

SPACE DRIVE: A FANTASY THAT COULD BECOME REALITY

BY ARTHUR C CLARKE

Introduction by Pat Dasch, Ad Astra Magazine

I wrote to Arthur C. Clarke, who serves on the Society's Board of Governors, in June, asking if he would contribute an assessment of how far we had traveled during the Society's 20 years and where we saw space exploration leading in the next 20 years. His initial response was enthusiastic, but demands for similar review pieces around the time of the Apollo 25th anniversary drew a fax that read, "I am exhausted from writing no less than six articles on space and [the] future in the past few weeks." You may have seen some of these pieces: they appeared in The Washington Post, Nature, Space News, the London Times and GQ magazine in the United Kingdom.

Clarke suggested I might wish to negotiate reprinting one of those pieces but concluded his fax: "I am also mailing you a short piece about space drives which you are free to use." The piece that duly arrived by snail mail was fairly short: a concise encapsulation of a possibility that had captured the author's attention. Indeed, the piece, which is printed below, is a prime example of that visionary quality of Clarke's work that we all admire so much—a quality that alas, is missing from most current pronouncements on space strategy for tomorrow.

Science-fiction writers have long dreamed of a mythical "Space Drive" that would allow us to go racing round the universe—or at least the solar system—without the rocket's noise, danger and horrendous expense. Until now, this has been pure fantasy, and it may always be so. However, recent theoretical studies published by Haisch, Rueda and Puthoff in *Physics Review A* in February of this year and based on some ideas put forward by the great Russian physicist and human rights campaigner, Andrei Sakharov, hint that some control may indeed be possible over the mysterious forces of gravity and inertia. (Warp Five, anyone?)

These conjectures—they are no more at the moment—depend on the astounding discovery that so-called empty space is actually a cauldron of seething energies, known technically as "quantum fluctuations" which have been detected but not yet tapped. If they can be, the impact upon our civilization will be incalculable. Oil, coal, nuclear, hydropower, would become obsolete—and so would many of our wrapped up in one big worry—heat pollution. All energy eventually degrades to heat, and if everyone had a few million horsepower to play with, this planet would soon be heading the way of Venus -- several hundred degrees in the

shade. However, there is a bright side to the picture: there may be no other way of averting that next Ice Age, which otherwise is inevitable.

I cannot help wondering if quantum fluctuations (also known as Zero Point Energy) explain some of the baffling and bizarre results reported by advocates of so-called "Cold Fusion" such as Drs. Pons and Fleischmann, who claimed in 1989 to have produced nuclear energy in a test tube at room temperature. At the moment the scientific establishment is completely polarized on the subject: probably 95% of chemists and physicists are sure the whole thing is nonsense-or even fraud-while 5% believe that some anomalous phenomenon is occurring, though it may not be fusion, and it certainly isn't cold. Time will settle the matter, as it always does. Don't sell your oil shares yet-but don't be surprised if the world again witnesses the four stages of response to any new and revolutionary development: 1. It's crazy! 2. It may be possible-so what? 3. I said it was a good idea all along. 4. I thought of it first.

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