

PhD project in FEMTOLAB

Shining light on the Origin of Life: photolysis of Amino acids.

Amino acid molecules are not identical to their mirror image, like the left hand is not identical to the right hand. Thus every amino acid come in a left handed- and a right handed form. Nevertheless, virtually all living organisms on Earth are exclusively made of left-handed amino acids. The reason for nature's left-handedness is among the top ten unsolved mysteries in chemistry.

Left-handed- and right-handed amino acids have different absorption coefficients when illuminated by right- or left-handed circularly polarized light. Consequently, illuminating an equal mixture of left-handed- and right-handed amino acids by, say right-handed circularly polarized light leads to the preferred destruction of one of the two forms and therefore an excess of the other. Accordingly, it has been hypothesized that nature's preference for left-handed amino acids may be due to the destruction of the right-handed amino acids on Earth by circularly polarized ultraviolet light before the first living organisms were created.

In a joint effort between Aarhus University and University of Southern California, we are going to measure the efficiency of the photo-destruction of amino acids dissolved in water in order to assess if asymmetric photo-destruction in the oceans of the young Earth may be the reason for the exclusively left-handed amino acids in living organisms.

We invite motivated candidates with a background in, preferably experimental chemistry, physics, nano-science or engineering to apply.

<http://talent.au.dk/phd/scienceandtechnology/opencalls/>

For more information concerning the project you are welcome to contact the supervisors directly:

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