is expected to have a crystalline structure, while for sufficiently large values of K, the system will remain a quantum fluid even in its ground state.

The values of the force parameters and the resulting quantality parameters for several condensed matter systems are collected in Table 2. For nuclei we have two sets. One associated with the bare NN-interaction ($^1S_0$ channel),

$$a_0 \approx 1\,\text{fm} \quad ; \quad v_0 = -100\,\text{MeV},$$

and another with the induced pairing interaction

$$a_0 \approx R\,(= 1.2\,A^{1/3}\,\text{fm}) \quad ; \quad v_0 \approx -0.5\,\text{MeV}.$$

It is seen that the transition between quantum liquid and crystalline solid occurs at $K \approx 0.1$ (between He and H_2). Thus nuclei are expected to display a (non-newtonian) quantum liquid structure.

Constituents		M [a]	a_0 (cm)	$\lvert v_0 \rvert$ (eV)	K	phase T=0
^{3}He		3	$2.9(10^{-8})$	$8.6(10^{-4})$	0.19	liquid
^{4}He		4	$2.9(10^{-8})$	$8.6(10^{-4})$	0.14	liquid
H_2		2	$3.3(10^{-8})$	$32(10^{-4})$	0.06	solid
^{20}Ne		20	$3.1(10^{-8})$	$31(10^{-4})$	0.007	solid
nucleons	bare	1	$9(10^{-13})$	$100(10^6)$ [b]	0.5	liquid
	ind.	1	$60(10^{-13})$	$0.5(10^6)$	2.0	liquid

a) units of nucleon mass
b) $^1S_0$ NN-Argonne v_{14}

Table 2 Quantality parameter. After Mottelson (1998)