Gapped excitations in a quantum solid

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The BCC phase of solid helium-4 has a gapped excitation mode, as revealed by inelastic neutron scattering experiments. This mode is unexpected, since BCC is a Bravais lattice and therefore acoustic modes are the only low-lying excitations expected in the harmonic solid. I will give a simple model for this new collective excitation based on the amplitude fluctuations of a quantum solid