# Organic Chemistry meets quantum magnetism

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In this talk I will discuss how a special class nanographenes can be used to **as building blocks for artificial quantum spin models.** These nanographenes are open-shell (or mutiradical) planar aromatic hydrocarbons. In conventional organic chemistry they are highly reactive and hard to study. Combining on-surface synthesis techniques in ultra-high vacuum and scanning tunnelling microscopy it is possible to study this fascinating class of molecules. In this talk I will focus on [n]-triangulenes[1], nanographenes with the shape of an equilateral triangle with lateral dimension of n benzenes. These triangulenes have a magnetic ground state with spin S=(n-1)/2. Thus, 3-triangulenes have S=1[2]. We recently showed[3] that [3]-triangulene dimers are coupled antiferromagnetically, with a strong exchange of 14 meV. This sets the stage for the formation of larger structures including chains and rings of antiferromagnetically coupled S=1, that permit to demonstrate one of the cornerstones of quantum magnetism, the Haldane phase of spin chains, as we reported recently[4]. I will also discuss thee prospect to explore other quantum spin models based on triangulene arrays.

## REFERENCES

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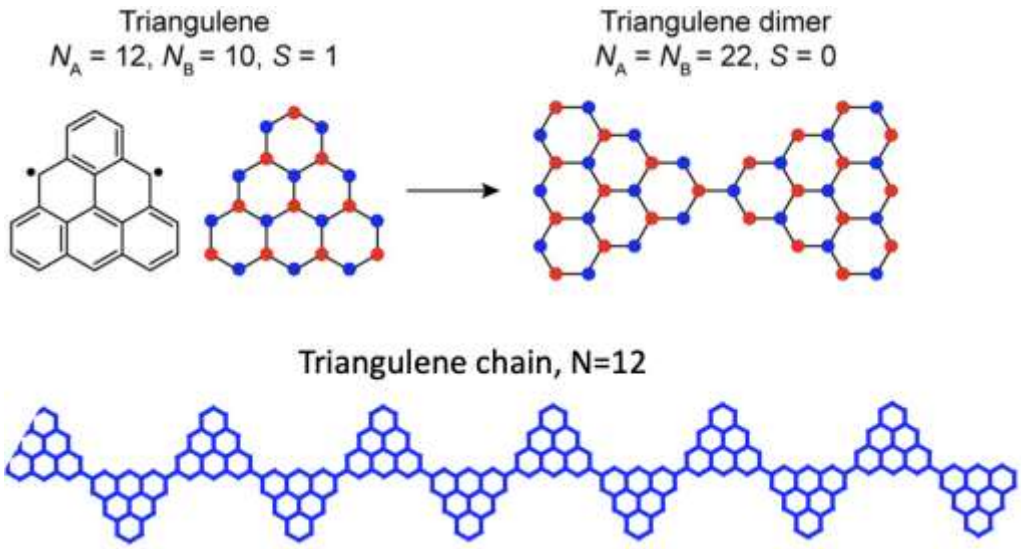


**Figure 1:** Top panels, from reference[3]: triangulene monomer (left) and dimer. Bottom: chain of 12 triangulenes, forming a S=1 spin chain that realizes the Haldane phase[4].