Proposed Optical and near-IR AO Capabilities: I

As a result of the ING's October 1999 Announcement of Instrumentation Opportunity, four proposals were received: all enhancing or adding to the WHT's AO programme capabilities:

- MOSAIC: a versatile, high spatial resolution, high efficiency, multi-object spectrograph and imager optimised for R–H. (PI: Sharples, Durham)
  - Main image turbulence at WHT due to atmospheric layer at $\sim$ 900m. A low cost Rayleigh beacon enables adaptively corrected images ($\sim$ 0.25 arc sec FWHM at R) over $\geq$ 5arc min. fields.
  - MOSAIC will use multi-slit masks (0.3 arcsec slits), and high-throughput volume phase gratings to give R$>$ 3000. Optionally a Tunable Filter can be included.
  - V–H operation with switch-able cameras; optical (0.5–1.0μm) deep depletion CCD detector array of 4k $\times$ 4k with 0.1 arcsec pixels; infrared (0.9–1.6μm) HgCdTe detector of 2k $\times$ 2k with 0.15 arcsec pixels.

Figure 6: A HST image of 2 arcmin field showing the gravitational lensing cluster A2218. The elongated arcs which have widths $\leq$0.3 arcsec in the transverse direction. There are 65 targets of R<23 in the field which would be accessible to spectroscopic surveys by MOSAIC. The IR extension to H would enable red-shift determinations using Hα, Hβ, O III emission lines $1 < z < 2$ where many of the background sources are predicted to lie.