Posters will be on Display for the Entire Week.
Presenters are Requested to be Present at Their Poster the Last Half-Hour Break of the Evening.

POSTER SESSION: THE FORMATION AND EVOLUTION OF ORGANICS ON THE EARLY EARTH
Price Center Ballroom East

Kobayashi K. Aoki R. Kebukawa Y. Shibata H. Fukuda H. Oguri Y. Airapetian V. S.
Roles of Solar Energetic Particles in Production of Bioorganic Compounds in Primitive Earth Atmosphere **[#4133]**
We examined the formation of amino acids from slightly reducing gas mixtures by proton irradiation to simulate the action of solar energetic particles (SEPs), and found that SEPs were promising energies for prebiotic synthesis of N-bearing organics.

Schreiber U. Mayer C. Bronja A. Schmitz O. J.
Archean Fluid Inclusion of Hydrothermal Quartz Minerals — Archives of Prebiotic Chemistry on Early Earth? **[#4018]**
Fluid inclusions in quartz crystals grown in the hydro-thermal environment of the continental crust during the Archean period contain a rich collection of organic compounds which are highly relevant for molecular evolution.

Kolb V. M.
Prebiotic Organic Reactions in Water **[#4025]**
Reactions of organic compounds which are not soluble in water may still occur in water, by the “on-water” mechanism or in supercritical water, which behaves as acetone and has acid/base catalytic properties.

Gavette J. V. Krishnamurthy R. Springsteen G.
Exploring the Role and Reaction Constraints of Malonate Within the Context of the “Glyoxylate Scenario” **[#4167]**
Exploration of the reaction conditions that influence the aldol addition of malonate and glyoxylate to understand their prebiotic importance.

Jaipaul R. Tewari B. B.
Interaction of Alanine and Aspartic Acid with Aluminum, Iron and Zinc Oxides and its Relevance in Chemical Evolution **[#4033]**
Studies on adsorptive interaction of alanine and aspartic acid with aluminum, iron and zinc oxides and its relevance to chemical evolution and origins of life.

Kim H. J.
Stereoselective Prebiotic Nucleotide Synthesis for Threose Nucleic Acid **[#4184]**
The reaction of threose-1,2-cyclic phosphate and adenine provided threose-adenine nucleoside 2’-phosphate under prebiotic plausible condition. This will be the first example of prebiotic synthesis of nucleotide from sugar and nucleic base.

Takahashi J.
Biological Homochirality and Symmertry Breaking of the Universe **[#4156]**
Scenarios for the origin of terrestrial bioorganic homochirality (enantiomeric domination of L-form amino acids in proteins and D-form sugars in DNA/RNA), Cosmic Scenario and Intrinsic Scenario, will be discussed.

Alvarez-Carreño C. Becerra A. Lazcano A.
Norvaline and Norleucine may have been more Abundant Protein Components During Early Stages of Cell Evolution **[#4103]**
Major prebiotic products are absent from the inventory of protein amino acids. We discuss the case of two hydrophobic amino acids: norvaline and norleucine.

Sorden S. Cooper G.
Increasing the Relative Production of Ribose Under Mild Prebiotic Conditions **[#4127]**
In the classic formose reaction, ribose is produced in low abundance relative to other sugars. We manipulated various parameters in formose-type reactions and found that the relative abundance of ribose can be significantly increased.

Adam Z. R. Fahrenbach A. C. Hongo Y. Cleaves H. J. II Ruiqin Y. Yoda I. Aono M.
Production and Concentration of Water-Alternative Solvents on the Prebiotic Earth **[#4204]**
Water creates special problems for prebiotic chemistry, notably that biopolymers are corroded by water. We report the conversion of aqueous acetonitrile and hydrogen cyanide into formamide under conditions mimicking exposure to radioactive minerals.

Lago J. L. Pasek M. A.
The Robustness of the Urea-Ammonium Formate-Water Mixture as a Prebiotic Solvent **[#4027]**
We propose a semi-aqueous solvent consisting of urea, ammonium formate, and water as a prebiotic solvent in which phosphorylation of nucleosides can occur spontaneously in appreciable quantities under mild conditions.

Burcar B. T. Pasek M. Gull M. Cafferty B. J. Velasco F. Menor-Salvan C. Hud N. V.
Phosphorylation in Urea-Rich Eutectic Solvents **[#4195]**
Phosphorylation reactions have been viewed as problematic due to phosphate sequestration in minerals and thermodynamically unfavorable reactions. Phosphorylation in urea-rich eutectics successfully phosphorylate, addressing these major issues.

Surman A. J. Rodriguez-Garcia M. Abul-Haija Y. Cooper G. J. T. Donkers K. Planchat i Barbarà J. M. Kube J. Mullin M. Hezwani M. Cronin L.
Can a Reaction's Environment Program its Outcome, and Does it Matter? **[#4006]**
Where most eschew reactions producing complex mixtures ('tar') and prefer to plan 'clean' syntheses, we embrace complexity. We show that environments can steer 'messy' reactions, and ask if this can yield significant difference in structure and function.

Aguilar-Ovando E. Buhse T. Negrón-Mendoza A.
Evaluation of Glyceraldehyde Under Simulated Prebiotic Conditions **[#4009]**
The aim of this work is to compare the behavior under irradiation of solid and aqueous DL-glyceraldehyde simulating prebiotic conditions. The results show the formation of sugar-like products of prebiotic significance as function of irradiation dose.

Febrian R. Roddy J. P. Devall C. T. Bracher P. J.
The Effects of Metal Ions on Reactions of Thioesters in Simulated Prebiotic Environments **[#4172]**
Our project explores the effects of various metals which are conjectured to have been present in the ancient ocean on the hydrolysis, aminolysis, and thiol–exchange reactions of thioesters in complex aqueous solutions.

Bracher P. J. Campbell T. D. Cheneler M. L. Devall C. T. Febrian R. Hart C. A. Roddy J. P.
Using Reaction Kinetics to Assess Chemistry of Prospective Importance to the Origin of Life **[#4173]**
This presentation concerns the use of physical-organic chemistry and the measurement of kinetics to assess proposed models for peptide coupling and reactions of thioesters with respect to the origin of life.

Frenkel-Pinter M. Yu S-S. Solano M. D. Forsythe J. G. Fernandez F. M. Grover M. A. Hud N. V.
Self-Assembly of Plausible Proto-Peptides **[#4150]**
Applying dry-hot conditions drives oligomerization of short, chemically synthesized depsipeptides (i.e. peptides that are composed of hydroxy and amino acids) into long oligomers, and a structural shift coincides with polymer growth.

Yi R. Q. Aono M. S. Cleaves H. J. Hara M. H.
The Formation of Oligopeptides in Good Yield Under Geyser System Model **[#4159]**
A one-pot wet-dry geyser reactor system was developed to explain how unactivated amino acids were condensed to oligopeptides.

Bahn P. R. Pravdo S. H.
Quad Amino Acids **[#4022]**
Amino acids are usually thought of as trifunctional chemicals having the amino group, the carboxyl group and the side chain. We propose synthesizing quadfunctional amino acids by replacing the hydrogen on the alpha carbon with a second side chain.

Vázquez-Salazar A. Tan G. Stockton A. Fani R. Becerra A. Lazcano A.
Can an Imidazole be Formed from an Alanyl-Seryl-Glycine Tripeptide Under Possible Prebiotic Conditions? **[#4013]**
We discuss the special role that the imidazole group and its derivatives play in extant biology. We also propose a possible prebiotic synthesis of an imidazolide, based on the biosynthesis of 4-methylidene-imidazole-one (MIO).

Bada J. L. Chalmers J. Burton A. Scheu B. Cimarelli C. Dinwell D. B.
Laboratory Simulated Volcanic Lightning and Prebiotic Synthesis **[#4102]**
We report here results from experiments using the laboratory-based generation of volcanic lightning in the presence volcanic ash and various gas mixtures. Glycine and well as other possible amino acids are readily synthesized in these simulations.