

**CONTRACTIONAL TECTONICS IN SOME OF THE MOST SPECTACULAR
FOLD-AND-THRUST BELTS OF THE EARTH: CANADIAN ROCKY
MOUNTAINS, THE FORELAND BASINS OF THE TIAN SHAN MOUNTAINS
IN CHINA, THE ARGENTINEAN SUB-ANDEAN FORELAND AND THE
ZAGROS MOUNTAINS IN IRAN**

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ABSTRACT

Contractional tectonics derived from collisions of lithospheric plates creates some of the most spectacular deformational structures and topographies on the planet. Orogenic fold-and-thrust belts originate the highest and most rugged mountains in Earth, where folds of the most varied nature and styles and thrust faults displaying diverse geometries have delighted generations of field geologists and more generic nature lovers.

Orogenic mountain ranges and foothills, cordilleras and piedemontes, are the only natural entities capable of displaying outcrops of seismic scale structures that are usually sought in petroleum exploration. They have been mapped for the last two centuries and most of the foundations of structural geology were understood and laid down in the cores of their folds and on the hanging walls and footwalls of their thrusts. Complete stratigraphic sections of thick sedimentary basins were assembled only due to the outcrops of deep-seated intervals on the hanging walls of deeply rooted thrust faults. Although exploration in fold-and-thrust belts have somewhat dwindled in the last two decades their study is presently undergoing a sudden revival because of the analogies between their structures and those found in petroleum-rich ultra-deep water gravitational fold-and-thrust belts.

The Zagros Mountains of Iran and the foreland foldbelts of the Tian Shan Mountains in China offer spectacular three-dimensional views of trains of tight folds in surface associated to deep-seated thrust faults in subsurface. Salt plugs in the core of anticlines and salt tongues along thrust and tear faults enhance the diversity of compressional structures in the Zagros foothills. As a contrast to these fold-dominated fold-and-thrust belts, the mountain ranges of the Canadian Rocky Mountains and the Argentinean foothills display thrust-dominated fold-and-thrust belts. There, striking repetitions of packages of sedimentary strata, pushed to breathtaking altitudes in the hanging walls of thrust faults, fault after fault, offer fascinating displays of the great stresses involved in plate collisions and crustal shortening.