PCE_3 Seminar Series

Thurs, August 5th

1 p.m. EST/10 a.m. PST

More information & registration:
prebioticchem.info/seminar-series/index.html

Ben Pearce

Graduate Student

McMaster University, Pudritz Lab

"En Route to RNA life: From atmospheric HCN to biomolecule production in warm little ponds"

Jay Forsythe

Assistant Professor

College of Charleston

"Sequence and structural diversity in proto-peptides formed by wet-dry cycling"

Topical introduction by Bruce Damer & David Deamer, University of California Santa Cruz

Ben Pearce

I'm in the final days of my PhD in astrophysics and astrobiology at McMaster University, under the supervision of Ralph Pudritz. In September I'll be joining the lab of Sarah Hörst at Johns Hopkins University as an NSERC Banting Postdoctoral Fellow. My research is centered around how planets obtain biomolecules for the emergence of life. On the theoretical side, I've used non-equilibrium atmospheric modeling, computational quantum chemistry, wet-dry pond modeling, and thermodynamics to try to understand the terrestrial processes and delivery mechanisms that lead to the origin of RNA on early Earth. At Hopkins I'll be switching to the experimental side, where I will be demonstrating biomolecule formation in early Earth conditions using our theoretical models as a guide.

Jay Forsythe

My research focuses on the chemistry of life's origins. Specifically, we investigate properties and behaviors of model prebiotic peptides formed by environmental processes which may have occurred on the early Earth. Such work is expected to advance the field of origins-of-life chemistry while providing high-quality, hands-on training to undergraduates in mass spectrometry, spectroscopy, sample preparation, and data analysis.

Bruce Damer

Bruce Damer is Associate Researcher in Biomolecular Engineering at UC Santa Cruz and Founding Director of the BIOTA Institute. He has worked with NASA for 20 years on mission simulation and design and collaborated for over a decade with Prof. David Deamer on proposing and testing the "Hot Spring Hypothesis" for an origin of life.

David Deamer

David Deamer is a Research Professor of Biomolecular Engineering at the University of California (Santa Cruz). Deamer's primary research interest concerns molecular self-assembly processes related to the structure and function of biological membranes, and particularly the origin and evolution of membrane structure. Deamer observed that amphiphilic compounds were present in carbonaceous meteorites and can self-assemble into membranous vesicles (Nature, 1985). Later work showed that photochemical reactions simulating those occurring in the interstellar medium give rise to amphiphilic molecules, presumably the source of such compounds in meteorites. More recent papers by Rajamani et al. (2008) and DeGuzman et al. (2014) demonstrated that the organizing liquid-crystalline matrix of multilamellar lipid membranes can encapsulate oligonucleotide polymers synthesized from mononucleotides undergoing hydration-dehydration cycles. These results suggest a way for primitive cellular compartments to emerge on the early Earth and encapsulate systems of polymers. These results are described in *First Life: Discovering the Connections between Stars, Cells and How Life Began* (University of California Press, 2011) and *Assembling Life: How life can begin on the Earth and other habitable planets,* (Oxford University Press, 2019). Deamer and his colleague and co-author Bruce Damer also published a review in Astrobiology (2020) entitled *The Hot Spring Hypothesis for an Origin of Life*.