Mission Statement

Our overarching objective is to find a way for humankind to reach the stars. This will require a breakthrough in propulsion.

The barrier to the stars can be conceived as two-fold: a fuel problem and a time-distance problem. We anticipate that both of these problems will entail a reckoning with general relativity. (see Proposals Sought below for further detail).

Any breakthrough must be ultimately explainable to other technical people, must depart sensibly from the known laws of physics, and must involve verifiable experiments to test new effects. A discovery is not real until a second person understands it.

Conference Motivation

No major technical institution is investing systematically in the research and development necessary to realize the goal of interstellar travel beyond the nearest stars – quite simply because no scientist or engineer has yet suggested a viable, testable way to achieve it.

Fundamental research in physics funded by the NSF tends to focus on quantum gravity and string theory. NASA funded a small breakthrough propulsion program in the 1990s, but it was not sustained. Even if money was available, it is not clear how and where funds should be invested.

The typical conference format is ill-suited to this venture. Many conferences that accept breakthrough propulsion papers allow any person to pay a fee and present any dubious technical claim with little peer review or engagement with subject matter experts.

Therefore, we want to attempt to assemble a handful of potentially viable concepts for a propulsion breakthrough, and give each of them a rigorous, real-time, peer-review on the twin bases of theory and experiment. If someone has something with potential, they should relish a chance to explain it to others. If their scheme is ultimately not viable, they can be freed to join work in a more promising area.
Conference Style and Setting

Since conventional conference formats have not advanced a breakthrough in propulsion, we wanted to attempt something different: a “Shelter Island” approach. In 1947, Oppenheimer, Bethe, Feynman, and a dozen other luminaries of physics came together in an isolated retreat to tackle the major conceptual problems of quantum electrodynamics.

We feel such an environment can act as a reboot to the breakthrough propulsion effort, and re-establish it on a firm technical footing, grounded in known physical law and in scientific best practices. We hope our findings can be the nucleus of later efforts and can guide investment. Getting back on such a firm footing is best achieved at this time in an invitation-only event. We don't seek to limit participation, but merely to insure it is productive.

We have chosen to have the conference in historic Estes Park, Colorado, the week of 19 September, at the YMCA of the Rockies, Estes Park Center. It is a beautiful location in a rustic setting and should afford an opportunity to see the Colorado autumn colors in nearby Rocky Mountain National Park. A rate of $150/day includes all conference and meeting areas, lodging, and 3 meals per day. There is no conference fee.

Session Technical Format

The 3-day conference will address at most 6 concepts for a breakthrough in propulsion. We devote a half-day per concept. The half-day is broken into theory and experiment sessions for the concept. The concept will be investigated on both grounds, with substantial give-and-take between the audience and the concept presenter, verbally and on the whiteboard.

The theory session will allow us to understand how the concept departs from existing theory of general relativity or electrodynamics. However, we are willing to entertain concepts with compelling experimental demonstrations for which there is yet no solid theory.

The experiment session will allow us to understand how to experimentally verify the concept, and the mechanism by which it could solve either the fuel or time-distance problems. However, we are willing to entertain concepts with compelling theoretical aspects well-rooted in known physics, for which concrete experiments could be contemplated.

We will moderate a disciplined and respectful interchange, working toward a goal of common understanding, while still “kicking all the tires” of rigorous peer-review.

Proceedings

The presentations and the discussions for the concept sessions will be recorded in a proceedings, along the lines of the Dirac birthday volume by Mehta, and other similar proceedings. We feel the technical discussion is an important part of the technical program to preserve. The intention is to create a conference proceedings that meets expected standards of peer-review. The proceedings will be made available to participants after the conference.
**Proposals Sought for Concept Sessions**

Proposals are being sought for consideration as one of the session concepts, to be explained and scrutinized on theoretical and experimental grounds. The concept should distinguish at the outset whether the work is in the area of the fuel problem, or of the time-distance problem.

The fuel problem is that conventional mass-ejection propulsion cannot power a craft to accelerate at 1 g for several years – a reasonable engineering goal – without impractical masses and volumes of fuel. We anticipate that this must amount to some form of breakthrough in gravity control. Yet if the fuel problem were to be solved, the time-distance problem would still exist.

The time-distance problem is that civilization on earth can never colonize the galaxy if no signal can be sent faster than light, and if no object can be accelerated faster than light. The limiting speed of light, and the associated effects of relativistic time dilation, mean that we can never, for example, send scouting parties to the center of the galaxy and back. Our astronauts could go and come back – and they would see the center of the galaxy -- but time dilation would put them home in the distant future, long after their civilization died. So to find a solution to the time-distance problem is really to transcend the light barrier. To solve the time-distance problem would probably also imply a solution to the fuel problem.

The conference is open to a promising theoretical framework without an obvious experiment to validate it, but the theory should have some potential for a testable prediction. Likewise, the conference is open to an experimental effect without a theory to explain it; but the experiment must be rigorously described and falsifiable, with the presumed theoretical context established to the limit of our understanding of theory.

A concept session should summarize its connection to the known laws of physics. For example, we expect to see the extra terms in the Einstein field equations. A concept proposal should give the technical committee the confidence to believe a credible connection to existing physical law can be sustained in discussion.

A concept session should also summarize its experimental implications, or experimental set-up if a new effect has been detected. In either case, the goal is a verifiable experiment that can be reproduced by others. The concept proposal should give the technical committee confidence to believe a technical discussion can reveal a feasible and testable implication that can be explored with available terrestrial means.

We invite you to share your ideas for a breakthrough in propulsion with technical peers. You have a chance to convince people if you have something for real. And it is better to learn the error of your ways earlier if you don’t. Contributing to healthy technical interchange regarding other theories may provide the missing spark in your own thinking.

If you have an idea for a session concept, start by contacting Jim, Heidi, or Lance.

Best regards,

The Estes Park Conference technical committee.