

## **ATLAS: DEEP RADIO OBSERVATIONS OF SIX SQUARE DEGREES**

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### **Abstract**

Over the last two years, we have conducted the Australia Telescope Large Area Survey (ATLAS) of the Chandra Deep Field South (CDFS) and European Large Area ISO Survey - South 1 (ELAIS-S1) regions, with the aim of producing the widest (6 square degrees) deep (10-15  $\mu$ Jy rms) radio survey ever attempted. The survey areas were chosen to cover the Southern SWIRE (Spitzer-Space-Telescope Wide-area Infrared Extragalactic Survey) fields, which have deep optical, near-infrared, and far-infrared (and in some parts of the field, deep X-ray) data, so that this combined SWIRE/ATLAS survey may be the most comprehensive multi-wavelength survey yet attempted. The broad scientific goals are to understand the evolution of galaxies in the early Universe, and the radio observations are important because they penetrate the heavy dust extinction which is found in the most active galaxies at all redshifts, and are particularly effective at detecting AGN buried within dusty galaxies. Unusual classes of object which may be important links in the early evolution of galaxies can only be found in such a wide, deep survey.

Although we are only about half-way through the survey, our existing data (with an rms between 20 and 40  $\mu$ Jy) are already proving remarkably fruitful in addressing some of our science goals. For example,

- We have discovered a new and unexpected class of object (the Infrared-Faint Radio Sources)
- We have found an apparent change in slope of the radio-FIR correlation at low flux densities
- We have found powerful AGN-like radio objects in galaxies with a star-forming SED