Study of a Tidal Disruption Event Candidate

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Picture: NASA
Extract from video:

https://www.youtube.com/watch?v=hu6hIhW00Fk
TDEs – What for?

- Extreme conditions
- IMBHs
- BH binaries
- Recoiling binaries
- Measurements BH spin + mass
- Map cores of quiescent galaxies
TDE Characteristics

• Very luminous
• X-ray outburst lasting up to several months
• Located at center of quiescent galaxy
• Soft spectrum
The Observation

- Set of 5 ROSAT PSPC observation within a year
- Two show the source
Optical Counterpart

• Image taken with OmegaCam

Prepared by Thomas Erben
• Missing emission lines
• Redshift $z = 0.051$
Light curve

Increase

$8.7 \pm 4.2$

Decrease

$143.7 \pm 17.7$

$L_{\text{max}}(0.1 - 2.4\text{keV}) = (1.4 \pm 0.2) \cdot 10^{44} \text{erg/s}$
X-ray Spectrum

Power law index: $-4.82 \pm 0.66$
Summary

• Very luminous ✓
• X-ray outburst lasting up to several months ✓
• Located at center of quiescent galaxy ✓
• Soft spectrum ✓

• Unlikely AGN, SN, GRB

→ Likely TDE

Fast luminosity increase