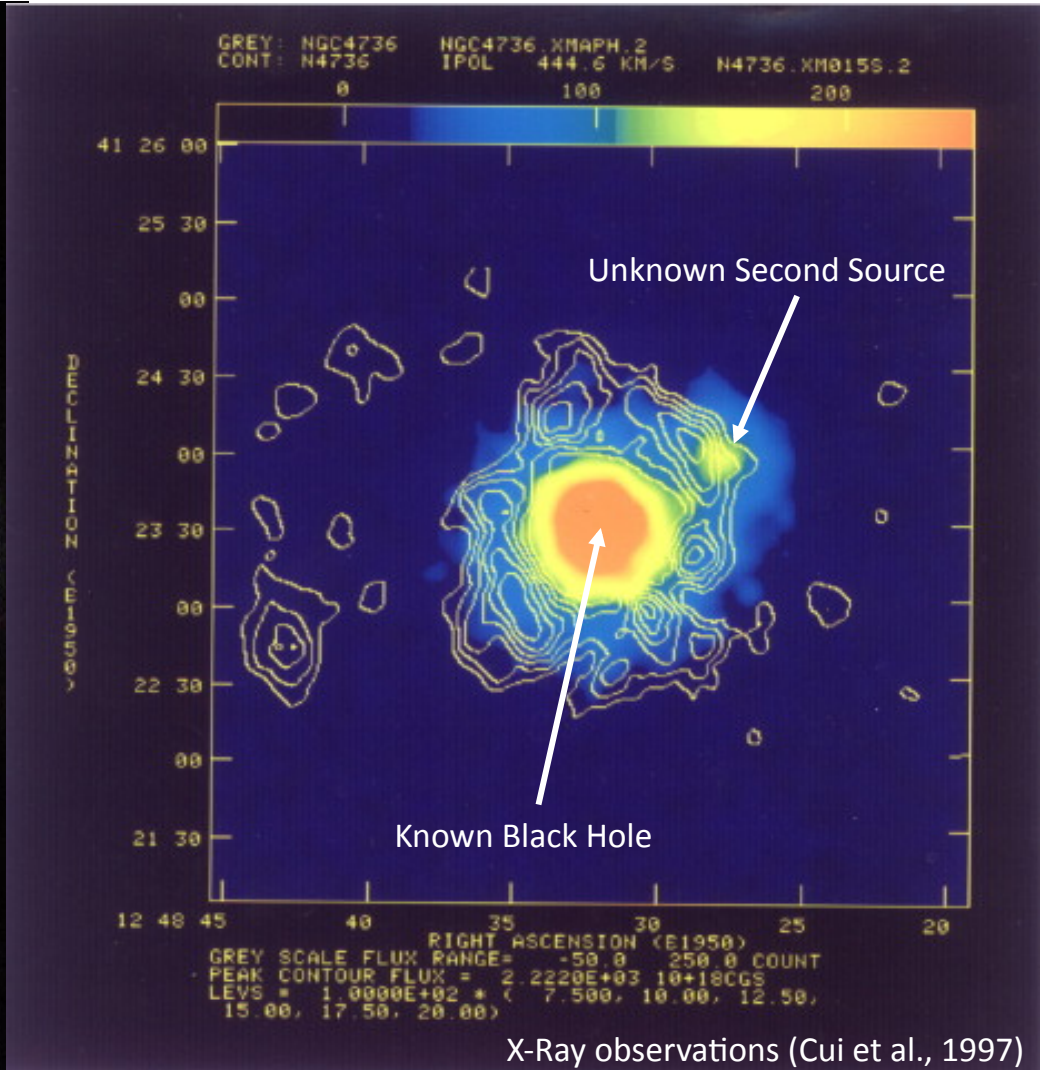
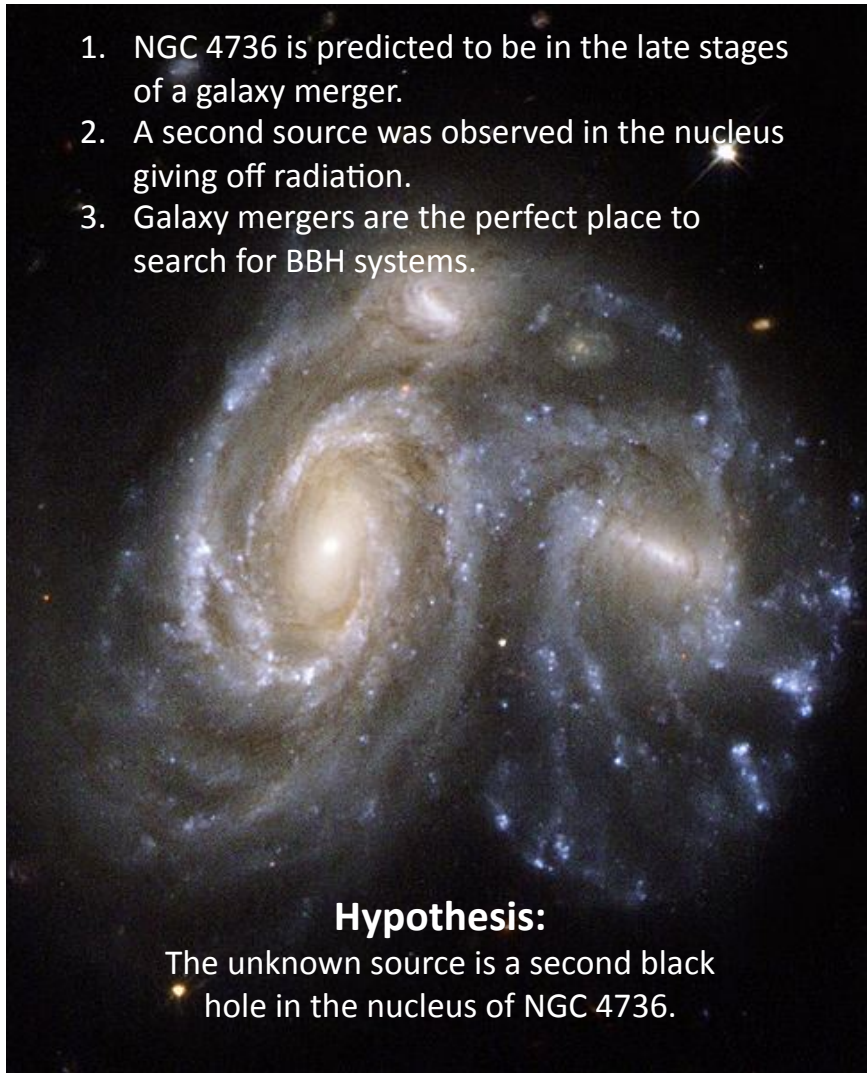


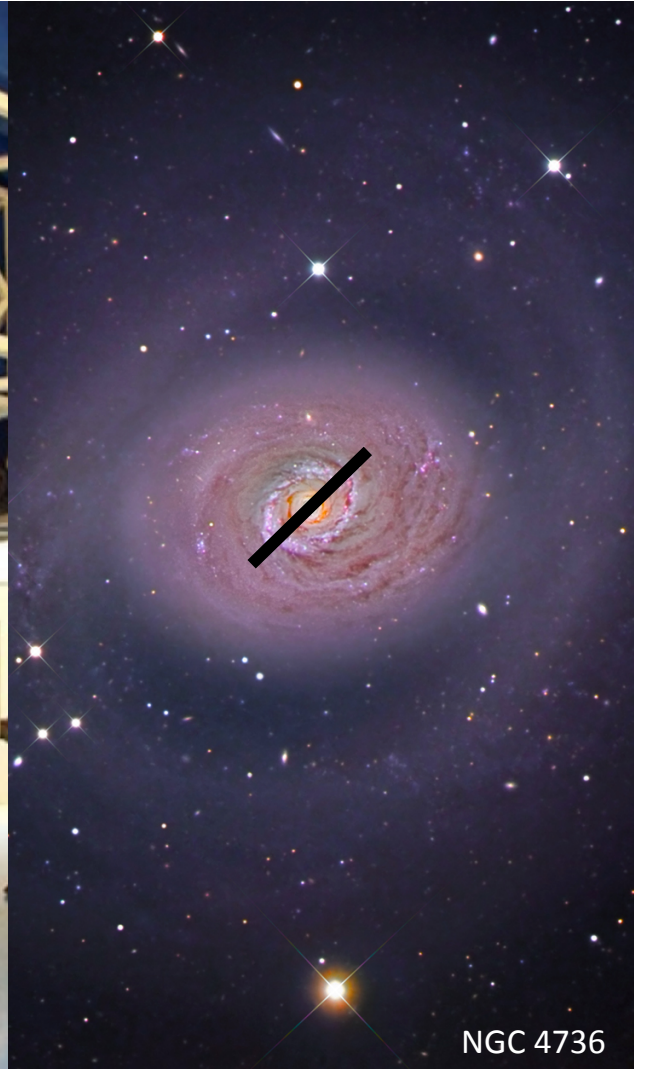
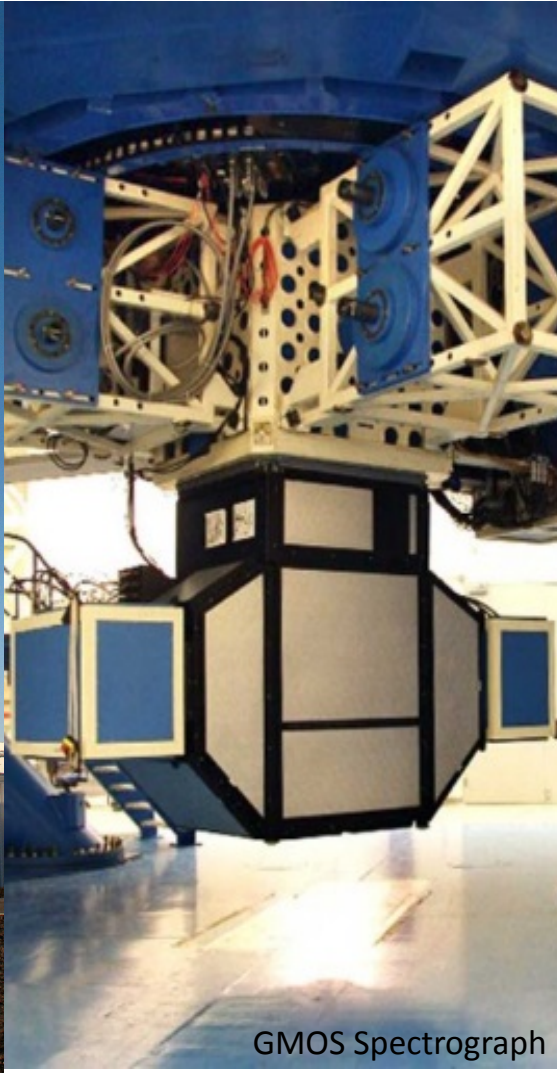
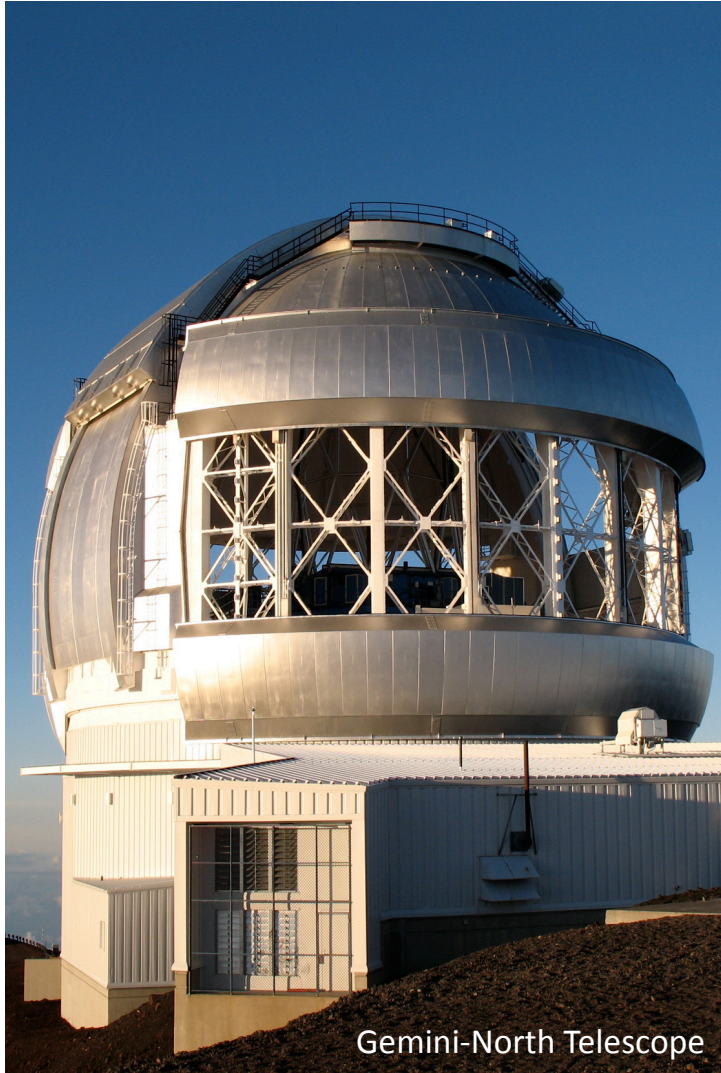
Searching for the Nearest Extragalactic Binary Black Hole:

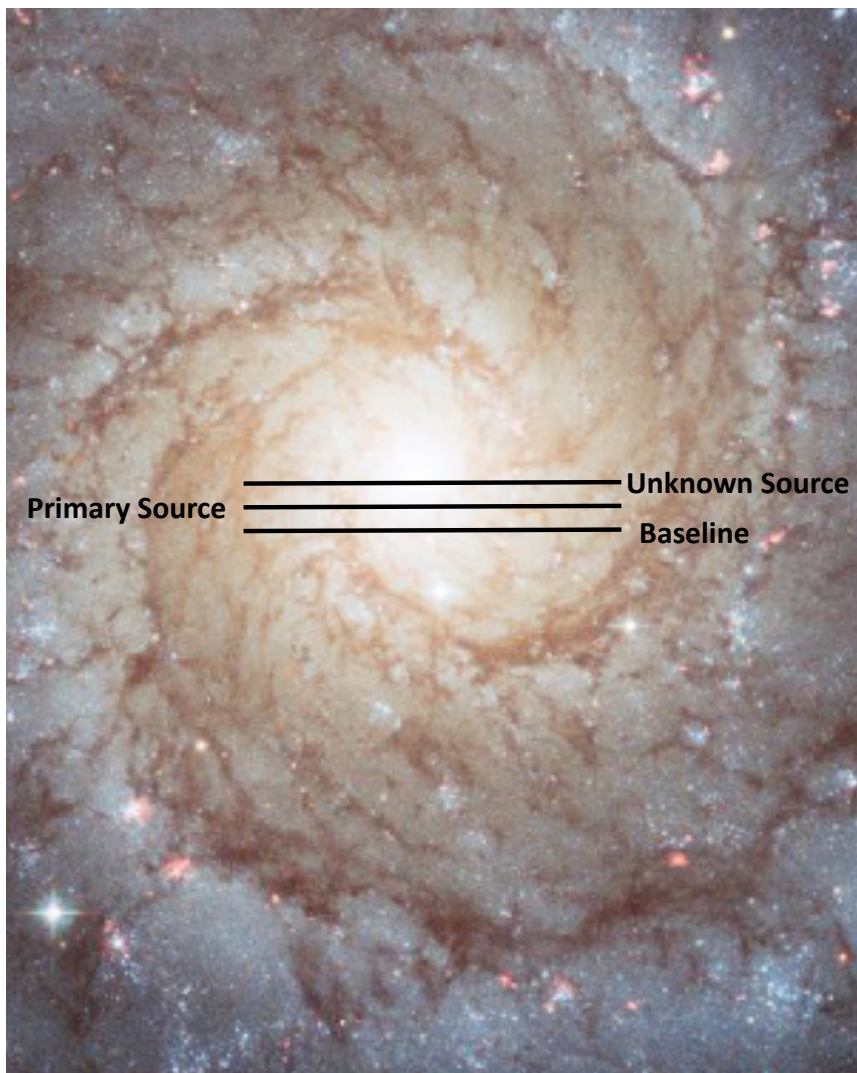
A Spectroscopic Study of NGC 4736

By Annika Gustafsson

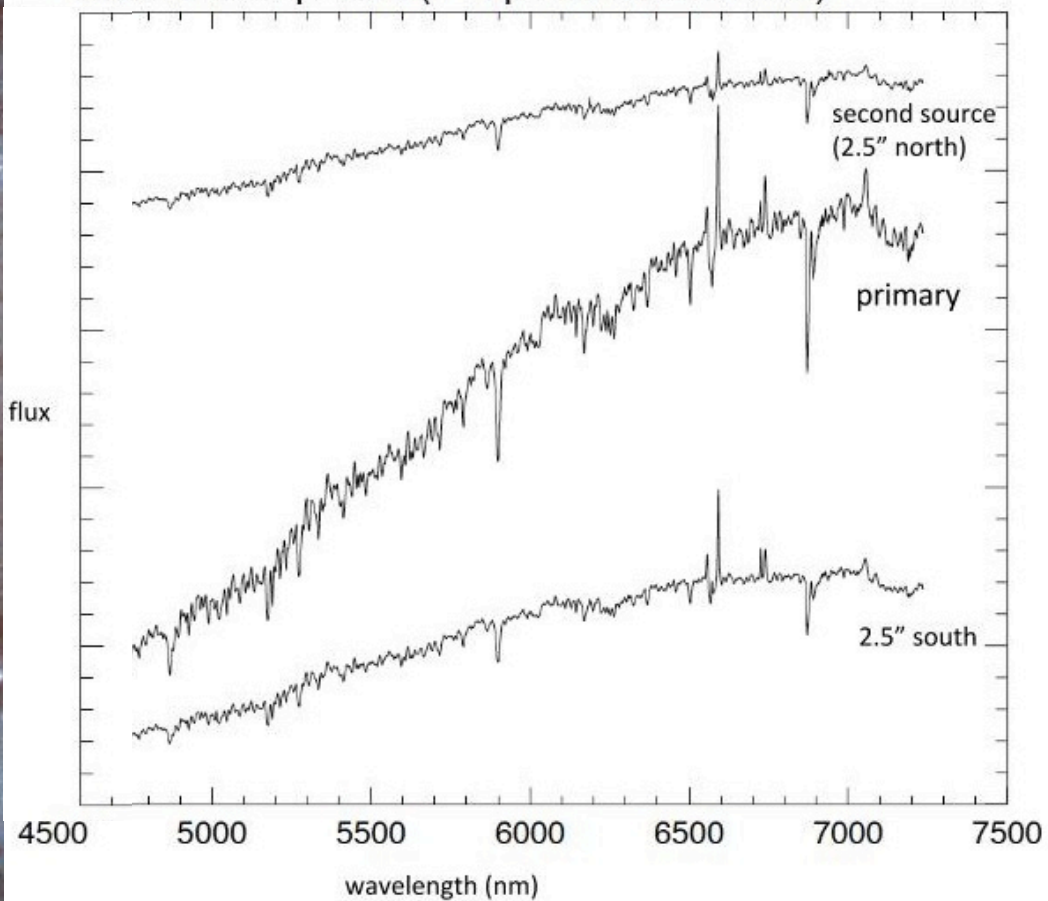
1. NGC 4736 is predicted to be in the late stages of a galaxy merger.
2. A second source was observed in the nucleus giving off radiation.
3. Galaxy mergers are the perfect place to search for BBH systems.



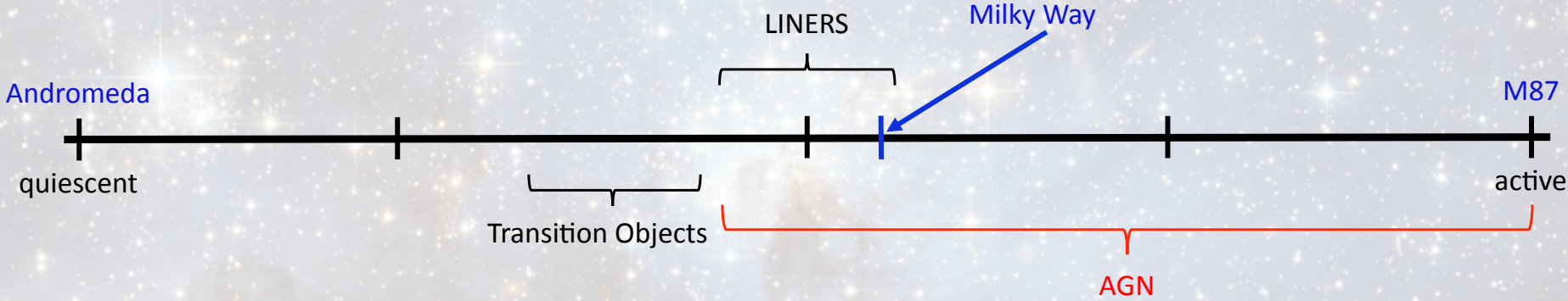




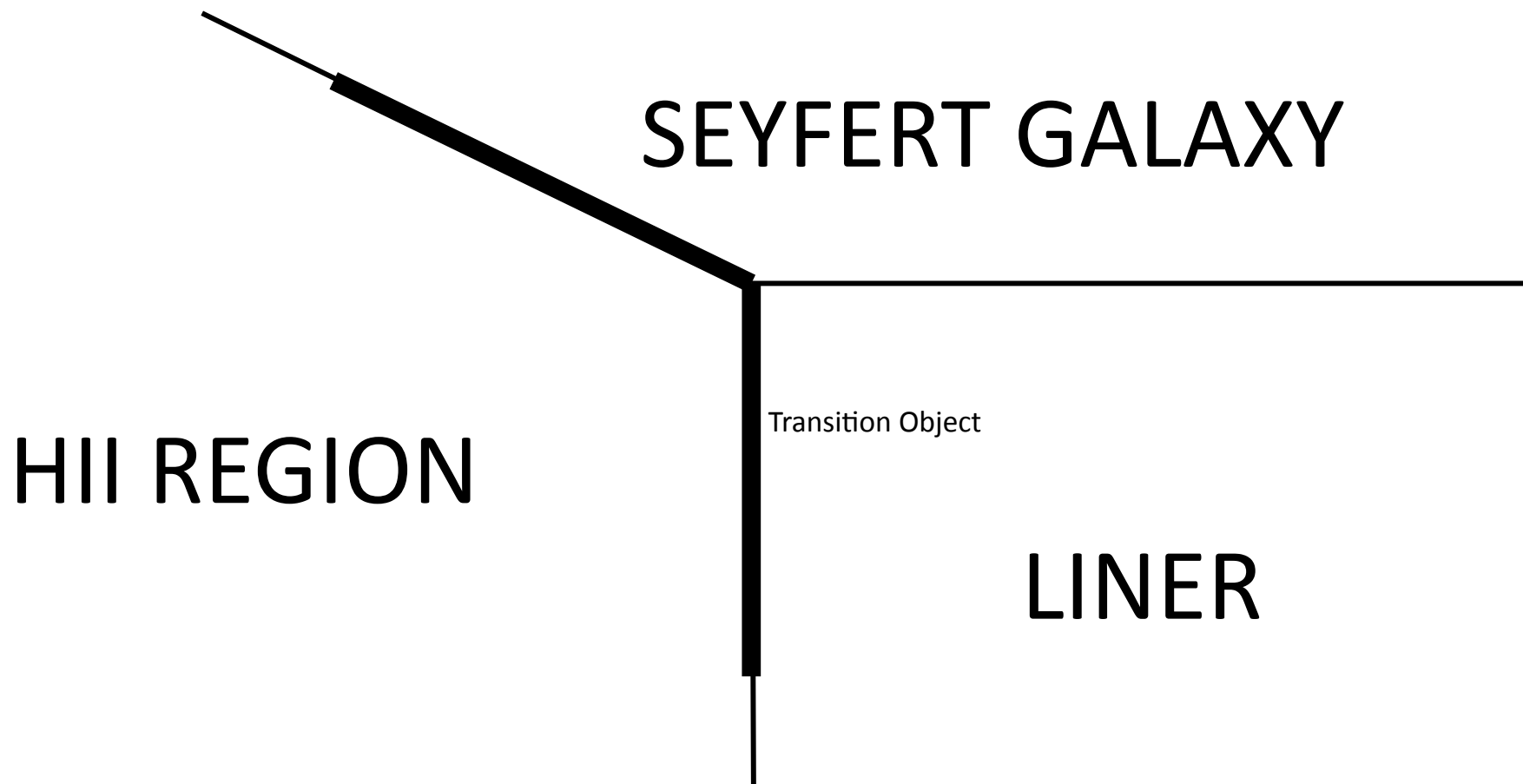
NGC 4736 Spectra (1" Aperture Extraction)



Categorization of Black Hole Activity:



Characterizing AGN:



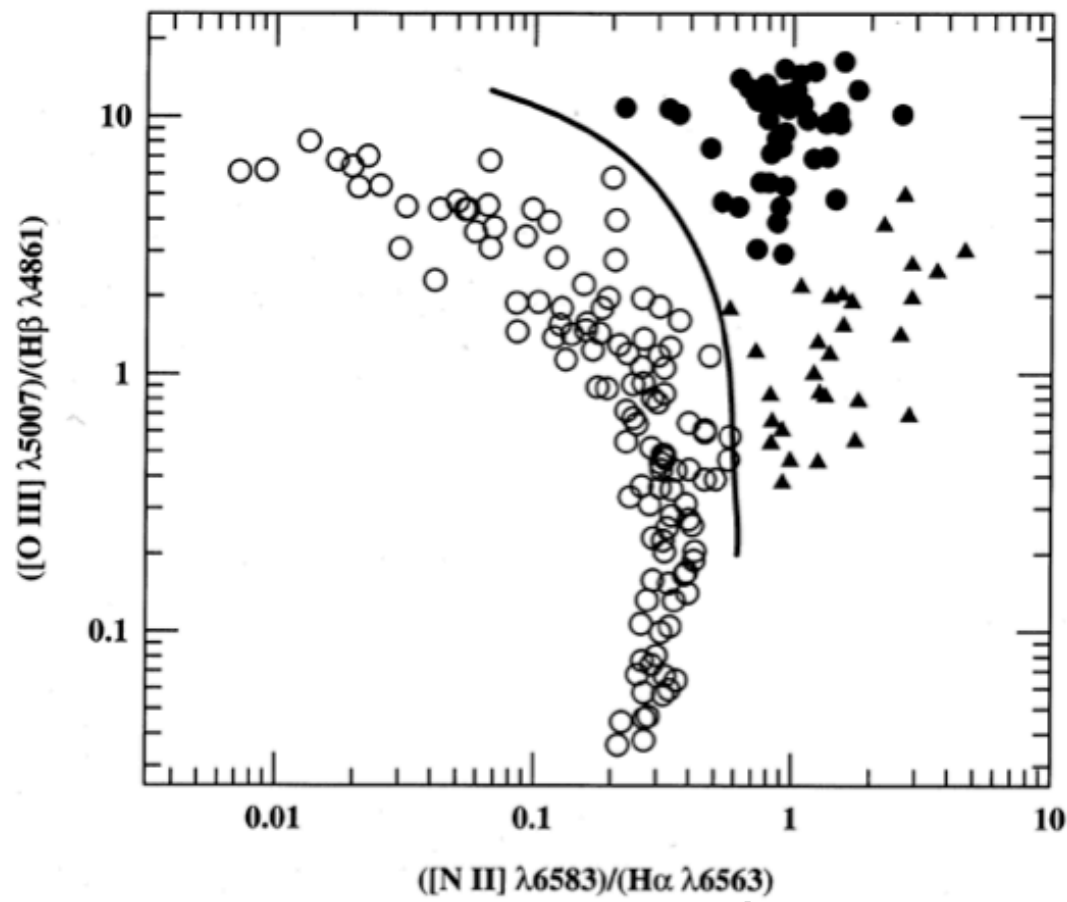
SEYFERT GALAXY

HII REGION

Transition Object

LINER

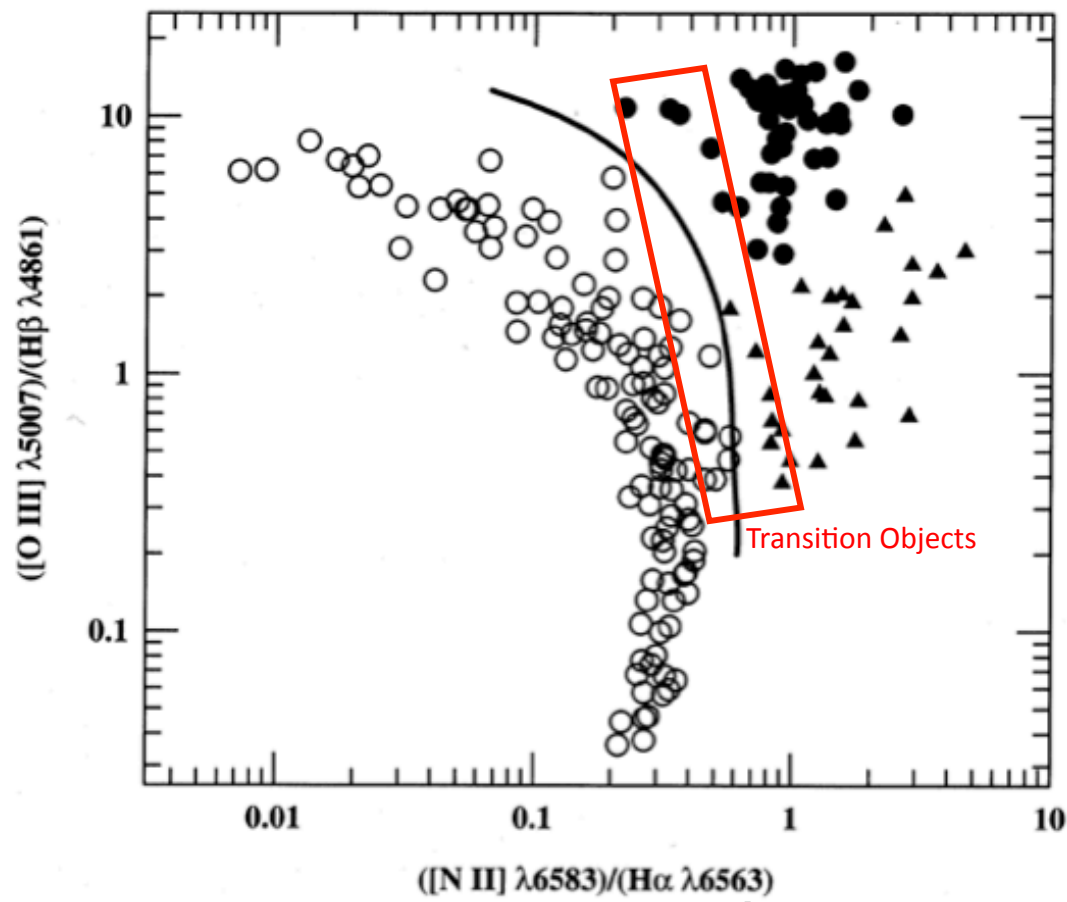
HII REGION



SEYFERT
GALAXIES

LINERS

HII REGION

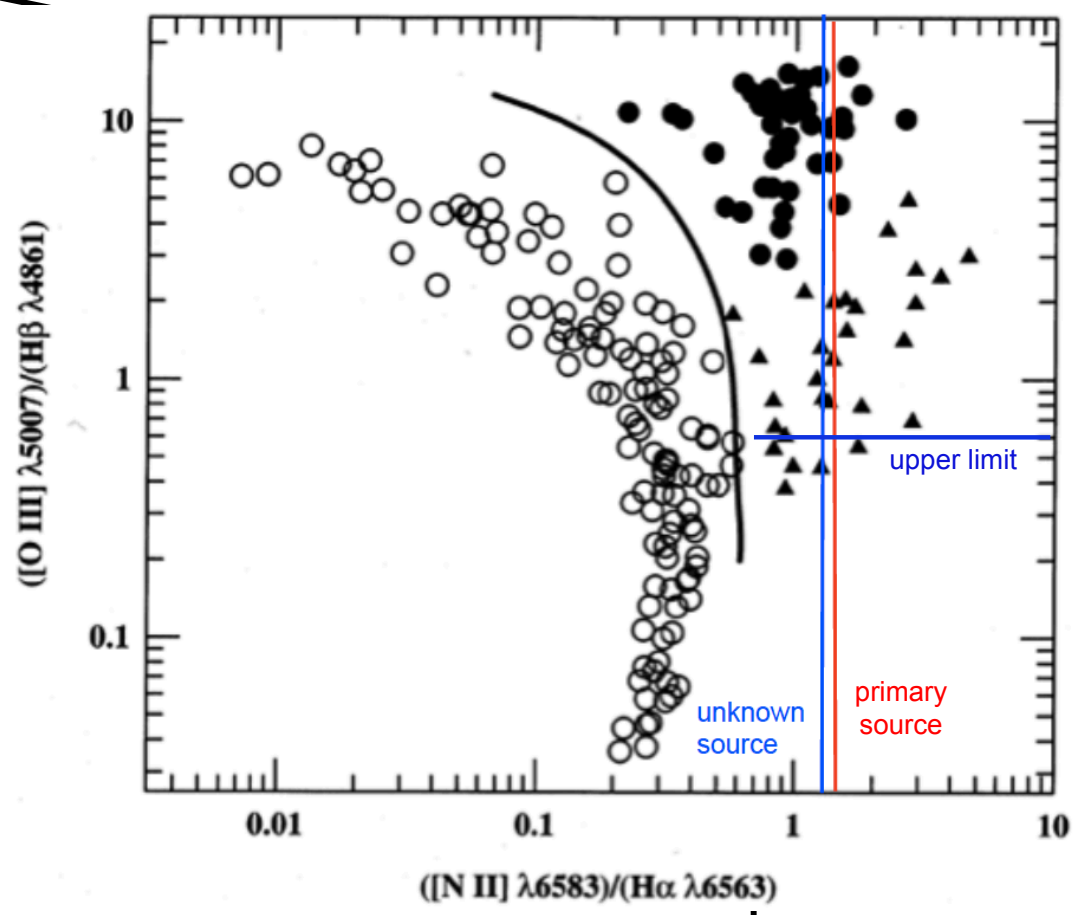


SEYFERT GALAXIES

LINERS

Transition Objects

HII REGION



SEYFERT
GALAXIES

LINERS

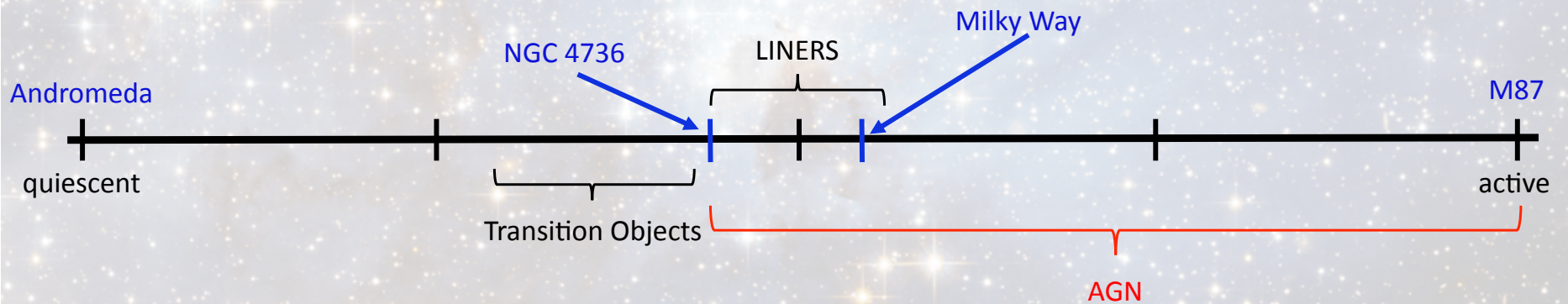
upper limit

unknown
source

primary
source

Conclusions:

We believe that the unknown source is in fact a **second black hole** in the nucleus of NGC 4736.



Significance:

1. This is the closest binary black hole system to Earth at 16 million light years away.
2. The system is in late stages of merging.
3. Studying such a low luminosity system ***nearby*** will help bridge the understanding of the formation and evolution of black holes.

Thank You

