Swift Monitoring of
Active Galactic Nuclei (AGN)

Dirk Grupe
## Pennsylvania State University

- Wavelength dependence of variability

- Amplitude, timescales, and time gaps between wavelengths/energies

- Geometry and size of the inner-most region of the AGN

- Total energy in the UV/X-ray SED

Swift Monitoring of
# Active Galactic Nuclei (AGN)

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- Trigger other observatories, e.g. WPVS 007

- Simultaneous ground-based observing campaigns, e.g., NGC 5548, PG 1211+143, Mkn 766

- Simultaneous observations with other satellites, like

   3C 279 with INTEGRAL, Mkn 766 with RXTE, PKS1510-089 with SUZAKU

Active Galactic Nuclei/ Quasars
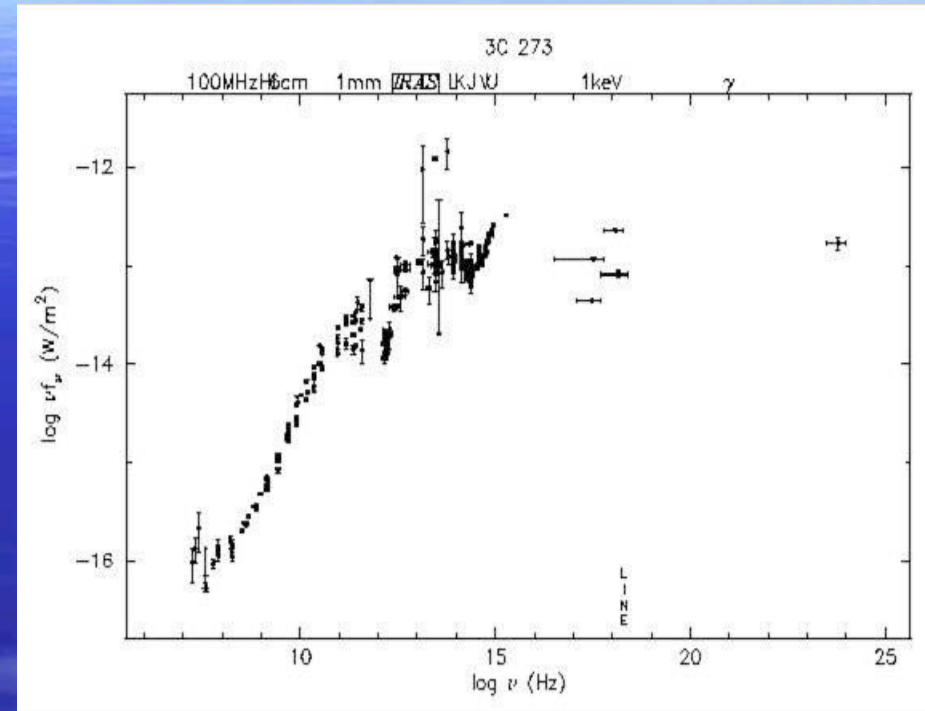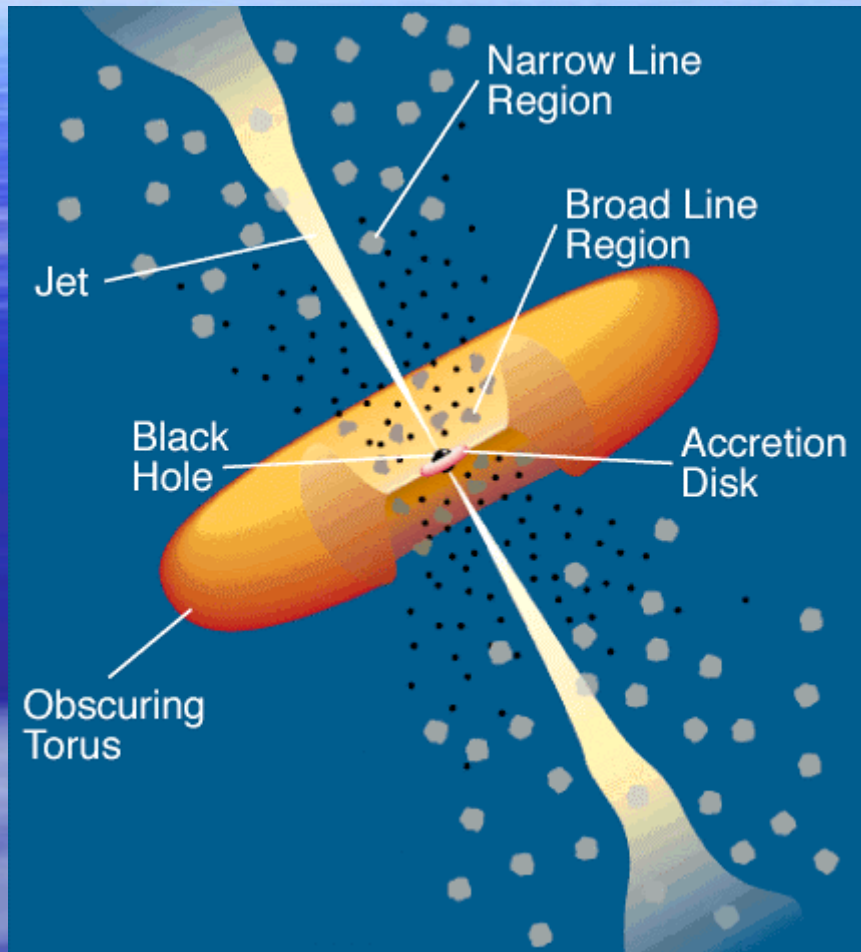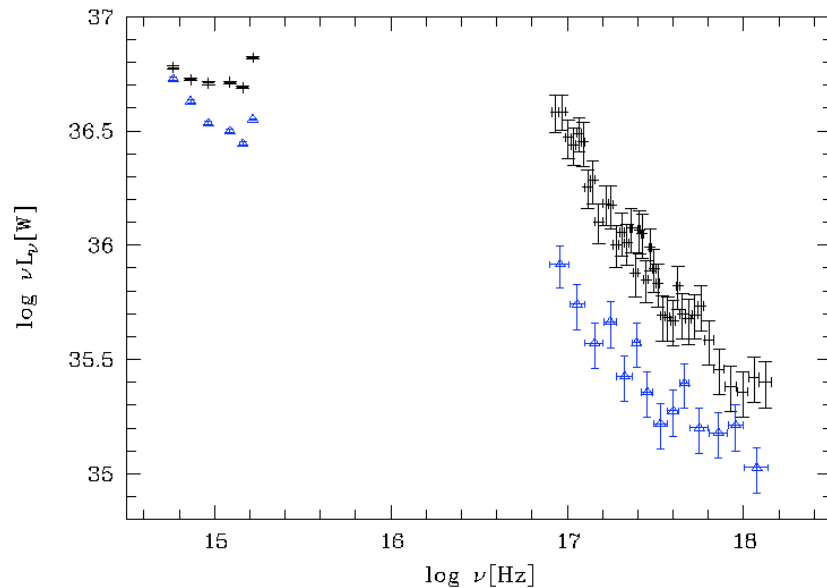
Active Galactic Nuclei/ Quasars
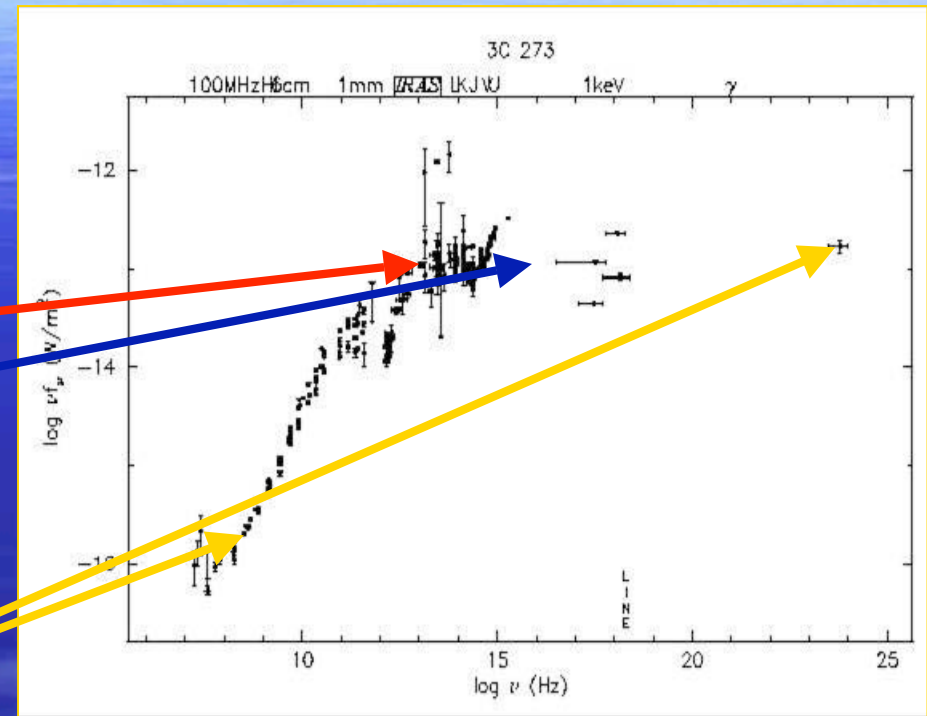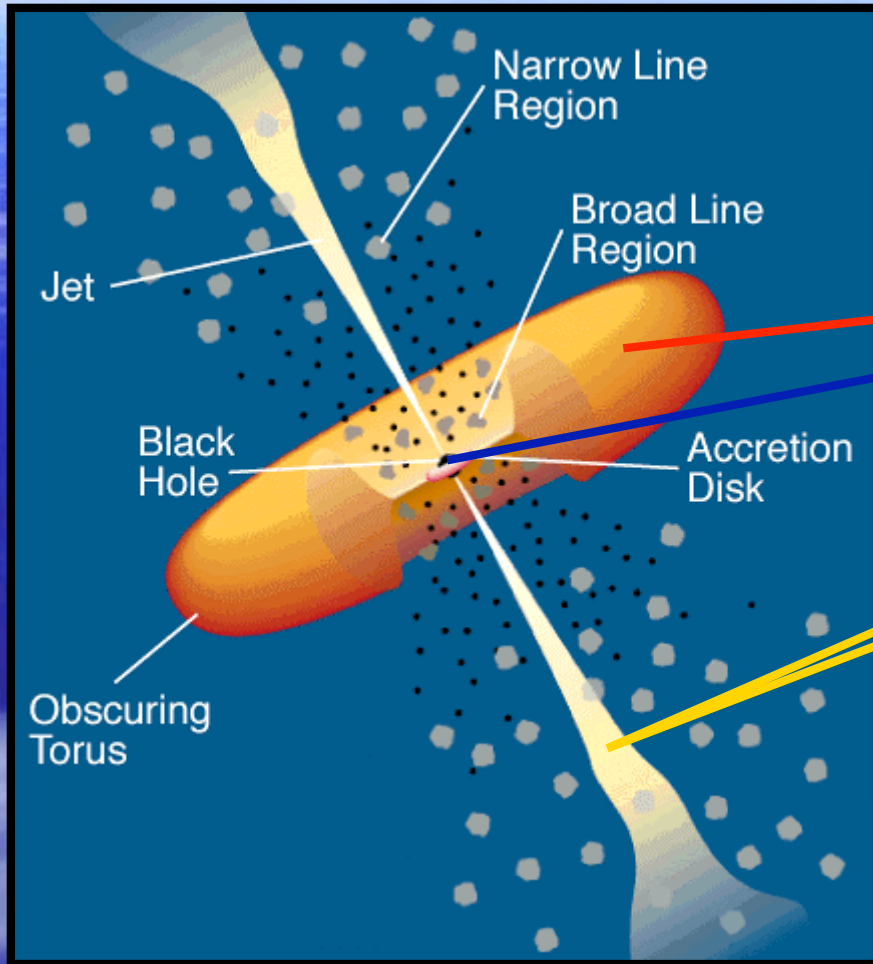
Jet: Radio + Gamma Rays (synchrotron)

Torus: IR emission (thermal)

Accretion disk: Optical/UV + X-rays
(thermal BBB emission, Swift)

Problem with Big Blue Bump Observations

ESO 242-G8 observed by Swift in 2006 August (blue) and 2006 November (black)

- AGN are highly variable in the UV and in X-rays

- Usually observations in the past were not simultaneous

- Problem is that AGN gets observed in different states

- Wrong Conclusions

- Wrong alpha-ox

- Wrong L-bol

- Swift and XMM allow simultaneous observations in Optical/UV and X-rays

- Swift is better suited (UV response, short snapshots)

# Monitoring the NLS1 WPVS 007
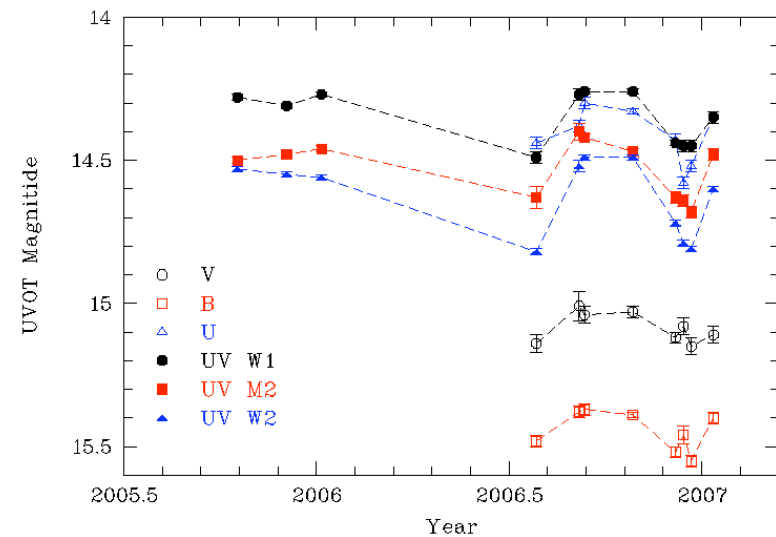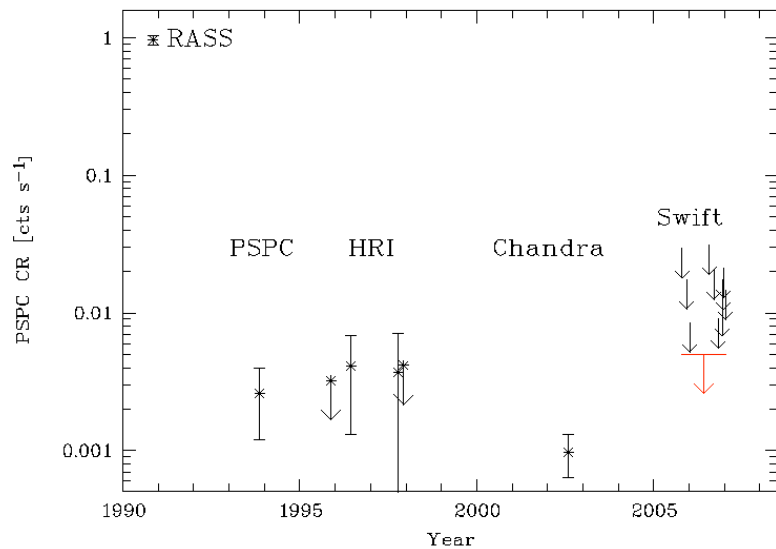
- X-ray transient AGN
- RASS Fx/Fo was normal
- Low-mass BAL QSO (HST + FUSE; Leighly et al. in prep)
- Monitor to see absorber disappear → brighter in X-rays again
- Significantly variable in the UV
- Monitor the UV to trigger X-ray observations
- Plan to continue this year

Monitoring Mkn 766
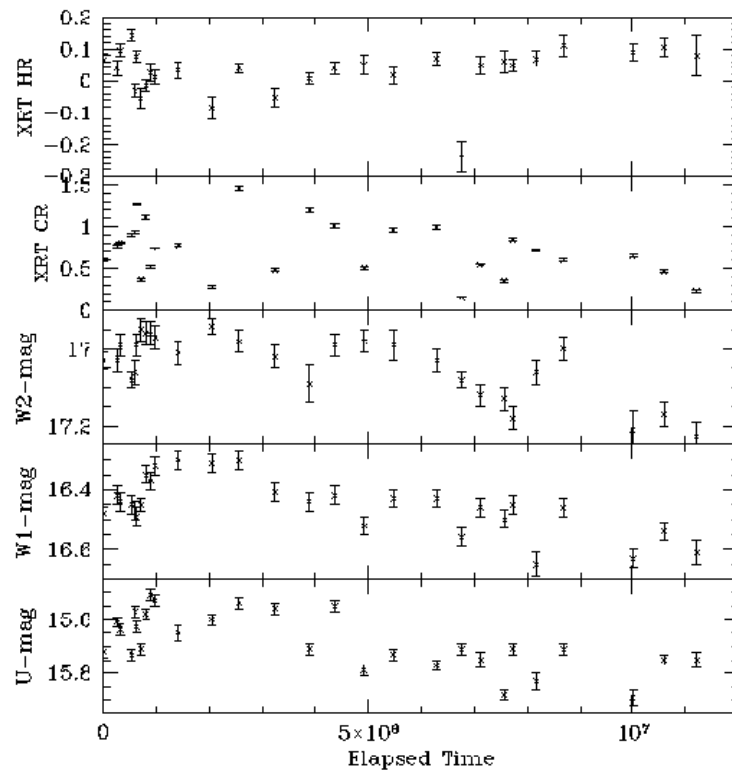
- PI: Alex Markowitz
- Simultaneous ground-based and RXTE observations
- Swift once a week
- Start in December 2006
- Significant X-ray and UV variability
- General trend: AGN becomes fainter and harder
- Stronger amplitude variations at shorter wavelengths
- Unique data set
- Plan to continue monitoring

Monitoring PG 1211+143
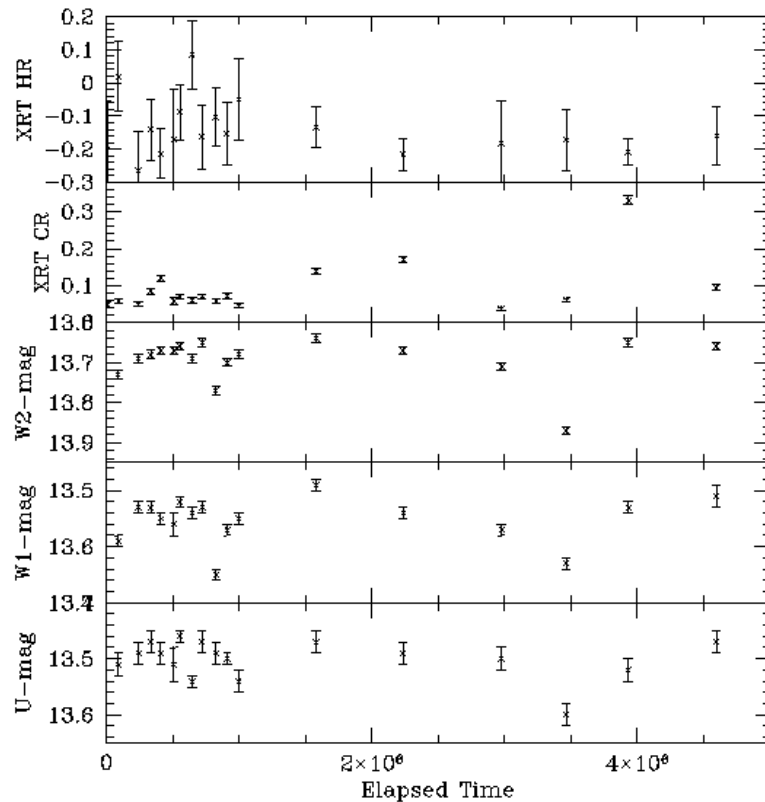
- PI: Rumen Bachev (BG)
- Simultaneous ground-based observations (photometry)
- Significant UV and X-ray variability
- Historic low-state
- Suggests time-lags between UV and X-rays
- Excellent candidate for future monitoring campaigns

Advantages of Swift

- Multi-wavelengths observations
- Relatively short observations
- Data are available within hours → Immediate response to increase/decease observing frequency
- Flexible observing schedule
- Future: Pick a few AGN and perform intensive monitoring campaign to search for UV and X-ray variability
- Basically reverberation mapping in UV and X-rays
- Size and Geometry of the inner part of the AGN
- Swift is the only mission capable of performing these projects!