

THE ADVENTURES OF BEV ACROSS THE BROAD LINE REGION

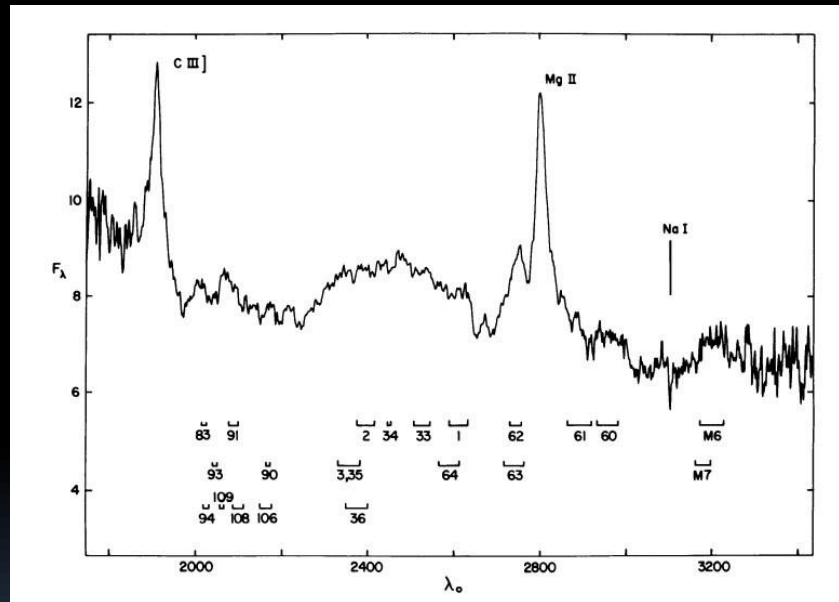
A TALE OF FOUR DECADES

1971-1980

The era of detailed spectroscopy

- Also: The era of radio surveys

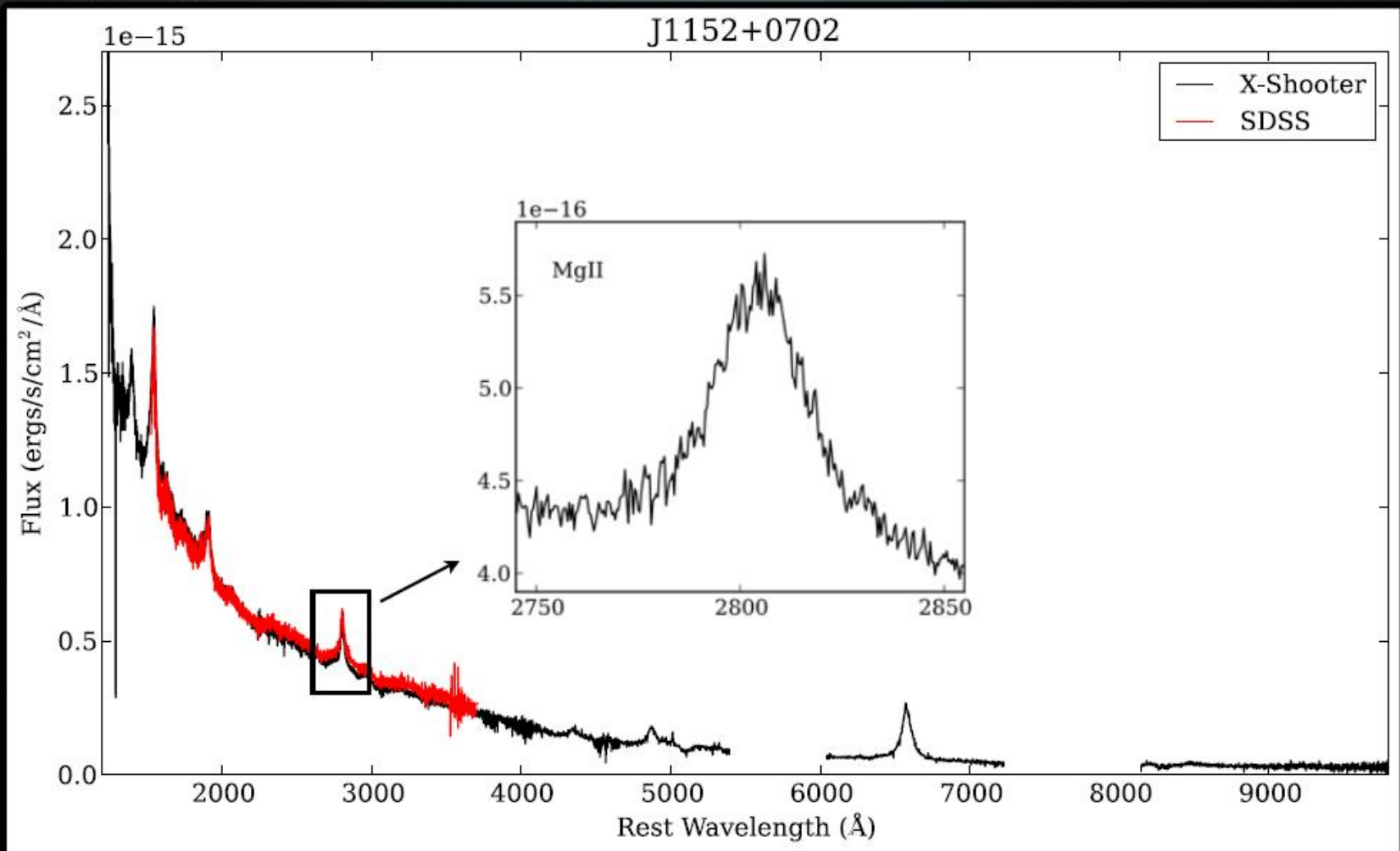
Radio properties
Richards
Shastri



Detailed spectroscopy
Kraemer
Is NV1240 a good
metallicity indicator?
Leighly – map the disk
with absorption lines

2.7m McDonald Observatory IDS (PKS 2216) Wills, Netzer, Wills 1980

Modern spectroscopy – X-shooter



1981-1990

The era of BLR models

- Also: The era of FeII lines
- Also: The era of AGN unification
- Also: the era of accretion disks

Kishimoto – unification under the microscope

Elvis – it is raining in Austin in September

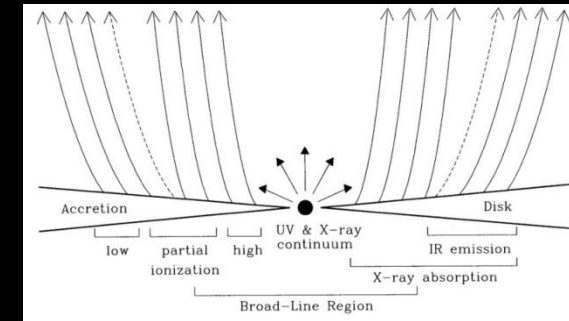
Gaskell – the BLR is really very simple

Ward – SEDs everywhere

Shen – it is all about orientation

Elitzur – the world is made of clumps

Runnoe – the way real science is done



Königl and Kartje 1994

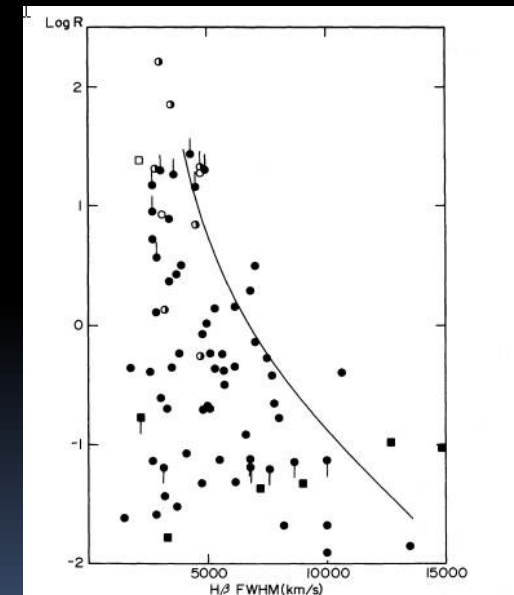
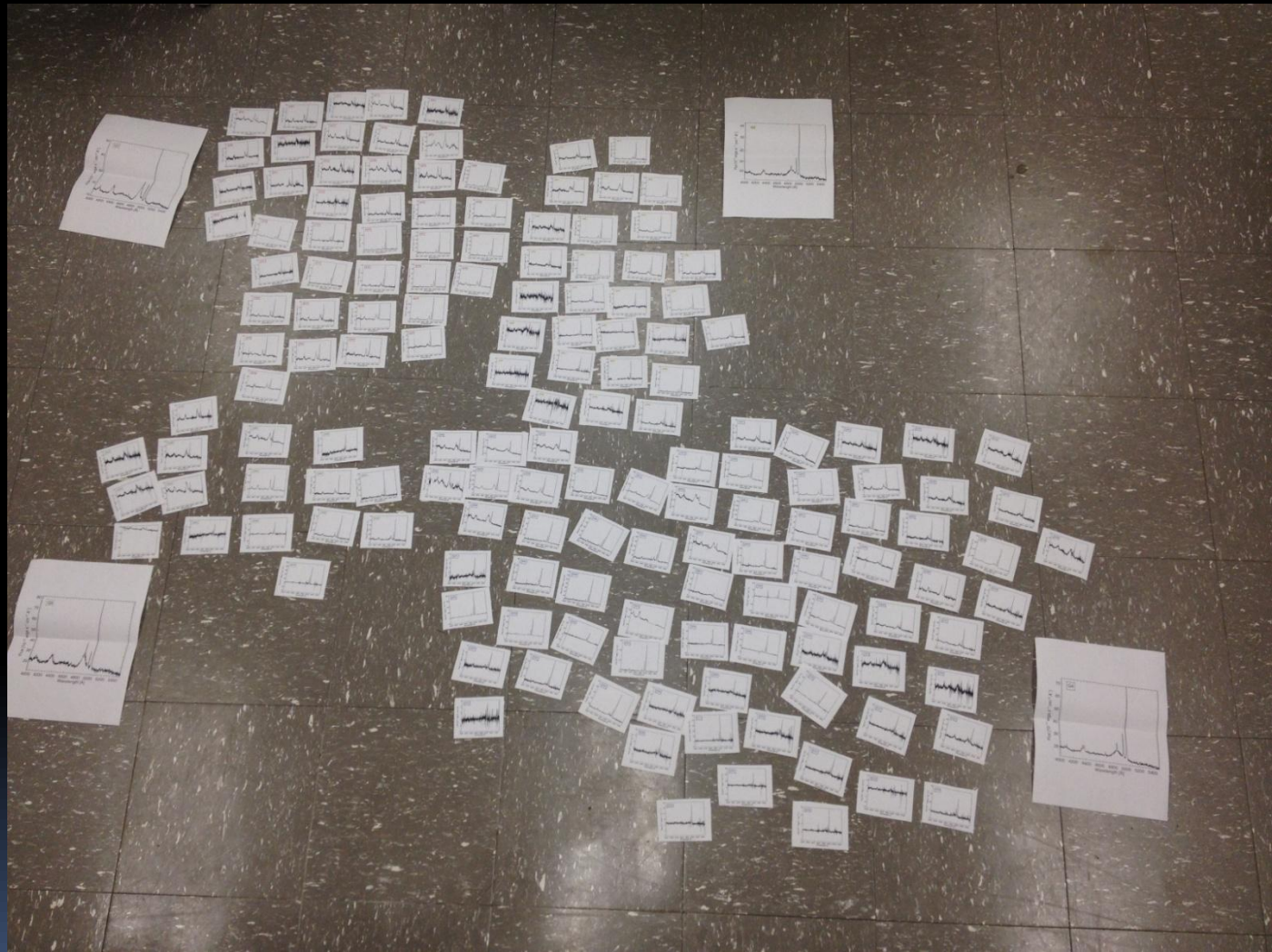


FIG. 1.—Ratio of 5 GHz core to extended component flux density R as a function of FWHM for the broad $H\beta$ line for quasars (circles) and BLRGs (squares). Open symbols represent sources with observed superluminal expansion. Half-open symbols represent optically violent variables and highly polarized quasars. Vertical bars indicate points with upper and lower limits to R . Curve represents the change of R with FWHM, predicted by beaming model discussed in text.

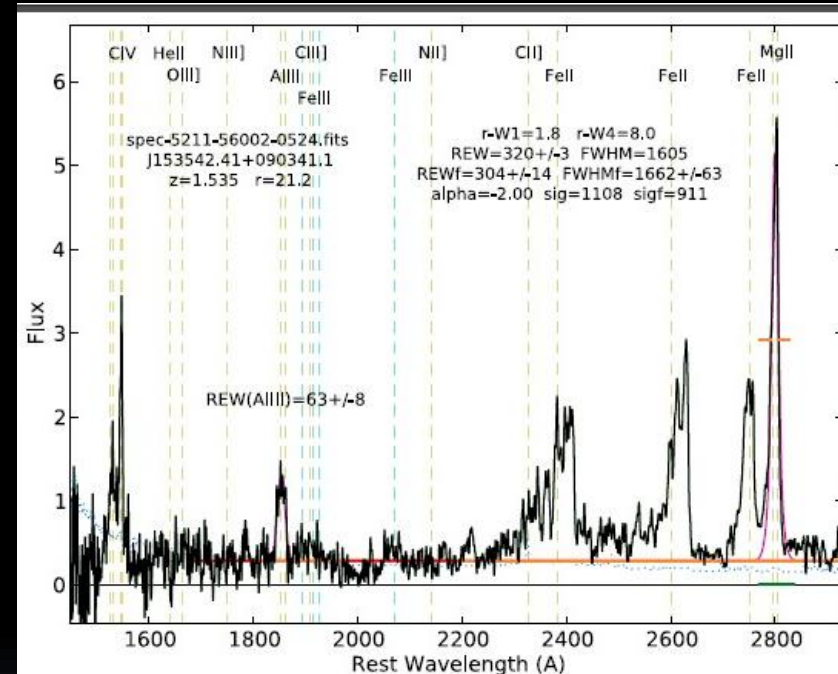
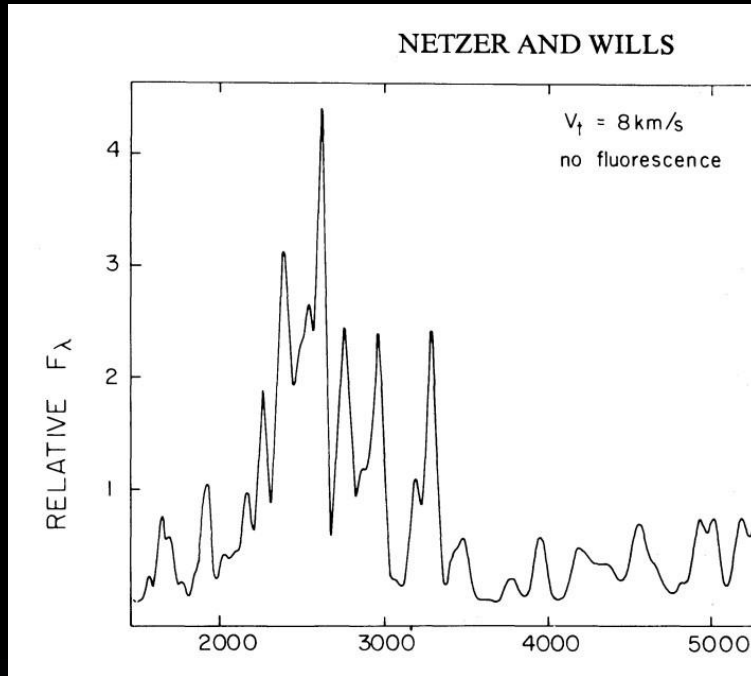
“Floor” plot

log R



FWHM H β

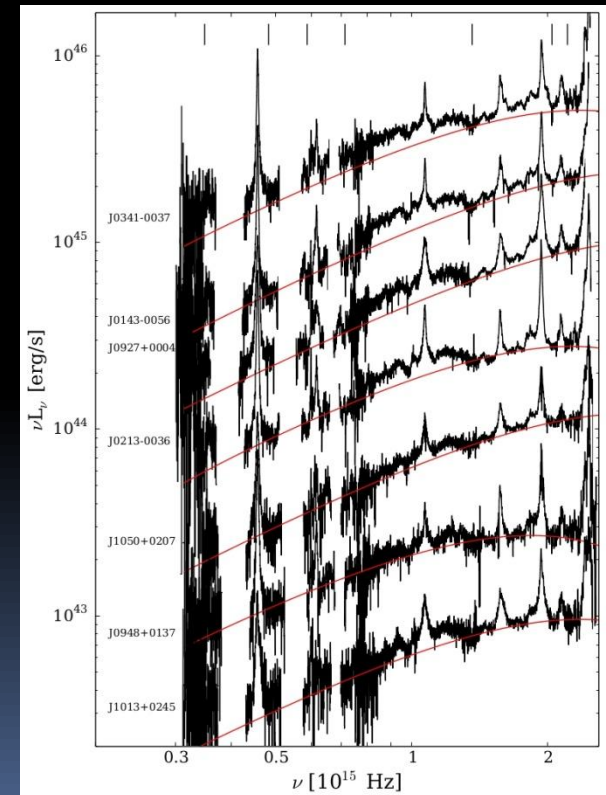
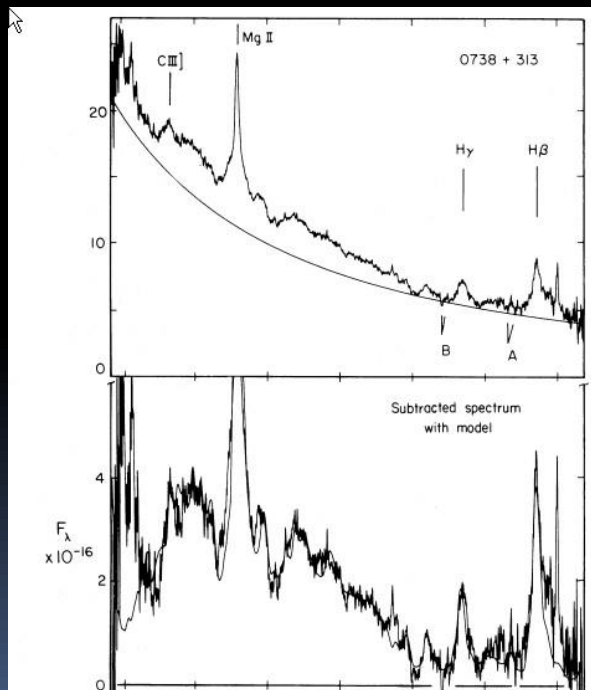
Life could be so simple without iron lines



- Fell lines can drive me mad (Hagai and Bev 1983)
- Fell lines drive us mad too (Gary Jack and Kirk 2004)
- Fell lines are so simple (Fred 2014)

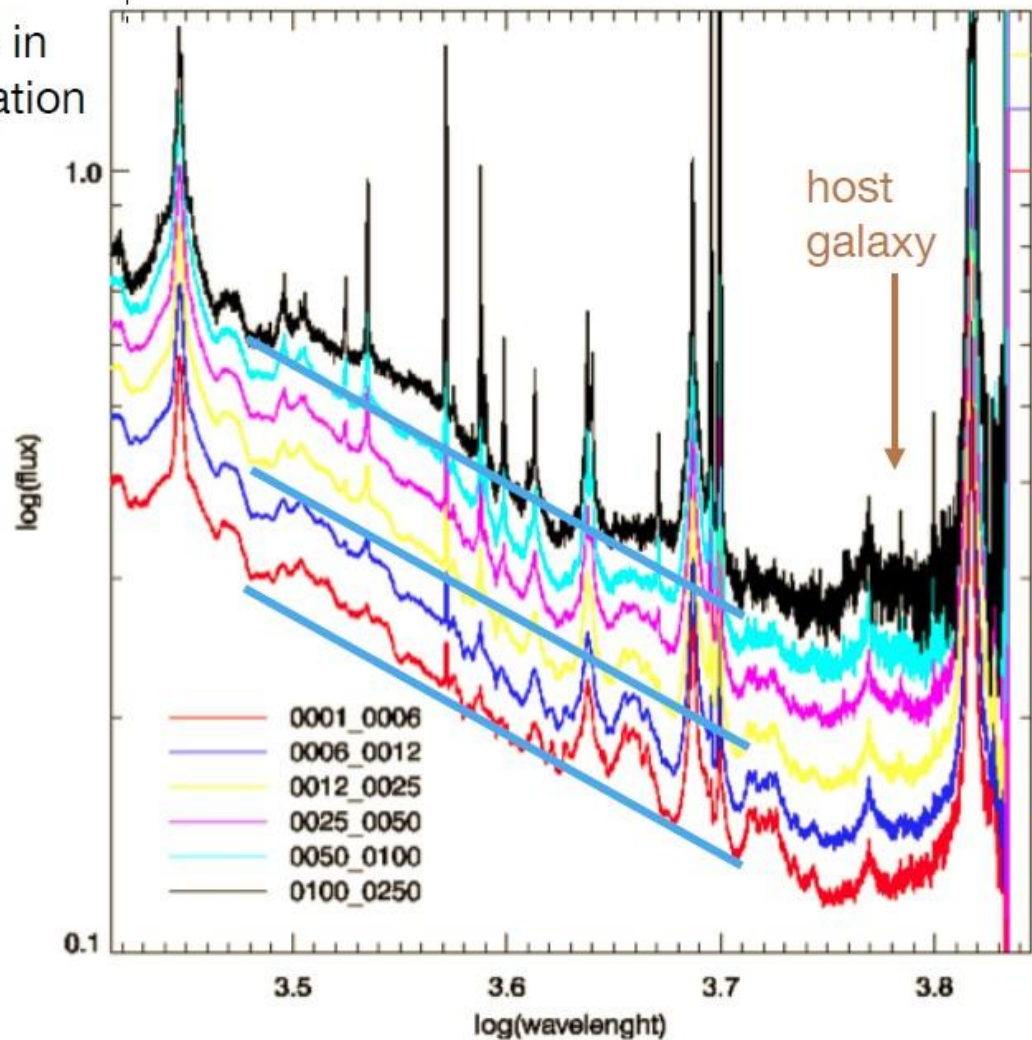
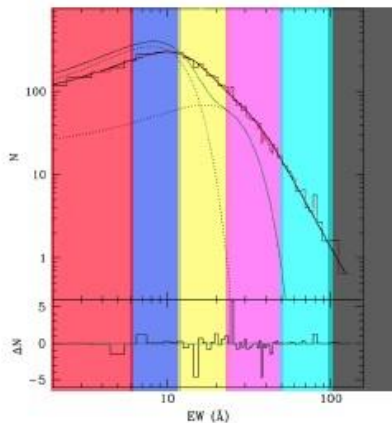
Power-law everywhere

- What is the canonical SED?
- What about accretion disks?



★ no significant changes in slope, no dust obscuration

★ also no change in AD spectrum ...



Marconi – how to measure disk inclination

1991-2000

The era of reverberation mapping

- BL clouds now working for a bigger purpose
- Also: the era of HST observations
- Also: The era of polarimetry

Talks:

Horne, Peterson, Pancoast – new RM

Lira – new polarization

On the Nature of Soft X-Ray Weak Quasi-stellar Objects

W. N. Brandt

Department of Astronomy and Astrophysics, 525 Davey Laboratory, Pennsylvania State University, University Park, PA 16802

A. Laor

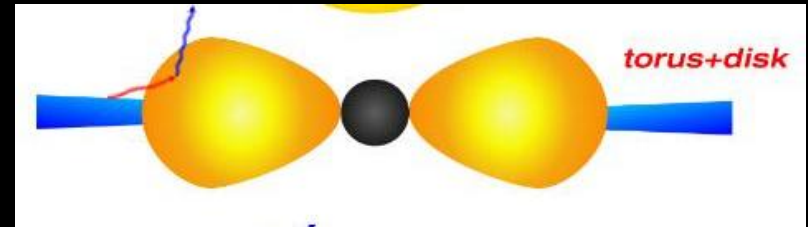
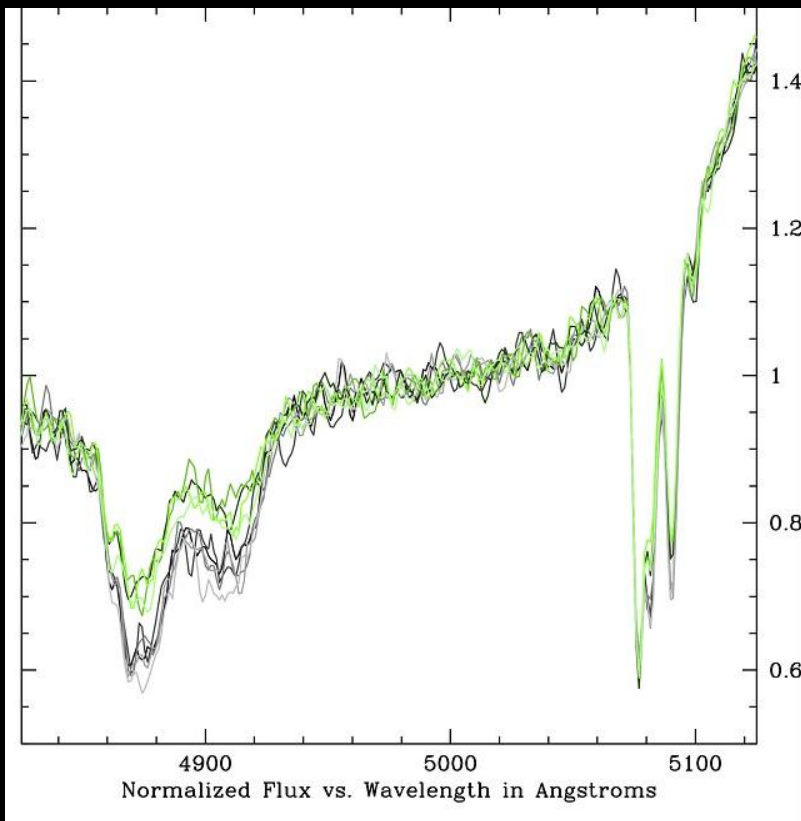
Physics Department, Technion, Haifa 32000, Israel

and

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Department of Astronomy, University of Texas at Austin, Austin, TX 78712

Exceptional sources



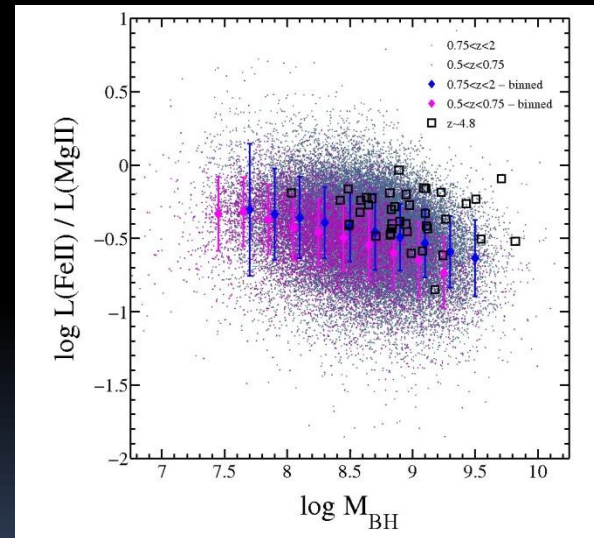
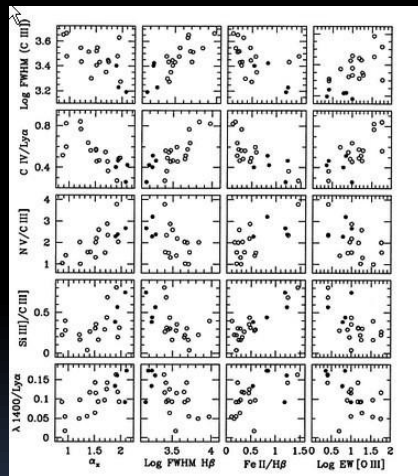
- Shemmer – weak emission lines
- Brandt – extremely weak emission lines
- Hall – disappearing BALs

$$\frac{\text{no. of papers on exceptional objects}}{\text{no. of exceptional objects}} \rightarrow \infty$$

2001-2010

The era of big samples

- Also: The era of selection effects
- Also: The era of BH and galaxy co-evolution



2000 New Astronomy Review
Wills, Shang, Yuan
H β line width and UV-X properties
(you just wait until the SDSS comes along)



2011-???

Back to the roots

- Revisiting BLR physics
- Revisiting accretion disks
- Revisiting dust in AGNs
- Revisiting the unified model of AGNs



Talks:

Laor – the nature of BLR clouds

Risaliti – I can actually see them moving

Czerny – BLR clouds are dust is in the air

Ferland – coronal lines from a dusty torus

???

???

in 2014 but !!! In 2020

- Unification – does it work for all AGNs?
 - Merger or not a merger
- What is the physical origin of EV₁?
- Very weak emission lines
 - Any relation to “real type-II AGNs” (torus does not disappear)
- What is the role of slim accretion disks?
 - 80% of all accretion disks at $z > 1.5$ are slim
- Can we see the other side of the BLR?