Here, we study particle creation by objects which collapse to form ultra-compact configurations, with the surface at an areal radius $R = R_f$ satisfying $1 - (2M/R_f) = \epsilon^2 \ll 1$ with M the object mass. We assume that gravitational collapse proceeds in a "standard" manner until $R = R_f + 2M\epsilon^{2\beta}$, where $\beta > 0$, and then slows down to form a static object of radius R_f. In the standard collapsing phase, Hawking-like thermal radiation is emitted, which is as strong as the Hawking radiation of a BH with the same mass but lasts only for $\sim 40\ (M/M_\odot)[44 + \ln(10^{-19}/\epsilon)]\ \mu$s. Thereafter, in a very large class of models, there exist two bursts of radiation separated by a very long dormant stage. The first burst occurs at the end of the transient Hawking radiation and is followed by a quiescent stage which lasts for $\sim 6 \times 10^6\ (\epsilon/10^{-19})^{-1}(M/M_\odot)$ yr. Afterwards, the second burst is triggered, after which there is no more particle production and the star is forever dark. In a class of models, both the first and second bursts exceedingly outpower the transient Hawking radiation.