

The AGN Content of the Two Micron All Sky Survey

R.M. Cutri (IPAC)

The Two Micron All Sky Survey (2MASS) began routine operations from its northern facility on Mt. Hopkins, AZ in June of 1997, and from its southern facility on Cerro Tololo, Chile in March of 1998. At each site, highly automated 1.3m telescopes equipped with identical 3-channel cameras, are systematically imaging the sky in three near infrared wavelength bands, J (1.25 μ m), H (1.65 μ m) and K_s (2.17 μ m). The Survey will ultimately produce an Image Atlas containing nearly two million 512x1024 pixel images (1 arcsec/pix) in the three colors, a highly complete and reliable catalog containing ~300 million point sources having SNR>10 photometry at J<=15.8, H<=15.1 and K_s<=14.3 mag. and an astrometric accuracy <0.5" RMS, and a catalog of 1-2 million resolved sources, primarily galaxies, having SNR>10 photometric accuracy at J<=15.5, H<=14.8 and K_s<=13.5 mag. The 2MASS Sampler, an introductory set of data, was released to the community in December of 1998 (see <http://www.ipac.caltech.edu/2mass/>).

The sensitivity and all-sky coverage of 2MASS will produce an unprecedented uniform set of three-color near infrared photometry for a large number of previously known X-ray, UV, optical and radio discovered AGN. For example, all of the PG QSOs will be detected by 2MASS at a SNR>10 in all three bands. 2MASS also has the potential to reveal large numbers of previously unknown AGN. Because AGN and QSOs occupy distinct regions of near infrared and infrared-optical color space, it is possible to carry out highly efficient automated searches of the 2MASS databases in combination with newly available digitized optical sky survey databases for candidates. A pilot search for extremely red AGN has found that nearly 75% of candidates selected only by J-K_s color turn out to be newly discovered AGN, over half of which are new QSOs with redshifts ranging from z=0.1 to 1.8.

We review the near IR and optical/IR properties of "conventional" QSOs from UV and optical samples, and estimate the number that will be detected by 2MASS. We also discuss 2MASS's ability to test for new populations of extremely red AGN that have been missed by UV and Visual surveys, as suggested by from IRAS and radio studies (e.g. Low et al. 1988, ApJ, 327, L41; Webster et al. 1995, Nature, 375, 469; Gregg et al. 1996, AJ, 112, 407). Results of spectroscopic follow-up of 2MASS-selected new AGN candidates will also be presented.