Predictions Group

In order for those attempting to observe high redshift galaxies to propose a detailed experimental plan, it is important to know how many galaxies one is expecting to observe within a certain volume of the sky. This is the fundamental purpose of the predictions sub-group; to be able to compute this quantity with the depth of the surveyed volume corresponding directly to redshift. In order to do this, a computer program is required to efficiently calculate this number as a function of redshift, field of view and apparent magnitude enabling those observing to make an informed prediction of the telescope one would need and the observing time required to make definitive observation of such elusive galaxies.

This section of the project was structured chronologically as follows:

* Research how early galaxies are professionally predicted.
* Find a general Schechter function in terms of luminosity and/or magnitude.
* Mathematically process this function to ensure it is consistent with the units used by those carrying out the observations.
* Build a computer program to automate the process of calculating the number of galaxies from the Schechter function.
* Find plausible starting parameters to use in primary program.
* Collate parameter data from published papers.
* Determine parameter evolution with time.
* Plot these results to produce a visual description of how these parameters affect the outcome.
* Give expected number of galaxies to the observers.
* Refine technique with the inclusion of more advanced adaptations.

In addition to running a program to calculate the total number of galaxies, there is also a separate program to determine the redshifts at which re-ionization began and ended to be included when calculating the number of galaxies in the main code.

The beginning of re-ionization has been determined by equating the star formation rate density with the critical star formation rate density required for matter to collapse into galaxies (see section..OWEN). The end of re-ionization occurs when the photons produced in star formation have completely ionized the IGM and hence required direct application of star formation rate densities also. This will be covered in more detail in section 7-‘LOWER REDSHIFT LIMIT ON RE-IONIZATION’.