

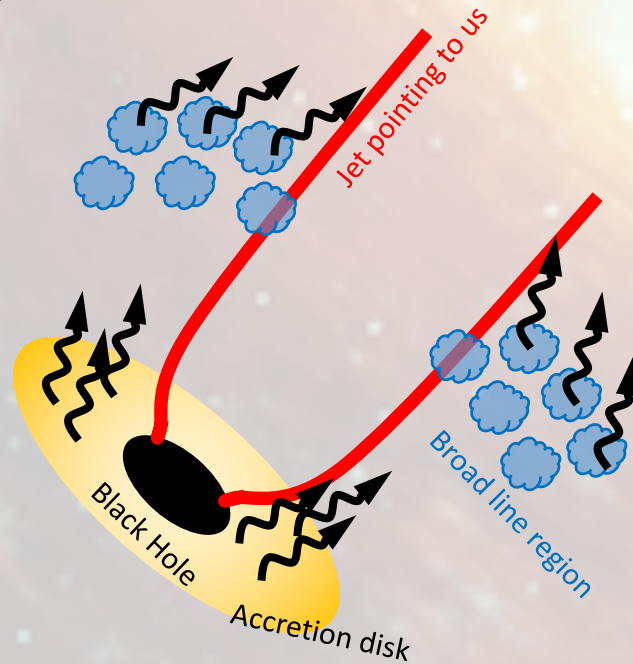
# Blazars as high-energy neutrino emitters

The source of the astrophysical neutrino source is still unknown. Blazars are considered as possible astrophysical  $\nu$  emitters.

## Blazars

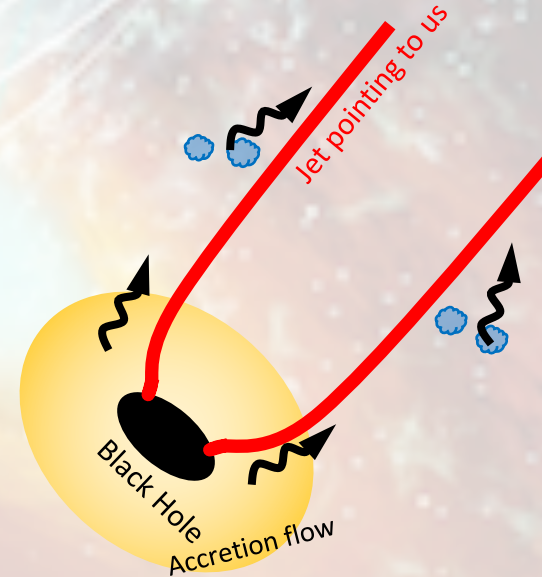
### Flat Spectrum Radio Quasars:

- ✓ The rich radiative environment boost the  $p\gamma$  reaction.
- ✗ But they are too rare in the Universe to produce the entire neutrino flux observed by IceCube. (No multiplets detection)



### BL Lacs:

- ✓ They are abundant in the nearby Universe.
- ✗ Their photon density is not enough to trigger  $p\gamma$  reaction. (low accretion rate)



**BUT**

- ✓ structured jet could potentially boost the BL Lac emission up to the level required by the  $\nu$  detected by IceCube!
- ✓ TXS0506+056 is a BL Lac object!!

# BL Lac as neutrino emitters

TXS0506+056 is a BL Lac of 2FHL catalogue (Fermi detection above 50GeV).

Assuming BL Lacs objects of 2FHL as the only emitters of IceCube neutrino flux:

- We assume a simple linear relation between  $\gamma$ -ray and neutrino fluxes,  $F_\gamma$  and  $F_\nu$  to obtain a neutrino flux for each source and the expected count rate observed by IceCube and Km3NeT. [Righi et al. 2017]
- We started an observational campaign to a better characterization of 7 others BL Lacs of 2FHL in spatial correlation with a neutrino event. [Righi et al. submitted]

## A NEW PROBLEM:

Mkn421 is the brightest BL Lac object in the sky.  
Why we do not have clear detection of neutrino events from this source? [Righi et al. in prep.]

For more details have a look to my poster

