

Seminarium Astrofizyczne
wtorek 24.09.2019 godz. 12:30
ul. Pasteura 7, sala 404

Krzysztof Suberlak
(University of Washington)

**Towards LSST Science: improving variability parameters for SDSS Stripe 82
Quasars with Pan-STARRS1**

Quasars are distant galaxies that harbor an actively accreting supermassive black hole - an active galactic nucleus. They are variable at rest-frame optical wavelengths at the asymptotic root-mean-square (rms) level of about 0.2 mag. Although it is agreed upon that the majority of optical light originates from the thermal emission of the accretion disk, the detailed origin of variability has been debated for the past 50 years. We analyze quasar time series data to shed light on the correlation between the information contained in each light curve and quasar physical properties, such as black hole mass, bolometric luminosity, and redshift. Using simulated light curves, we find that a longer baseline allows us to better constrain the DRW parameters. Thus we extend the Sloan Digital Sky Survey (SDSS) Stripe 82 quasar light curves with the Panoramic Survey Telescope and Rapid Response System 1 Survey (Pan-STARRS1, PS1) data. Combined dataset provides a 15-year baseline for 9248 quasars - 5 years longer than prior studies that used only SDSS. We fit the light curves with the Damped Random Walk (DRW) model, and correlate the DRW model parameters with quasar physical properties. We also make predictions for the fidelity of DRW model parameter retrieval when light curves will be further extended with the ZTF and LSST data. Finally we show how updated DRW parameters lend an independent method of discovering Changing-Look Quasar Candidates (CLQSO). We identify 38 objects (33 newly reported) exhibiting a tenfold increase in variability timescale between SDSS and SDSS-PS1 data, that show a large change in brightness (over 0.5 mag) - a characteristic for CLQSO.

Serdecznie zapraszam,
Agnieszka Majczyna