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We also find that additional bipolar neutral regions moving away with a speed  $\sim 70 \text{ km s}^{-1}$  in the directions perpendicular to the orbital plane provide considerably improved fit to the red wing parts of Raman features.

**[포SA-04] Intensive Monitoring Survey of Nearby Galaxies: Current Status**

Myungshin Im<sup>1</sup>, Changsu Choi<sup>1</sup>, Gu Lim<sup>1</sup>, Sophia Kim<sup>1</sup>, Seunghak Gregory Paek<sup>1</sup>, Joonho Kim<sup>1</sup>, Sungyong Hwang<sup>1</sup>, Suhyung Shin<sup>1</sup>, Insu Baek<sup>1</sup>, Sangyun Lee<sup>1</sup>, Sung A O<sup>1</sup>, Sung Chul Yoon<sup>1</sup>, Hyun-Il Sung<sup>2</sup>, Yeong-Beom Jeon<sup>2</sup>, Sang Gak Lee<sup>3</sup>, Wonseok Kang<sup>3</sup>, Tae-Woo Kim<sup>3</sup>, Sun-gil Kwon<sup>3</sup>, Soojong Pak<sup>4</sup>, Shuhrat Eghamberdiev<sup>5</sup>, and IMSNG Team

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SNe light curves have been used to understand the expansion history of the universe, and a lot of efforts have gone into understanding the overall shape of the radioactively powered light curve. However, we still have little direct observational evidence for the theorized SN progenitor systems. Recent studies suggest that the light curve of a supernova shortly after its explosion ( $< 1 \text{ day}$ ) contains valuable information about its progenitor system and can be used to set a limit on the progenitor size,  $R_*$ . In order to catch the early light curve of SNe explosion and understand SNe progenitors, we are performing a  $\sim 8\text{hr}$  interval monitoring survey of nearby galaxies ( $d < 50 \text{ Mpc}$ ) with 1-m class telescopes around the world. Through this survey, we expect to catch the very early precursor emission as faint as  $R=21 \text{ mag}$  ( $\sim 0.1 R_{\text{sun}}$  for the progenitor). In this poster, we outline this project, and present a few scientific highlights, such as the early light curve of SN 2015F in NGC 2442.

**교육홍보 & 기타**

**[포SE-01] IAnalysis of Michigan catalog of HD stars**

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<sup>1</sup>National Youth Space Center, <sup>2</sup>Seoul National University

지금으로부터 100년 전, 하버드대학교 천문대에서 에드워드 찰스 피커링과 윌리엄 플레밍, 애니 점프 캐넌 등의 여성 천문학자들이 분광관측 자료를 가지고 헨리 드레이퍼 목록(HD catalog)을 만들기 시작했다. 이는 항성 분류의 근간을 마련하고 현대 천문학의 본격적인 시작을 알리는 일이었다. 현재 국립청소년우주센터는 이를 기념하여, 디지털 이미지로 보유중인 1975년에서 1999년에 걸쳐 발간된 『Michigan catalog of HD stars』의 사진건판을 활용한 연구를 진행 중이다. 본 센터를 방문하는 청소년이 100년 전 그들과 한 것과 같은 고전적 항성 분류 과정을 체험하며, 별의 스펙트럼을 이해하고 우주를 이해하는데 필수적인 분광학에 대한 이해를 높이기 기대한다. 이를 위한 선행 작업인 대물프리즘 사진건판 이미지에서 별의 스펙트럼을 추출하는 과정을 소개하고자 한다.

**[포SE-02] Development of the Astronomy Education Program for Elementary Students and Astronomy Outreach Initiative : 초등학생 천문교육 프로그램 개발을 통한 천문학 대중화**

Jinhee Yu<sup>1,2,3</sup>, Seunghyun Kim<sup>2</sup>, Yongik Byun<sup>3</sup>, San NamKung<sup>1,2</sup>, Eunseok Lee<sup>2</sup>, Donggan Park<sup>2</sup>, Hyunsik Jo<sup>2</sup>, Hyunyoung Lee<sup>1,2</sup>, Yojun Hyun<sup>2</sup>, Jungmin Kim<sup>1,2</sup>, Jeehye Yu<sup>1,2</sup>, Honggyu Lee<sup>2</sup>

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어린이천문대는 2003년부터 15년간 어린이들의 천문 지식 함양과 과학탐구 능력의 향상을 도모하기 위해 수준별 3단계 프로그램을 연구 개발해왔다. 우리의 3단계 천문교육 시스템은 저학년을 대상으로 한 체험교실, 고학년을 대상으로 한 탐구교실, 그리고 탐구교실을 수료한 학생들을 위한 심화 단계인 테마교실로 이루어져 있다. 단계별 교재, 교보재, 관측실험 및 시각자료의 개발을 통해 프로그램의 완성도를 높여왔다. 우리의 천문교육 프로그램으로 교육된 누적 인원은 모두 67986명(2018년 3월 31일 기준)에 달한다. 그중 천문학 진출 사례로는 페리저로켓의 신동윤 대표와 다수의 천문학 전공 학생들이 있다. 전문적인 초등학생 천문교육 프로그램의 지속적인 연구개발을 통해 대한민국 천문학 대중화에 이바지할 수 있을 것으로 기대된다.

**[포SE-03] Citizen Science in KMLA**

Sukbum A. Hong, SeungJunRhee, Jeongjun Yun, Minseok Kim, Seung Ho Lee, Jaihyun Kim, Gukmyeong Son

Korean Minjok Leadership Academy

We present a study of citizen science performed at Korean Minjok Leadership Academy (KMLA). The importance of citizen involvements in scientific

studies has been increasing, with remarkable results and performances. For instance, the discovery of an impact scar near Jupiter's south polar region (A. Wesley, 2009) led to an international campaign of professional observations to understand the asteroidal collision responsible for the scar. Citizen science at KMLA has been and will be mainly conducted by members of the astronomical observation club 'Apple-Pie' through amateur telescopes. Members of 'Apple-Pie' are specialized in various fields related to astronomy, from planetary science to cosmology. The spectrum not only includes fields that are directly related to astronomy but also fields such as computer science and astrophotography. The scheduled construction of a new observatory will further enable students to participate in higher level projects such as planetary monitoring over long timescales and the observation and detection of solar system bodies and exoplanets. In addition, a new supervisor with expertise and research experience in galactic astronomy, planetary science, and meteorology has joined the school faculty. He will supplement students with fundamental theoretical backgrounds and essential research techniques to enhance astronomical research at KMLA. KMLA's ultimate goal is to deploy a remote-controlled observatory available to aspiring scientists around the world to create a network of citizen science system. The prime observational conditions of KMLA and the willingness of the students and faculty members will provide a competitive edge for KMLA over other similar institutes in Korea.

**[포SE-04] ctivity Report of Young Astronomers Meeting in 2017-18 Season**

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지난 2017년 4월, 젊은 천문학자 모임 (Young Astronomers Meeting, YAM) 정기총회에서 2017-18년도 임원진으로 회장 최두현 회원(세종대학교), 부회장 김진협 회원(연세대학교), 총무 한두리 회원(충남대학교)를 선출하였다. 임원진은 경북대학교 김동현 회원, 경희대학

교 박소명 회원, 과학기술연합대학원 박민아 회원, 서울대학교 김소피아 회원을 학교별 운영위원으로 임명하였다. 현 임원진은 본 모임의 온라인 소식지인 <하늘 사랑>을 2017년 가을에 7호, 2018년 봄에 8호를 발간하였다. 이와 더불어 2017년 일본 이시가키에서 개최된 EAYAM에 권유나 회원 외 6명의 회원이 참여하여 동아시아 젊은 천문학자들과 함께 학술 발표 및 교류를 하였다. 2018년 2월에는 We Love Galaxies - Young Astronomers Meet Universe 워크샵을 개최하고 YAM의 지속적인 학술 모임을 위한 기반을 다졌다. 이번 포스터에서는 2017-18년도 동안의 활동 내용을 보고하고 이후의 계획에 대해 논의하려고 한다.

**성간물질/별생성/우리는하**

**[포IM-01] IGRINS observations of a Herbig Be star, MWC 1080**

Il-Joong Kim<sup>1</sup>, Heeyoung Oh<sup>1</sup>, Woong-Seob Jeong<sup>1</sup>  
<sup>1</sup>Korea Astronomy and Space Science Institute

Through MIRIS Pa $\alpha$  Galactic plane survey, a lot of Pa $\alpha$  blobs were detected along the plane. To reveal their characteristics, we are planning to collect NIR high-resolution spectroscopic data for them by using Immersion GRating INfrared Spectrograph (IGRINS). Here, we present the preliminary results of the IGRINS observations for a Herbig Be star, MWC 1080, which is one of the Pa  $\alpha$  blobs detected in Cepheus. This Herbig Be star is known to possess a lot of young stellar objects (YSOs) and bright MIR (10-20  $\mu$ m) nebulosity in its vicinity. From IPHAS H $\alpha$  data, we revealed large extended H $\alpha$  features that correlate well with MIR and 13CO morphologies around MWC 1080. A part of the H $\alpha$  features shows a bow shock shape to the northeast of the primary star MWC 1080A, which seems to be due to an outflow from MWC 1080A. Through IGRINS observations, we detected faint [Fe II]  $\lambda$ 1.644  $\mu$ m and H2 1-0 S(1)  $\lambda$ 2.122  $\mu$ m emission lines around the bow shock feature. Interestingly, to the east region of MWC 1080A, we also detected strong [Fe II] and H2 emission lines with a couple of velocity components, which suggests the detection of a new outflow from another YSO. Broad Br $\gamma$   $\lambda$ 2.1662  $\mu$ m line and H2 lines with various velocity components were detected around the bright MIR and H $\alpha$  nebulosity as well.

**[포IM-02] High-resolution Optical and Near-infrared Monitoring Observations of 2MASS J06593158-0405277**

Sunkyung Park<sup>1</sup>, Jeong-Eun Lee<sup>1</sup>, Tae-Soo Pyo<sup>2</sup>, Hyun-Il Sung<sup>3</sup>, Sang-Gak Lee<sup>4</sup>, Wonseok Kang<sup>5</sup>,