SSC site selection: How to proceed

If it is built, the Super Superconducting Collider (SSC) will be the world's most energetic particle accelerator. It will collide protons with energies of 10 trillion electron-volts (10 TeV) or so against protons or antiprotons with the same amount of energy. Its construction will bring several billion dollars and several thousand jobs to the area chosen as its site (SN: 9/22/84, p. 181). Although no decision has been made to build the SSC — the only authorization so far is for funds for preliminary planning — Alvin W. Trivelpiece, director of energy research for the U.S. Department of Energy (DOE), recently announced a procedure for site selection.

Trivelpiece's action may seem a bit premature, but he seems to be trying to get ahead of those who have already jumped the gun. Texas would like to be the site of the SSC. Texan universities and industries have put together a preliminary design group and are touting the advantages of Texas's wide open terrain. Another sweetener is the suggestion that Texas state money might be available.

Colorado sent a group of sociologists to the recent meeting in Santa Fe, N.M., of the Division of Particles and Fields of the American Physical Society to survey particle physicists' attitudes toward their work. The hope seems to be that a good sociological profile of the particle physicist species will show that Colorado is the place where such people will be happiest. (It is already known that many particle physicists like to ski.)

The Tevatron at the Fermi National Accelerator Laboratory, with a maximum energy of 1 TeV, is now the world's most energetic proton accelerator. The state of Illinois reportedly has been doing geological surveys of the area west of Fermilab and sounding out farmers about easements and rights of way.

Suggestions won't stop there. When Fermilab was planned in the late 1960s, nearly every state of the union put in a site proposal. The discussions became acrimonious. The success of Illinois is attributed to the political skills of the then Sen. Everett M. Dirksen (R-Ill.) in bargaining with President Lyndon B. Johnson.

Physical criteria of the SSC would seem to limit possibilities somewhat. The SSC is envisioned as a circle something like 40 to 60 kilometers across, all built in tunnels underground. Furthermore, planners would like it to be near a metropolitan city with good educational facilities. (One of the gripes about Fermilab is that it is not close enough to Chicago.) However, even Long Island, which is too narrow to accommodate the SSC on the surface, has been suggested. Since the SSC will be built underground, some say, why not burrow a little under the ocean?

The DOE has tried to prevent premature campaigning for a particular site. It has largely prevented its own employees from promoting their favorite locations. However, it does not seem to have had much influence with people like the governor of Texas or the Sociology Department of the University of Colorado.

Trivelpiece outlined the procedure he wants to follow in letters to Frank Press, president of the National Academy of Sciences (NAS), Robert M. White, president of the National Academy of Engineering (NAE), and Guyford Stever, president of Universities Research Association (URA), which operates Fermilab and other laboratories for the DOE. URA is working on a "site criteria document" which will describe the SSC sufficiently to define site requirements. This will go to the DOE for review. If a decision is made to proceed with the project, then, at a time the DOE deems appropriate, the site criteria document will be released to parties interested in proposing sites. The presidents of the NAS and NAE will then appoint a panel to review site proposals. This panel would narrow the field to "a few of the most excellent proposals." Later, the DOE could select the SSC site from this group "if all the other conditions needed to proceed have been satisfied." —*D. E. Thomsen*

Soviet Halley probes carry U.S. gear

The first members of the international Halley armada are under way. On Dec. 15 and 21, two Soviet spacecraft — Vega 1 and Vega 2 — were launched toward June flybys of the planet Venus, where each will deploy a descent capsule and then head off for close looks at Comet Halley in March of 1986. Jan. 5 has been the expected launch date of Japan's Halley-bound MS-T5; the European Space Agency's Giotto probe is to take off in July, followed in August by another Japanese entry, Planet A. The United States is not on the list.

Several U.S. researchers are participating in the spacecraft assault on Halley, however — on the Soviet side. The two Vega craft (bearing names derived from the Russian words for Venus and Halley) each carry cometary dust analyzers invented by University of Chicago physicist John Simpson, and designed, built and delivered by Simpson and his colleagues. In addition, Anthony J. Tuzzolino and Murry Perkins of the university are both official co-investigators on the research team that will be using the instruments' results.

Despite strained relations between the U.S. and Soviet governments, the devices' development was funded by the National Aeronautics and Space Administration.

Simpson first proposed the concept for the instrument in the spring of 1983, and described it that September at a scientific meeting in Holland. Within a month, he was surprised to receive an invitation from R. Z. Sagdeev of the Space Research Institute of the Soviet Academy of Sciences, to include the devices on each of the Vega probes. "We really had to make an extraordinary effort to build these instruments," Simpson says. "... We worked on an astonishingly short time scale for a space mission."

Furthermore, he says, "We believe this University of Chicago-Soviet space collaboration is also exceptional in the degree to which I was able to control our experiment and in the level of cooperation between technical staffs of the two laboratories." Ensuring compatibility of computer and electrical connections, for example, required considerable coordination, and a telex "hotline" was established for the purpose between Simpson's laboratory and a facility in Moscow. He made several trips to Moscow in connection with the project, received computer tapes of the instruments' performance while they were on the launch pad and he was in his laboratory, and has been told that he will regularly receive similar tapes as the Halley encounter nears. And before any such collaborative efforts could be conducted with the Soviets, he had to get approval from the White House, the State Department, the Defense Department and NASA itself.

But there are other U.S. links with the Vega missions. Bradford Smith of the University of Arizona in Tucson, for example, head of the imaging team for the U.S. Voyager missions to the outer planets, is also part of the Vega imaging group. (And Voyager 2's flyby of Uranus occurs in late January of 1986, barely a month and a half before the Vegas fly past Halley.) Andrew Nagy of the University of Michigan in Ann Arbor, who has been part of the U.S. Pioneer Venus mission, is with the Vega plasma physics experiment team. Ke Chiang Hsieh of the University of Arizona designed the Vega neutral mass spectrometers, which will measure the composition of the particles surrounding Halley as the spacecraft fly past.

In addition, the dust measurements from Simpson's instrument will be part of collaborative links between the Soviet Halley mission and those from Europe and Japan. The dust findings from Vega 1 will be used (on necessarily short notice) to help determine how close Vega 2 can safely come to the comet's nucleus, and will be applied to the same question for Europe's Giotto (which may pass as close as 500 kilometers) and Japan's Planet A. —*J. Eberhart*