
AOWG Telecon: 09/16/05

Attendees: Max, Koo, Liu, Dekany, Matthews, Wizinowich, Chaffee,
Marchis, Macintosh, Neyman

Agenda:

- Results from KPAO/MCAO/MOAO brainstorming
 - Planetary (Marchis)
 - Galactic (Macintosh)
 - Extragalactic (Max)
- Planning for Keck Science Meeting strategic planning session (Max & Liu)
 - AOWG 10-minute presentation
 - Key questions for the audience

Next-gen A0 science cases

- > AOWG (all): send input to Keck Forum web page before Keck Sci
- > Meeting

Extragalactic discussion

- Max: can MOAO be considered for expressly for imaging?
- Dekany: usually think of MOAO as intimately tied to spectroscopy
 - (can always make images)
 - "spaxial" = spatial sampling of an IFU head
 - max spaxial size drives the optical design
 - tradeoff is then between FOV and pixel sampling
 - more interesting xgal science *not* for diffraction-limited sampling
 - ~0.1" spaxials is better
- Koo: high-SR in optical is big driver
 - may not have HST in ~5 years, thus need/enthusiam for optical HST
 - *also 4x angular resolution --> ~4x farther for stellar pop studies*
 - $4^3 = 64x$ larger sample available for study, in some sense
- Max: laser technology is getting there - optical A0 is no longer crazy
- Koo: OSIRIS will only do a handful of objects over several years
 - bring able to multiplex is a big gain
- Matthews: high Strehl is key to sensitivity, more important than wide field

Galactic discussion

- Macintosh: two broad areas of application
 1. crowded field - Gal Center, globular clusters ...
 2. high contrast - have done some quick calculations
 - at 0.5", 10x better than Keck A0 contrast
 - planet detection: young embedded stars, low mass stars, brown dwarfs
- Liu: MOAO, MCAO not so compelling
 - proper motion study of Orion is good, but Gemini/MCAO will have big headstart

Planetary science

Marchis: KPAO is the most appealing capability,
FOV is not a driver for solar system science
even ~5" FOV is ok: e.g. want to see *local* dynamics of planet atm
(don't need to see the whole planet - already have observed this)
Matthews: high Strehl much reduces the blending of surrounding stuff
also significant S/N boost for many applications
Max: AO on Jupiter using same methods as solar AO may be possible
Marchis: optical AO is very appealing
broad absorption at ~0.8-0.9 um due to hydrated materials
better sensitivity to fragments/moonlets around TNOs & asteroids
gives internal distribution of mass --> origin
directly resolve TNOs & Trojans
reconstruct the size & shape
resolve surface composition
going to ~7000 A would be very desirable
* AO will happen much faster than new space probes *

----- General discussion -----

Dekany: if want shorter wl's, all that's needed is more \$\$\$ to get more laser power

short wl cutoff is key question to answer by science
simulations show that PSF falls apart most quickly due lack of laser power
e.g. fitting error (too few subapertures) falls apart less slowly

Dekany: resolution with a single LGS is different than a multiple LGS system
single system: resolution never reaches diff limit
multiple laser: can overcome this problem

Chaffee: would like to get the community so excited that they are clamoring for AO
generate a "chorus" that AO is one of most important things for Keck's future

Max: would like to start a discussion of "narrow field" vs "wide field" among community

Chaffee: are these two approaches exclusive?

Dekany: no. think about KPAO as just delivering a wide-field.

Neyman: can design KPAO smartly so can go down either MCAO or MOAO path
and could still be used in high Strehl & in the visible
laser cost is a big driver, could be bought incrementally

Wizinowich: "KPAO-120" and "KPAO-90" concepts

Wizinowich: we need a Science Team and a Project Scientist !!