

Abstract Submitted
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Superfluid Glass of He-4 BORIS SVISTUNOV, University of Massachusetts, MASSIMO BONINSEGNI, University of Alberta, NIKOLAY PROKOF'EV, University of Massachusetts — With a recently developed worm algorithm, we simulate 800 atoms of He-4 at the density corresponding to the zero- T melting point of the hcp crystal. We find that low- T properties of the system— in our case, at $T = 0.2\text{K}$ —crucially depend on the initial state and cooling protocol. An ideal hcp crystal is a clear-cut insulator. But if we start with a high- T liquid state and quench-cool the sample down to $T = 0.2\text{K}$, we end up with a new state of matter, 'superglass',—a metastable amorphous solid that features off-diagonal long-range order and superfluidity.

Boris Svistunov
University of Massachusetts

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