

The UKIDSS high-redshift quasar survey

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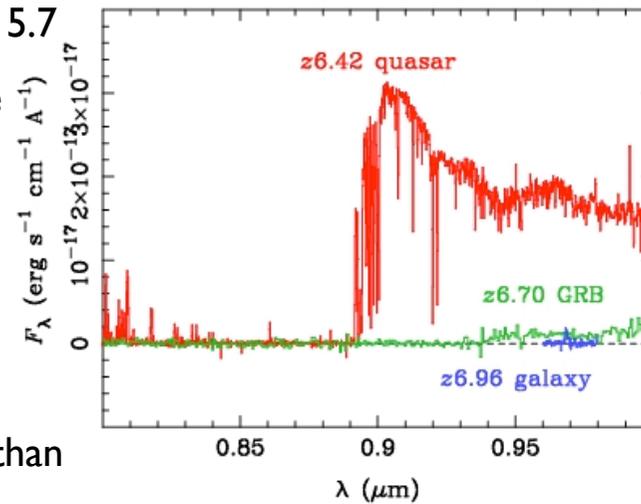
High-redshift quasars

20 QSOs with $z > 5.7$

Probe of structure
formation

HI absorption
reveals
reionization
history

Quasars brighter than
galaxies and GRBs



UKIDSS, VISTA, Pan-STARRS

DR5 LAS: 1,360 square deg to $Y = 20.2$ and $J = 19.5$

Full LAS: 3,800 square deg to $Y = 20.2$ and $J = 19.5+$

All but ~ 20 square deg has SDSS u,g,r,i,z coverage

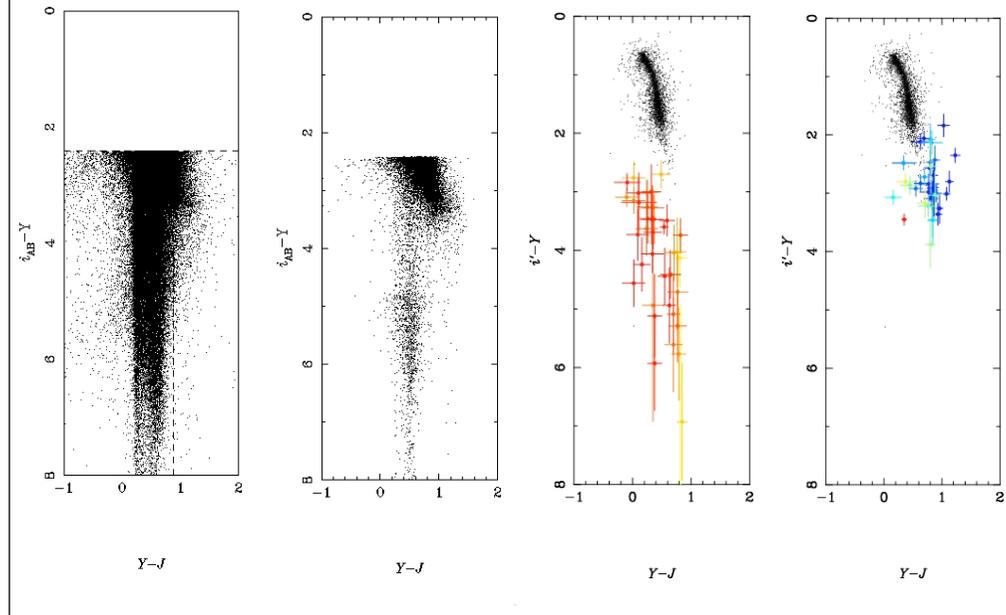
VISTA VIKING: 1,500 square deg to $Y = 21.4$;

but no i band until KIDS - hard to identify red sources

Pan-STARRS PSI: 30,000 square deg to $Y = 20+$ in time;

but no J band coverage - hard to separate brown dwarfs

Selection method



Results

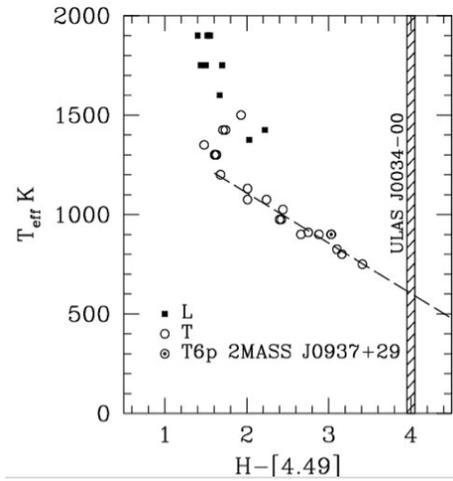
200 new square deg in DR5:
only 16 sources followed-up;
only one Gemini spectrum

Double SDSS in the same area

Two other research groups
also doing this search but
no other discoveries - good
sign we're not missing (m)any

| | |
|-------------------|------------|
| (SDSS J0836+0054) | $z = 5.82$ |
| (SDSS J1411+1217) | $z = 5.93$ |
| ULAS J0203+0012 | $z = 5.74$ |
| ULAS J1319+0950 | $z = 6.13$ |
| ULAS J1307+0630 | $z = 6.00$ |

Unexpected discoveries



ULAS J0034-0052: then the coolest known brown dwarf

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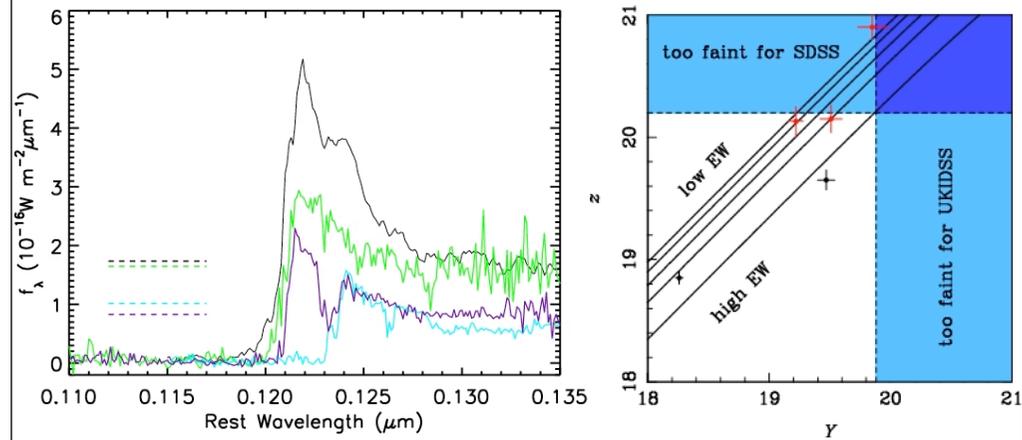


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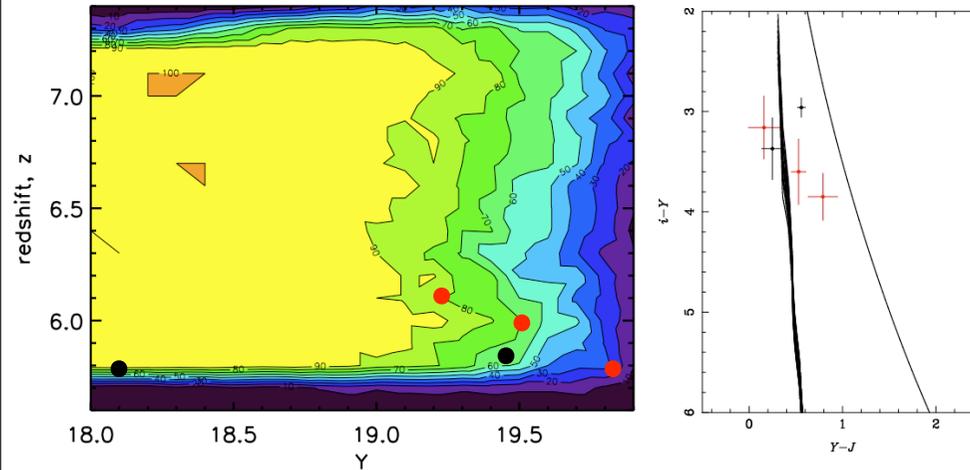
UKIDSS vs. SDSS



Selection effects: UKIDSS quasars have lower EWs

HI optical depths to UKIDSS and SDSS quasars consistent

Completeness



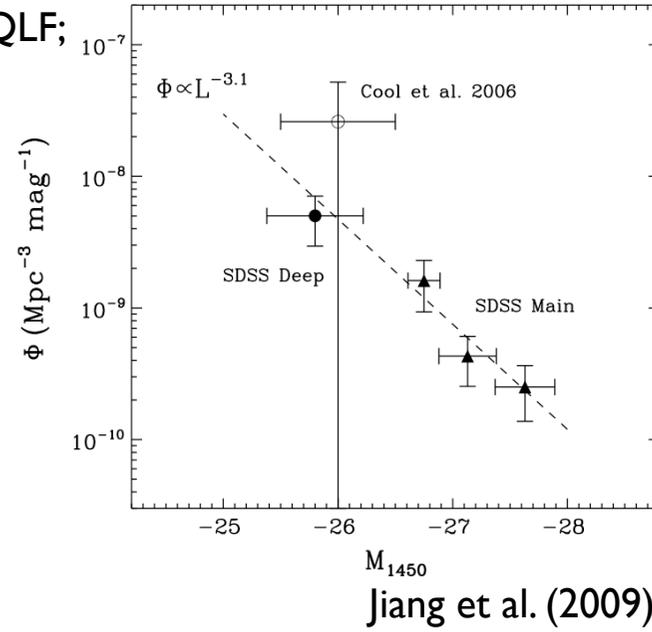
Completeness includes detection criteria and probability
~90% complete to $Y = 19.2$; ~50% complete to $Y = 19.6$

Future prospects

Jiang et al. (2006) QLF;
Fan et al. (2004)
evolution

10 \pm 3 \pm 2
5.6 < z < 6.4
expected

3 \pm 2 z > 6.4
expected



Summary

5 $z > 5.7$ quasars but 0 $z > 6.4$ quasars in UKIDSS DR5

30 \pm 6 $z > 5.8$ quasars and 9 \pm 3 $z > 6.4$ quasars expected in full 3800 square deg of LAS

90% complete to $Y = 19.2$; 50% complete to $Y = 19.6$

Will make the best measurement of $z \sim 7$ QLF

Completion in 2012, before VISTA and Pan-STARRS