GHOU2007 Junior Session

Global Hands-On Universe Conference 2007
Student Junior Session

(GHOU 2007 Tokyo, Day 4)

July 16, 2007 9:00-12:00

9:00-11:00 Oral session
11:00-12:00 Free discussion

Large Seminar Room, Data Analysis Bldg.

Natinal Astronomical Observatory of Japan (NAOJ), MITAKA campus

AGENA

GHOU 2007 Tokyo, Day 4 (July 16 Mon/holiday) @ NAOJ-Mitaka

Junior Session chair **K.Nonaka**

9:00	9:10	F01b	"***Activities of Astronomy and Meteorology Club***", Ino et al. (Koshigoe-Kita HS)
9:10	9:20	F02b	"***Laboratory simulation for some characterics of asteroid(25143) Itokawa***", Shimura (Seikei HS)
9:20	9:40	F03a	"***A models of the shapes of three selected minor planets***", Fjii et al. (Kokura HS)
9:40	9:50	F04b	"***Photometric observation of the cataclysmic variable star IP Peg***", Goto & Terada (Rakuto HS)
9:50	10:00	F05b	"***Spectrum of stars observed with Bisei astronomical observatory and self-made fiber type spectroscope***", Kunitomo et al. (Okayama Shodai Fuzoku HS)
10:00	10:10		**coffee break**
10:10	10:20	F06b	"***The H alpha radial velocities of an arch filament system in solar emerging flux region***", Kawahara (Rakuto HS)
10:20	10:30	F07b	"***Spectral analysis of Saturn***", Shinozaki et al. (Keio HS)
10:30	10:50	F08a	"***In order to know our Galaxy --Presentation of Data and Method for Measuring the Spin velocity of the Galaxy***", Miyagi & Kawaguchi (Hyogo Kenritsu Univ. Fuzoku HS)
10:50	11:00	F09b	"***Observation of the Sun with the Smallest Radio Telescope in the World***", Osawa (Sugamo HS)

Abstracts of presentations

F01b

Activities of Astronomy and Meteorology Club

天文気象部の活動

Saitama Prefectural Koshigaya-Kita Senior High School, Astronomy and Meteorology Club

Akiko Ino , Kanako Susuki , Ayaka Moro , Ryota Okuma , Takahiro Takeuchi

埼玉県立越谷北高等学校 天文気象部

猪野　亜季子・鈴木　佳南子・茂呂　彩花・大熊　瞭汰・竹内　貴大

At present, there are 16 members in our club. We have a meeting once a week and we discuss our schedule. The first purpose of our club is to enjoy watching stars. For example, we watch stars once a month on the roof of the school-building and we go once a year to places such as mountain, where there are few town lights. The second purpose is to study about Space and Earth. So, we have opportunities for the presentation of those results in the school festival or some contests. This year, we set up two study groups “Meteors” and “Lunar eclipse”. In this presentation, we introduce our observations and our activities of school festival, and report "Light Curves of Meteors" that we studied in 2006.

F02b

Laboratory simulations for some characteristics of asteroid (25143) Itokawa

小惑星(25143)イトカワに関する室内実験

Seikei Astronomy and Meteorology Club

成蹊高等学校天文気象部

The spacecraft “Hayabusa (Falcon) = Muses C” is a sample return mission to the asteroid (25143) Itokawa. Hayabusa reached the target on Sept. through Dec. 2005, and measured the surface topography, mass, gravity and the other features. These data reveal that Itokawa is rubble-pile asteroid and the global Itokawa as “sea otter” like shape, and has two distinct parts such as rough terrain and smooth one. JAXA made 1/2000 precise scale model of Itokawa using the Hayabusa data.

We observed this model, and strike upon some laboratory simulations to examine the characteristics of Itokawa. One is making in situ lightcurve of the Itokawa model using band-pass filtered cooling CCD camera. We put the model on the rotating stage lighted by OHP as a light source, and measured refrected light intensity. The light curve is so complicated in the shape correlate with the ground observation, so that we suppose the reasons of the anomaly are resulted complex shape of the asteroid, or experimental error of photometry.

The other experiment is to make the landform feature of Itokawa. We demonstrate experimental simulations of the seismic segregation on boomerang-shaped slopes likely to Itokawa with vibration exciters. Peridotite sand (3.2g/cm3) was adopted as regolith simulant. This simulation showed that particles allocation in size controlled surface features. A higher contents of smaller grains and gentle slope tend to bring the similar dichotomy of surface. Plausible process of the landform formation is the seismic segregation in boulders and regolith induced by impacts. Our experiment strongly supported the hypothesis.

F03b

Models of the shapes of three selected minor planets

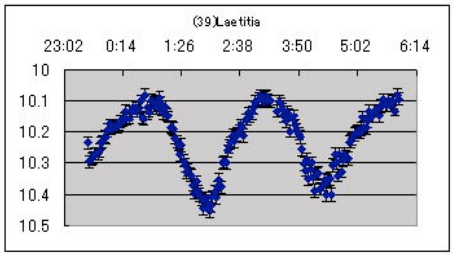
３つの小惑星に関する形状モデル

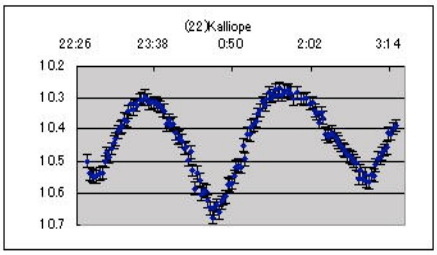
Fukuoka Prefectural High School

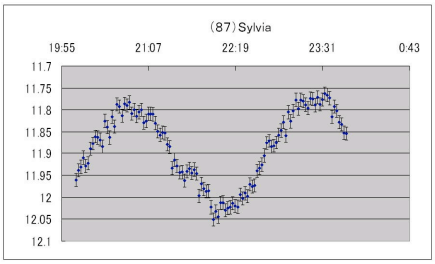
Ryou Fjii , Honoka Kushida , Naoya Misumi , Daisuke Shinokawa

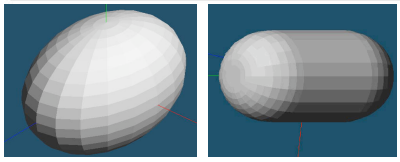
福岡県立小倉高等学校　　藤井　涼、串田穂野香、三隅直哉、篠川大輔

We present models of the shapes of three selected minor planets, (22)kalliope, (39)Laetitia, (87)Sylvia, whose luminosities change keenly and whose rotational cycles are short.　The following is process of the observation.　First, we measured the luminosities by a CCD photometric measurement attached on a 20-centimeter Newtonian telescope, and we completed the light curves of the three minor planets we observed.　Finally we made miniatures which have the same light curves.









Model A　(87)Sylvia

Model B　(22)kalliope, (39)Laetitia

Model A　　Model B

F04b

Photometric observation of the cataclysmic variable star IP Peg

激変星 IP Peg の測光観測

Rakutou High School

Kasumi Goto, Ayano Terada

京都府立洛東高等学校

後藤香寿美，寺田彩乃

Using 40cm telescope at Kyoto University's roof observatory, we performed photometric observation of the cataclysmic variables (CV) star IP Peg. CV is the binary system; the central star is compact star with accretion disc (AD) and companion star is red giant. When gas flow from companion star to hot spot of AD, the brightness change rapidly. IP Peg is famous bright CV (mv=14mag) in northern hemisphere. The rotational period is 3.8 hours. Automatic observations were performed, which exposure times are 30 sec. Observing Date is 18:53~21:25 Dec 23rd of 2006 (JT). Using iraf system at Kyoto university and Makali`i (Subaru image processing software) at school, we obtained the light curve of IP Peg. Using the IDL system at Department of Astronomy, Kyoto University, the light curve was compared with simulation light curves. Derived inclination and angle of hot spot with companion star are 85° and 25° , respectively. The simulation code was made by Mr. Sugiyasu.

We thank staffs of Department of Astronomy, Kyoto University for helping observations.

F05b

Spectrum of stars observed with Bisei astronomical observatory

And self-made fiber type spectroscope

恒星のスペクトルを観察し、その特徴を調べる

Okayama Shoka University High School nature science club

Kazuki Kunitomo, Ryo Ishii, Yasuhiro Nakata,

Yukihiro Matsumoto, Kazuki Hama, Ikuya Miyamoto

岡山商科大学附属高等学校　自然科学部

国友和樹，石井涼，仲田泰浩，松本透浩，浜一輝，宮元侑也

We can get a lot of informations concerning, temperature, the composition and the distance etc. of astronomical objects by analyzing its spectrum. In star school 2006 at Bisei Observatory, we observed various astronomical objects using 101 cm reflecting telescope. We analyzed the spectrums of those fixed stars and examined the peculialities of them. Moreover, we obserbed them by using fiber spectroscope of our own making for"MEAD LX200GPS-30 ".The analytical result is announced.

F06b

The H-alpha radial velocities of an arch filament system in solar emerging flux region

浮上磁場領域の視線速度分布

Rakutou High School

Shino Kawahara

京都府立洛東高等学校

河原　梓乃

Using the 70cm coelostat telescope and high dispersion spectrogram, we observed the solar surface phenomena at Kwasan observatory from 7th to 11th Aug.2006. We found sunspots which seemed to have just appeared at the east end of the sun about 2:30 at 10th Aug.2006 (UT). There were black bands among east and west sunspots on H-alpha image. These bands are called Arch Filament System (AFS) in solar emerging flux region (EFR).We examined distributions of velocity in AFS by means of Doppler shift measurements of H-alpha lines. The mean radial velocities from 12 observations obtained from 0:42 to 1:56 on 11th Aug. are as follows; +2.1km/s ±1.13km/s (the eastward), -13.1km/s ±2.8km/s (the center),-0.5km/s (the westward).

We thank Drs. Shibata, Kurokawa, and Ishii, and staffs of Kwasan observatory.

This work was supported by SPP/JST (2006).

F07b

Spectral Analysis of Saturn

土星のスペクトル観測

Keio Senior High School

Shun, Shinozaki　Yutaro, Ao　Ryosuke, Nyui　Atsushi, Takei

慶應義塾高等学校

篠崎　駿，　青　祐太朗，　乳井　亮介，　武井　敦史

We investigated the atmospheric element of Saturn and calculated the relative velocity between Saturn’s ring and the main body by using spectral data at the Gunma Astronomical Observatory. To investigate the atmospheric element, we compared the spectrum of Saturn’s body with that of the ring. Then, we specified the wavelengths of absorption spectrum. After this investigation, we found methane and ammonia in the atmosphere of Saturn. To calculate relative velocity between Saturn’s ring and the main body we drew on approximate curve, calculated the local minimum and its coordinate. Then, we calculated the relative velocity by using Formula the Doppler Effect Formula. We consider the difference between our relative velocity and that of the reference materials. In order to know our Galaxy－ Presentation of Data and Method for Measuring the Spin Velocity of the Galaxy

F08b

In order to know our Galaxy --Presentation of Data and Method for Measuring the Spin velocity of the Galaxy

The High School of University of Hyogo

Miyagi Takayuki, Kawaguchi Natsuki

兵庫県立大学附属高等学校

宮城　宇志，川口　夏樹

In order to examine/ determine how our own galaxy rotates, we decided to observe and measure the rotational velocity of galaxies far from us.

With the aid of the Nayuta telescope in Nishi Harima Astronomical Observatory, we conducted a spectral observation and a spectral analysis on visual light traveling from galaxies such as M63, M64, M82, M90, and M106. Then we calculated the difference in wavelength of samples taken from within the same galaxy, which may be explained by the Doppler effect.

We observed that galaxies rotate in a spiral formation, much like a whirlpool in which the center twists at a greater velocity than the periphery. Furthermore, we found that the rotational velocity at the edge of galaxies fell between 200km/s and 300 km/s. We decided to investigate the reason for this relatively minor variation, taking into consideration the size of the galaxies, their absolute magnitude, their rate of activity, and age.

We also investigated the galactic spiral structure, inferring their mass-distributions from the difference in brightness of samples taken from individual galaxies at specified distances from the center. We also applied the Newton's Law of Universal Gravitation to the rotational velocity data and arrived at contradictory mass distributions. After checking and re-checking all variables of our research, we attributed the differences in results to dark matter in the universe, whether inside the observed galaxies or in between those galaxies and our own.

Our research is still underway.

F9b

The Observation of the Sun with the Smallest Radio Telescope in the World

世界で一番小さい電波望遠鏡で太陽を観る

Sugamo High School Earth Science Club

Oki OSAWA

巣鴨高等学校地学班

大澤 大

The author observed the Sun with “the Smallest Radio Telescope in the World” (Mr. Junichi Nakajima, 2004). The diameter of the antenna used is 35cm. From observations of the Sun, it was found that the antenna was receiving the radio from around 10 degrees (this equivalent to 20 apparent Sun diameters).

Resolutions were found to be about 4.1 degrees given the diameter of the antenna. Width at half minimum can be said resolutions from the observations. This is the time width the tester indicates over the average between maximum and minimum. Thus Width was found to be 4.3 degrees considering the velocity of Earth rotating.

All things considered, the brightness temperature of the Sun was found to be from 9,000[K] to 10,000[K]. The author observed the radio whose frequency is 12GHz (wavelength is 2.5cm) as large as that of BS coverage in Japan. As the author referred to the papers indicating what he observed with the radio under 30cm is not corona but chromospheres, this was found to be of “chromospheres”.