

ted to the long haul, are our most vital resource."

The unprecedented size of the laboratory affects every aspect of the project. A steady stream of organizational changes reflect the fact that, as Schwitters readily admits, "it's a harder job that I expected. I had no idea of the demands from the business side of the equation."

There have been more than half-a-dozen project managers since the laboratory became the first tenant in a business park owned by Texas real estate magnate Trammell Crow. Schwitters more than once reshuffled his own deck of top administrators, and in October 1990 his bosses at the US Department of Energy decided to appoint Edward Siskin, a nonscientist with experience in running large construction projects, to the new position of general manager. At the same time, Schwitters inducted Paul Reardon, a veteran accelerator builder, to join the laboratory as project director.

While Siskin remains in charge, the supporting staff continues to evolve. Last July, when accelerator division chief Helen



The linear accelerator is the first of four machines that will prepare protons for the SSC.

Edwards left, her job was divided between Dugan and John Rees, who came from SLAC. In December, her husband and associate, Don Edwards, also retired from the laboratory. In January, Reardon went on medical leave.

In the wake of those departures, the entire accelerator division became part of project management. Rees succeeded Reardon as project manager, and Dugan added the job of deputy project manager to his duties as head of the accelerator division. Such turnover may not be unusual for an organization as large as the SSC project, but it has drawn increased attention to a project already under intense scrutiny because of its cost.

If the SSC succeeds, Texas will become the centre of the universe for high-energy physics. Its failure could be equally momentous — the end, perhaps, of an era in which the United States has led the world in big science.

"We're breaking new ground here", says Schwitters, "And even the old hands in the field — people like Robert Wilson [Fermilab's first director] — admit that the SSC is a different world." **Jeffrey Mervis**

Four who have come

As with any new laboratory, the people working at the Superconducting Super Collider (SSC) have come from somewhere else. Their presence, in many ways, is a testament to their faith that the huge collider will not only be built, but will also be worth working on.

Fred Gilman, head of physics research, and Jerry Dugan, who oversees the science and the construction of the big accelerators, are part of a large group who have left existing high-energy physics laboratories in the United States. Gilman had spent his entire career at the Stanford Linear Accelerator Center, and Dugan worked at Fermilab for eight years, before both joined the SSC in 1990.

In addition, a significant number of researchers — some 30 per cent of his scientific staff, Gilman estimates — are from laboratories outside the United States, in particular DESY in Germany and CERN, although some of those are Americans returning home. Still others are on short-term contracts, notably a contingent of Russian high-energy physicists from the scientific complex at Novosibirsk. And there are a growing number of professors from US universities, both nearby and around the country, who will spend varying lengths of time at the SSC laboratory working on specific projects.

They come to Texas for all the usual reasons: the opportunity to make their mark, to assume greater responsibility, to tackle the next great challenge. For the average Texan, the SSC represents a \$2,000-million construction project, its 54-mile elliptical tunnel providing thousands of jobs for an economy just beginning to climb out of a long and severe recession. But for high-energy physicists, the SSC is the future.

Here is a brief look at four who have taken the plunge:

■ After spending almost 20 years at Fermilab, Sam Baker jumped at the chance to join the SSC two years ago because "it is such a wonderful opportunity to start from scratch". A health radiation physicist who directs the growing environmental safety team at the laboratory, Baker also finds time to carry out his own research projects as well as to make regular visits to area schools.

"Educating the next generation is part of everybody's job here", he says about his community involvement. "I can't imagine not doing it, it's so important." At the age of 57, Baker expects to retire from the laboratory after the collider is turned on and the environmental programme is fully in place.

■ Weiren Chou became an accelerator physicist by accident in 1986, when he joined Argonne National Laboratory outside Chicago to study nonlinear dynamics of the giant machines. Chou came to the United States in 1980 as part of the pioneering efforts of Nobel laureate T. D. Lee of Columbia University to attract talented graduate students from mainland China.

Although Chou says he was very happy working on the Advanced Photon Source being built at Argonne, he says SSC officials contacted him at a national physics conference and persuaded him to come to Texas in 1990. His only complaint is the lack of established procedures for purchasing things, large and small: his group has tried for months to buy a \$50,000 computer work station, and he has almost abandoned hope of getting the laboratory to pay for business cards to give to vendors.

■ Vera Luth's arrival this spring from SLAC is a measure of how far the laboratory has come. Two years ago Luth, an experimental physicist, decided she was not ready to be one-quarter of the scientists in the physics research division. But the opportunity to be Gilman's deputy was sufficiently attractive to lure her and her husband away from what she calls "probably the best place to live in the United States".

Luth has hedged her bet; her husband and she decided to rent rather than buy a home, and she is officially on leave from SLAC to give her time to settle into her new job. So far she is withholding judgement on the laboratory. She is concerned about who will pay for the two huge detectors and whether they have grown too big for university teams to handle, and she is unhappy that such megaprojects take so long to design and build that they have knocked students out of the picture. But she says that those are facts of life for today's high-energy physicists, and she seems eager to find answers to these and other problems.

■ A restructuring of the SSC laboratory last year gave Jerry Dugan the chance to walk away from operating a 'mature' accelerator at Fermilab and embrace the challenge of building new and bigger accelerators. It was the second time in two years that he had seized an opportunity created by his boss at Fermilab, Helen Edwards. Edwards left Fermilab in 1989 to join the SSC project; last July, she retired and returned to Illinois.

Such musical chairs is common in the field. Dugan is hoping to fill the remaining 20 or so slots in his programme with experienced accelerator physicists, which means persuading them to forsake comfortable positions at existing laboratories.

J.M.