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**Equilibrium Switching: Nucleosomes and Transmembrane Proteins** DAVID SCHWAB, KARIM WAHBA, ROBIJN BRUINSMA, Dept. of Physics and Astronomy, UCLA — The problem of placing rods on a line is an old problem in statistical mechanics. It has recently found applications in biology in the context of nucleosome positioning and transmembrane helix prediction. In both of these problems, the underlying lattice possesses a heterogeneous energy landscape, making the problem nontrivial. We explain the relative ease of helix prediction over nucleosome positioning as due to the existence of “switching” regions, i.e. a ground state density profile that deviates from that formed by successively occupying the lowest available energy minima. We illustrate the concept with a simple disordered systems model that can be solved exactly and discuss the functional implications for both transmembrane proteins and nucleosomes.

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