

**Palomar LGSAO test schedule**  
**2-6 March 2007 (local)**

v1.1: 03/26/07 - AB & JR  
 Spotters requested 19:30-05:40 (on station 20:10-05:30)

| Test ID  | PDT start | PDT end | Test Name                             |       |       |      |      | Obs mode | Target | Description                                                         | Priority | Duration | Lead     | Clear sky<br>r0>10cm | Laser |
|----------|-----------|---------|---------------------------------------|-------|-------|------|------|----------|--------|---------------------------------------------------------------------|----------|----------|----------|----------------------|-------|
| 04/02/07 |           |         | 19:15                                 | 20:02 | 12:58 | 5:39 | 6:27 |          |        |                                                                     |          |          |          |                      |       |
| 1        | 10:00     | 13:00   | Install LLT                           |       |       |      |      | closed   | zen    |                                                                     | 1        | 3.00     | Doyle    | N                    | N     |
| 2        | 10:00     | 14:00   | AO bench setup and checkout           |       |       |      |      | closed   | zen    | Setup Aerotech controller, co-focus WFS, setup chopper & delay      | 1        | 4.00     | Roberts  | N                    | N     |
| 3        | 13:00     | 14:00   | BTO setup and checkout                |       |       |      |      | closed   | zen    | Test Q3, servo control.                                             | 1        | 1.00     | Angione  | N                    | N     |
|          | 14:00     | 14:30   | <i>status and safety meeting</i>      |       |       |      |      |          |        |                                                                     |          | 0.50     |          |                      |       |
| 4        | 14:30     | 15:30   | Prepare laser for observing           |       |       |      |      | closed   | NA     | Final alignment and testing of laser, control loops.                | 1        | 1.00     | Tripathi | N                    | N     |
| 5        | 14:30     | 16:00   | LLT alignment and checkout            |       |       |      |      | closed   | zen    | Align stimulus laser to LLT.                                        | 1        | 1.50     | Bouchez  | N                    | N     |
| 6        | 15:30     | 16:00   | Align laser to BTO                    |       |       |      |      | closed   | NA     | Align CSFL to BTO in Coude lab.                                     | 1        | 0.50     | Bouchez  | N                    | N     |
| 7        | 16:00     | 16:30   | Test safety interlocks                |       |       |      |      | closed   | NA     | Install barriers and test interlocks.                               | 1        | 0.50     | Cromer   |                      |       |
| 8        | 16:30     | 17:30   | Laser alignment in dome.              |       |       |      |      | closed   | zen    | Low/high power laser projection in the dome.                        | 1        | 1.00     | Bouchez  | N                    | N     |
| 9        | 18:00     | 19:00   | Calibrate PHARO                       |       |       |      |      | closed   | NA     | Calibrate centroids for both refl. spot & dichroic.                 | 1        | 1.00     | Hickey   |                      |       |
|          | 18:00     | 19:00   | <i>dinner</i>                         |       |       |      |      |          |        |                                                                     |          | 1.00     |          |                      |       |
| 10       | 19:45     | 20:15   | <b>AO Checkout</b>                    |       |       |      |      | NGS      | V=8    | Measure seeing, NGS performance.                                    | 1        | 0.50     | Hickey   | N                    | N     |
| 11       | 20:15     | 20:30   | <b>Calibrate Acq Cam (NGS)</b>        |       |       |      |      | NGS      | V=6    | Image calibrated binary with Acq and PHARO.                         | 1        | 0.25     | Bouchez  | N                    | N     |
| 12       | 20:30     | 22:00   | <b>LLT boresighting</b>               |       |       |      |      | NGS      | V=3    | Check and correct LLT boresighting.                                 | 1        | 1.50     | Moore    | N                    | N     |
| 13       | 22:00     | 23:00   | <b>LLT image quality</b>              |       |       |      |      | NGS      | V=3    | Measure and optimize LLT image quality.                             | 2        | 1.00     | Roberts  | N                    | N     |
| 14       | 23:00     | 0:00    | <b>LGS acquisition</b>                |       |       |      |      | LGS      | zen    | Project laser at zenith, focus, UTT optimization                    | 1        | 1.00     | Troy     | N                    | N     |
| 15       | 0:00      | 0:15    | <b>Calibrate Acq Cam (LGS)</b>        |       |       |      |      | LGS      | zen    | Dither TTM while imaging LGS on Acq and star on PHARO               | 1        | 0.25     | Bouchez  | Y                    | N     |
| 16       | 0:15      | 2:45    | <b>LGS bright star performance</b>    |       |       |      |      | LGS      | V=10   | Acquire star, optimize servo loops, measure Strehl & PSD            | 1        | 2.50     | Roberts  | Y                    | Y     |
| 17       | 2:45      | 3:15    | <b>Off-axis acquisition procedure</b> |       |       |      |      | LGS      | V=10   | Demonstrate off-axis NGS acquisition procedure                      | 2        | 0.50     | Bouchez  | N                    | N     |
| 18       | 3:15      | 4:30    | <b>LGS science demo</b>               |       |       |      |      | LGS      | V=15   | Observe 1 science target and test dithering & backgrounds           | 2        | 1.25     | Bouchez  | Y                    | Y     |
| 19       | 4:30      | 5:00    | <b>Field dependent LOWFS focus</b>    |       |       |      |      | NGS      | V=10   | Acquire star at several points in LOWFS patrol field, record focus. | 2        | 0.50     | Bouchez  | N                    | N     |
| 20       | 5:00      | 6:00    | <b>LOWFS transfer curves</b>          |       |       |      |      | NGS      | V=10   | Measure TT and Focus transfer curves                                | 3        | 1.00     | Roberts  | N                    | N     |

| 04/03/07 |       |       | 19:16                            | 20:03 | 13:02 | 5:38 | 6:25   |      |                                                              |  |      |  |   |      |          |   |   |   |
|----------|-------|-------|----------------------------------|-------|-------|------|--------|------|--------------------------------------------------------------|--|------|--|---|------|----------|---|---|---|
|          | 14:00 | 14:30 | status and safety meeting        |       |       |      |        |      |                                                              |  | 0.50 |  |   |      |          |   |   |   |
| 1        | 14:30 | 15:30 | Prepare laser for observing      |       |       |      | closed | NA   | Final alignment and testing of laser, control loops.         |  |      |  | 1 | 1.00 | Tripathi | N | N | N |
| 2        | 15:30 | 16:00 | Align laser to BTO               |       |       |      | closed | NA   | Align CSFL to BTO in Coude lab.                              |  |      |  | 1 | 0.50 | Bouchez  | N | N | N |
| 3        | 16:00 | 16:30 | Test safety interlocks           |       |       |      | closed | NA   | Install barriers and test interlocks.                        |  |      |  | 1 | 0.50 | Cromer   |   |   |   |
| 4        | 16:30 | 17:30 | Laser alignment in dome.         |       |       |      | closed | zen  | Low/high power laser projection in the dome.                 |  |      |  | 1 | 1.00 | Bouchez  | N | N | N |
|          | 18:00 | 19:00 | dinner                           |       |       |      |        |      |                                                              |  | 1.00 |  |   |      |          |   |   |   |
| 5        | 19:45 | 20:15 | AO Checkout                      |       |       |      | NGS    | V=8  | Measure seeing, NGS performance.                             |  |      |  | 1 | 0.50 | Hickey   | N | N | N |
| 6        | 20:15 | 21:00 | LGS acquisition                  |       |       |      | LGS    | zen  | Project laser at zenith, focus, UTT optimization             |  |      |  | 1 | 0.75 | Troy     | Y | N | Y |
| 7        | 21:00 | 1:00  | LGS faint target practice        |       |       |      | LGS    | V=17 | Acquire and measure Strehl for 2 stars each at V=14,15,16,17 |  |      |  | 1 | 4.00 | Roberts  | Y | Y | Y |
| 8        | 1:00  | 3:30  | LGS science demo                 |       |       |      | LGS    | V=15 | Observe 2 science targets and test dithering & backgrounds   |  |      |  | 2 | 2.50 | Bouchez  | Y | Y | Y |
| 9        | 3:30  | 4:30  | UTT vs. CR angle                 |       |       |      | LGS    | V=17 | Test new reconstructor software                              |  |      |  | 2 | 1.00 | Bouchez  | Y | N | Y |
| 10       | 4:30  | 5:30  | Circular polarization experiment |       |       |      | LGS    | zen  | Repeat Jul. 06 experiment. Requires person at prime focus.   |  |      |  | 3 | 1.00 | Bouchez  | Y | N | Y |

| 04/04/07 |       |       | 19:17                            | 20:04  | 13:06 | 5:37                                                      | 6:24 |  |   |      |            |   |   |   |
|----------|-------|-------|----------------------------------|--------|-------|-----------------------------------------------------------|------|--|---|------|------------|---|---|---|
| 1        | 14:30 | 15:30 | Prepare laser for observing      | closed | NA    | Final alignment and testing of laser, control loops.      |      |  | 1 | 1.00 | Tripathi   | N | N | N |
|          | 15:30 | 16:00 | <i>status and safety meeting</i> |        |       |                                                           |      |  |   | 0.50 |            |   |   |   |
| 2        | 16:00 | 16:30 | Test safety interlocks           | closed | NA    | Install barriers and test interlocks.                     |      |  | 1 | 0.50 | Cromer     |   |   |   |
| 3        | 16:30 | 17:30 | Verify BTO alignment             | closed | zen   | Verify laser alignment to BTO in Coude, Dome, LLT.        |      |  | 1 | 1.00 | Bouchez    | N | N | N |
|          | 18:00 | 19:00 | <i>dinner</i>                    |        |       |                                                           |      |  |   | 1.00 |            |   |   |   |
| 4        | 19:45 | 20:15 | <b>AO Checkout</b>               | NGS    | V=8   | Measure seeing, NGS performance.                          |      |  | 2 | 0.50 | Burruss    | N | N | N |
| 5        | 20:15 | 21:00 | <b>LGS acquisition</b>           | LGS    | zen   | Project laser at zenith, focus, UTT optimization          |      |  | 1 | 0.75 | Troy       | Y | N | Y |
| 6        | 21:00 | 5:30  | <b>Shared-risk Science</b>       | LGS    | V=17  | LGS-AO Multiplicity and Planet Formation at Bottom of IMF |      |  | 1 | 8.50 | Hillenbran | Y | N | Y |

| 04/05/07 |       |       | 19:17                            | 20:05  | 13:09 | 5:35                                                      | 6:23 |      |            |   |   |   |  |  |
|----------|-------|-------|----------------------------------|--------|-------|-----------------------------------------------------------|------|------|------------|---|---|---|--|--|
| 1        | 14:30 | 15:30 | Prepare laser for observing      | closed | NA    | Final alignment and testing of laser, control loops.      | 1    | 1.00 | Tripathi   | N | N | N |  |  |
|          | 15:30 | 16:00 | <i>status and safety meeting</i> |        |       |                                                           |      | 0.50 |            |   |   |   |  |  |
| 2        | 16:00 | 16:30 | Test safety interlocks           | closed | NA    | Install barriers and test interlocks.                     | 1    | 0.50 | Cromer     |   |   |   |  |  |
| 3        | 16:30 | 17:30 | Verify BTO alignment             | closed | zen   | Verify laser alignment to BTO in Coude, Dome, LLT.        | 1    | 1.00 | Bouchez    | N | N | N |  |  |
|          | 18:00 | 19:00 | <i>dinner</i>                    |        |       |                                                           |      | 1.00 |            |   |   |   |  |  |
| 4        | 19:45 | 20:15 | <b>AO Checkout</b>               | NGS    | V=8   | Measure seeing, NGS performance.                          | 1    | 0.50 | Hickey     | N | N | N |  |  |
| 5        | 20:15 | 21:00 | <b>LGS acquisition</b>           | LGS    | zen   | Project laser at zenith, focus, UTT optimization          | 1    | 0.75 | Troy       | Y | N | Y |  |  |
| 6        | 21:00 | 5:30  | <b>Shared-risk Science</b>       | LGS    | V=17  | LGS-AO Multiplicity and Planet Formation at Bottom of IMF | 1    | 8.50 | Hillenbran | Y | N | Y |  |  |

| 04/06/07 |       |       | 19:18                            | 20:06  | 13:13 | 5:34                                                 | 6:21 |      |          |   |   |   |  |  |
|----------|-------|-------|----------------------------------|--------|-------|------------------------------------------------------|------|------|----------|---|---|---|--|--|
| 1        | 14:30 | 15:30 | Prepare laser for observing      | closed | NA    | Final alignment and testing of laser, control loops. | 1    | 1.00 | Tripathi | N | N | N |  |  |
|          | 15:30 | 16:00 | <i>status and safety meeting</i> |        |       |                                                      |      | 0.50 |          |   |   |   |  |  |
| 2        | 16:00 | 16:30 | Test safety interlocks           | closed | NA    | Install barriers and test interlocks.                | 1    | 0.50 | Cromer   |   |   |   |  |  |
| 3        | 16:30 | 17:30 | Verify BTO alignment             | closed | zen   | Verify laser alignment to BTO in Coude, Dome, LLT.   | 1    | 1.00 | Bouchez  | N | N | N |  |  |
|          | 18:00 | 19:00 | <i>dinner</i>                    |        |       |                                                      |      | 1.00 |          |   |   |   |  |  |
| 4        | 19:45 | 20:15 | <b>AO Checkout</b>               | NGS    | V=8   | Measure seeing, NGS performance.                     | 1    | 0.50 | Burruss  | N | N | N |  |  |
| 5        | 20:15 | 21:00 | <b>LGS acquisition</b>           | LGS    | zen   | Project laser at zenith, focus, UTT optimization     | 1    | 0.75 | Troy     | Y | N | Y |  |  |
| 6        | 21:00 | 5:30  | <b>Shared-risk Science</b>       | LGS    | V=17  | LGS-AO Observations of Ultraluminous IR Galaxies     | 1    | 8.50 | Surace   | Y | N | Y |  |  |

### Other proposed LGS experiments

|    |       |       |                                         |     |      |                                                            |   |      |         |   |   |   |
|----|-------|-------|-----------------------------------------|-----|------|------------------------------------------------------------|---|------|---------|---|---|---|
| 1  | 0:00  | 1:00  | LGS bright star performance             | LGS | V=10 | Acquire star, optimize servo loops, measure Strehl & PSD   | 1 | 1.00 | Roberts | Y | Y | Y |
| 2  | 1:00  | 4:00  | LGS faint star performance              | LGS | V=17 | Optimize TT, measure Strehl & PSD for V=14,15,16,17        | 2 | 3.00 | Roberts | Y | Y | Y |
| 3  | 4:00  | 5:00  | Rayleigh scatter characterization       | LGS | zen  | Quantify altitude of scattering components on WFS.         | 3 | 1.00 | Bouchez | Y | N | Y |
| 4  | 5:00  | 6:30  | Off-axis acquisition procedure          | LGS | V=10 | Demonstrate off-axis NGS acquisition procedure             | 2 | 1.50 | Bouchez | N | N | Y |
| 5  | 6:30  | 7:30  | UTT performance                         | LGS | zen  | Investigate UTT performance. GOOD.                         | 3 | 1.00 | ?       | Y | Y | Y |
| 6  | 7:30  | 9:30  | LGS performance vs. airmass             | LGS | V=10 | Measure laser magnitude & Strehl at el=90,60,45            | 3 | 2.00 | ?       | Y | Y | Y |
| 7  | 9:30  | 11:30 | LGS isoplanatism                        | LGS | V=10 | Measure LGS and NGS isoplanatic angles                     | 3 | 2.00 | AB      | Y | Y | Y |
| 8  | 11:30 | 12:30 | <b>Test laser frequency lock</b>        | LGS | zen  | Test effects of etalon dither on HOWFS return.             | 2 | 1.00 | Bouchez | Y | N | Y |
| ## | ##### | ##### | <b>Circular polarization experiment</b> | LGS | zen  | Repeat Jul. 06 experiment. Requires person at prime focus. | 2 | 1.00 | Bouchez | Y | N | Y |

### Other proposed NGS experiments

|   |      |       |                            |     |      |                                               |   |      |         |   |   |   |
|---|------|-------|----------------------------|-----|------|-----------------------------------------------|---|------|---------|---|---|---|
| 1 | 0:00 | 2:00  | Demo flexure compensation. | NGS | V=4  | Good cloudy night test.                       | 1 | 2.00 | Bouchez | N | N | N |
| 2 | 2:00 | 4:00  | Leaky integrator testing   | NGS | V=4  | Requires stable seeing, clear sky.            | 1 | 2.00 | Troy    | N | N | N |
| 3 | 4:00 | 7:00  | Faint object NGS testing   | NGS | V=15 | Need a clear test plan.                       | 1 | 3.00 | Shelton | N | N | N |
| 4 | 7:00 | 10:00 | LOWFS performance          | NGS | V=16 | Continue LOWFS performance test from Sep. run | 2 | 3.00 | Roberts | Y | Y | N |

### Proposed closed-dome experments

|   |      |       |                                     |    |      |                                                       |   |      |         |   |   |   |
|---|------|-------|-------------------------------------|----|------|-------------------------------------------------------|---|------|---------|---|---|---|
| 1 | 0:00 | 2:00  | Adjust PF diagnostics bench filters | NA | zen  | Using high-power laser in dome.                       | 1 | 2.00 | Moore   | N | N | Y |
| 2 | 2:00 | 4:00  | Demo flexure compensation.          | WL | move | Measure flexure of LOWFS using white light stimulus.  | 2 | 2.00 | Bouchez | N | N | N |
| 3 | 4:00 | 6:00  | Measure LGS NCP flexure             | WL | move | Re-measure flexure while locked on LOWFS.             | 2 | 2.00 | Bouchez | N | N | N |
| 4 | 6:00 | 8:00  | Measure NGS NCP flexure             | WL | move | Measure flexure while locked on HOWFS.                | 2 | 2.00 | Bouchez | N | N | N |
| 5 | 8:00 | 10:00 | Field-dependent LOWFS focus         | WL | zen  | Does not take into account telescope field curvature. | 3 | 2.00 | Roberts | N | N | N |

### Background experiments

|   |  |  |                             |     |  |                                                              |   |  |        |   |   |   |
|---|--|--|-----------------------------|-----|--|--------------------------------------------------------------|---|--|--------|---|---|---|
| 1 |  |  | Aircraft camera sensitivity | NGS |  | Gather statistics on camera vs. spotter aircraft sensitivity | 2 |  | Cromer | Y | N | N |
| 2 |  |  | RADAR sensitivity           | NGS |  | Note range and SNR of all RADAR aircraft detections          | 3 |  | Cromer | N | N | N |
| 3 |  |  | Laser diagnostics benches   | LGS |  | Calibrate output of photodiodes & cameras.                   | 2 |  | Moore  | N | N | Y |
| 4 |  |  | Understand IRCAM latency    | LGS |  |                                                              | 2 |  | Cromer | N | N | N |