

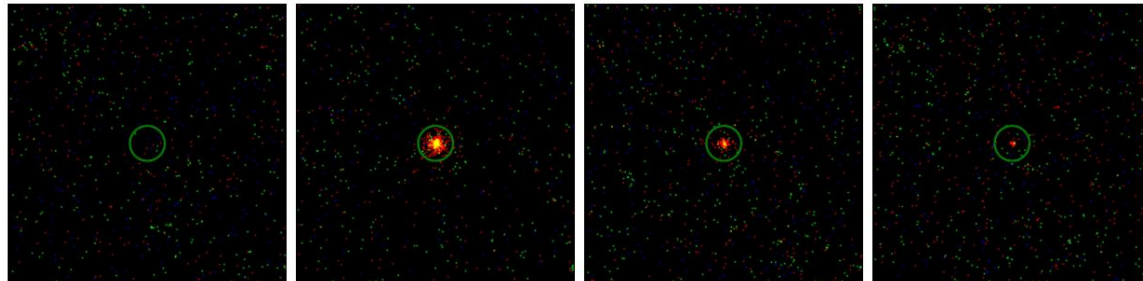
Multiwavelength Study of Extreme Variability in AGNs

Annual Report 2024

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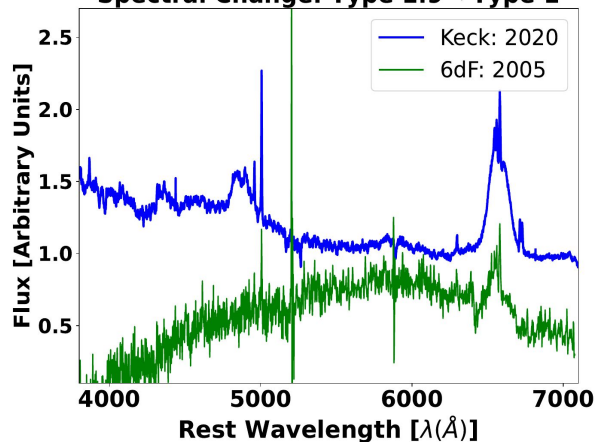
Supervisor: dr. hab. Alex G. Markowitz



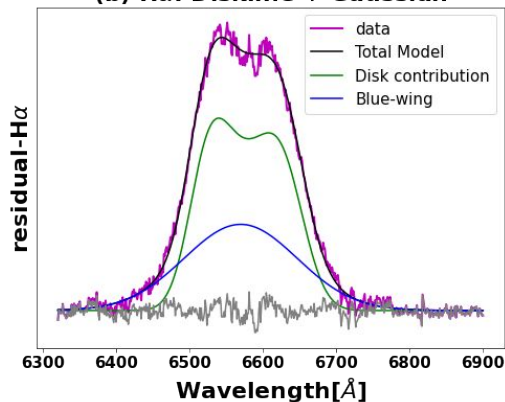
The CLAGN phenomena in LEDA 1154204

- ZTF and eROSITA detection: 2020 Type-1.9 to Type-1 transition & flaring
- Appearance of blue continuum & H β broad line
- Broad emission line double-peaked and dominated by emission from a flattened disk-type BLR.
- X-ray no spectral variability and UV varies in concert
- Infrared exhibits a dust echo
- Triggered by disk instability

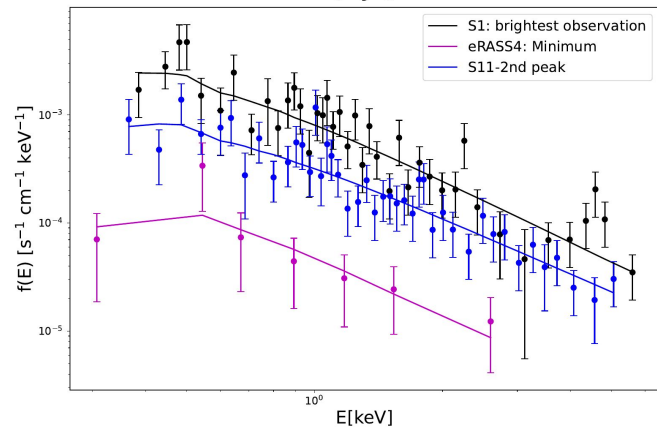
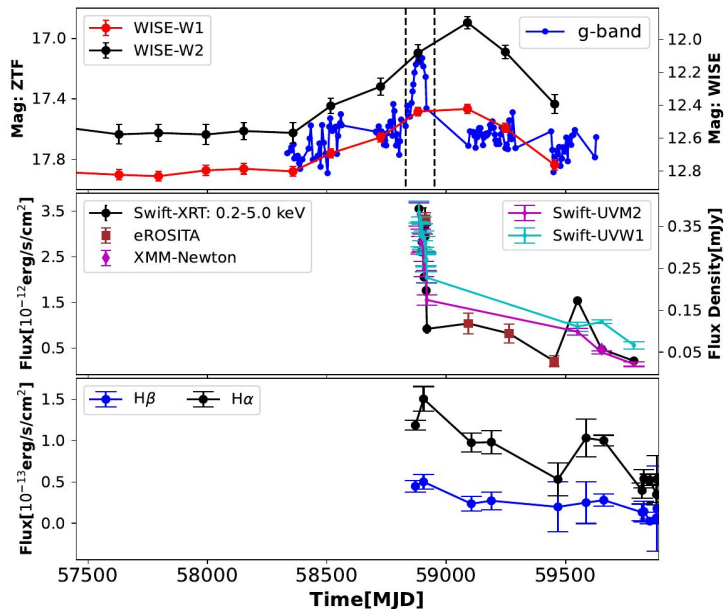
Spectral Change: Type 1.9 \rightarrow Type 1



(b) H α : Diskline + Gaussian



Saha et al. 2023,
(arXiv:2309.08956), Subm.
A&A, under review



Changing obscuration with eROSITA

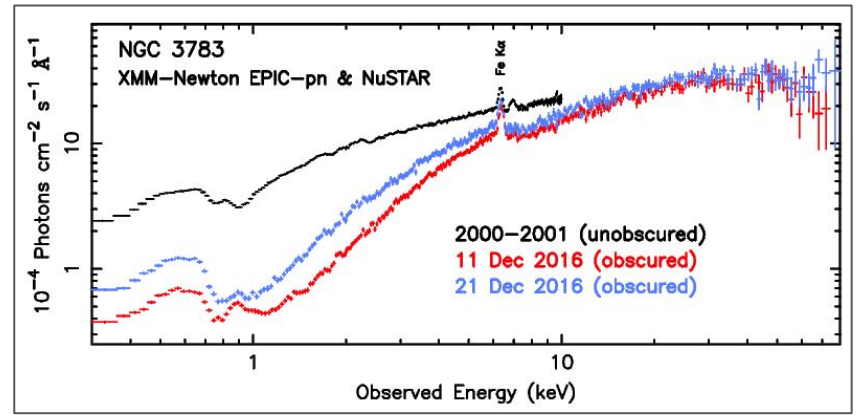
- Change in $\Delta N_{H,los}$ in BLR / Torus cloud => spectral shape - **From eROSITA scans**
- Spectral shape – Hardness ratio
 - $HR = C_1/C_2$
 - $HR = (C_2 - C_1)/(C_1 + C_2)$

C = SRC-BKG, photon counts in a given band*

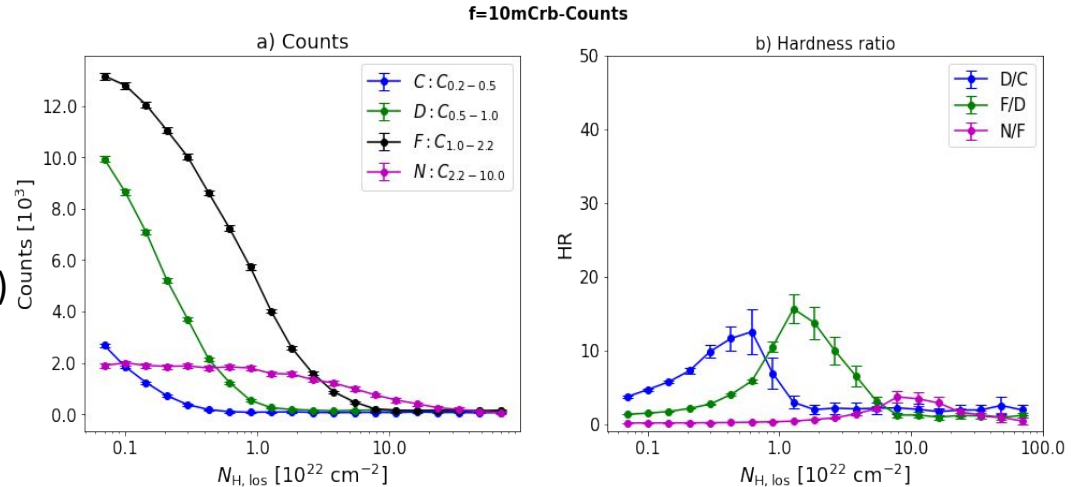
- Flux levels: 10 mCrab, 1mCrab, 0.5 mCrab,...
- Simple obscuration model:

$$M = Gal_abs(plaw + AGN_abs(N_{H,los}) plaw)$$

*NOTES: Low counts regime, all counts are Poisson variable



(Mehdipour et al. 2017)



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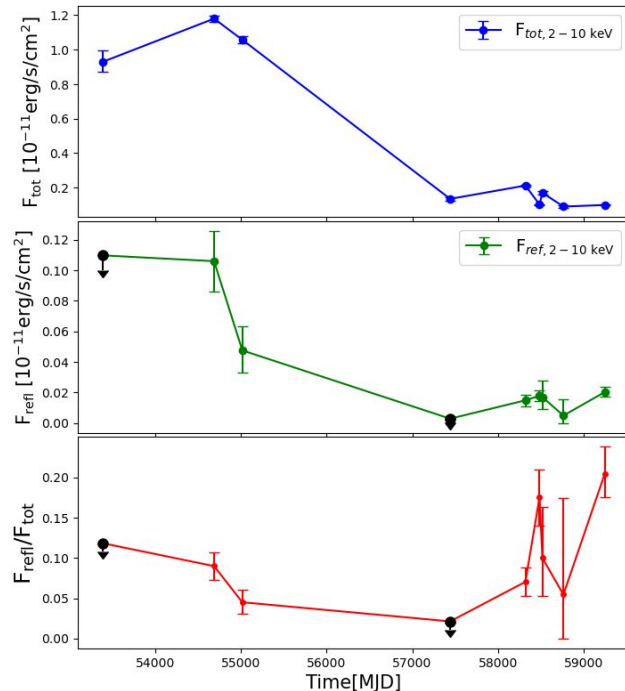
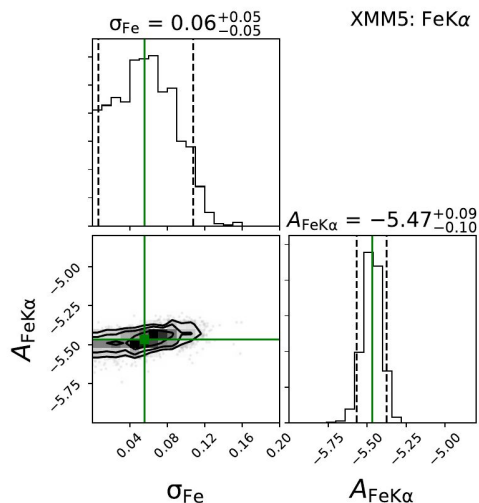
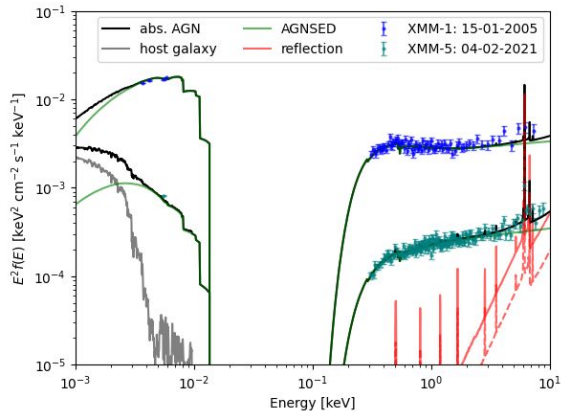
- **Type-1** before **2016**

Strong soft excess relatively weak reflection

- **Type-1.9** after **2016**: Soft excess disappears with relative strengthening of the reflection

– Investigation the source(s) of the reflection component: disk/torus

– The iron line: Narrow (width in keV) and is consistent with a distant reflection.



Summary of Activities (2023)

- Submission of the manuscript ([arXiv:2309.08956](https://arxiv.org/abs/2309.08956)) on LEDA 1154204 Astronomy & Astrophysics (currently under review)
- Submission of doctoral dissertation and completion of education in the GeoPlanet Doctoral School
- Pre-doctoral position at Leibniz Institute for Astrophysics Potsdam
- Multiple International talks and seminars: — ASI Meeting, India — Restless AGN, Napoli —SALT Conference, Warsaw— EAS 2023 Krakow — Gaia Alerts etc.