

NEW INTERNATIONAL AGREEMENTS ABOUT SPACE TECHNIQUES AMONG ARGENTINA, CHINA AND FRANCE

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The International Earth Rotation and Reference Systems (IERS) is in charge of defining and materializing celestial reference systems (ICRS - ICRF) and terrestrial reference systems (ITRS - ITRF). In order to perform this task it uses data from the following techniques: Very Long Baseline Interferometry (VLBI), Satellite Laser Ranging (SLR), Global Navigation Satellite System (GNSS) and Doppler Orbitography and Radiopositioning Integrated by Satellite (DORIS). Nowadays, the Observatorio Astronómico Félix Aguilar (Oafa) has two instruments with these advanced techniques: SLR and a permanent GNSS station. In the near future a 40 m diameter radio telescope will be available that will be operated in VLBI mode along with a DORIS buoy which will be co-localized with a SLR telescope and GNSS antennas. In this way Oafa will become a zero station, first class, of the ITRF 2014 frame.

The CART Project (Chinese Argentine Radio-Telescope), the Oafa of Universidad Nacional de San Juan (UNSJ), Argentina, and the National Astronomical Observatories of China (NAOC) of the Chinese Academy of Sciences (CAS), have supported a close collaboration over more than 20 years for astrometry. Based on this very good relationship, UNSJ and CAS, through their respective research institutes, have shown the desire to extend the agreement to other areas of astronomy and related sciences. For that purpose, both institutions have signed an agreement to place a 40 m diameter radio telescope in the Province of San Juan, Argentina, which will be the largest in all of South America. The working frequency will cover a 1 - 43 GHz range and, although formally dedicated to the estab-

lishment and maintenance of the celestial reference frame (ICRF) and the terrestrial reference frame (ITRF), it will also be able to carry out cosmology, astrometry, geodesy, geophysics and space navigation studies. The search of the best site, including geophysics, geology and seismology studies, has been done, and the selected place is Oafa, UNSJ Dr. Carlos Ulrico Cesco Station, in El Leoncito, Barreal. Nowadays a CART antenna is under construction in China and we hope the installation, calibration and operation will be ready in 2-3 years. The DORIS project (Doppler Orbitography and Radiopositioning Integrated by Satellite) has been operating since 1990 in 35 countries. The French system, DORIS, is composed of a net of 57 transmitters uniformly distributed all around the world, and sends signals at frequencies of 2036.25 MHz and 401.25 MHz. Although the DORIS system was primarily designed for precise determination of orbits, the science applications of this technique have amazingly increased, including now subjects such as astrometry, geodesy, geophysics, and others. From 1988 on, the Chile University had a DORIS transmitter in Santiago which, due to problems of the host institution, will be moved. So, the National Geographic Institute of France began searching for a new place near Santiago. From 2013 on, the IGN started looking for sites with free vision from 5° over the horizon, a stable rock support and a stable power supply. These studies were carried out in several places of Chile, and in the west of Argentina (San Juan). In the first months of 2014 Oafa performed the job of recognizing, marking and locating two possible places for the DORIS antenna. One was the Astronomical Station Dr. Carlos Ulrico Cesco, in Barreal, and the other the Central Headquarters of Oafa, where now in operation (under co-localization) are a SLR and a permanent GNSS station. After the reconnaissance tasks, and studies of electromagnetic radiation, Oafa Central Headquarters was confirmed as the most convenient place, because IERS considered that co-localized sites, where two or more geodetic spatial techniques operate jointly, have a greater weight for the ITRF.

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