

## **LIGHT CURVES AND MASSES OF AGN IN THE KEPLER FIELD OF VIEW**

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The Kepler mission will stare at the same patch of the sky for its entire mission lifetime, allowing virtually uninterrupted optical observations of any object in its field of view. This provides the opportunity to obtain optical light curves of AGN of unprecedented duration and sampling. I propose to use the unique capabilities of KEPLER to observe 2 AGN in its field of view and obtain the highest time resolution and longest continuous optical light curve of any AGN to date. The two sources I propose to observe are ZW 229.015 and IGR J19473+4452. ZW 229.015 is a V=15.4 Seyfert 1 galaxy at a redshift of 0.028 and IGR J19473+4452 is a B=15.7 Seyfert 2 galaxy at a redshift 0.054. Neither source has ever been the target of variability studies at any wavelength.

For ground based optical astronomy, the limitations to time series analysis of light curves have always been sampling, duration and quality of the data. The Kepler mission allows us to overcome those limitations by providing continuous, high time resolution optical light curves over timescales sufficient to determine the power density spectrum (PDS) break frequency. The break frequency represents a characteristic variability timescale that is related to the mass of the SMBH. The resulting time series will also be analyzed for the presence of any periodic oscillations in the observed light curve. Such oscillations can be used to infer the mass of the central SMBH, assuming they arise from processes on the accretion disk. The timescales of the fastest discrete events will also be used to set upper limits to the smallest emission regions present (regardless of location) via light travel time arguments. This proposal fulfills the NASA strategic goal of understanding phenomena near black holes and the origin and destiny of the universe.