

Targets for FLAO/PISCES commissioning, Jun 2011

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P	Target	Coordinates J2000	Ref. star Coordinates	Ref. star Mag Dist''	Description	Links	LT AM
1	Mkn231	12:56:14.2 +56:52:25		V=13.6 I~13	AGN and ULIRG, possibly with bright star clusters around the nucleus. The nucleus is bright enough to be used as reference. Strategy: (also see Description) <ol style="list-style-type: none"> DIT~10sec, 10min in Ks, 20min in J DIT~0.8sec, a few images in both filters A reference PSF (isolated star of similar mag) is needed. 	Image Description	20:00 1.10 21:30 1.16 22:30 1.26
2	HD 128311	14 36 00.4 +09 44 49.6 (~0.4"/ yr proper motion)		R=6.9 I=6.4 H=5.3	The target is a planetary system, 16.6pc from the Sun. 2 planets have been observed with RV. They are both not observable with direct imaging. - HD 128311 c: theta=0.1", D=1.76 AU, mass=3.2 Mj - HD 128311 b: theta=0.07", D=1.09 AU, mass=2.18 Mj With the assumption that a planetary system has a higher probability to have another planet, we could detect planets with mass in the (12-30) Mj range at ~0.5" of distance. Strategy: <ol style="list-style-type: none"> both J and K, 15 min each for each filter, use a NB filter at the same wavelength to obtain unsaturated images with the same PSF ADI imaging? rotation? 	Masciadri's presentation	20:00 1.15 21:30 1.08 23:30 1.24
2	HP Boo	14 50 15.72 +23 54 42.3		R=5.9 J=5.0 H=4.9 K=4.5	Bright star with a nearby (2.64" at PA=104.5) binary L brown dwarfs with mags H=13.0 and H=13.2. The Delta mag is H=8, should be easy to do. Excellent Test of ADI Proposed strategy: <ol style="list-style-type: none"> TIMING: ONLY GOOD FOR ADI FROM 8-11 PM (need about 30 degrees of total rotation for ADI) rotator off H band (or J or K if H is not present) DIT=10 sec NDIT=20 (saturated images) (don't saturate more than 0.5" dia of PSF core, if so make DIT smaller and NDIT larger) DIT=0.5 sec NDIT=3 (as short an exposure as possible-- if still badly saturated (like >0.2" dia.) use NB filter near H) repeat steps 4 & 5 for ~30 minutes total CLOCK time 	Laird's document see image of system fig 1 in this paper	20:00 1.09 22:00 1.01 0:00 1.18

					(should have >20-30 deg of sky rotation since the start of the program)		
2	GJ 569A	14 54 29.07 +16 06 04.9		R=9.1 J=6.6 H=5.9 K=5.7	<p>Binary stars ("A" and "B"), with 5" arcsec separation, where B is a binary brown dwarf system Ba/Bb with 0.1" of separation. There is evidence that Ba is really two more very low mass brown dwarfs, here we could really see if the PSFs are different between Ba and Bb, and so if it is a triple system.</p> <p>Strategy: <u>ADI imaging</u>, 70 deg of rotation between 9 and 11 PM</p> <p>In J band the brown dwarfs are J_Ba=11.41, J_Bb=11.65 so they are quite bright. I would think that the following integration would work well (must be short to avoid blurring at 5" offset)</p> <p>J band = 5 s DIT</p> <p>So to observe J band ADI: TIMING: ONLY GOOD FOR ADI FROM 8 PM - 1 AM (need about 20 degrees of total rotation for ADI here) observing steps:</p> <ol style="list-style-type: none"> 1. rotator off 2. DIT=5 sec NDIT=30 (saturated images) (don't saturate more than 0.5" dia of PSF core, if so make DIT smaller and NDIT larger) 3. DIT=0.5 sec NDIT=3 (as short an exposure as possible - if still badly saturated (like >0.2" dia.) use NB filter near J) 4. repeat steps 2 & 3 for ~30 minutes total CLOCK time (should have >20 deg of sky rotation since the start of the program) Need to take Ks Band as well : <p>Ks band = 10 s DIT</p> <p>So to observe Ks band ADI: TIMING: ONLY GOOD FOR ADI FROM 8 PM - 1 AM (need about 20 degrees of total rotation for ADI here)</p>	<p>Paper with near-IR images</p> <p>Laird's document</p> <p>Another paper</p>	20:00 1.14 22:00 1.04 0:00 1.21

					<p>observing steps:</p> <ol style="list-style-type: none"> 1. rotator off 2. DIT=10 sec NDIT=30 (saturated images) (don't saturate more than 0.5" dia of PSF core, if so make DIT smaller and NDIT larger) 3. DIT=0.5 sec NDIT=3 (as short an exposure as possible - if still badly saturated (like >0.2" dia.) use NB filter near Ks) 4. repeat steps 2 & 3 for ~30 minutes total CLOCK time (should have >20 deg of sky rotation since the start of the program) 		
2	ARP302	<p>14:57:00.64 +24:36:58.51 (north gal.)</p> <p>14:57:00.38 +24:36:23.3 (south gal.)</p>	<p>14:57:00.2 +24:36:40.7</p>	l~14.9 ~20"	<p>ULIRG (Ultra-luminous IR galaxy) with a nearby bright star. It is a system of two galaxies at an early stage of merging, with a guide star in between. The distance between the centers of the two galaxies is ~40". The northern galaxy is an edge-on spiral, with a prominent dust lane. Both galaxies could be observed, with priority to the northern galaxy.</p> <p>Strategy: J and K, 30min each. Northern galaxy could be observed with a rotation of the PA of 50deg N->E</p>	<p>HST I image (fits) HST I image (jpg)</p>	<p>20:00 1.10 22:00 1.01 0:00 1.16</p>
1	<p>QSO1035</p> <p>QSO1369_1.6 with nearby star</p> <p>QSO2198_1.6</p> <p>QSO3028_1.7</p> <p>QSO3079_1.9</p>	<p>14:54:26.61 +40:44:58.4</p> <p>15:12:45.19 +09:29:39.8</p> <p>16:02:10.19 +30:47:55.5</p> <p>17:07:12.59 +35:39:22.45</p> <p>17:15:18.76 +32:45:03.24</p>	<p>14:54:26.16 +40:45:09.87</p> <p>15:12:45.47 +09:29:52.2</p> <p>16:02:10.24 30:47:46.59</p> <p>17:07:11.06 +35:39:26.34</p> <p>17:15:18.2 +32:45:11.4</p>	<p>R~10.2 12"</p> <p>R~12.6 13"</p> <p>R~10.5 9"</p> <p>R~11.4 19"</p> <p>R~11.9 11"</p>	<p>AGN near foreground bright stars. Observations are aimed at detecting the host galaxies. Strategy:</p> <ol style="list-style-type: none"> 1. both J and K, 1 hour each 2. a good estimate of the PSF is needed to subtract the AGN. This can be obtained by observing nearby asterisms with similar characteristics: <ol style="list-style-type: none"> a. for QSO1035 (FC) b. for QSO2198 c. for QSO3028 d. for QSO3079 (FC) 3. QSO1369 has a nearby star (R~19, H~17?) which may be useful to estimate the PSF 	<p>Marconi's presentation</p> <p>FC QSO1035 FC QSO1369 FC QSO2198 FC QSO3028 FC QSO3079</p>	<p>20:00 1.08 22:00 1.01 1:00 1.30</p> <p>20:30 1.17 22:00 1.09 0:00 1.22</p> <p>20:00 1.24 23:00 1.00 2:00 1.30</p> <p>21:00 1.25 0:00 1.00 3:00 1.27</p> <p>21:00 1.28 0:00 1.00 3:00 1.25</p>

2	NGC6240	16:52:58.9 +02:24:03	16:53:01.21 +02:24:14.5	R~13.7 36"	Late stage merger AGN+Ulirg, galaxy with two obscured nuclei. Strategy: 1. J and K, 30min each	HST I image (fits) HST I image (jpg)	20:30 1.20 23:00 1.07 1:30 1.20
1	M92	17 17 07.39 +43 08 09.4	17:17:07.58 +43:08:04.9		Globular cluster with HST images, to obtain near-IR HR diagrams. Strategy: 1. both J and K 2. two different orientations on the array to estimate the photometric uniformity 3. 15min for each filter and each orientation 4. few minutes with very short DITs to have unsaturated PSF on bright stars	IRTC image HST H image (fits) Bono's presentation	21:00 1.27 0:00 1.02 3:00 1.23
1	3c371	18 06 50.7 +69 49 28		R~15 nuclear	Jet in a nearby QSO. Strategy: 1. K-band, 30min 2. unsaturated images for the PSF	Paper - HST photom. Falomos' preasetation Paper - NICMOS images	23:00 1.33 1:00 1.27 3:00 1.34
2	Palomar 10	19 18 02.10 +18 34 18.0			Galactic plane globular cluster, J and K observations to obtain age and membership. No HST images. Reference stars (see image): A: 19:18:05.16 +18:35:00.0 R=12.1 B: 19:18:05.75 +18:33:55.3 R=13.9 C: 19:18:02.38 +18:34:31.4 R=14.3 (closer to nucleus) Strategy: J, H and K, 30min on-souce per filter, with an ON_OFF dithering pattern, with DIT~10 sec and small offsets between the different images. A few images with short DIT (~0.8sec) to observe the bright stars)	DSS image (fits) DSS image (jpg) Ortolani's presentation	23:30 1.27 2:00 1.02 4:30 1.21
2	NGC6791	19:20:54.16 +37:46:29.0			Globular cluster with stars much more sparse than in M92. Several possible reference stars are possible, see the image: A: 19:20:55.09 +37:47:17.0 I=11.9 B: 19:20:54.16 +37:46:29.0 I=13.0 C: 19:20:50.75 +37:46:34.5 I=12.3 D: 19:20:52.86 +37:45:33.8 I=13.2 Strategy: J and K filters, two orientations per filter with 90deg of rotation, 15min per filter per position	HST H image (fits) HST H image (jpg) HST V image (fits) Bono's presentation	23:00 1.29 2:00 1.01 4:30 1.14
1	GJ 758 A	19 23 33.95 +33 13 17.6		R=5.8 J =5.3 H =4.7 K =4.5	Bright star "A" with a *ultra* Cool Methane brown dwarf companion "B" just 1.8" away (PA=198 deg), and a tighter fainter (background?) planet like object "C" just 1.2" away (PA=219 deg)	Paper with near-IR images Laird's document	0:00 1.13 2:00 1.00 4:00 1.08

					<p>Strategy: EXCELENT TEST of <u>ADI imaging</u> 100deg of rotation between 1 and 3 AM</p> <p>In H band the brown dwarf B and "planet" C are H_A=18.30, H_C=17.51 mag (delta H = 14.51 and 13.72 mag) so they are quite faint. I would think that the following integration would work well H band 30 s</p> <p>So to observe H band ADI: TIMING: ONLY GOOD FOR ADI FROM 1 to 3 AM (you may wish to observe on either side of transit since it goes right overhead -- skip 10 mins during transit if needed to keep AO stable) (need about 30 degrees (or more) of total rotation for ADI)</p> <p>observing steps: 1. rotator off 2. DIT=30 sec NDIT=10 (saturated images) (don't saturate more than 0.5" dia of PSF core, if so make DIT smaller and NDIT larger) 3. DIT=0.5 sec NDIT=3 (as short an exposure as possible - if still badly saturated (like >0.2" dia.) use NB filter near H) 4. repeat steps 2 & 3 for ~50 minutes total CLOCK time (should have >30 deg of sky rotation since the start of the program)</p>		
1	BD +30 3639	19:34:45.23 +30:30:58.9		V=9.6	<p>Publicity image of a compact planetary nebula Strategy: NB filter H2 (2.12mic, 30min) + K (10 min)</p>	<p>images: Gemini Chandra Observ. description by McCarthy</p>	23:30 1.25 2:30 1.00 4:30 1.12
1	2 Pallas	20:25:50.7 +19:04:21 (on June 18) ephemeris			<p>Observations of a large (0.27") asteroid to characterize the albedo features on its surface, closing the loop on the target itself. On June 18 (~8 UT at HA ~2h east) Pallas passes within 6" of two bright stars (H=10-11) which can be used to estimate the PSF. Strategy:</p> <ol style="list-style-type: none"> NB filter at 1.64mic, observations for ~1 hr/night on each of two consecutive dates. On June 18, when Pallas and both 2MASS field stars 	<p>HST paper Observ. description by McCarthy</p>	1:00 1.19 3:00 1.03 4:30 1.07

					<p>are in the same field-of-view on PISCES, use short exposures (maybe ~5sec. with many repetitions) so that the PSF stars are not "trailed" by closing the loop on the moving Pallas.</p> <p>3. On the other nights, use longer DITs in order to build the highest signal-to-noise.</p> <p>Bright star coordinates:</p> <ol style="list-style-type: none"> 1. 20h25m50.19s 19d04m19.79s 2. 20h25m50.95s 19d04m23.28s 		
1	Q2051+1950	20:51:12.67 +19:50:06.34	20:51:11.87 +19:49:48.7	R=12.2 21"	<p>A $z=2.37$ QSO with intervening Lyman-alpha absorption at $z=1.12$. Images are aimed at detecting the adjacent galaxy which makes the intervening absorption.</p> <p>Strategy: Ks, 1hr total on-source time</p> <p>Integration must be divided into two parts with slightly different PAs (approx +/-15 deg), where the exact PA doesn't matter (so we can do rotational PSF subtraction). The K integrations should be summed up for 2-5 minutes (whatever is found to be sensible with PISCES). Small dithers (~3 arcsec) between the 2-5 minute sums are probably useful, but not absolutely required.</p>	Hill's proposal QSO2051 FC	1.00 1.26 3:30 1.02 4:30 1.04
1	HR8799	23 07 28.71 +21:08:03.30		R~5.8 H~5.3	<p>Star with 4 known planets. Observations to obtain better images of these planets and check the presence of more planets closed to the star. Strategy:</p> <ol style="list-style-type: none"> 4. both J and K, 15-30 min each 5. for each filter, use a NB filter at the same wavelength to obtain unsaturated images with the same PSF 6. the field rotation is about 15deg in 1 hour. A ADI technique (observing without field derotation) can be tested 	Discovery paper Paper with L-band images Paper with K-band images Desidera's presentation Document with more targets for planets Data on HR8799	2:00 1.68 3:00 1.32 4:00 1.13

[MORE TARGETS](#) for the old IRTC runs