanetary dust particles, which are continuously settling to Earth, contain some of the most primitive materials from the beginnings of the Solar System before Earth was a planet. And most recently, Japanese and NASA space missions have sent unmanned spacecraft hundreds of millions of miles to grab samples from ancient asteroids, and return those samples to Earth for study. I will show the results of analyzing some of those precious samples, and what they teach us about their history and origins. Most of these materials formed under conditions that do not occur on Earth, so they can be quite strange. They preserve information about the formation of the Solar System and its planets, 4.5 billion years ago. Most interestingly, extraterrestrial materials may have provided the raw materials necessary for the earliest life on Earth.



Paul Northrup is Research Professor in the Geosciences Department at Stony Brook. He earned his PhD here, then worked as a physicist at Bell laboratories and later as an environmental scientist at BNL. His research now includes both environmental science and space science, looking at the chemistry and composition of complex natural materials. To do this, he designed and built an X-ray microscope beamline at the National Synchrotron light Source II.