Review of: "A Case for Nature in Long-Haul Space Exploration"

Pekka Janhunen[1]

1 Finnish Meteorological Institute

Potential competing interests: No potential competing interests to declare.

Including biology-inspired crew environment elements on long-haul spaceflight is a rather self-evident idea. The question is then how much additional mass is allocated for this purpose. In this paper the authors take a minimal approach of in principle zero extra mass. While one must start somewhere, I think that we should probably allocate at least a few kilograms if not a few tens or even hundreds of kilograms to improving the well-being of the crew. After all, the whole design of the spacecraft is devoted to keep the crew alive, functional and performant. To that end, even low artificial gravity might help, and it would enable bringing onboard a box of soil or at least sand, to enable the crew members to have a physical touch with soil.

Regarding audiovisual entertainment, thousands of relaxing or otherwise stimulating audiovisual soundscapes already exist on youtube and other such places. The astronauts could just select among those, instead of developing new ones specifically for space travel.

If more than zero mass is available, one could have a more immersive environment with e.g. projected screens, surround sound and breeze driven by quiet fans. Such environment could be made to e.g. look like a shore of a lake. Sitting on a shore of a lake watching waves feels relaxing to many people. It usually feels like a genuine and even top-class nature experience, even if there are not necessarily any plants, birds or other organisms visible in the scene. An important feature what makes it interesting and genuine is that the water in the lake and the sky are never exactly the same. Always the angle of the Sun, the wind speed, scattering of light from the clouds etc. create a unique combination. Such unpredictability can be emulated by software, but care must be taken to do it in enough sophisticated way so that the viewer does not feel the underlying artificial nature of the algorithms. The various parameters of the scene could be obtained from some natural frequencies such as astronomical frequencies, mixed with quasi-random or truly random numbers.