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The GMT-Consortium Large Earth Finder (G-CLEF) is the very first light instrument of the Giant Magellan Telescope (GMT) to be commissioned in 2022. The instrument is a fiber feed, optical band echelle spectrograph that is capable of extremely precise radial velocity measurement. Korea Astronomy and Space Science Institute (KASI) has been involved in the development of the G-CLEF as one member of the international consortium consisted of five astronomical institutes including Smithsonian Astrophysical Observatory (SAO), Observatories of the Carnegie Institution of Washington (OCIW). It is scheduled to have KASI side Critical Design Review in December 2017. In this presentation we will report the recent progress on the critical design activities for the G-CLEF Flexure Control Camera (FCC).

#### [구 AT-03] Development of KHU Automatic Observing Software for McDonald 30inch telescope (KAOS30)

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Automatic observing is the most efficient system for sky surveys that image many targets over large areas of the sky. Such a system requires the integrating control software that systematically manages astronomical instruments that are not connected to each other. In February of 2017, we installed a wide-field 10 inch telescope for Supernovae survey on the McDonald 30 inch telescope as a piggyback system. However, during

the observations, information such as target coordinates could not be exchanged with the telescope mount. The reason is the program that controls the telescope control system (TCS) and the program that controls the imager operate on independent PCs. KAOS30 is an integrated observing software developed to improve this environment. The software is composed of four packages that are the Telescope Control Package (TCP), the Data Acquisition Package (DAP), the Auto Focus Package (AFP), and the Script Mode Package (SMP). The TCP communicates to the TCS and also communicates weather information. SMP supports automatic observing in a script mode, which improves the efficiency of the survey. KAOS30 was developed based on Visual C ++ and runs on the Windows operating system. It also supports the ASCOM driver platform for various manufacturers. The instruments that support ASCOM can be installed without modification of the program code. KAOS30 can be applied as software for many different telescopes in future projects.

#### [구 AT-04] Plan of the Extended KVN (KVN 확장 계획)

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KVN is a millimeter VLBI array composed of three 21m-diameter radio telescopes at Seoul, Ulsan and Jeju island in Korea. KVN has unique simultaneous multi-frequency receiving systems, which enable us to correct phase fluctuation of troposphere by transferring phase solution of low frequency data to higher frequency data. Although KVN can achieve very high performance up to 130 GHz through multi-frequency technique, imaging capability is highly limited because of lack of the number of baselines. In order to enhance imaging capability and maximizing multi-frequency capability, we plan to extend KVN baselines from 3 to 10 (or more) by constructing new KVN stations. This talk introduce expected performances, science cases, required budgets and periods of the Extended-KVN.

#### [구 AT-05] ASTE receiver optics design using ultra wideband corrugated horn at combined ALMA band 7 and band 8 frequencies

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We report the detailed design of an unprecedented wideband(band7+8) corrugated feed horn in ASTE focal plane array aiming for future ALMA receiver. We have found that such design constraints as return loss, cross-polarization level, beam width and phase curvature can be controlled by optimizing critical corrugation parameters at the throat and flare region of the horn. The success of optimization manifest itself through simulated aperture efficiency over 80 % at the entire frequency range. Physical implications of the resulting corrugation parameters are discussed.

**[구 AT-06] The Performance of Flight Model of the NISS onboard NEXTSat-1**

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The NISS (Near-infrared Imaging Spectrometer for Star formation history) is the near-infrared spectro-photometric instrument optimized to the first Next Generation of small satellite (NEXTSat-1). The off-axis optics was developed to cover a wide field of view with 2 deg. x 2 deg. as well as a wide wavelength range from 0.95 to 2.5 $\mu$ m. Considering the simple alignment scheme, afocal system was adapted in the optical components. The mechanical structures were tested under the space environment. We have obtained the accurate calibration data using our test facilities under the operational condition. After the final integration of flight model into the satellite, the communication with the satellite and the functional test were passed.

The NISS will be launched in early 2018. During around 2-year operation, the spectro-photometric survey covering more than 100 square degree will be performed. To achieve the major scientific objectives for the study of the cosmic star formation in local and distant universe, the main observational targets will be nearby galaxies, galaxy clusters, star-forming regions and low

background regions. Here, we report the final performance of the flight model of the NISS.

**동아시아천문대**

**[구 EAO-01] East Asian Observatory: Current Status and Future Prospect**

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The special session of the East Asian Observatory was prepared to let the Korean Astronomical Community know the current status and future prospect of the EAO, and to hear the opinion from the community. The East Asian Observatory (EAO) was formulated on September 5, 2014 by East Asian Core Observatories Associations (EACOA) as a non-profit company registered in the State of Hawaii. As a first mission of the EAO, it has successfully operated the James Clerk Maxwell Telescope (JCMT) since March 2015. The Submillimeter Array (SMA) has been available to the East Asian astronomers from 2017A season through the EAO, and the Subaru and the East Asian VLBI Network (EAVN) are the possible facilities to be available in near future.

**[구 EAO-02] Report on the Current Status of EAO/JCMT**

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The JCMT is now in its third year of operations under EAO management. During this past year, we continued with calls for regular PI programs as well as the second call for Large Programs. The performance of SCUBA-2 has been improved by replacing internal optical filters. The 230GHz Receiver A is in the process of being replaced by a new closed-cycle system. The SCUBA-2 polarimeter, POL-2, commissioned during the past year, has been working very well in measuring the magnetic field structures in molecular clouds. The JCMT successfully participated in the Event Horizon Telescope experiment during April 2017, which utilized the phased-up ALMA for the first time. The first round of Large Programs are nearing completion, with first publications beginning to be published. The JCMT continues to welcome inputs from the community, and the next users meeting will be