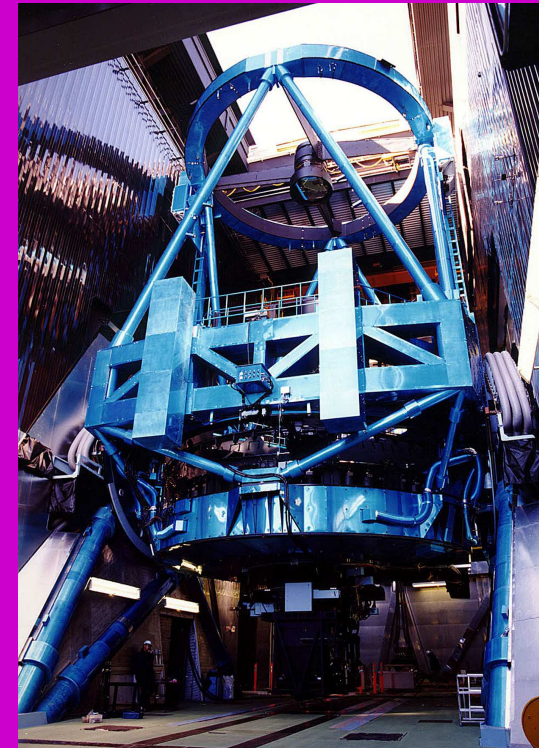




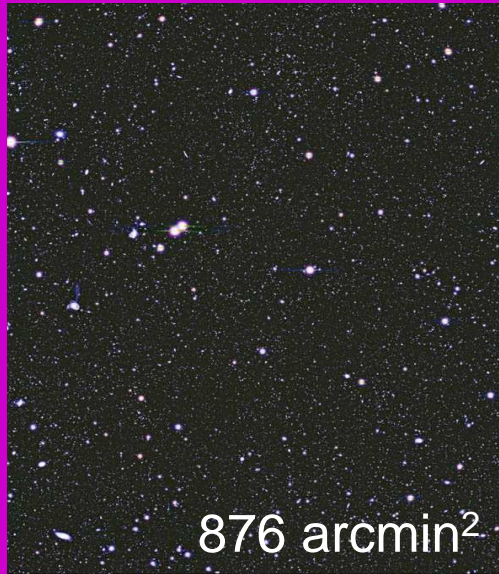
Lyman α emitting galaxy at redshift $z = 7$ and its implications for cosmic reionization

Kazuaki Ota¹, Masanori Iye², Nobunari Kashikawa²

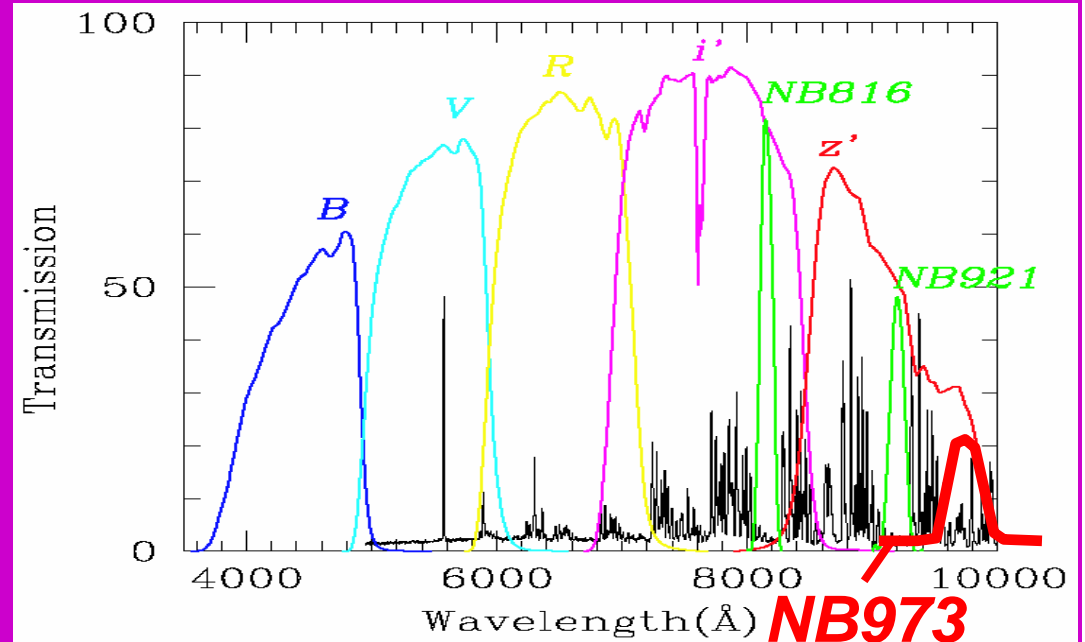
University of Tokyo¹, National Astronomical Observatory of Japan²



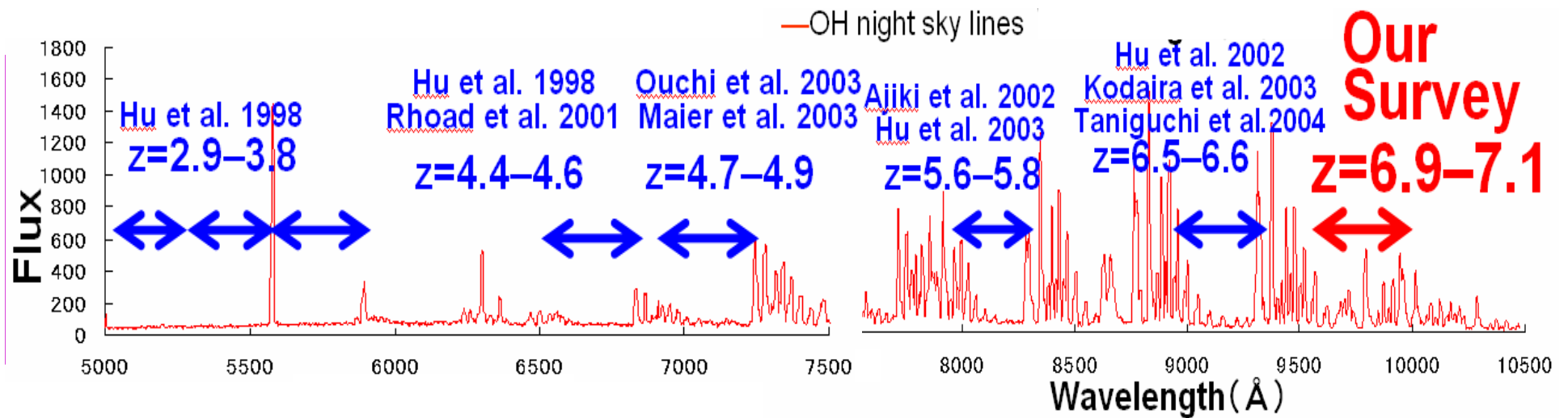
Imaging Observation



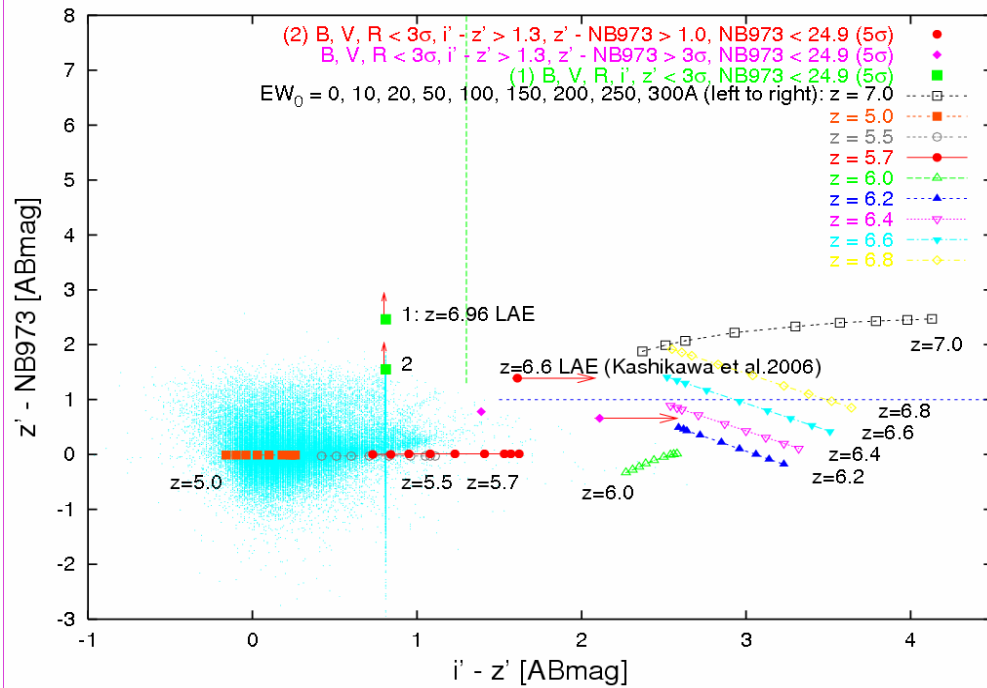
Subaru Deep Field
Suprime-Cam / Subaru Telescope



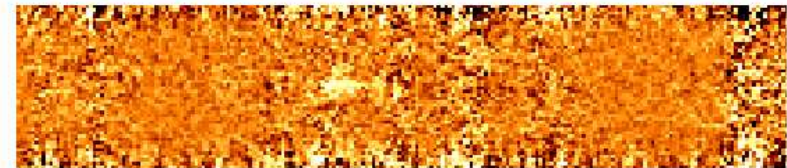
Our narrowband filter



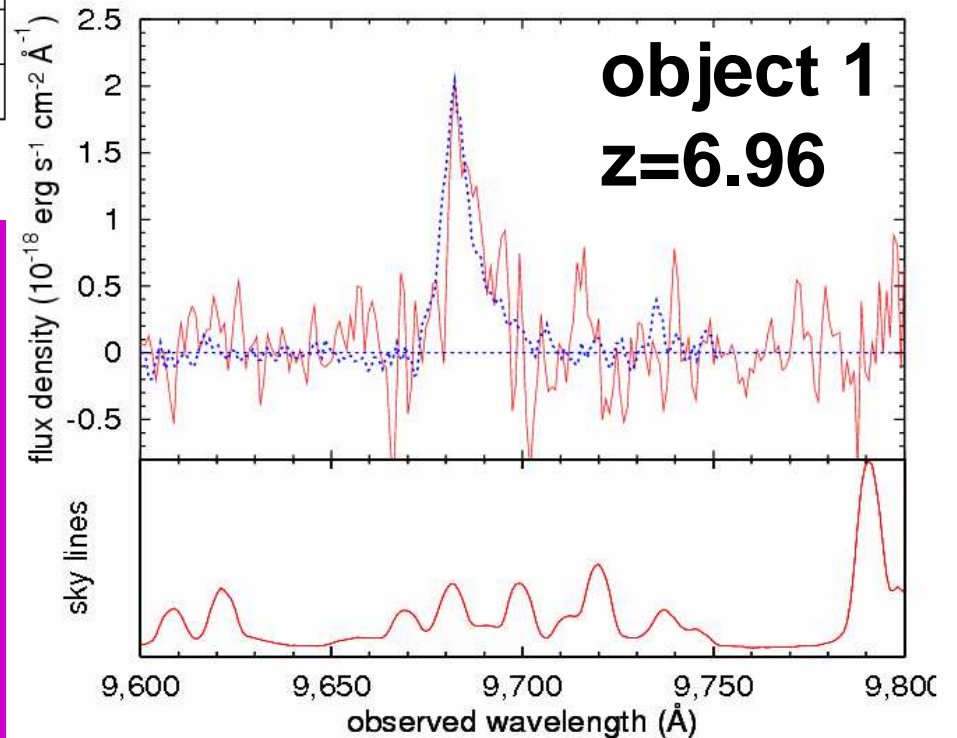
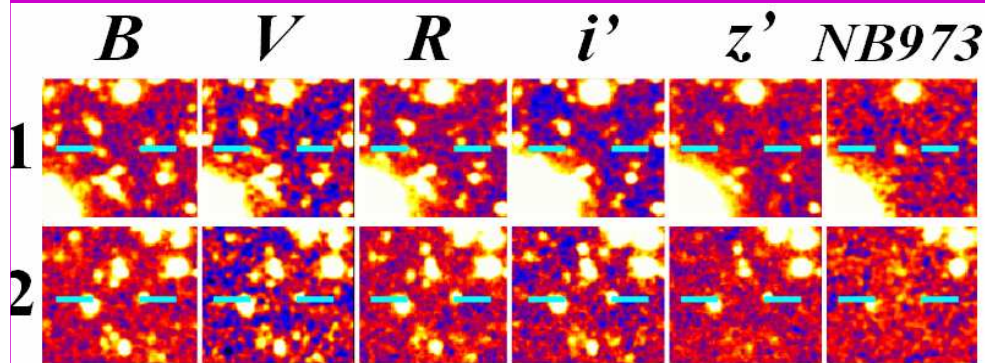
Candidate Selection & Spectroscopy



- (1) $B, V, R, i', z' < 3\sigma$, for $z=7.0$ LAE candidates: object 1 and 2,
 (2) $B, V, R < 3\sigma, i' - z' > 1.3, z' - NB973 > 1.0$
 $z=6.4-7.0$ LAE candidate: object 3.



Colors: $z=5-7$ model galaxies & $z=7$ LAE candidates

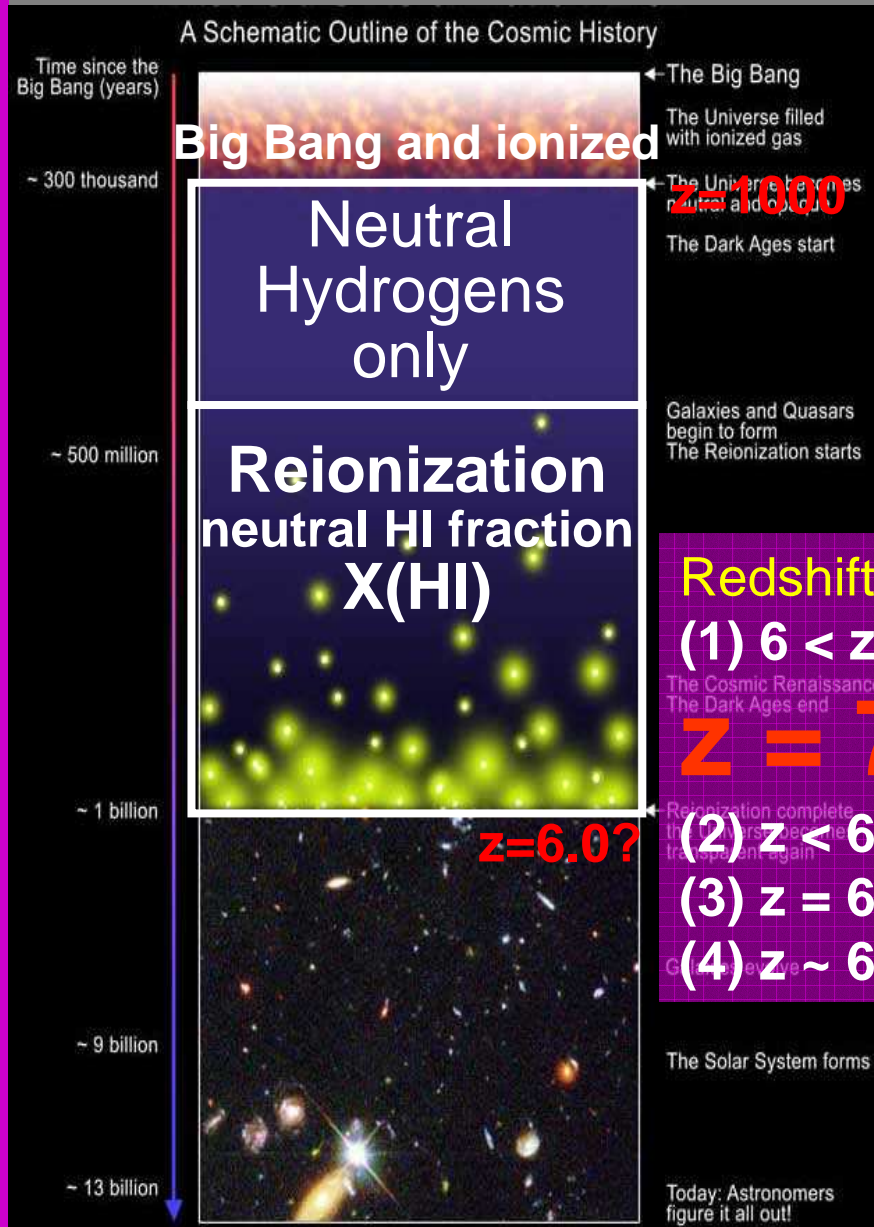


Images of $z=7.0$ LAE candidates

Spectrum of $z=6.96$ LAE

Epoch of the Reionization

History of the Universe (credit: Djorgovsky)



- (1) **WMAP**: CMB polarization obs.
- (2) **High-z Ly α emitting galaxies**
- (3) **Ly α absorption of γ -ray bursts**
- (4) **z~6 SDSS quasars' GP troughs**

Redshifts z & neutral hydrogen fractions $x(\text{HI})$

(1) $6 < z < 14$ WMAP (Page et al. 2006)

$z = 7.0$ $x(\text{HI}) < 0.63 - 0.83$

(2) $z < 6.6$ $x(\text{HI}) < 0.45$ (Kashikawa et al. 2006)

(3) $z = 6.3$ $x(\text{HI}) < 0.17$ (Totani et al. 2006)

(4) $z \sim 6.0$ $x(\text{HI}) < 0.01$ (Becker et al. 2001)