SDSS J1413+5305: a "changing-look" quasar with a "turn-on" transition

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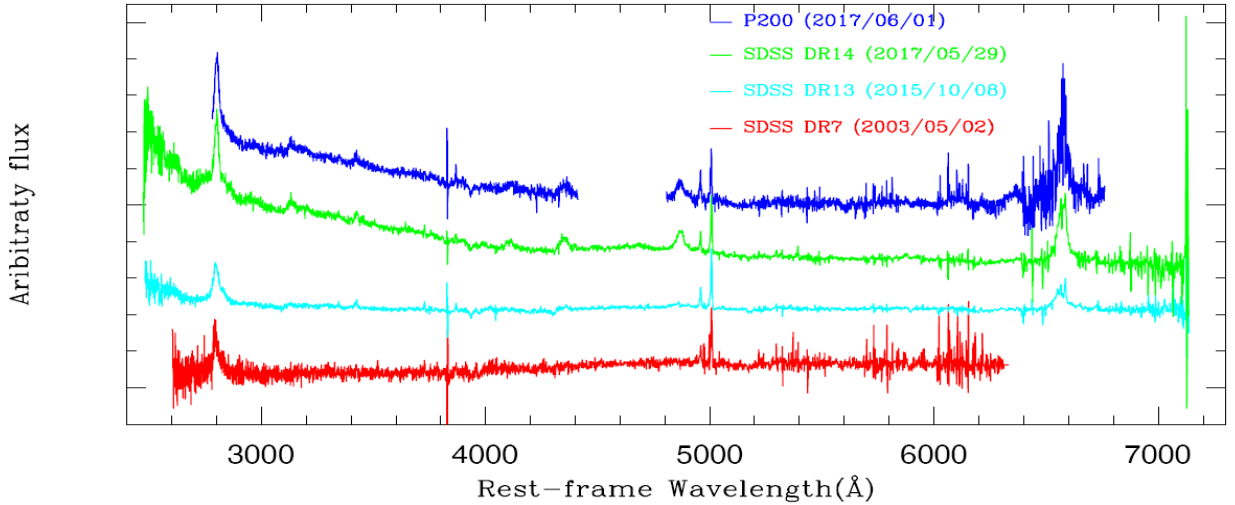
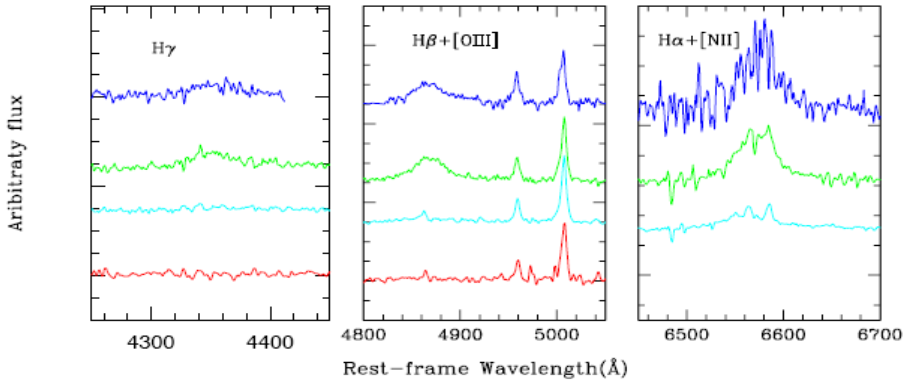
Spectroscopic observation
–P200/DBSP, Palomar Obs.
–2017/06/01
–7×1200s exposure



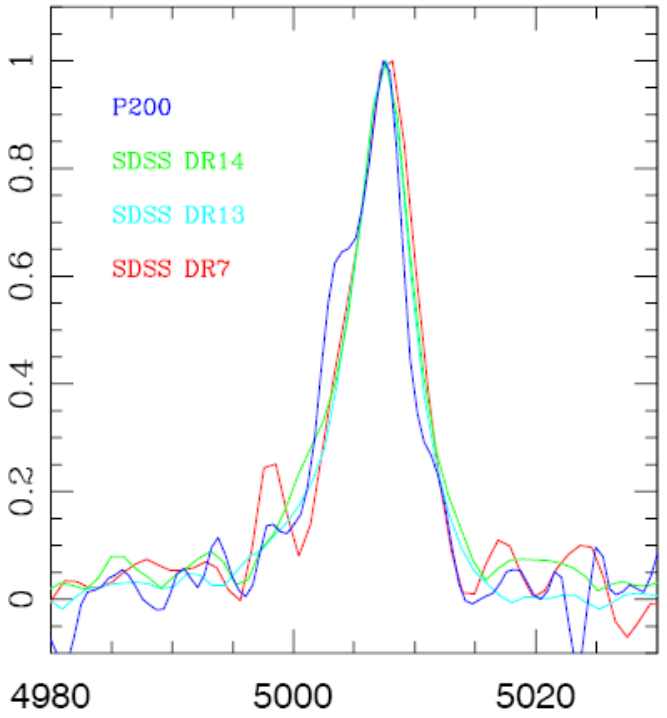
Type 2/1.9 ➡ Type 1.8 ➡ Type 1 (turn-on)

- A CL quasar (z = 0.456 and M_{BH} ~5-9×$10^7 M_\odot$) with a "turn-on" type transition from Type-2/1.9 into Type-1 within a rest frame time scale of 1-10 yr.
- Plausible driver: viscous radial inflow → change in accretion rate
  - ✓ Inflow time scale Δt~1-5 yr
  - ✓ thermal instability time scale Δt~3-4 yr
  - ✓ mid-infrared brightening



Implication for the mechanism

- **Proposed mechanisms**
- × **Variation of obscuration**
- × **Accelerating outflow**
- × **TDE**
- ✓ **Viscous radial inflow**



× Crossing time out of BLR > 42 yr

× In-variation of [OIII] blue asymmetry

× Fade-out time scale Δt~1yr

See details in Wang, Xu & Wei 2018, ApJ 858, 49

A future UV time-domain survey

See details in Wang et al. 2019, PASP, 131, 095001

–Explore supernova progenitor by shock breakout

–Explore inactive massive black hole by tidal disruption event

–Explore challenge of AGN's unified model by CL-AGN

–Explore future of Sun through flares of stars

–Explore death of massive stars through GRB

–Explore EM counterpart of GW(BBH/BHNS) & neutrino event

–…

•Preliminary specification

Item	Value
Total sky coverage	8×400=3200 deg^2
Limiting magnitude	21.5 mag (AB) @ 2000A (S/N=7, exp=300s)
Cadence	30-300s

Transient	Detection rate (yr^{-1})
SBOs	~150
TDEs	~50-60
Flares of star	~600-1000

•Current stage

Pre-Phase A has been founded by Chinese Academy of Sciences