

# June 14: Active Galactic Nuclei

- **Required readings:**

- Short introduction on Active Galactic Nuclei
- Answer two questions on Slido and look through the two associated papers.

- Other useful references (not required readings):

- Complete up-to-date review of relativistic jets in AGN: Blandford, Maier, Redhead 2019, ARAA, 57, 467
- Flux variability in gamma rays: Begelman, Fabian & Rees 2008, MNRAS, 384, 19
- Properties of AGN at all wavelengths: Active Galactic Nuclei, Robson 1996, Wiley

# Slido Question 1

Answer on Slido: <https://app.sli.do/event/9bkgkzolg/live/polls>

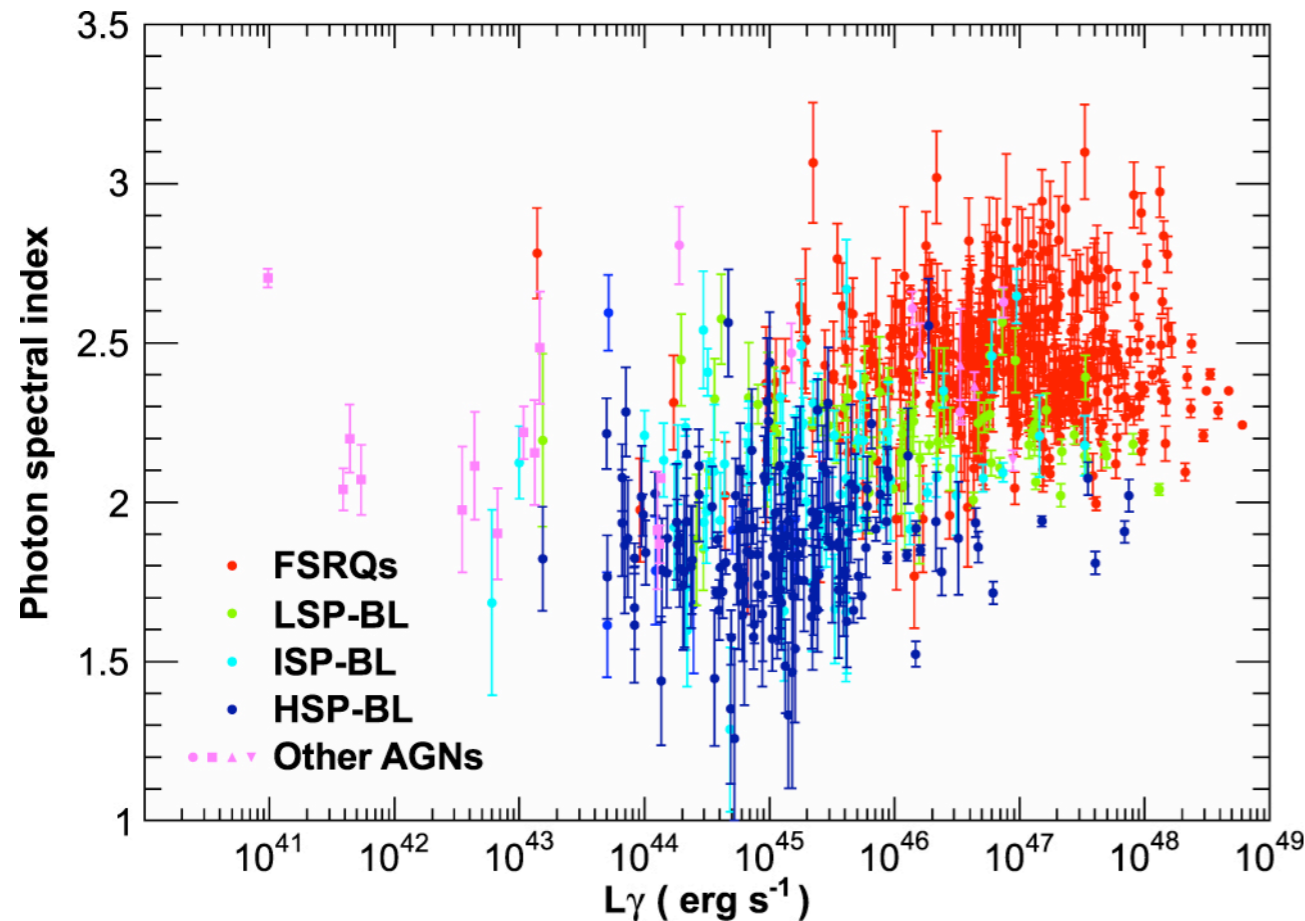
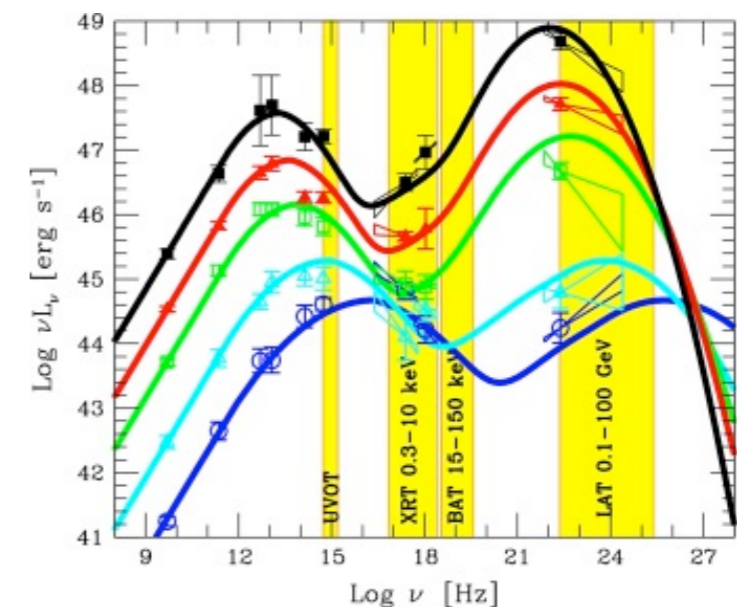


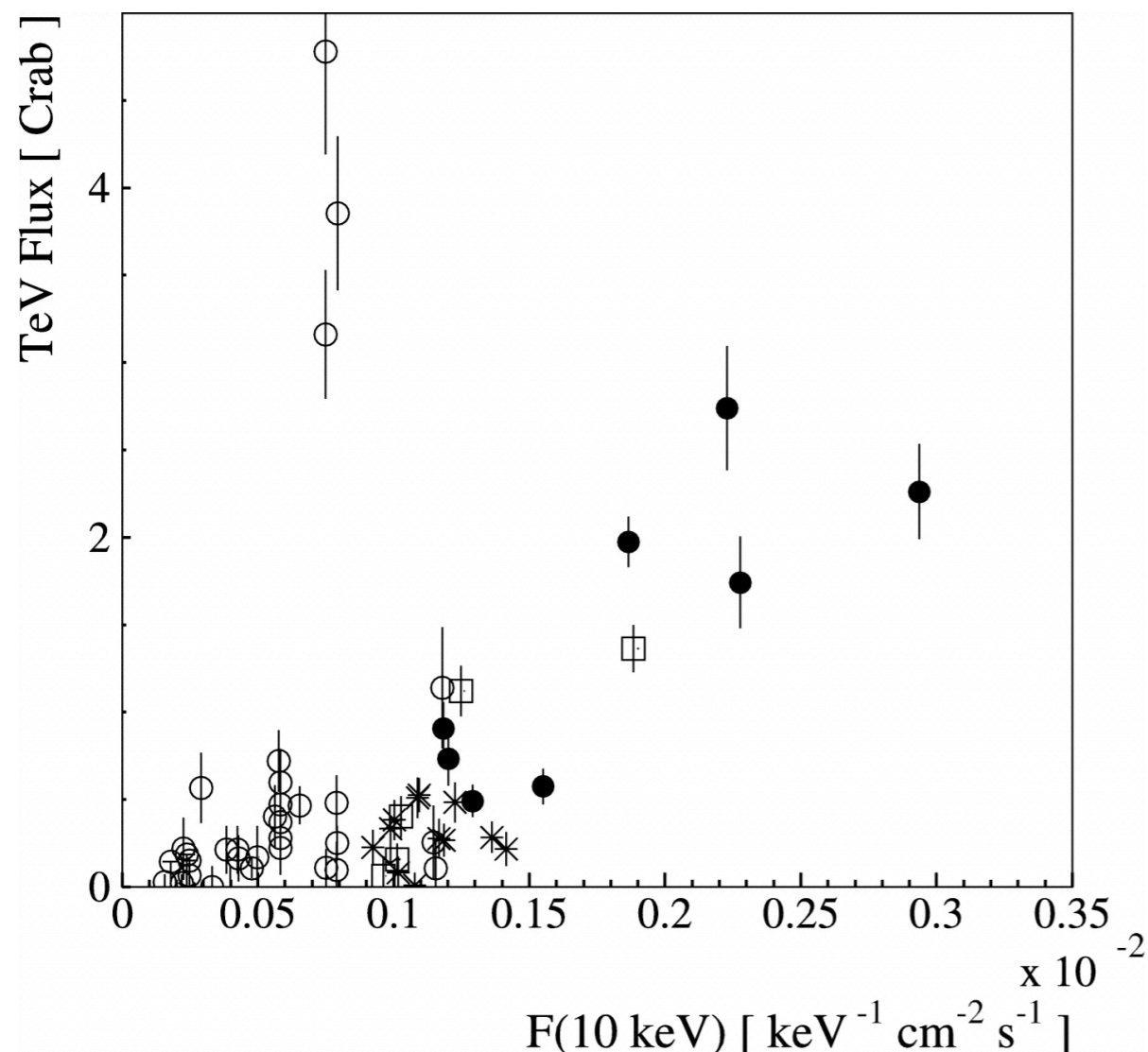
Figure 14: Photon index vs. gamma-ray luminosity. Red: FSRQs; green: LSP-BL Lacs; light blue: ISP-BL Lacs; dark blue: HSP-BL Lacs; magenta: other AGNs (circles: NLSy1s; squares: radio galaxies; up triangles: SSRQs; down triangles: AGNs of other types).

- If one looks at all the blazars detected by LAT, why would their spectral index be correlated with gamma-ray luminosity?
- Hint:



# Slido Question 2

Answer on Slido: <https://app.sli.do/event/zjenm0zr>



- This figure plots the gamma-ray flux of a blazar vs its X-ray flux. Why would we expect the fluxes to be correlated, and what happens when they are not?

Fig. 8: Correlation between the X-ray flux and the Whipple and HEGRA  $\gamma$ -ray fluxes: epochs 1 (*filled circles*), 2 (*open circles*), 3 (*squares*), and 4 (*asterisks*). Only points with a direct overlap of the  $\gamma$ -ray and X-ray observations have been included.