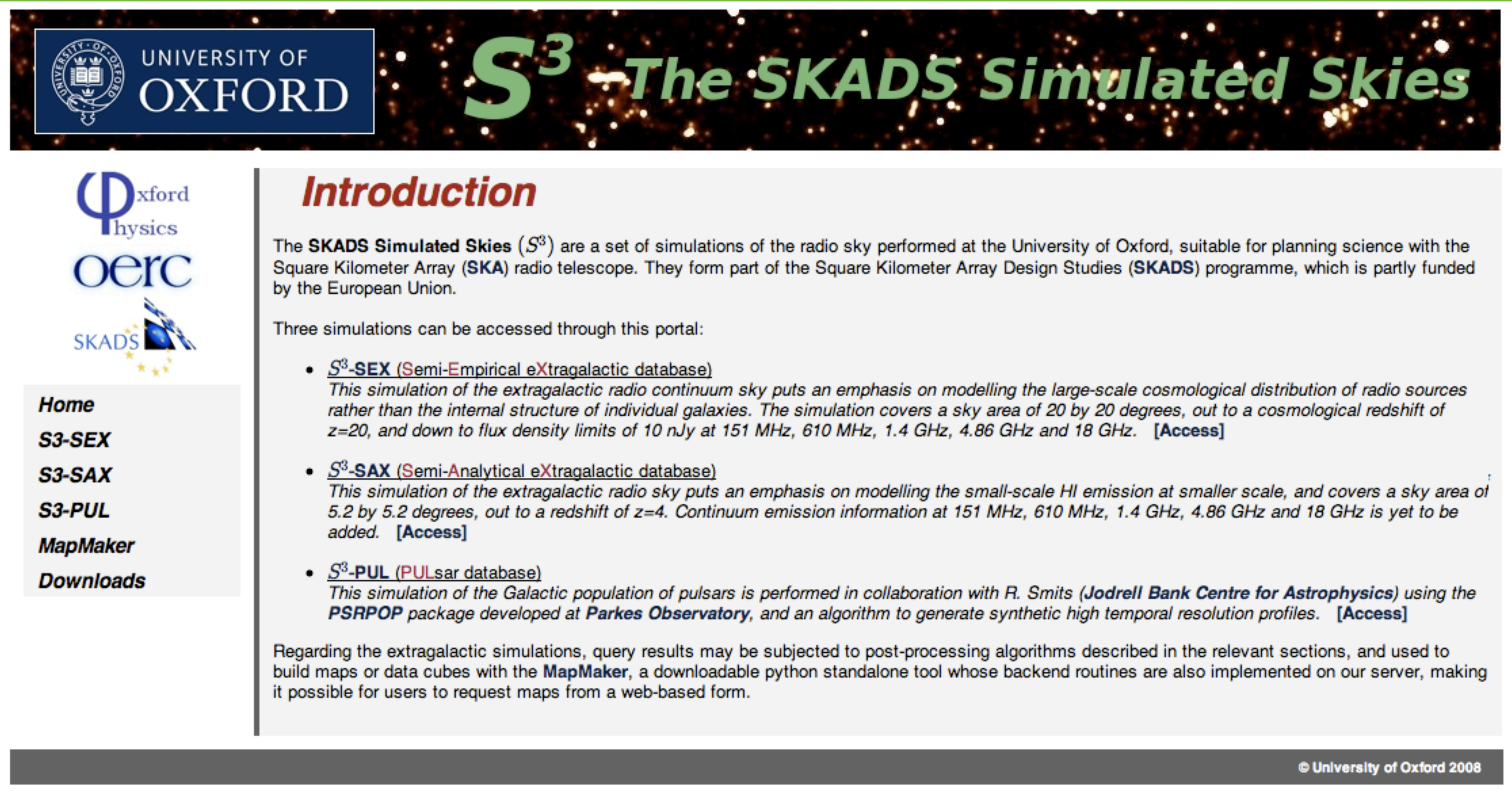
# Accessing the SKADS Simulated Skies




## Overview

The **SKADS Simulated Skies (S-cubed)** are a set of simulations of the radio sky performed at the University of Oxford, suitable for planning science with the Square Kilometer Array radio telescope. They form part of the SKADS program, which is partly funded by the European Union.

Their purpose is to provide the community with a common testing ground for many of the SKA key science projects, as well as for instrument design issues on the way to the SKA. Consequently, they also form an ideal set of simulated skies for SKA pathfinders.

The S-cubed simulations can be accessed freely through a web portal at

**http://s-cubed.physics.ox.ac.uk**

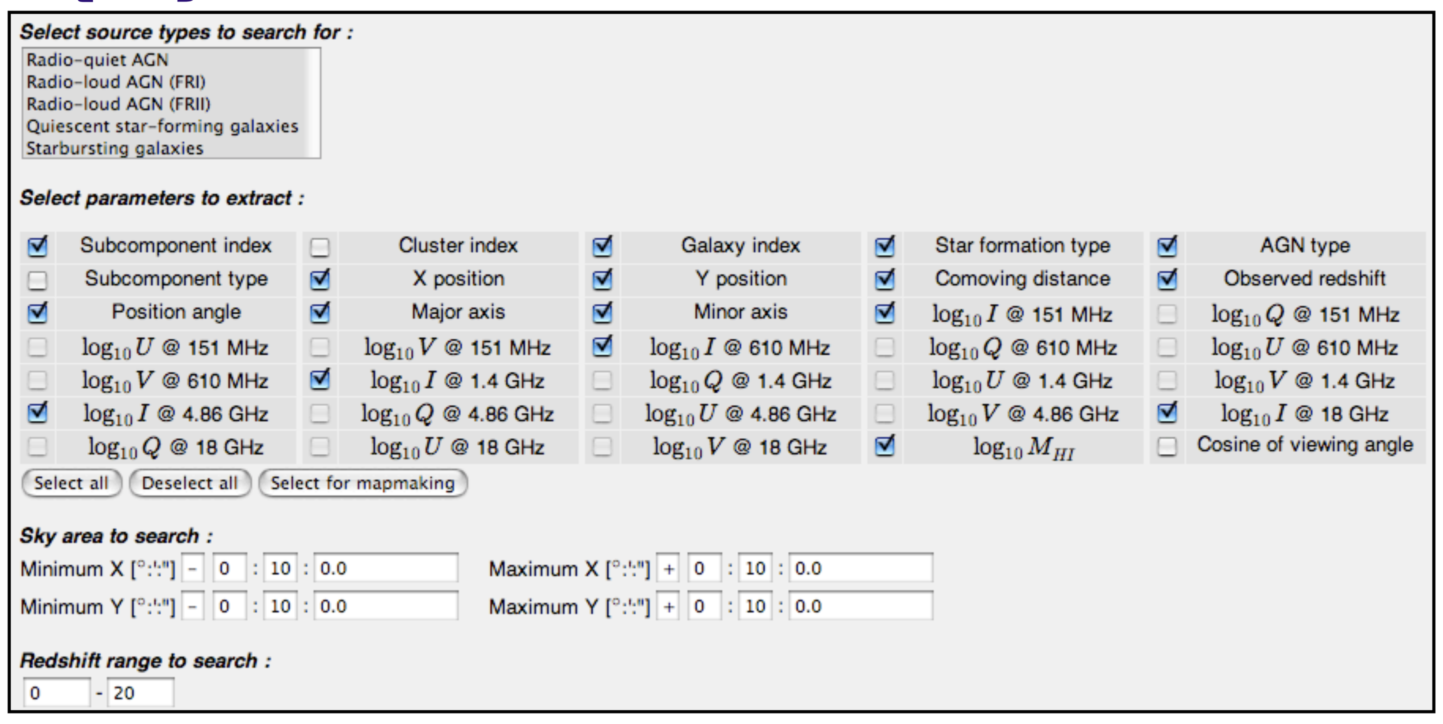
The current state of the simulations is the following (see left for descriptions) :

- **S-cubed SEX : Simulation finished; database, post-processing and map-making implemented**
- **S-cubed SAX : Simulation finished; database in progress**
- **S-cubed PUL : Simulation design complete**

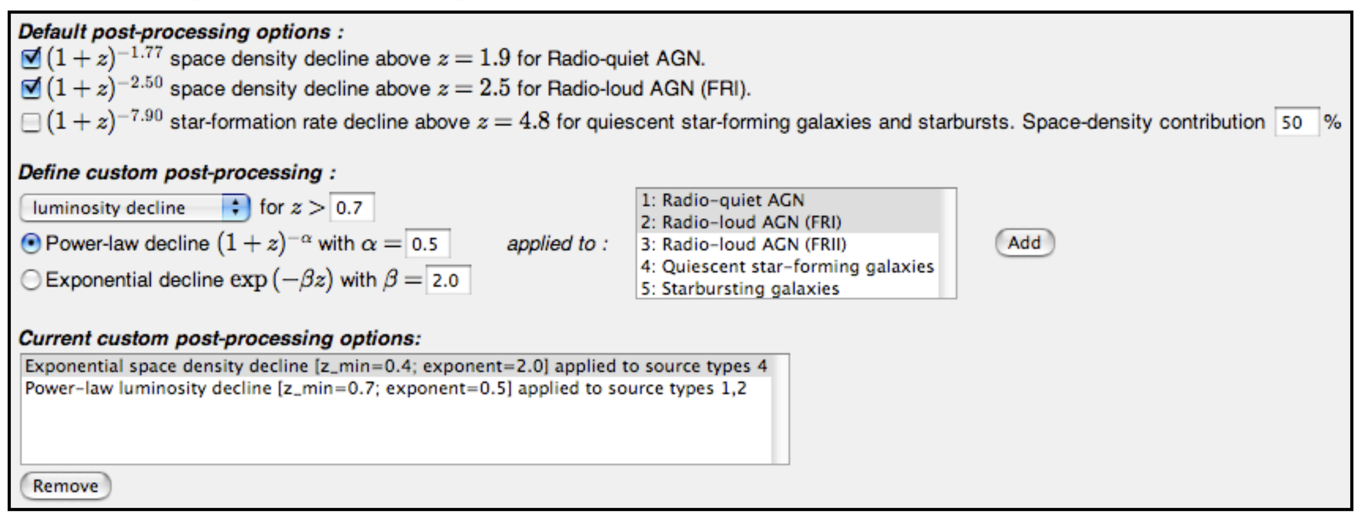
*See talks by S. Rawlings, R. Wilman, D. Obreschkow and A. Karastergiou*

## Make your own sky

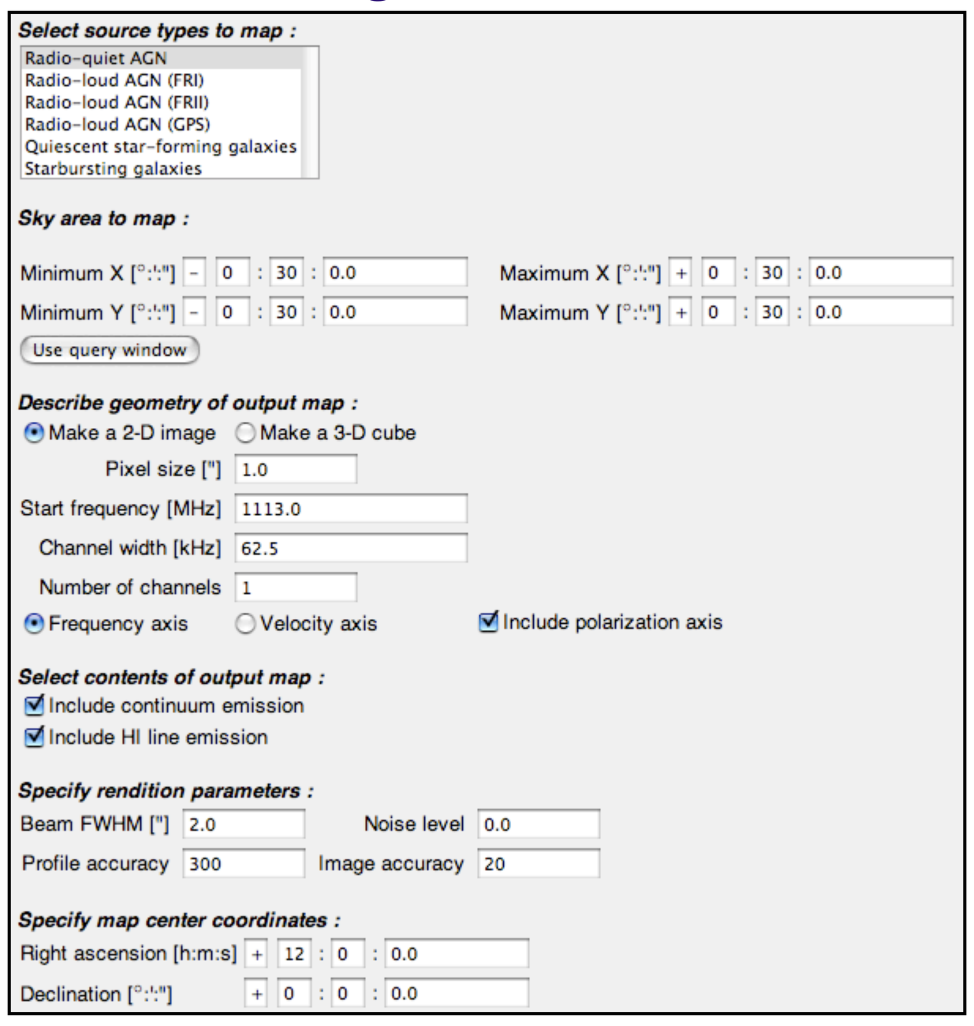
### 1 : Query the database



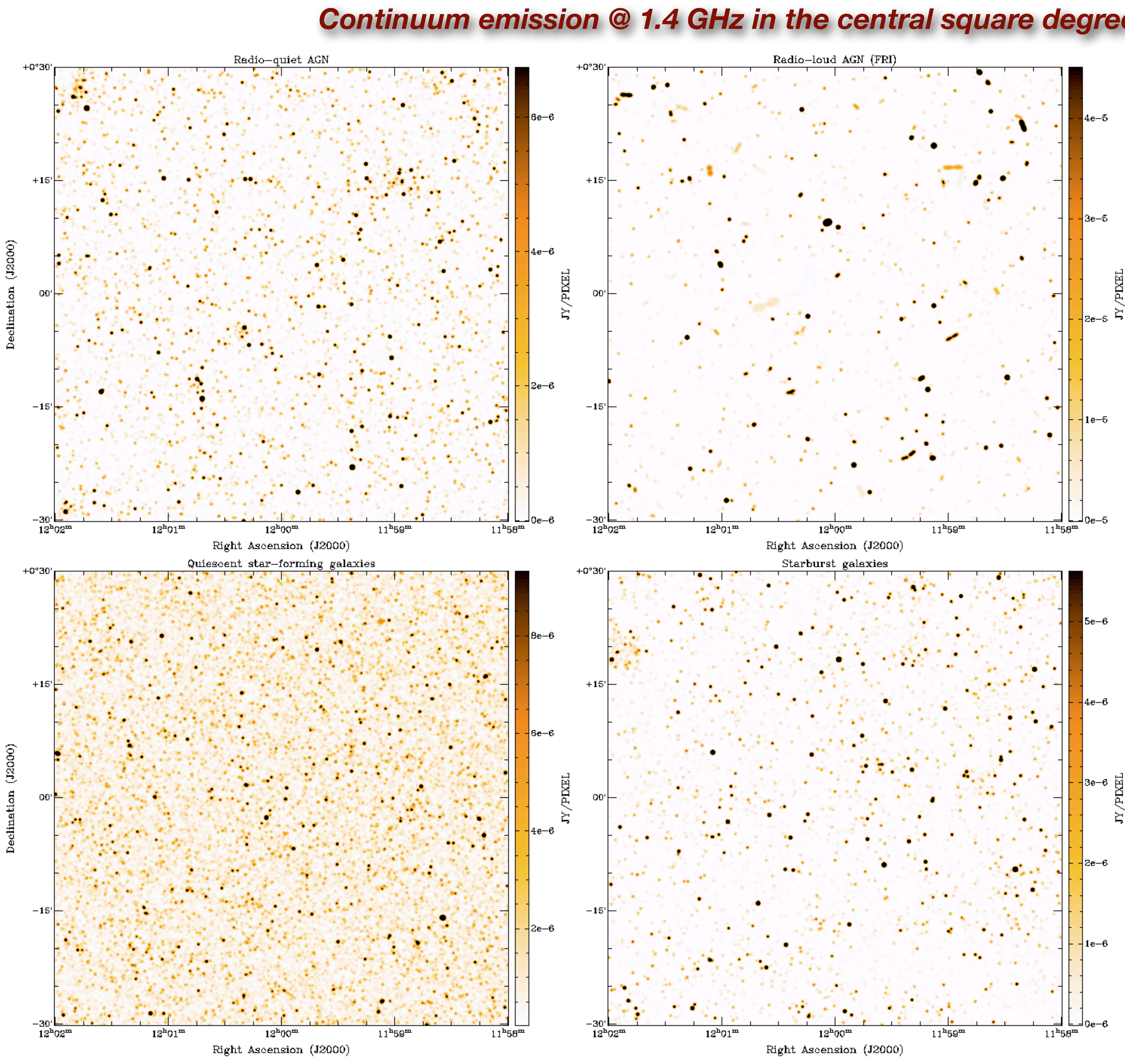

### 2 : Post-process (optional)



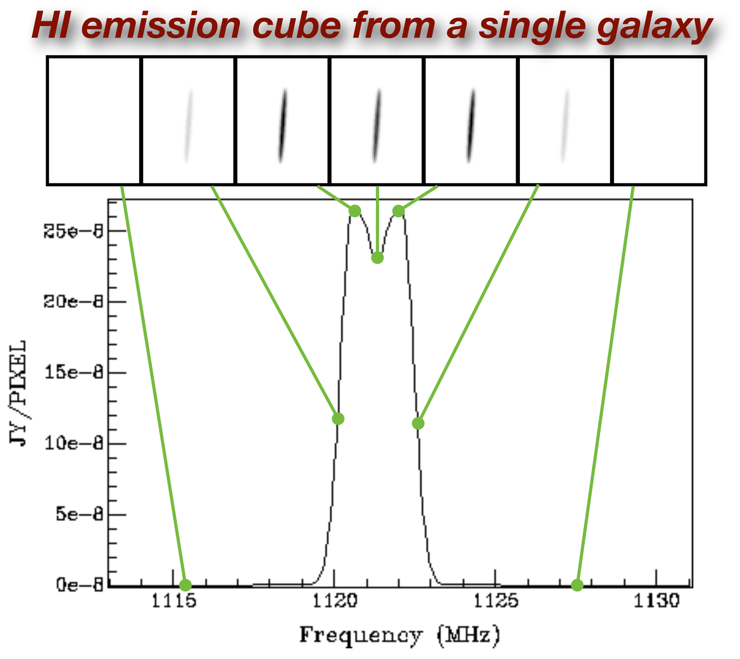

### 3 : Make an image




*Continuum emission @ 1.4 GHz in the central square degree of S-cubed SEX*




*HI emission cube from a single galaxy*



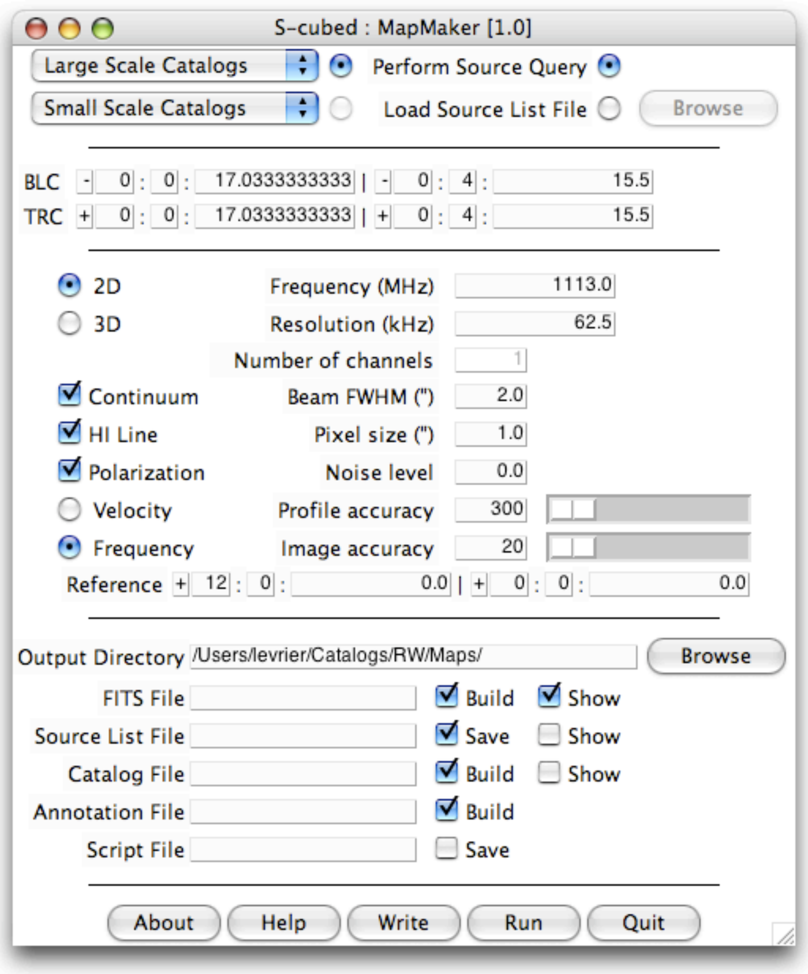

## Do try this at home!

The python routines implemented on the SKADS Simulated Skies server may be downloaded freely from the website, so that users may locally :

- **Build a MySQL database from raw ASCII data (access to this data subject to request)**
- **Query this local database**
- **Post-process query results**
- **Build maps and cubes of the resulting sky**

To facilitate the use of these routines by the end user, a set of graphical user interfaces (GUI) is being actively developed. On the right is a screenshot of the current MapMaker GUI. It essentially mimics the front-end of the website.

Back-end routines, GUIs and web server are concurrently developed in collaboration with the Oxford e-Research Center, to ensure cross-compatibility and thus enable users to e.g. perform an online query of the S-cubed database, download the results, apply post-processing steps locally, and upload the output for the web server to handle the map-making.




## What's to come...

**High-resolution HI emission**

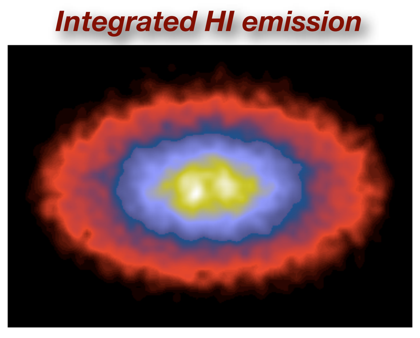
Currently, in S-cubed SEX :

- HI disk identified to star-formation disk
- HI emission painted uniformly

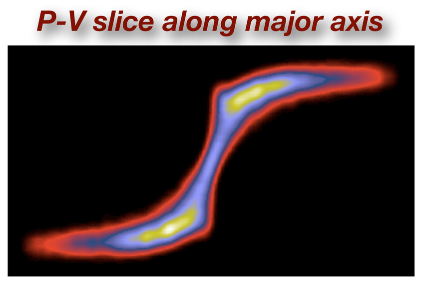
To come, in S-cubed SAX :

- HI disk distinct from star-formation disk
- Use of 1,150 HI emission template PPV cubes (spirals and irregulars, varying rotation velocity and inclination) built by Rense Boomsma (Kapteyn Institute)

*Integrated HI emission*



*P-V slice along major axis*



**Polarization**

Currently, in both extragalactic databases, only total intensity values are given.

Q, U and V parameters will be implemented thanks to a collaboration with Paul Alexander (MRAO), Rainer Beck and Tigran Arshakian (MPIfR).

**AstroGrid implementation**

S-cubed SEX is currently being plugged into AstroGrid (www2.astrogrid.org), the UK's Virtual Observatory. Eventually, post-processing and map-making routines will be callable from the Task Launcher, to benefit from the grid's computing capabilities. This work is done in collaboration with Eduardo Gonzalez-Solares and Nicholas Walton (IoA Cambridge).


## ACKNOWLEDGEMENTS

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# s-cubed.physics.ox.ac.uk


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