

intrinsically carries a bias due to noise in the distance estimates. We provide convolution- and deconvolution-based algorithms capable of removing this bias -- thus able to exploit the full cosmological information -- in order to reconstruct intrinsic distributions and correlations between distance-dependent quantities. We then show some direct applications of our techniques to the VIMOS Public Extragalactic Redshift Survey (VIPERS) and the Sloan Digital Sky Survey (SDSS) datasets. Our methods impact a broader range of studies, when at least one distance-dependent quantity is involved; hence, they will be useful for upcoming large-volume surveys, some of which will only have photometric information.

## 태양계

### [포 SS-01] A Study on Rima Hadley Region of the Moon Using Moon Mineralogy Mapper(M3) Spectra (M3 스펙트럼 데이터를 이용한 달 Rima Hadley 지역 연구)

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달의 지형 중 계곡과 같이 보이는 곳을 Rima 또는 Rille 지형이라고 부르며 국제천문연맹(IAU : International Astronomical Union)과 미국지질조사국(USGS : United States Geological Survey)에서 관리하는 행성 지명 사전(Gazetteer of Planetary Nomenclature)에 명명된 달의 Rima 지역은 111개에 이른다. 그 중 Rima Hadley 지역은 아폴로 15호가 착륙한 지점으로 잘 알려져 있다. 본 연구에서는 2008년에 발사된 Chandrayaan-1 위성의 적외선 초분광 영상 탑재체인 Moon Mineralogy Mapper(M3) 데이터를 통해 Rima Hadley 지역의 분광학적 특성을 살펴보았다. M3 데이터는 감람석(olivine)이 풍부한 지역에서는 1 um 를 중심으로 흡수선이 나타남을 보이며, (Peter J. Isaacson et al., 2011) 2.8 um 중심의 흡수선을 통해 달의 OH(hydroxyl) 분포에 대해 설명한다. (Carle M. Piters et al., 2009, Georgiana Y. Kramer et al., 2011) 본 연구에서는 Rima Hadley 지역이 1 um 파장 근처에서 강한 흡수선을 가지는 것을 볼 수 있었고, 감람석이 풍부한 지역임을 확인할 수 있었다. 이처럼 감람석이 풍부한 곳은 현무암 지역으로 과거 용암이 분출되어진 곳으로 추측 해 볼 수 있다. 본 연구를 발전시킨다면 Rima Hadley 지역의 생성과 다른 Rima 지형의 형성 과정에 대해 더욱 많은 정보를 얻을 수 있을 것으로 기대된다.

## 고에너지천문학/이론천문학

### [발표취소] Gravitational Lensing by an Isothermal Sphere with a Supermassive Black Hole

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Gravitational lensed quasar systems are usually explained by a source quasar lensed by a galaxy that can be approximated by an isothermal sphere. But most galaxies have a supermassive black hole (SMBH) at its center. We study the lensing by an isothermal sphere with a central SMBH. The additional lensing effects of a SMBH on the number, position, and magnification of lensed images are investigated. We apply the analysis to observed lens systems including Q0957+561. We also study the lensing by an elliptical mass distribution with a SMBH.

### [포 HA-02] The Relation between the Spectral Lag and the Collimation-Corrected Luminosity in Gamma-Ray Bursts

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Gamma-Ray Bursts(GRBs) are the most violent event in the universe, whose detection rate is a few in a day. The spectral lag, which is commonly observed in the observed light curves of GRBs, is a difference in arrival times of the high-energy and low-energy photons. The relation between the spectral lag and the luminosity of the observed GRBs is shown to be anti-correlated in previous studies. In reported relations to date, the isotropic luminosity has been assumed. On the other hand, GRBs are likely to emit its energy through a beamed jet. In this study, we attempt to obtain the relation between the spectral lag and the collimation-corrected luminosity. We have