

Editorial

K L Sebastian, Chief Editor

This issue of *Resonance* features Norman Borlaug, the famous agricultural scientist. His enormous contributions to food safety of our world are covered in an excellent article by M S Swaminathan.



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Usually, in a chemical reaction, the reactants have to acquire enough energy to overcome the activation barrier. However, if a light atom like the hydrogen is the main player, then the reaction can take place even when the atom does not have enough energy to climb over the barrier – it tunnels through the barrier. In a pedagogic article, Karmakar *et al.* outline the basics of quantum tunneling and illustrate its importance in several chemical reactions. It is interesting to note that a paper published in *Nature Chemistry* (Vol.5, pp.745–749, 2013, doi:10.1038/nchem.1692), reported that tunneling can be of great astrochemical significance. It was found that reactions that one would have thought of as impossible do take place due to tunneling. The reaction studied was the abstraction of hydrogen by the OH radical from methanol (CH₃OH) resulting in the methoxyradical (CH₃O[•]). At 63K, not only does the reaction take place, but is fifty times faster than at room temperature! This finding changes our understanding of how alcohols like methanol are formed and destroyed in space. It also implies that even in astronomical bodies that are usually considered as very cold (Titan, for example), biochemical reactions are going on.

This issue of *Resonance* has a variety of other interesting articles. Kesavan discusses the isoperimetric inequality in the plane and its generalization to higher dimensions, which has connections to shape optimization. Optimization in three dimensions is responsible for the shapes that droplets take in free space or when in contact with a surface. Mampallil discusses the drying of droplets, a fascinating physical process of great industrial importance. A droplet of a solution or suspension leaves behind a ring-like residue. The article also discusses how one can suppress the ring formation, when it is undesirable. The physics of pool shots, in particular why slice shots are more difficult than direct shots is the subject of the article by Zare *et al.*

In addition to the above, this issue also has two biology articles. The first is by Bast who discusses seaweeds (which really are not weeds) and their importance, while the second is the concluding part of the series on circadian rhythms, by Sharma *et al.*

