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It is well known that polymer can act as an agent of reinforcement to improve the strength and the flexibility of a composite. What about its reinforcement capability in silica aerogels? This is what Professor Sadhan Jana and his team reported in a recent article that could provide an ideal material for a space mission.

Silica aerogels are simply a highly porous solid materials. It has an extremely low thermal conductivity and a low density. A perfect combination for thermal insulation materials as is used in space missions. Unfortunately, unmodified silica aerogels are fragile. Even at low stresses, it could fall apart. This is where polymer reinforcement comes to play.

Professor Sadhan Jana and Jason Randall of the University of Akron, and Dr. Mary Ann Meador of NASA Glenn Research Center reported how a polymer coating on the silica nanoskeleton not only improves the strength of aerogels, but their elasticity and flexibility as well. As a result, the nanocomposites structure is capable of withstanding compression and bending stresses while resisting temperature extremes. Researchers have studied density, pore structure, modulus and elastic recovery of epoxy-reinforced aerogels.

[Reference: J. P. Randall, M. Ann B. Meador, and S. C. Jana; ACS Appl. Mater. Interfaces, **3** (3), pp 613–626 (2011)]