It could appear at first sight that formation of molecular hydrogen in the interstellar medium (ISM) has nothing to see with the title of the conference. It is not true as they are in fact two links, even if the first of them is daring.

The first link deals with renewable energies … but on an astronomical time scale! When AGB stars become Super Novae, they expel their material out in the space and part of it constitutes the interstellar dust grains made of silicates, SiC and carbonaceous material. Much later on, when this material, coming from several such explosions, is gathered together with the pervading atomic hydrogen in giant clouds, new stars may form inside denser clumps of materials. Renewed energy will arise out of these stars.

In the early stages of star formation, molecules will form either in the gas phase or, for many of them, at the surface of the nano- or micro-material forming the dust grains. The first of them is molecular hydrogen. STM techniques, in addition to many other techniques, are now currently used to show how such formation reactions proceed. Theoretical works are able to explain the mechanisms involved. Examples of these two aspects will be presented.