



MSc. Projects in the Origins of Life

Are you interested in studies on the ingredients for life?

We aim to investigate the roles of water and minerals for the building blocks of life and thereby the origins of life. In 1953 exciting studies on Earth's pre-biotic atmosphere were performed by Miller and Urey (MU) [Science 117 (1953) 528], where they imitated early-Earth conditions using a gaseous mixture of H_2O , CH_4 , NH_3 , and H_2 , producing several amino acids under electric discharge (Fig.1). Since then, our understanding of early-Earth conditions and origins of life have greatly advanced. For instance, CO_2 and N_2 are now known to have been present, which would have formed nitrites and easily destroyed amino acids [Annu. Rev. Earth Planet. Sci. 41, 207 (2013)]. However, adding minerals will again lead to the formation of amino acids [Orig. Life Evol. Biosph.. 38, 105 (2008)]. Also since then, synthesis studies have given a wealth of information, but the link between these synthetic formation routes and pre-biotic Earth remain unclear. Moreover, the role of liquid water has become much more prominent and investigations on the role of water for evolution of life have started to give insight to the required minimal water activity for e.g. bacteria [Environ. Microbiol. 17 (2015) 257]. We are interested in the precise role that water and minerals play for the building blocks and origins of life; on Earth and possibly beyond.

Possible MSc projects:

- **Water and the origin of life: *Can there be life without water?***
- **Alternatives to water: *How would the (bio)chemistry be different?***
- **Radiation and atmospheric activity: *What is the role of light in the origin of life?***
- **Exogenous delivery: *Did the pre-building blocks of life come from outer space?***
- **Exogenous chiral delivery: *What determined the handedness of life on earth?***
- **Systematic study of the influence of minerals (UU)**

For excellent BSc students who have a min. of 3 months research time, a possibility may be created.

Investigating Team UvA:

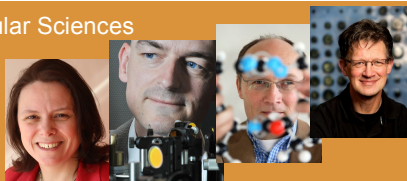
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Interested?

Apply by sending an email to
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Multiple students may apply.