Solid state physics is often considered to be a solved problem. As long as a crystal is ordered, isn't the issue just to derive consequences of Bloch theorem? The answer is very clearly no, and for two fundamental reasons: strong correlations, and topology. After a general introduction, I will discuss a few problems of current interest in the group in which these aspects combine to yield new quantum phenomena such as the emergence of Majorana fermions or the stabilization of chiral quantum liquids.