

## 1. QUASAR HOSTS

- (a) Observe morphology of significant samples of quasars as function of: radio loudness, redshift, quasar luminosity, galaxy environment -- so 100's not few, test merger models for quasar evolution

High dynamic range imaging; nulling?; stable PSF  
--> near-IR AO imaging + optical to get colors

- (b) Kinematics of fuzz  
contamination by intervening galaxies significant, so need spectra to get redshift of fuzz  
use emission line diagnostics to get SFR, abundances, detect presence of starburst  
stellar populations (colors) + dynamics

Long slit spectroscopy, or IFU; optical and IR; R=1000-20,000

- (c) properties of inner gas disks in nearby seyferts; push to higher z with better spatial resolution. are these gas disks related to how the black hole is fueled?

Narrow band imaging or IFU; spectra.

## 2. BLACK HOLE DEMOGRAPHICS

- (a) census of nuclei-- look for very low luminosity AGN in galaxies
- (b) Does Mogorian relation hold for dwarfs? High z galaxies?
- (c) Get redshifts of very high z quasars; what is luminosity function at  $z > 6$ ?
- (d) demographics of "faint" quasars at  $z=1-10$ ;
- (e) demographics of red quasars

MOS of faint sources to get redshifts  
long slit R=1000 of single faint objects  
long slit R=10,000 of single objects

## 3. QUASAR OUTFLOWS

- (a) Galactic scale outflows in nearby seyferts: ionization cones; push past very local seyferts
- (b) search for optical counterparts of radio+xray jets
- (c) detailed spectroscopy of BAL and associated absorbers  
--> abundances, kinematics
- (d) variability of associated absorption, BALs --> size and geometry of absorbing outflow; densities + kinematics

Deep optical imaging; narrow band imaging  
R=30,000 optical spectroscopy of single sources  
spectropolarimetry, R=1000-30,000  
R=1000 spectra in optical of faint features

#### 4. RADIO GALAXIES

(a) optical+nearIR spectroscopy of hosts to understand kinematics wrt radio absorption, VLBI/VSOP structure, and kinematics

(b) spectropolarimetry to understand physics, search for AGN

R=10,000 long slit/IFU in optical and IR  
spectropolarimetry R=5000 in optical and near-IR

#### 5. QUASAR CLUSTER ENVIRONMENTS

(a) Search for clusters + galaxy companions for quasars as a function of redshift, radio loudness, luminosity

deep, multiband (optical+ir) imaging to identify galaxies with photoz's

MOS to confirm with spectroscopic redshifts to get galaxy cluster scale kinematics, look at properties of galaxies (emission lines etc)

#### 6. STRUCTURE OF THE CENTRAL ENGINE

(a) Test unified model with Mid-IR measures of dust, search for evidence that there is hot dust being heated by AGN

(b) identify faint sources found in mm- and IR surveys; (spectroscopic redshift or photo-z)

(c) spectropolarimetry of narrow line quasars

#### 7. MICROQUASARS

(a) demographics in Milky Way; candidates in M31 (identify objects)

(b) optical and near-IR spectroscopic and spectropolarimetric monitoring; spectral energy distributions

#### 8. GALACTIC CENTER

NEED HELP HERE!