Olbers' paradox

SIR — At least in a mathematical sense there is yet another solution to Olbers' paradox[1]: fractals[2]. Fractal structures like Menger's sponge can have infinite surface area but zero volume and show a self-similar, scaling-independent distribution of their points. Suppose galaxies, clusters and higher order superclusters of galaxies (or, more exactly, the total mass energy including dark matter) would be distributed in such or a similar fractal fashion. Due to the fractal structure bigger volumes have to contain a relatively lower amount of matter and energy. The energy (and thus also radiation) content per volume falls below any given positive boundary only if a sufficiently large total volume is looked at. Even if it should be static, unlimited or eternal, the sky in such a fractal universe remains dark at night. And so, too, does the sky in our own expanding, finite-age Universe, but what about its large-scale structure[3]; are there some underlying fractal properties?

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