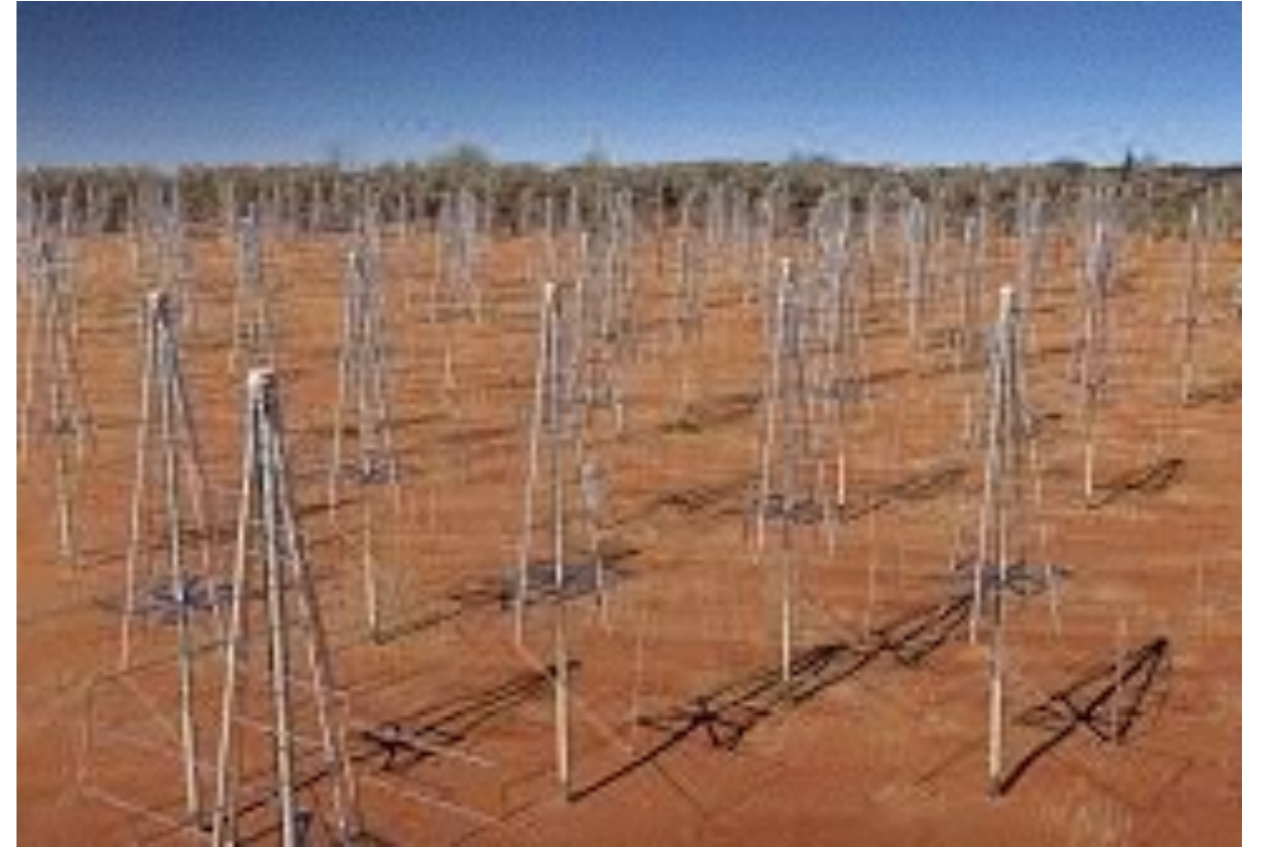




SKA1-LOW



LOFAR

Actually LOFAR is like a cross between SKA1-LOW and SKA1-MID.

Large FoV and high resolution

=

big images

widefield effects

subtle calibration issues

## Why is LOFAR a good test case for GridPP?

1. **Data size** - LOFAR data are BIG  
*Not just in a general sense, but comparatively relative to other existing telescopes.*
2. **Processing steps** - LOFAR data are COMPLICATED  
*Most existing telescopes do not have the stringent image fidelity requirements that SKA has and therefore do not implement all of the same steps in image creation. LOFAR data do require these steps, even at the moment.*
3. **Community benefit** - LOFAR data are DIFFICULT  
*People have difficulty processing LOFAR data as standard. Making the processing available through GridPP would be a community service.*

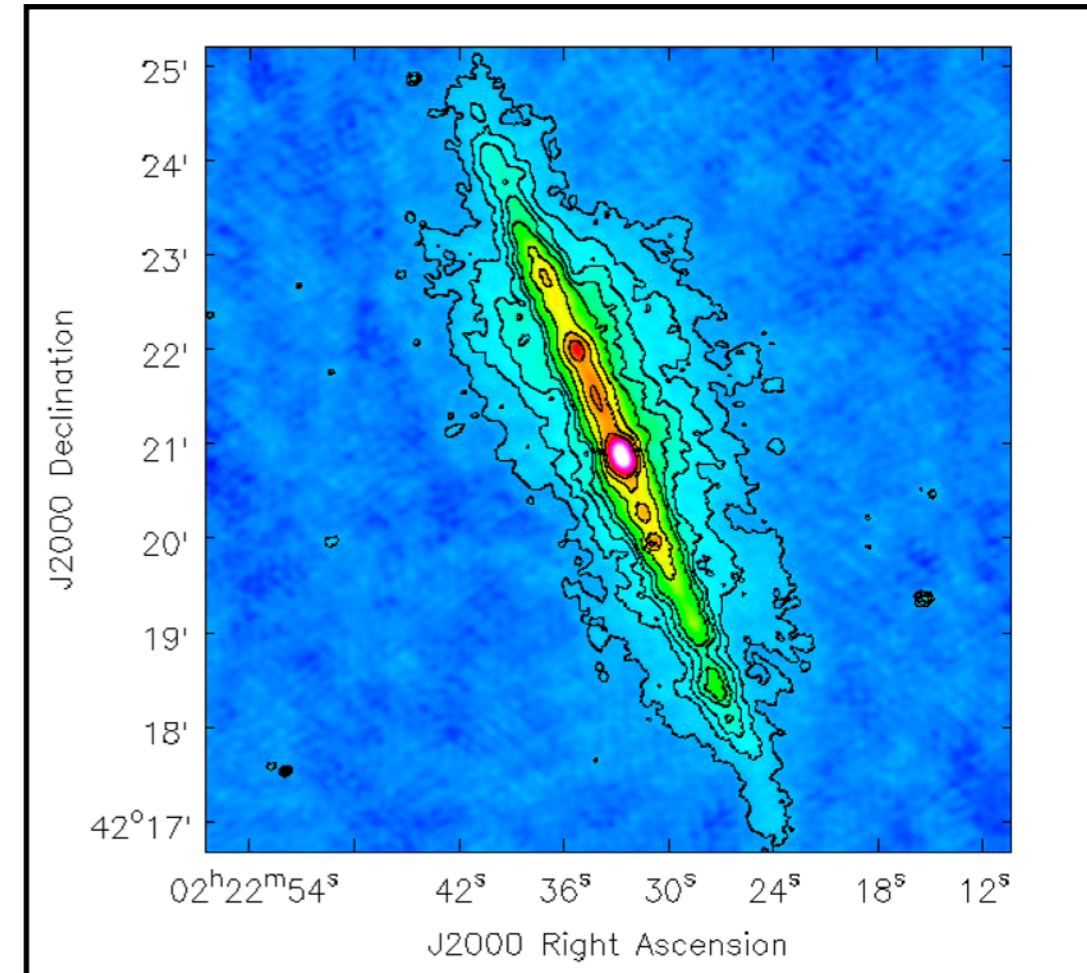
# Layout of LOFAR data

A typical observation comprised of  
400+ sub bands → 200kHz  
bandwidth

1 subband depends on averaging  
16 channels  
2 sec integration time  
21 GB → 8.6TB

Potential for distributed processing

NGC891 observed with LOFAR



# What has been done

Obtained a grid certificate and joined the SKA VO

- Quite a lengthy process
- If laptop lost/broken process has to be restarted

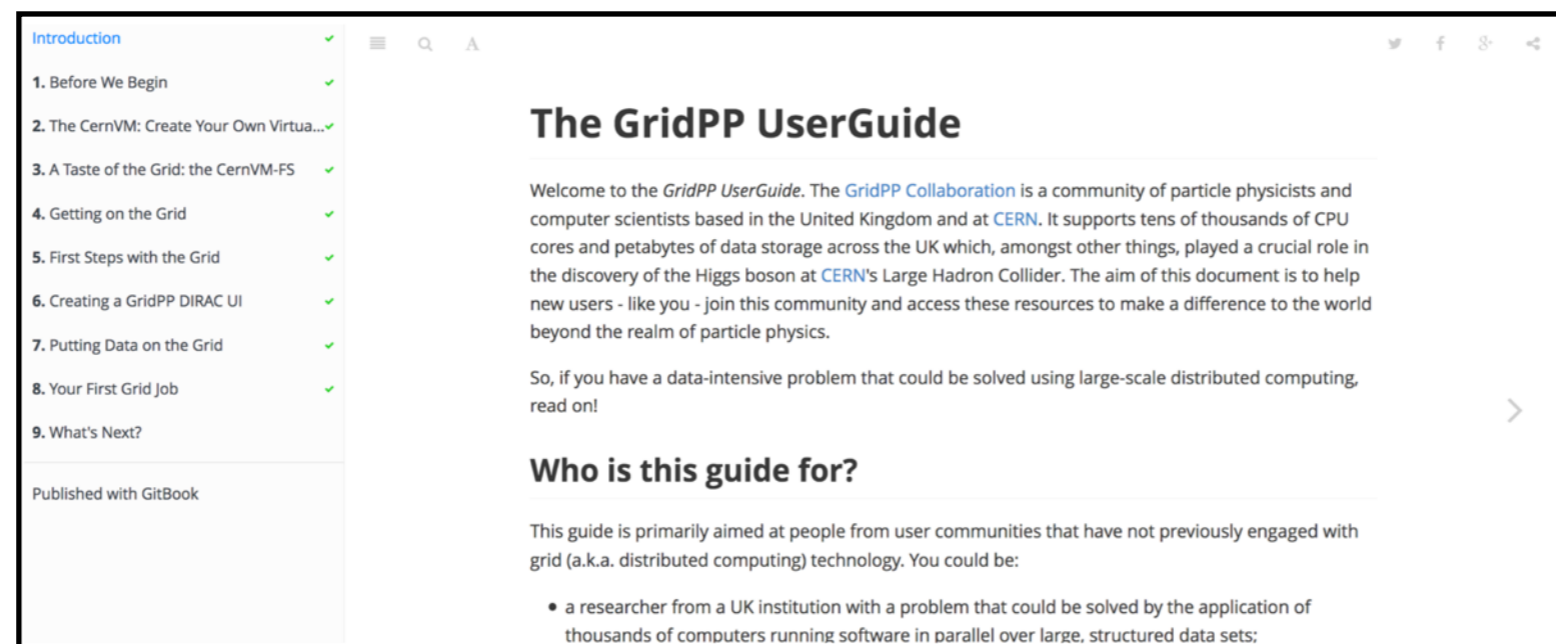
Access and setup of DIRAC

- Very straightforward thanks to great documentation

Setting up a proxy

Running of a simple job

- Again great documentation makes this straightforward



The screenshot shows a web page titled "The GridPP UserGuide". On the left, there is a navigation menu with a list of sections, each followed by a green checkmark: "Introduction", "1. Before We Begin", "2. The CernVM: Create Your Own Virtua...", "3. A Taste of the Grid: the CernVM-FS", "4. Getting on the Grid", "5. First Steps with the Grid", "6. Creating a GridPP DIRAC UI", "7. Putting Data on the Grid", "8. Your First Grid Job", and "9. What's Next?". Below the menu, it says "Published with GitBook". The main content area has the title "The GridPP UserGuide" and a welcome message: "Welcome to the *GridPP UserGuide*. The [GridPP Collaboration](#) is a community of particle physicists and computer scientists based in the United Kingdom and at [CERN](#). It supports tens of thousands of CPU cores and petabytes of data storage across the UK which, amongst other things, played a crucial role in the discovery of the Higgs boson at [CERN's Large Hadron Collider](#). The aim of this document is to help new users - like you - join this community and access these resources to make a difference to the world beyond the realm of particle physics." Below this, it says "So, if you have a data-intensive problem that could be solved using large-scale distributed computing, read on!". There is a right-pointing arrow next to this text. The next section is "Who is this guide for?" followed by the text: "This guide is primarily aimed at people from user communities that have not previously engaged with grid (a.k.a. distributed computing) technology. You could be:" and a bulleted list: "• a researcher from a UK institution with a problem that could be solved by the application of thousands of computers running software in parallel over large, structured data sets;".

# What has been done

Using the Dirac File Catalog (DFC) Command Line Interface (CLI) to create own directory in DFC skatelescope.eu

```
FC:/skatelescope.eu/user/m>ls -l
drwxrwxr-x 0 andrew.mcnab skatelescope.eu_user 0 2016-10-28 09:26:04 andrew.mcnab
drwxr-xr-x 0 david.mulcahy skatelescope.eu_user 0 2016-11-02 17:28:06 david.mulcahy
FC:/skatelescope.eu/user/m>
```

## Testing of uploading a test file to storage element

```
FC:/skatelescope.eu/user/m/david.mulcahy/tmp>add 123.txt 123.txt UKI-NORTHGRID-MAN-HEP-disk
File /skatelescope.eu/user/m/david.mulcahy/tmp/123.txt successfully uploaded to the UKI-NORTHGRID-MAN-HEP-disk SE
FC:/skatelescope.eu/user/m/david.mulcahy/tmp>ls -l
-rwxrwxr-x 1 david.mulcahy skatelescope.eu_user 4 2016-11-02 19:18:08 123.txt
FC:/skatelescope.eu/user/m/david.mulcahy/tmp>
```

## testing of retrieving a file from a storage element

```
-bash-4.1$ dirac-dms-lfn-replicas /skatelescope.eu/user/m/david.mulcahy/tmp/123.txt
LFN                               StorageElement                    URL
=====
/skatelescope.eu/user/m/david.mulcahy/tmp/123.txt UKI-NORTHGRID-MAN-HEP-disk srm://bohr3226.tier2.hep.manchester.ac.uk:
8446/srm/managerv2?SFN=/skatelescope.eu/user/m/david.mulcahy/tmp/123.txt

-bash-4.1$ pwd
/home/mulcahy/tmp
-bash-4.1$ ls
123.txt
-bash-4.1$ rm 123.txt
-bash-4.1$ dirac-dms-get-file /skatelescope.eu/user/m/david.mulcahy/tmp/123.txt
{'Failed': {}},
'Successful': {'/skatelescope.eu/user/m/david.mulcahy/tmp/123.txt': '/home/mulcahy/tmp/123.txt'}}
-bash-4.1$ cat 123.txt
123
```

# What has to be done

Many tests!

- Copy data directly from lta to gridpp
- Download and install LOFAR software in CVMFS
- Tests on initial calibration of LOFAR data pipeline (prefactor)
- Tests on Facet calibration (FACTOR)