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Solar Observation Started with the Flare Monitoring Telescope at King Saud University under the CHAIN Project

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The main purposes of our CHAIN project are reinforcement of multi-wavelength H-alpha observations of the full-disk Sun by formation of an international network of ground-based solar station, and international spread, academic exchange and promotion of the space-weather research including developing countries. Under this purposes, we had supported the installation of a new Flare Monitoring Telescope (FMT) at King Saud University (KSU) in Saudi Arabia.

Photo 1: The building and astrodomes of the department of physics and astrophysics of KSU

In 2011, KSU started the project to install the FMT by their own budget and research space weather through solar observations. KSU has very wide campus in the capital city Riyadh. The department of physics and astronomy has two 6.6 m astronomical domes (photo 1). In the one dome, a telescope for the solar observation in white-light has been already working. In another dome, a telescope for night astronomy was working in former times. However, nighttime observation in Riyadh city has become difficult due to the light pollution. Therefore, they decided to replace this nighttime telescope with the FMT and focus on the researches of solar activities and space weather.

Therefore, Kyoto University and Japanese telescope-company cooperatively performed initial installation of a new FMT at KSU in December 2014 under the fund of KSU (photo 2, 3).

Moreover, in October 2015, we did further optical adjustment (photo 4, 5, 6) and training of telescope-operation and data-analysis for Saudi Arabian researchers (photo 7, 8). After that, the daily solar observation with the FMT in KSU safely started on Oct-31 (photo 9, 10, 11).

By starting daily observation at KSU, the CHAIN project came to be able to monitor the Sun for 24 hours continuously without blank time all year round, with including solar observations at Japanese and Peruvian CHAIN stations.

Photo 2: Carrying the fork-mount of the FMT in the astrodome (Dec 2014)

Photo 3: Assembling the FMT (Dec 2014)

Photo 4: Assembling focus-adjustment systems (Oct 2015)

Photo 5: Adjustment of the allignment of objective lenses (Oct 2015)

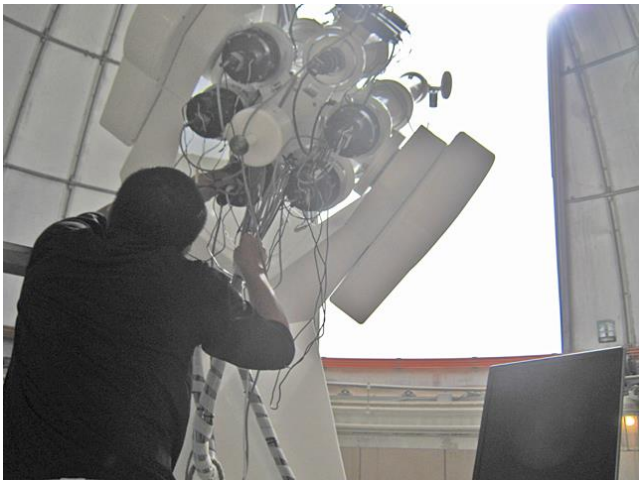

Photo 6: Adjustment of observational wavelengths of optical filters (Oct 2015)

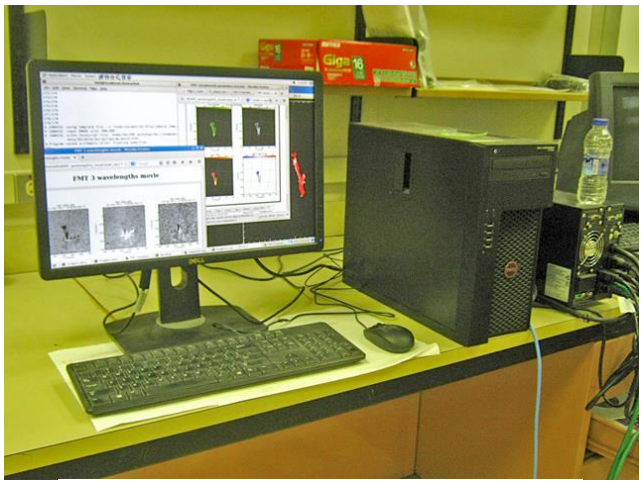

Photo 7: The Linux computer in which data-analysis software was installed

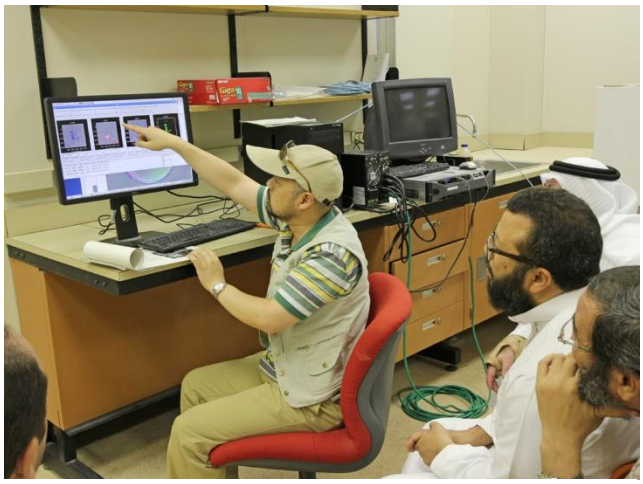

Photo 8: Training of data-analysis of the FMT-data for Saudi Arabian researchers (Oct 2015)

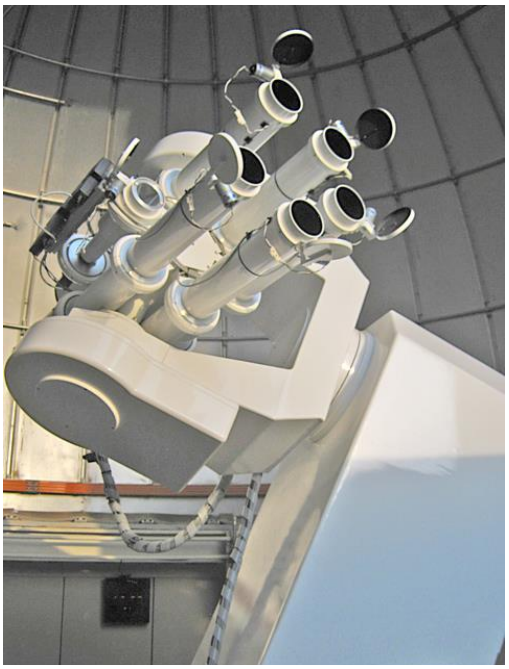

Photo 9: The completed FMT that started daily solar observation (Oct 2015)

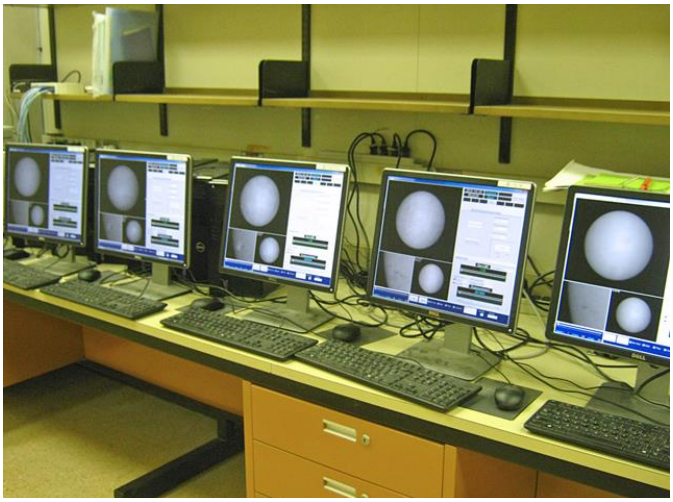

Photo 10: Monitors of each solar image in the control & data-analysis room (Oct 2015)

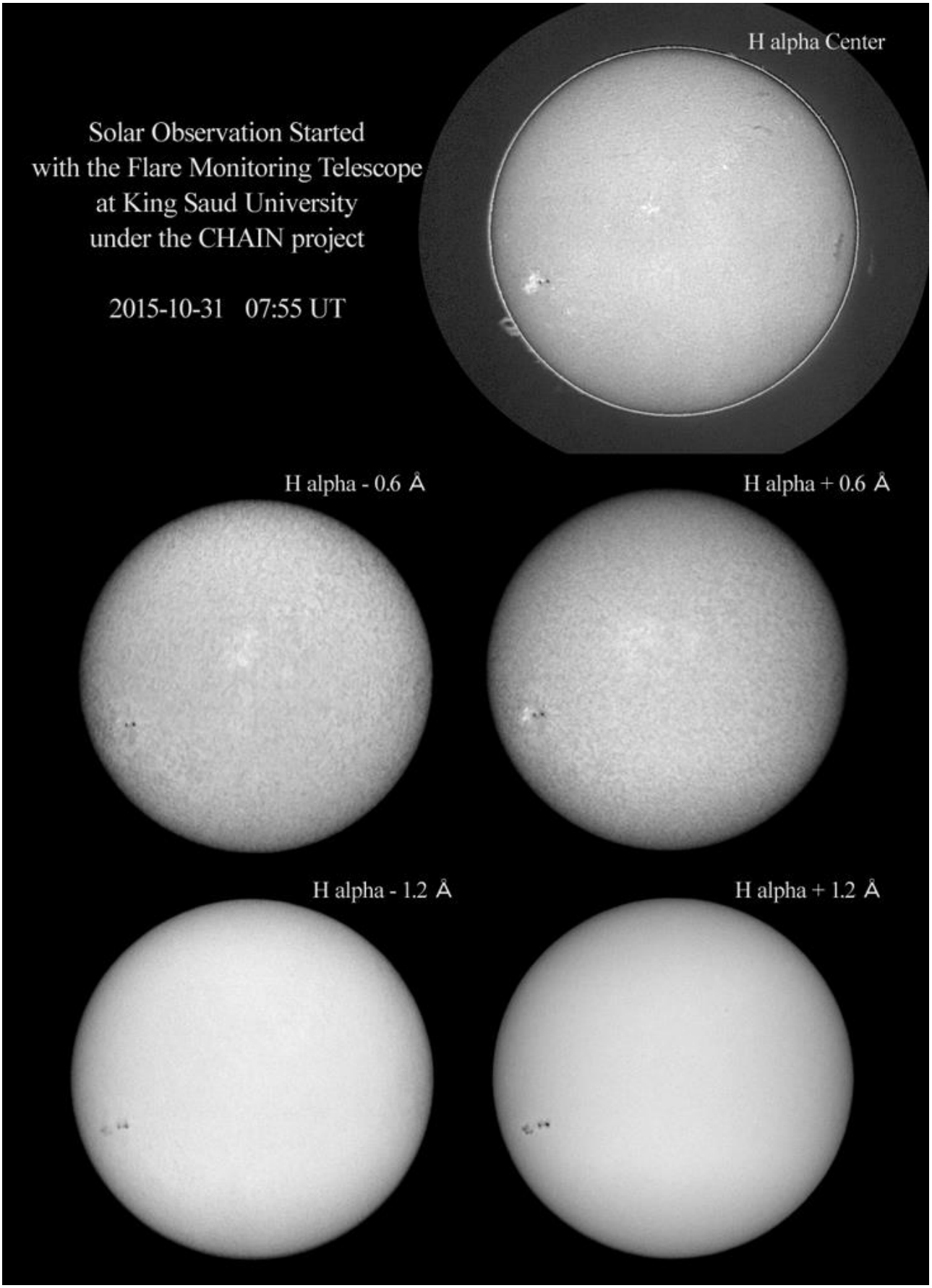

Photo 11: Five kinds of solar images at different wavelengths around H-alpha absorption line on the first day of daily observation with the Saudi Arabian FMT