

Lutetium's Rarity Makes Mass Production of Room-Temperature Superconductors Improbable

written by Jack Lifton | March 10, 2023

This week the New York Times [carried a story](#) about what its “journalists” deemed a breakthrough in the development of a room-temperature superconductor, a material that could theoretically carry any amount of electricity without losses for any distance. Such a material, the holy grail of power distribution, has been sought for more than a century, since the discovery of this property, superconductivity, at near absolute zero temperature first in certain metal-based alloys and later also in certain exotic ceramics.

In fact, superconducting magnets expensively bathed in intensely cold liquid gases are used in the world's most powerful particle colliders to control the intense high-energy beams of subatomic particles that these machines hurl into each other at fantastic energies to reproduce for a tiny moment the conditions at the beginning of our universe.

Pretty exciting, huh?

Not really, unless you're a particle physicist, who doesn't care about the costs or practicalities of distributing energy “cheaply” to the masses of humans who aren't excited by the expensively explored mysteries of the subatomic universe.

But journalists and their political users love to hide the billions of dollars they pour into such experiments behind the rubric of the fantasized value of technological spinoffs, such as practical superconductors, which could maybe, perhaps, carry

power produced cheaply on a sunny Spanish beach by wind or sun to remote Lapland in northern Europe without loss, cheaply.

This is just political bulls**t designed to cover a ridiculous immensely expensive prioritization of the exotic and glamorous over the practical and important in our daily lives.

Lutetium – A Heavy Rare Earths Metal but Truly Rare

The breakthrough touted by the New York Times would require large tonnages of the rare earth element, lutetium, the final and heaviest rare earth in the periodic table. No one really knows how much lutetium is produced annually, because that amount is trivial, perhaps a few tens of tons annually at the very most.

There is very little lutetium accessible to the human race's mining technology because the higher atomic numbered rare earths, also known as the "heavy rare earths" are just a tiny fraction of the overall composition and thus of the production of the rare earths.

Lutetium is today used commercially only in specialized radiation detectors, each of which uses just a few grams of the extremely rare element.

The discovery of a room-temperature superconductor that critically requires lutetium is science, not technology because such material cannot be mass-produced, period.

Rare earth investors can safely ignore this "research." Unless it leads to its implementation by the use of a common metal, any study requiring lutetium as a critical component is pure science not technology.