Abstract Submitted
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High-T_c superconducting state of metal nanoclusters: Experimental observation[1] VITALY KRESIN, AVIK HALDER, University of Southern California — A spectroscopic investigation of size-resolved aluminum nanoclusters, Al_n, has revealed a novel phenomenon: a rapid rise in the near-threshold density of states of several specific clusters with decreasing temperature. The effect is especially prominent in the closed-shell "magic" cluster Al_{66}. The characteristics of this behavior are fully consistent with a pairing transition, implying a high-temperature superconducting state with $T_c > \sim 100$ K. This value exceeds that of bulk aluminum by two orders of magnitude. This is the first experimental observation of high temperature superconductivity in nanocluster particles. Our results highlight the promise of metal nanoclusters as high-T_c building blocks for materials and networks.

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