



Heavenly Mountains, Down-to-Earth Job



BY ELISABETH NADIN

Tien Shan is Chinese for “heavenly mountains”—the name alone reflects how hard it is to get there. In June 2006 a group of 21 Caltech students, postdocs, and professors made the trip to this remote region of northwestern China as participants in a two-week research field trip, sponsored by the Institute’s Division of Geological and Planetary Sciences. After landing in Beijing, we flew to Urumqi, capital of the Xinjiang Province—where the range is located—and caught up with the 15 Chinese students and four professors who had traveled 48 hours by train from the east-coast city of Nanjing to join us. A 10-hour drive to the southwest Tien Shan foothills brought us to this arid central Asian landscape of red, yellow, and brown rocks cut by lethargic rivers.



Top: Our happy group, at the end of a field day.

Above right: Uyghur men and their delicious fruit.

Above: Our fleet.

Left: Caltech geophysics professor Rob Clayton, with the help of two students, triggers seismic waves with the Betsy gun.

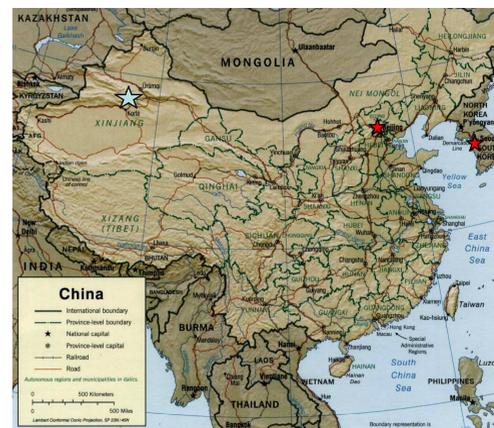
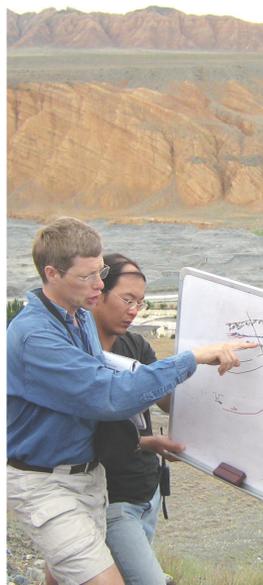
Below: Built along the Silk Road in the third century and abandoned in the tenth century when Islam became a dominant force in the region, these hillside Buddhist caves known as the Kizil grottoes still stand today, although many paintings from their ceilings and walls were plundered for their gold foil or removed by archaeologists.

Top to bottom: Jean-Philippe Avouac discusses the Qilatak anticline.

An Uyghur merchant passes tilted rock beds.

A spectacular scene of the stark wilderness, with Paleozoic rocks in the background.

At right, Jean-Philippe Avouac explains the interactions between the tilted rock layers and overlying terraces, as Nanjing University geology professor Shengli Wang looks on.



The banner at the top of the page shows the Tien Shan’s Qilatak anticline, a large fold that formed over a blind thrust. Fault-bend folds formed the core of the field investigations. Minibuses in the foreground give a sense of how enormous it is.

Below that, a closeup of one of the limbs of the fold, showing sheared thrust offsets (tops to left) consistent with the compressive field.

Above: a map of eastern Asia—red stars show our short stops, and the blue star is on the Tien Shan.

Left: Satellite image centered on the Tien Shan.



Top left: Min Chen collects samples as Rob Clayton looks on.

Top right: Our happy home for two weeks.

Middle left: Coal mining in the Tien Shan.

Middle right: Nanjing University student Bao Xue and Caltech undergrad Sonia Tikoo check the quality of seismic images coming from geophones into a field computer.

Above: Growth strata!!

Left: A nice meal hosted by the Tarim oil company.

