Session:	**[B5A-1] S1 : Solar System and Sun-Earth Interactions**
Date:	August 22, 2014 (Friday)
Time:	09:00~10:25
Room:	Room A (Room 101~102)
Chair:	Shuhrat Ehgamberdiev (Ulugh Beg Astronomical Institute)

[B5A-1-1] **09:00~09:20**

[Invited] The Observations of Comet 67P/C-G from the Ground-Based Telescopes and from In-Situ Instruments of Rosetta Spacecraft

Zhong-Yi Lin (National Central University, Taiwan), Wing-Huen Ip, and OSIRIS Team

ESA's Rosetta spacecraft has awoken from its long hibernation in mid-January 2014 and now is the way on its destination, comet 67P/Churyumov-Gerasimenko. The spacecraft will follow the comet 67P/C-G as it comes back to the perihelion (2015), monitoring the activity and releasing a lander to study the surface in-situ. We will summarize the monitoring results from the ground-based telescopes during its last perihelion passage (2009) and present the last observations (2014) of comet C-G. In parallel, the last images and preliminary results of comet 67P/C-G in-situ from Rosetta spacecraft's instrument, OSIRIS' camera, will also be presented.

[B5A-1-2] **09:20~09:40**

[Invited] Astrometry for Natural Satellites of Planets in China

Q. Y. Peng (Jinan University, China), A. Vienne, Q. F. Zhang, N. Wang, and Z. Li

Astrometric observation for natural satellites of some major planets has been regularly performed in China since the 1990s. These satellites are mainly involved with the major satellites of Jupiter, Saturn, Uranus and Neptune. Different telescopes with apertures from 30 ~ 240 cm have been used. The observed approaches are mainly CCD tangent plane astrometry as well as photometric astrometry for some mutual events appearing in the satellite systems of Jupiter and Saturn. Several novel observational and image-analytic techniques are successfully developed for improving the precision of observations. Many observations as much as several thousands have been published with quite good precision.

[B5A-1-3] **09:40~09:55**

Non-LTE and LTE Emissions of the 3.3-micron Bands of CH4 in the Auroral Regions of Jupiter

Sang Joon Kim (Kyung Hee University, Korea)

We developed radiative transfer programs to simulate the auroral emissions of the V^3, V^3+V^4-V^4 and V^2+V^3-V^2 bands of CH_4 in the auroral regions of Jupiter. We investigated non-LTE (local thermodynamic equilibrium) and LTE processes in the auroral regions considering excitations by auroral particle precipitations as well as fluorescent excitations by sunlight. We will discuss the magnitudes of the auroral excitations vs fluorescent excitations based on available high-altitude mixing ratios of CH_4 from the most updated hydrocarbon photochemistry of the auroral regions in literature. Our study on the non-LTE and LTE emissions of the CH_4 bands provides an aide for the analysis of the near-infrared data of CH_4 expected from Juno, a NASA New Frontier mission, which will arrive in July, 2016 and be placed in a polar orbit to study the polar regions of Jupiter.

[B5A-1-4] **09:55~10:10**

Temporal Variations of Io's Magnetic Footprint Brightness

Suwicha Wannawichian (Chiang Mai University, Thailand) and Tatphicha Promfu

The brightness of Io's magnetic footprint, an indicator of electromagnetic interaction at the satellite, appears to be strongly connected to the satellite's distance from the plasma equator. As a result, the brightest footprints were detected when Io is near the interception location between the satellite's orbital plane and the plasma equator. However volcanic activities on Io show strong correlation with the equatorward shift of Jupiter main auroral oval, consequently causing the disappearance of Io footprint. The same conclusion was suggested via the observation of Jupiter's hectometric radio emission called HOM, which closely corresponds to Jupiter's auroral activity. The plasma environment near the Jovian satellites was found to vary significantly in different observational epochs. The electron density increased by approximately a factor of three from the Voyager epoch (1979) to the Galileo epoch (1995), while the electron density was found to be significantly higher (~ 5 times) in the Cassini epoch (2001). In this current study, the magnetic footprints were clearly brighter ten years ago (from peak brightness in 1998-2001) than the footprints detected in 2007. For volcanoes activities on Io in 2007, there are two clear activities in February and late May. The magnetic footprint appears to be dimmer in March 2007, expectedly resulted by the volcano activities in Feb 2007. However the magnetic footprint brightness in June appears to be slightly brighter than the footprints observed in May. The reason could be the time delay between the brightening of sodium nebula in approximately May 31st and, a while later, the enhancement of flux tube content peaks in approximately June 5th. On the other hand, Io's magnetic footprints were observed during June 1st - 10th which may not be yet affected by the increasing of mass outflow due to the increasing of plasma density.

[B5A-1-5] **10:10~10:25**

The Study of Minor Planets at the Maidanak Observatory

O. A. Burkhonov (Ulugh Beg Astronomical Institute (UBAI) of the Uzbekistan Academy of Sciences, Uzbekistan), Sh. A. Ehgamberdiev, K. E. Ergashev, F. Yoshida, T. Ito, and Yu. N. Krugly

The international program of observations of minor planets is carried out by joint efforts of Tashkent (UBAI), Tokyo (NAOJ) and Kharkov (IAKhNU) scientific groups, which is named as "Maidanak collaboration". Maidanak observatory (Uzbekistan) is located at the west edge of Pamir Mountains and has the excellent seeing conditions. There are at least three important science aspects: (1) The main purpose of the observations of main belt asteroids (MBAs) is getting lightcurves to determine the periods of rotation of asteroids (Uzbekistan team). This task arises from the fact that the fundamental spin parameters are unknown for majority of MBAs. (2) The Multi color observations of young family asteroids (NAOJ and UBAI). The purpose is to obtain the fresh information of the family forming events which is essential for investigating the physical process of the asteroid collisional impact. (3) CCD photometry of near-Earth asteroids (NEAs) and the observations are also aimed to search for binary asteroids (IAKhNU and UBAI). It is well known the NEAs are good candidates to detecting YORP effect.

During the previous period of observations in 2011-2013 years, a huge set of observational data for more than forty asteroids were gathered in the frame of Maidanak collaboration. All observational data are obtained by using the 60-cm Zeiss-600 ("North") telescope, 1k x 1k FLI IMG1001E CCD camera with the resolution of 0.67 arcsec/pixel, FOV of 10.7' x 10.7' and Bessel filters. The temperature of the camera was set to –30°C. The most recent multicolor observational data were obtained by using the 1.5 meter ("AZT") telescope with the 4096 x 4096 SNUCAM camera provided by Seoul National University. The images taken with this CCD camera have pixel scale of 0.268 arcsec/pixel and FOV of 18.1' x 18.1'. The temperature of the camera was set to –108°C.

All images of studied asteroids were reduced with master bias, dark, and flat frames. Calibration frames were created using IRAF (Image Reduction and Analysis Facility). Instrumental star magnitudes were also obtained using IRAF, with zero point set to 25 mag. For estimation of extinction coefficient, we used photometric standard stars from Landolt catalogue. We used LS periodogram for period analysis of the photometric data. We have also used two other software packages: "Period04" and "cyclocode" to confirm the resulting period.

In the frame of the research, we have determined rotation periods (for five asteroids), color indices (for three asteroids), and estimated the size and shape for one asteroid which has not been previously studied.