Q&A with John Stachel: Wed., Feb. 21, 2007

1.What is the significance of Einstein's twin paradox? Does the paradox have any practical applications or is it simply an academic curiosity?

The significance of the twin "paradox" is that, in special relativity, time becomes more like space. We are all used to the idea that the distance between two places depends on the path that we take between them. (The distance between New York and San Francisco depends on whether you go by way of Chicago or Miami.) But we are used to thinking of the time between two events as independent of what one does between them. Special relativity shows us that this is not the case: The time between two events depends on what we do between them.

But there is still a big difference between time and space: In space the straightest path between two places is the shortest. In time, the strightest path between two events is the longest. That is the twin "paradox": When they meet again, the stay at home twin is on a straigher path and will have aged more than the roaming twin who goes on a crooked path.

This effect must be taken into account in any device that depends on very precise measurements of time, such as the GPS (Global positioning system).

2. How does a peer reviewed article, such as Kak's, become an accepted part of the special relativity canon?

I have no idea what is in the paper by Dr. Kak that you mention, so I cannot comment on it. But I will say that mere publication in a journal - even a peer-reviewed one-- is no guarantee of the accuracy of the results, nor of their significance. A much longer period of testing and evaluation after publication is needed until these things can be setttled.

Q&A with David Ritz Finkelstein: Thu., Feb. 22, 2007

1. What is the scientific significance of Einstein's twin paradox?

The twin "paradox" illustrates an important principle: Travel time as registered by the traveler depends on the path taken, not just on the
initial and final coordinate times as Newton assumed. This was not understood before Einstein.

2. There are already resolutions to the paradox. Why is there a need for another one?

Good question. I prefer to call it the twin effect; it is a paradox only relative to the previous, less correct, theory of time. Why institutionalize
the viewpoint of an inaccurate theory when the better theory is available? From the viewpoint of relativity, it would be a paradox if the travel time DIDN'T depend on the path. I think it is not the best pedagogy to name something that actually happens a paradox, except transiently.

3. Have you read Dr. Kak's resolution? If you have, would it be possible to comment on it?

No, I haven't, so I can't