



Università degli Studi di Trieste

Dipartimento di Matematica ed Informatica
Dipartimento di Geoscienze



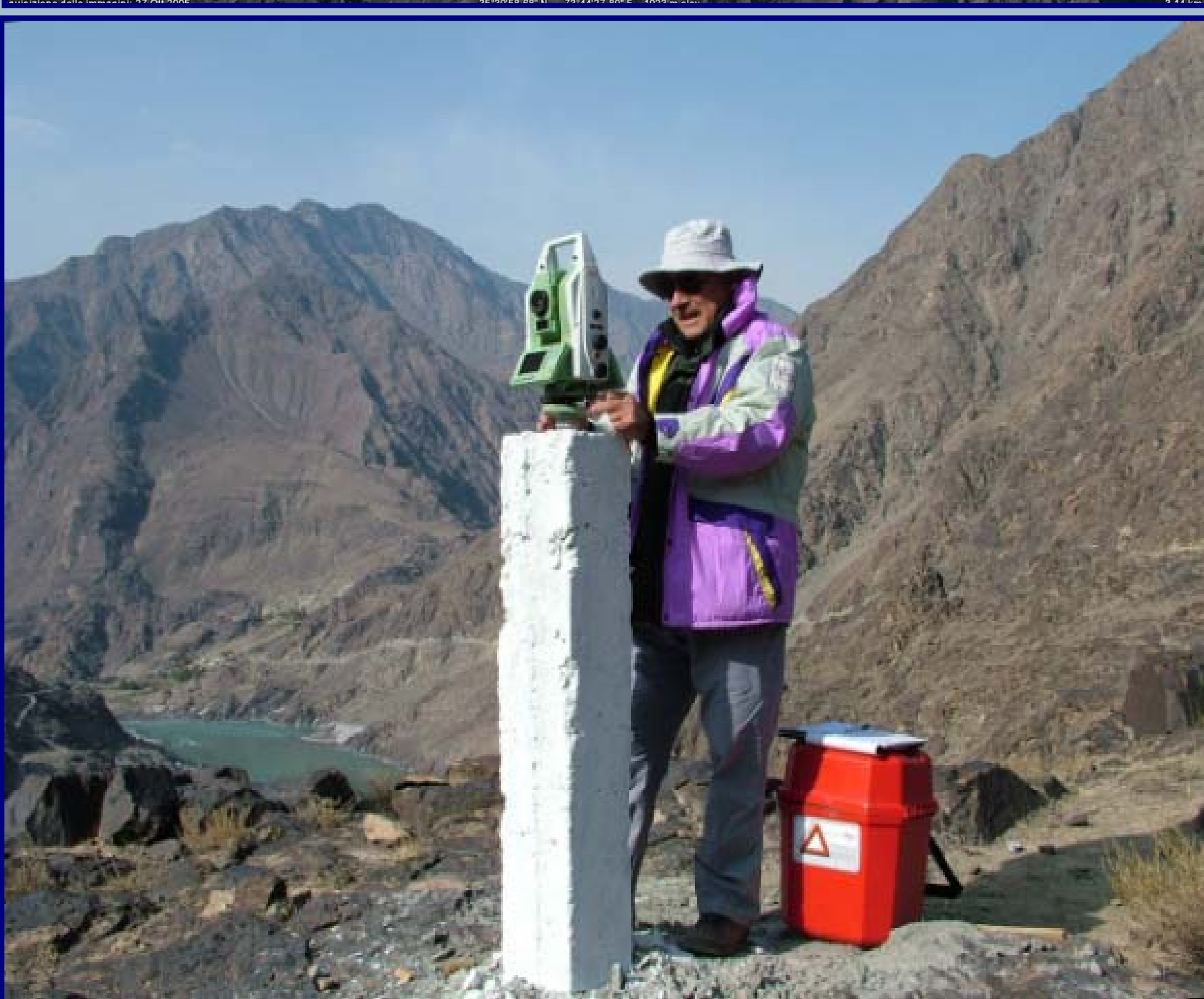
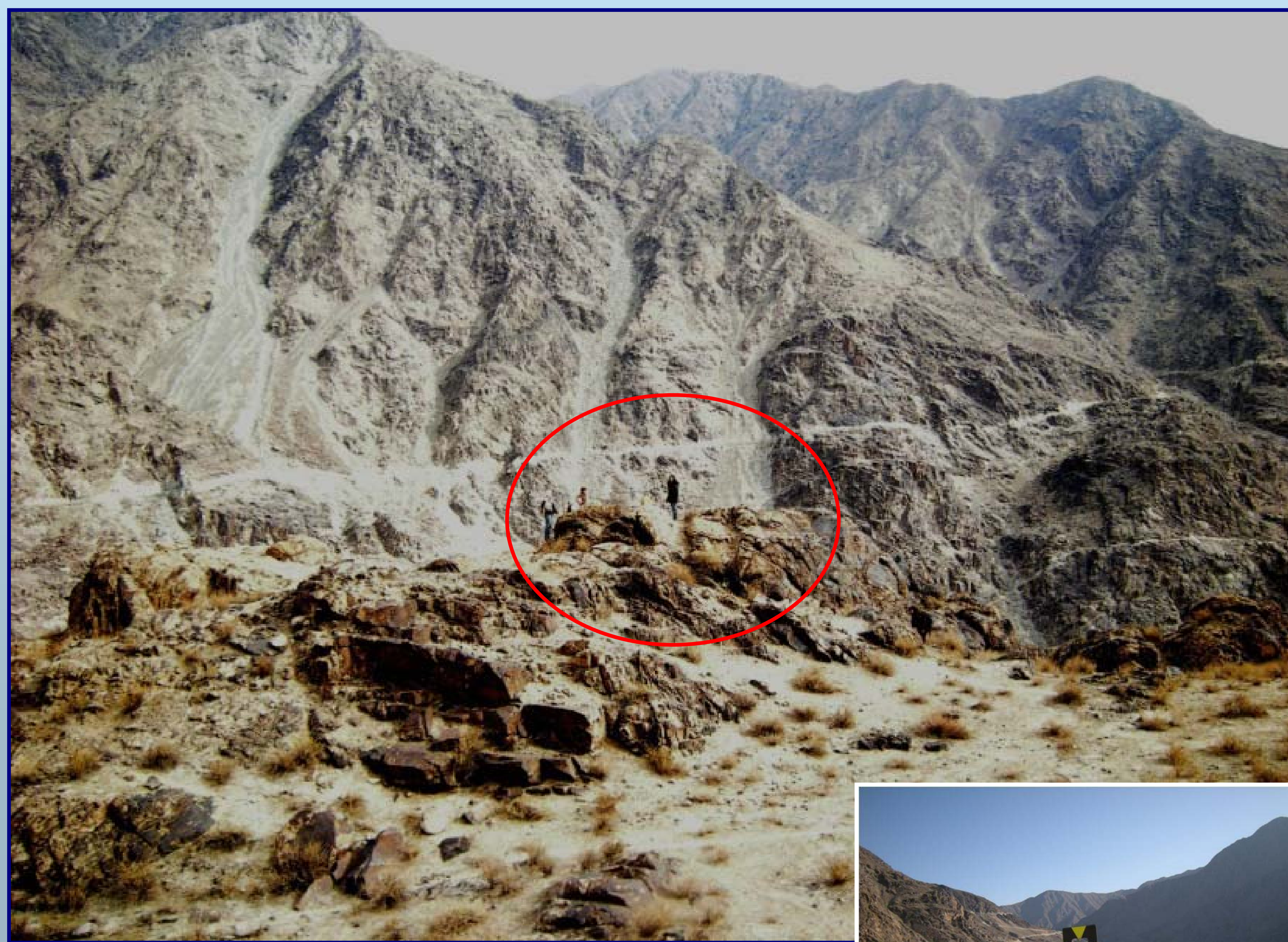
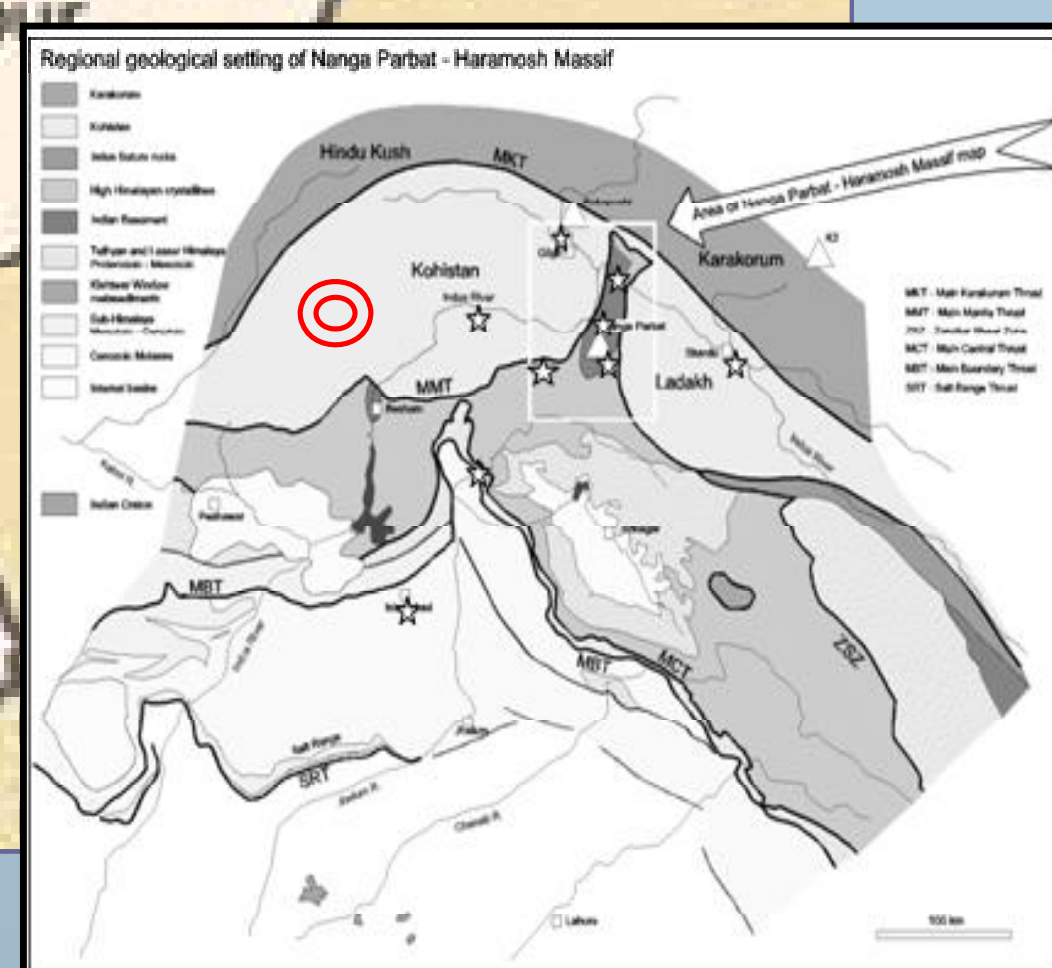
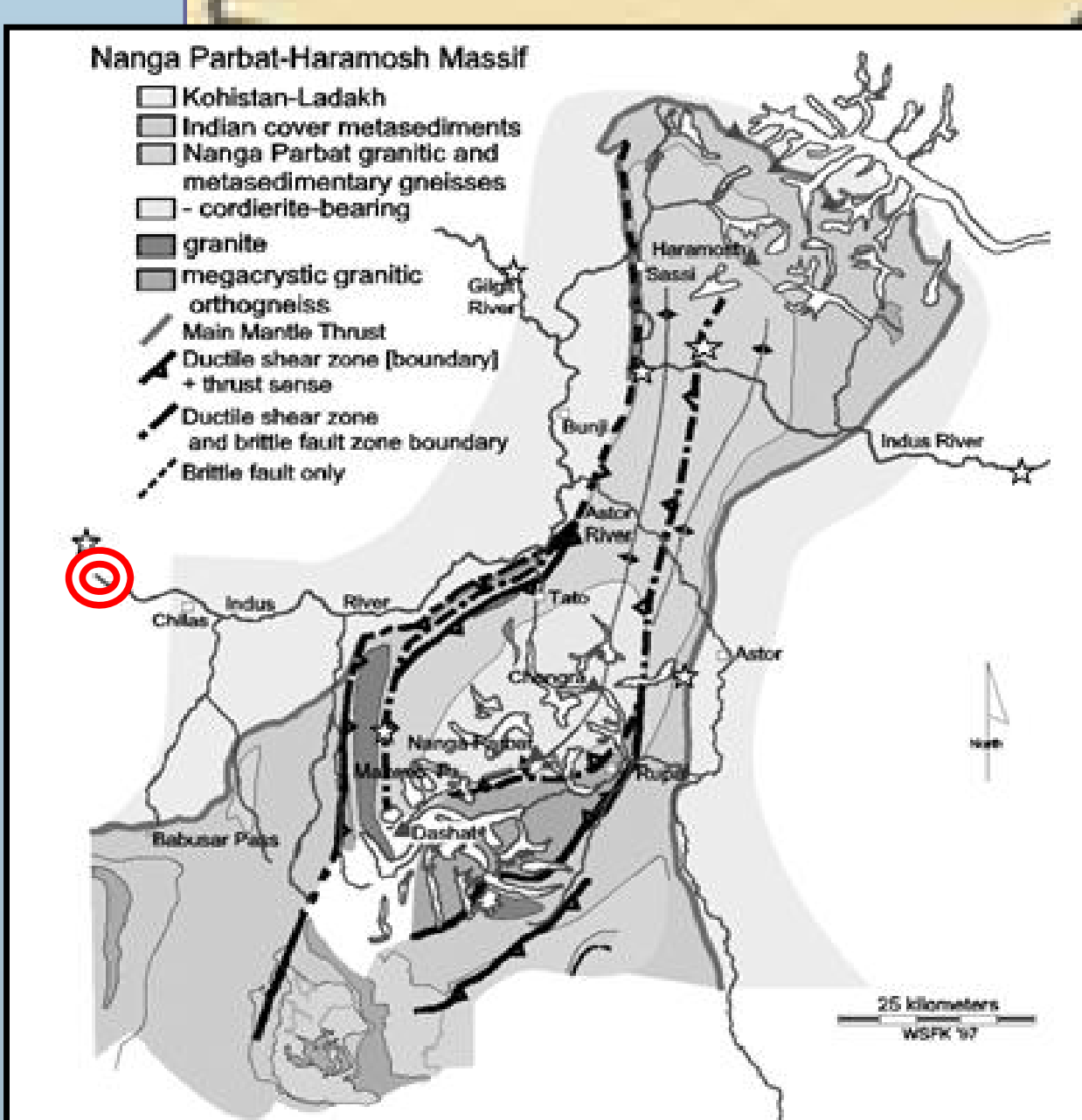
Ministero degli Affari Esteri



Topographical, Geological and Geophysical Measurements in the Damer Basha Dam Area (Gilgit Baltistan)

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Agriculture and electricity are the backbone of Pakistan's economy. Pakistan today is one of the World's fastest growing countries with a population estimated to be around 170 million at the beginning of 2009. Due to the inability to regulate large rivers by means of sizeable storages, the country is already facing frequent power deficits in electricity and serious shortages in edible grains production. If the present trend continues, Pakistan could become one of the food deficit countries in the near future. Therefore, there is a dire need to build new reservoirs for improving agriculture and increasing electricity production.

The **Diamer Basha Dam** with its 272-metres in height, will be the highest roller compacted concrete (RCC) gravity dam in the world. It will be situated on the Indus River, about 315 km upstream from the Tarbela Dam site, 180 km below the Gilgit-Baltistan capital Gilgit and about 40 Km downstream from Chilas. The reservoir created behind the dam will extend for about 105 Km up to the Raikot Bridge on the Karakoram Highway. The project started in September 2005 (with the preliminary geological investigations) and the dead line for its completion is 2016.

Angles and distances between the 6 benchmarks of the network installed on the banks of the Indus River in the Basha Dam area

Line	H _z	V	D	SQM
(6-7)	132°55'5.6"	88°48'9.7"	490.997	0.0039
(6-9)	18°38'07.5"	88°05'35.7"	599.830	0.0046
(6-10)	57°05'04.2"	90°03'50.9"	588.684	0.0011
(7-10)	323°49'56.5"	90°56'04.2"	668.007	0.0039
(7-8)	98°29'18.5"	91°03'08.3"	714.230	0.0028
(7-11)	20°34'41.3"	87°41'41.5"	642.627	0.0000
(8-10)	112°32'56.3"	89°53'29.1"	1275.478	0.0007
(8-11)	137°59'05.3"	87°22'48.8"	854.887	0.0127
(11-10)	184°05'30.6"	93°22'23.6"	623.092	0.0145
(10-9)	134°02'41.3"	86°59'22.2"	391.479	0.0025
(9-7)	81°38'42.8"	90°35'41.0"	918.246	0.0000

The project involves the determination of six monitoring points in the area of the dam, and in particular two corresponding to the dam itself, two upstream and two downstream (three on the right bank and three on the left bank of the Indus river). These six points have been linked by high accuracy measurements of distances and angles.

The present study shows the results of the initial topographical survey of the dam's area realized within the framework of a larger monitoring project called "Nanga Parbat – Haramosh Massif Monitoring Project" the target of which is to determine the uplift of the massif due to geo-tectonic compressions.

The distances measured with a Leica TS30 total station were verified with short GPS measurements performed on the same benchmarks.

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