In their attempt to generalize Euler elastic theory of beams to flexible membranes, Sophie Germain and Siméon Poisson introduced, two centuries ago, a lagrangian that has now become a mathematical object whose study goes a way beyond the mechanics of bent surfaces. The so-called Willmore Lagrangian is a functional that shows up in many areas of science, such as conformal geometry, general relativity, cell biology, optics, etc. • We will try to shed some light on the universality of this Lagrangian. One remarkable fact is a quantization phenomenon of the Willmore critical spherical membranes, which happen to have all integer valued energy. • We will then present the project of using the Willmore energy as a Morse function for studying the fascinating space of immersed 2-spheres in the Euclidian 3-space and relate topological obstructions in this space to integer values and minimal surfaces.