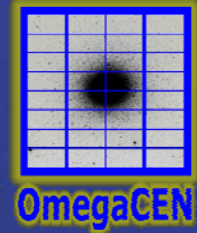


EGEE NA4 Lofar



Lofar Information System Design

OmegaCEN

Kapteyn Institute

TARGET- Computing Center

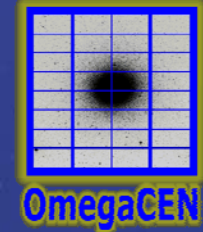
University Groningen

Orsay, 10 June 2008

Fokke Dijkstra

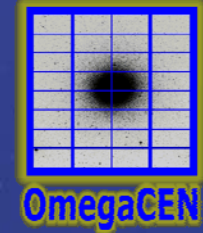
(most slides by Edwin Valentijn)

LOFAR in short



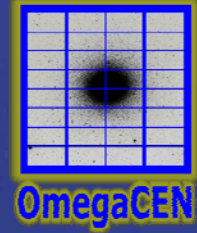
- Large distributed radio telescope
 - In NL 2008: initial roll out 20 stations
 - In NL 2009: 18 central (24 Gbps) + 18 remote (2 Gbps) phased array antenna stations each ~4 soccerfields size
 - Full scale aperture synthesis array, extends 100 km
- Two main bands
 - High Band ~ 7,500 tiles 120 – 240 MHz
 - Low Band ~ 7,500 dipoles 20 – 80 MHz
- Fibre network, Software Correlator
- Run as a broad common-user observatory
 - Making the transition now from “project” to “observatory”

E-LOFAR Participants



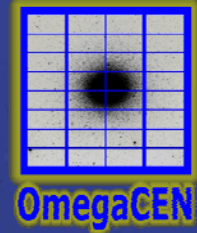
- GLOW:
 - Effelsberg station delivered
 - Garching, Potsdam, Tautenburg stations ordered
 - Jülich station federal funding proposal submitted
- LOFAR-UK:
 - Chilbolton, Cambridge, Jodrell, Edinburgh
 - 1 station funded, site to be chosen
 - 3 more stations
- Sweden:
 - Onsala station funded
- + Poland, Italy, Austria, Bulgaria, Ireland, France

Wires in the field

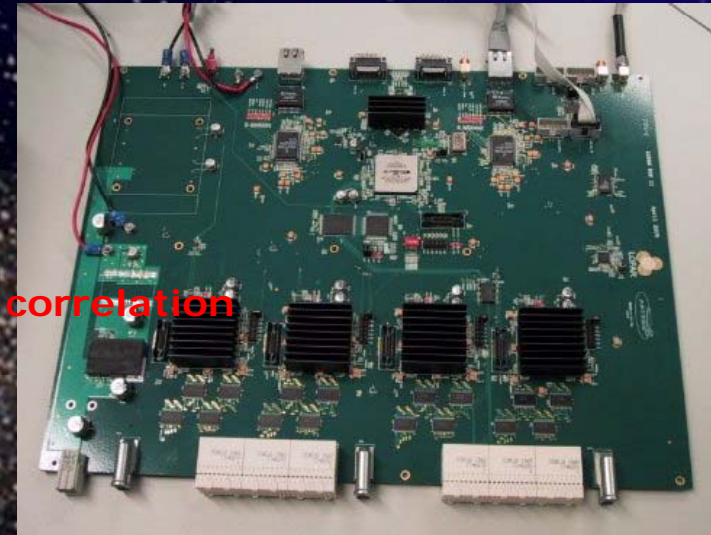


EGEE: Lofar

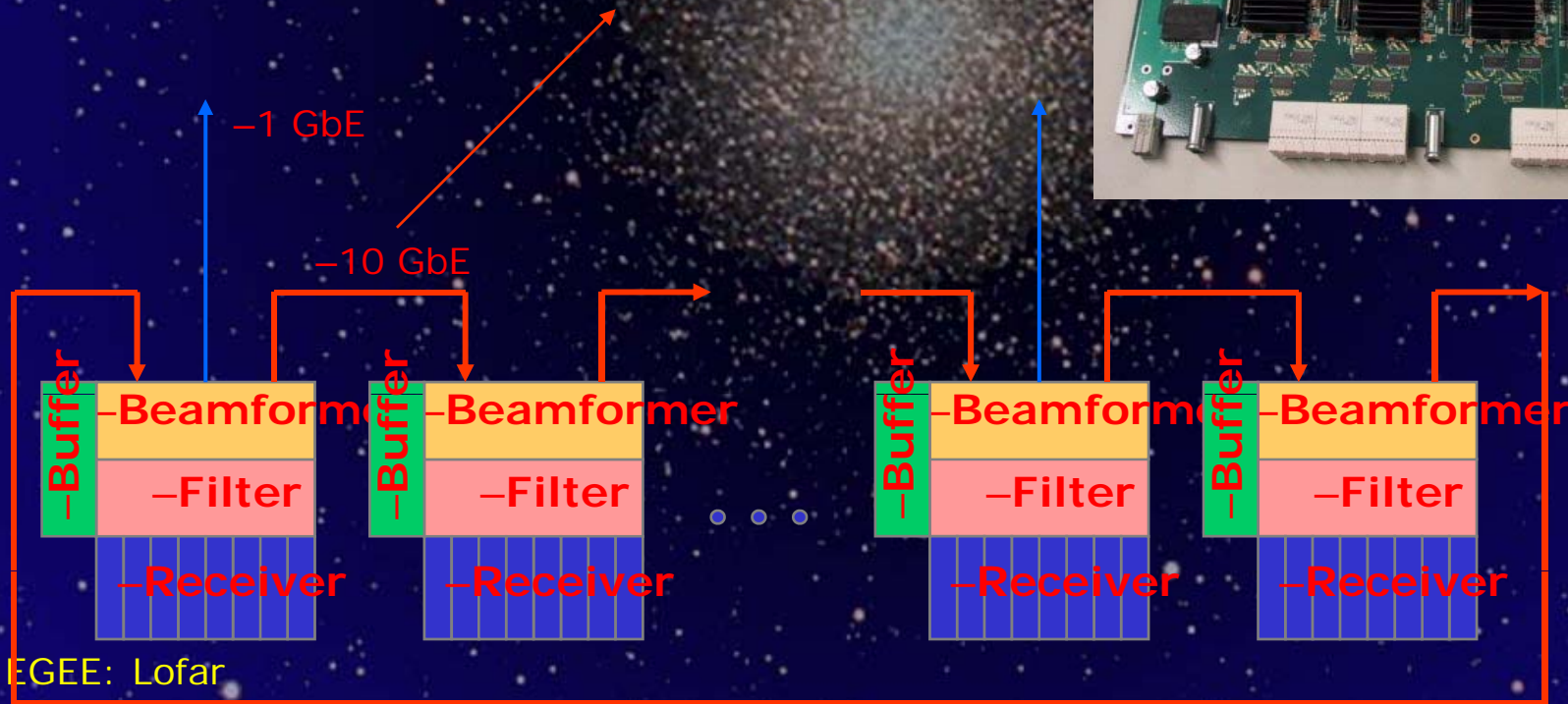
Station based processing



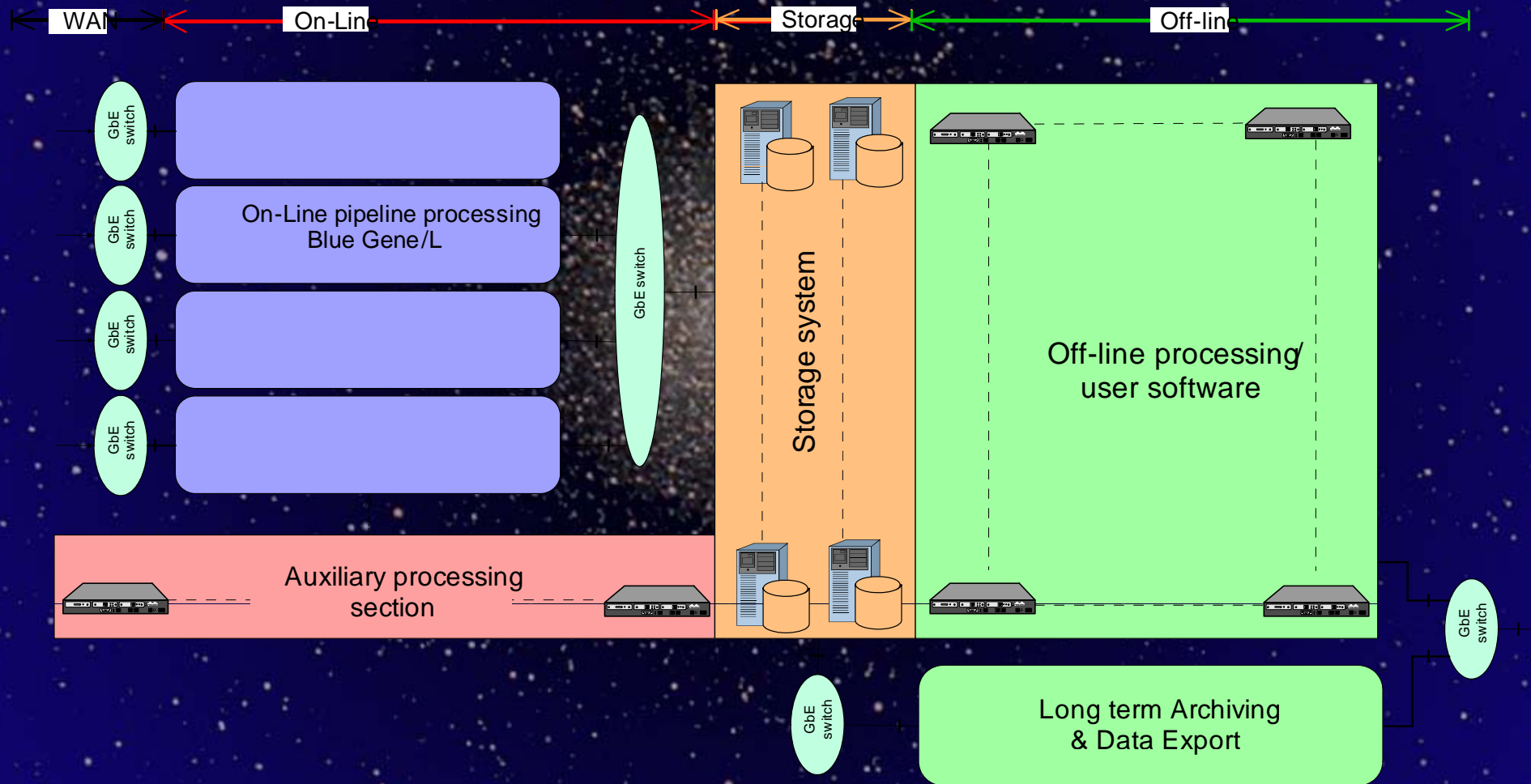
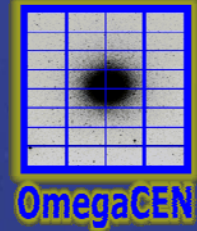
- Input data rate: ~ 460 Gbps
- Output data rate: ~ 2 Gbps
- Processing capacity: ~ 1.5 Tmul/s
- Storage capacity: 96 Gbyte



-Used for 1 beam & station cross correlation



Lofar: Data Stream



Lofar Storage



Table 1: Tier 0 Temporary storage and throughput

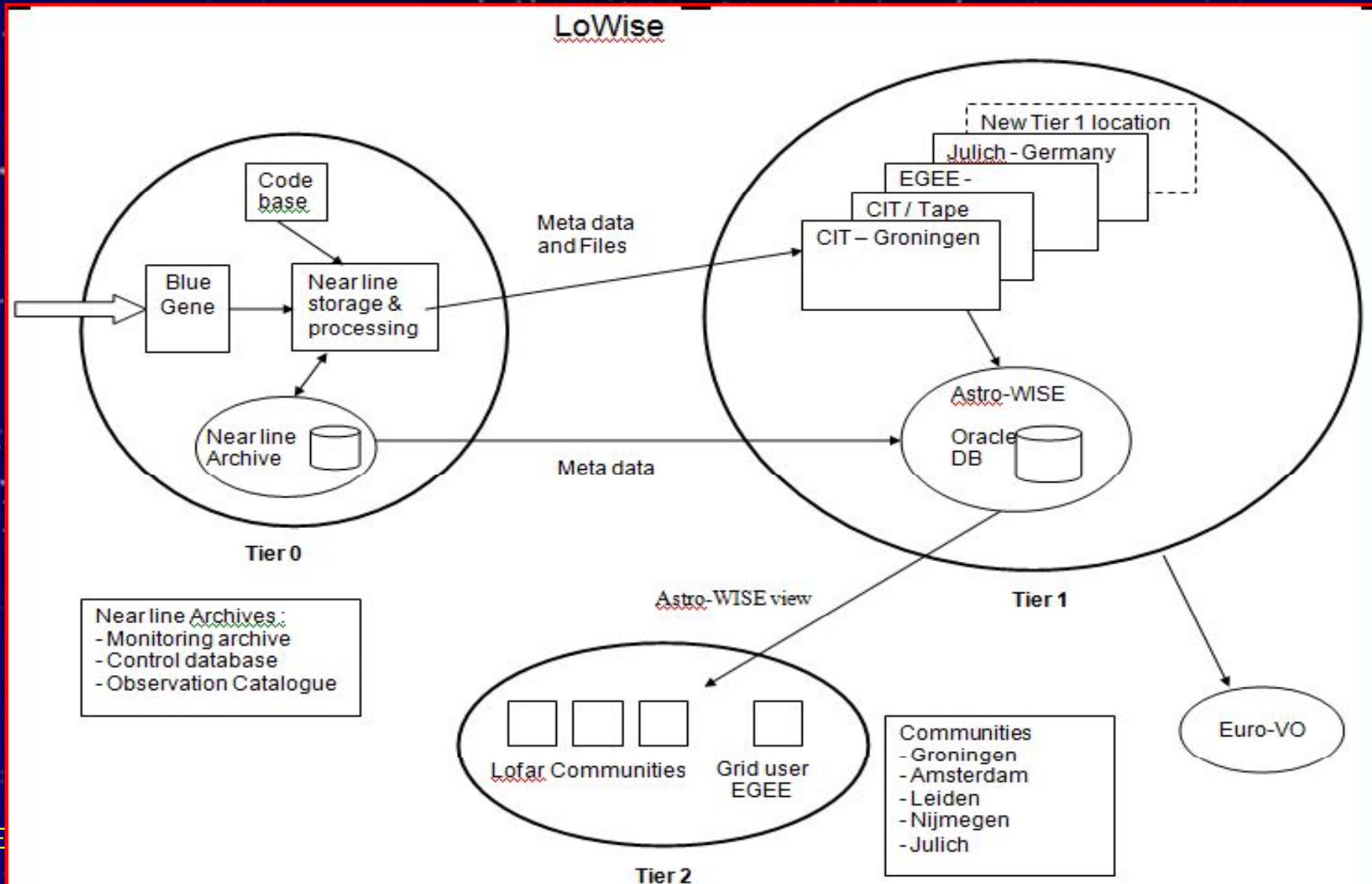
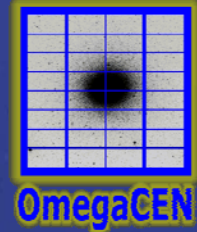
	2008	2009
capacity	500 TB	2 PB
Input	15 Gb/s	50 Gb/s
Output	25 Gb/s	100 Gb/s

<i>User</i>	<i>Temporary storage</i>	<i>Permanent storage</i>
Survey	50TB	240TB
EoR	2PB	800TB
Transients		1.1PB/yr
Cosmic Ray	1PB	745TB + 70TB/yr
Project	2.2PB	3.8PB/yr

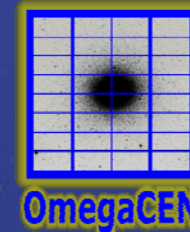
EGE

Table 7: Summarising the actual storage need of the KSP's and a general user.

LoWISE design

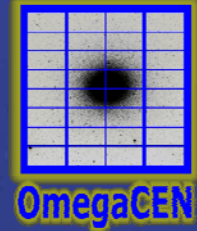


LoWise- concepts



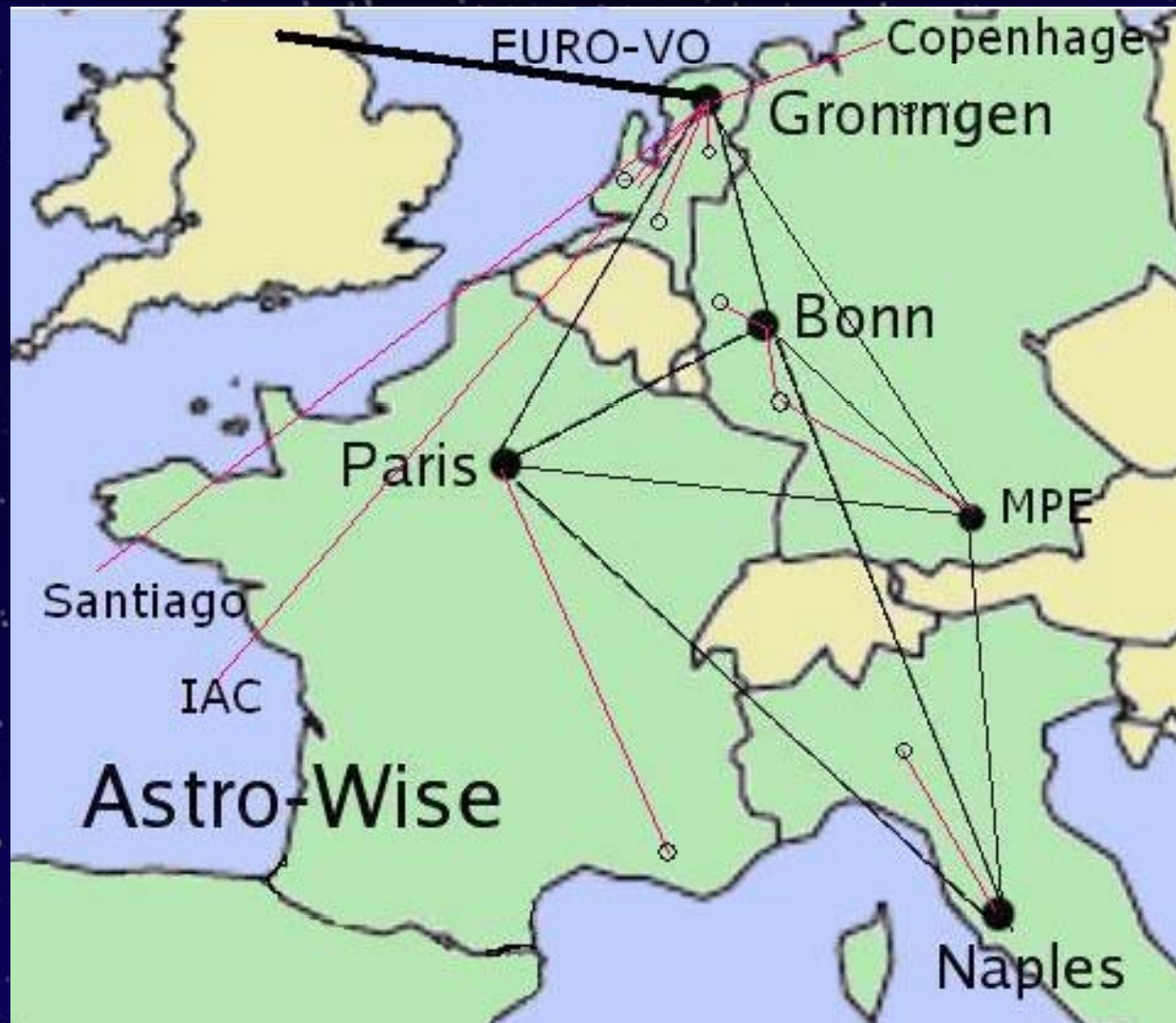
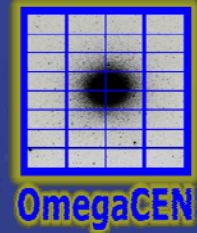
- All Tier 1s on an equal footing
- Centrally operated GPFS distributed filesystem
- File retrieval
 - Db viewer (web)
 - Prompt (db query)
 - Pathname – data server
 - gLite – Grid ftp
- Single distributed db- with all Meta and source data
 - Valid --Quality -- ready for publication flags
- Visibility of data
 - Owner –Project –Archive --EURO-VO
- Authentication / Assigned resources
 - AstroWISE Oracle system

Processing - options



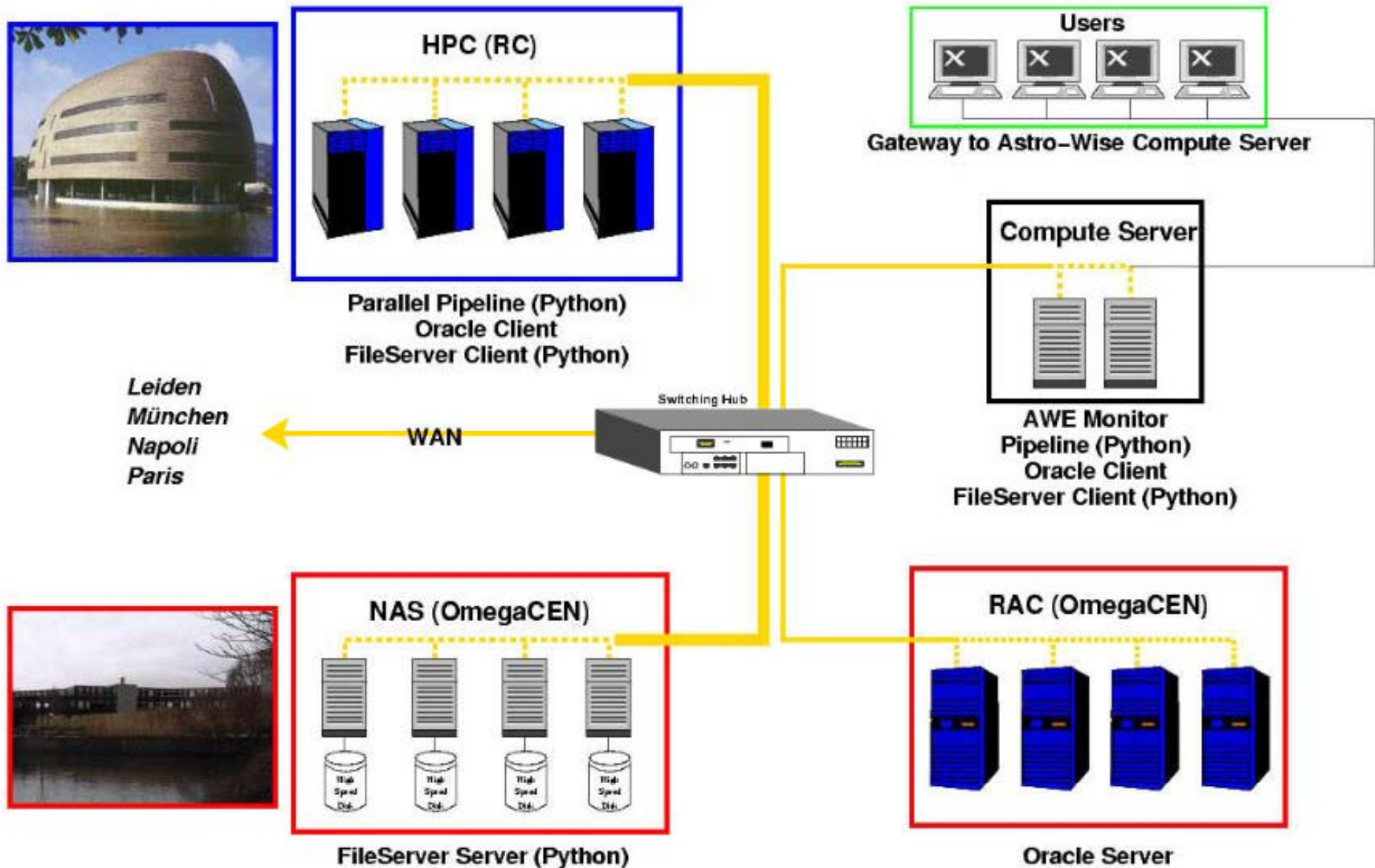
- Tier 0 – CP
- Tier 1 – re-processing
 - Local clusters
 - EGEE GRID
- Tier 2
 - On Tier 1
 - Local anarchy

AstroWISE-Up

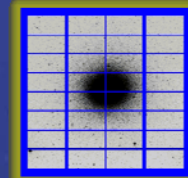


EGEE: Lofar

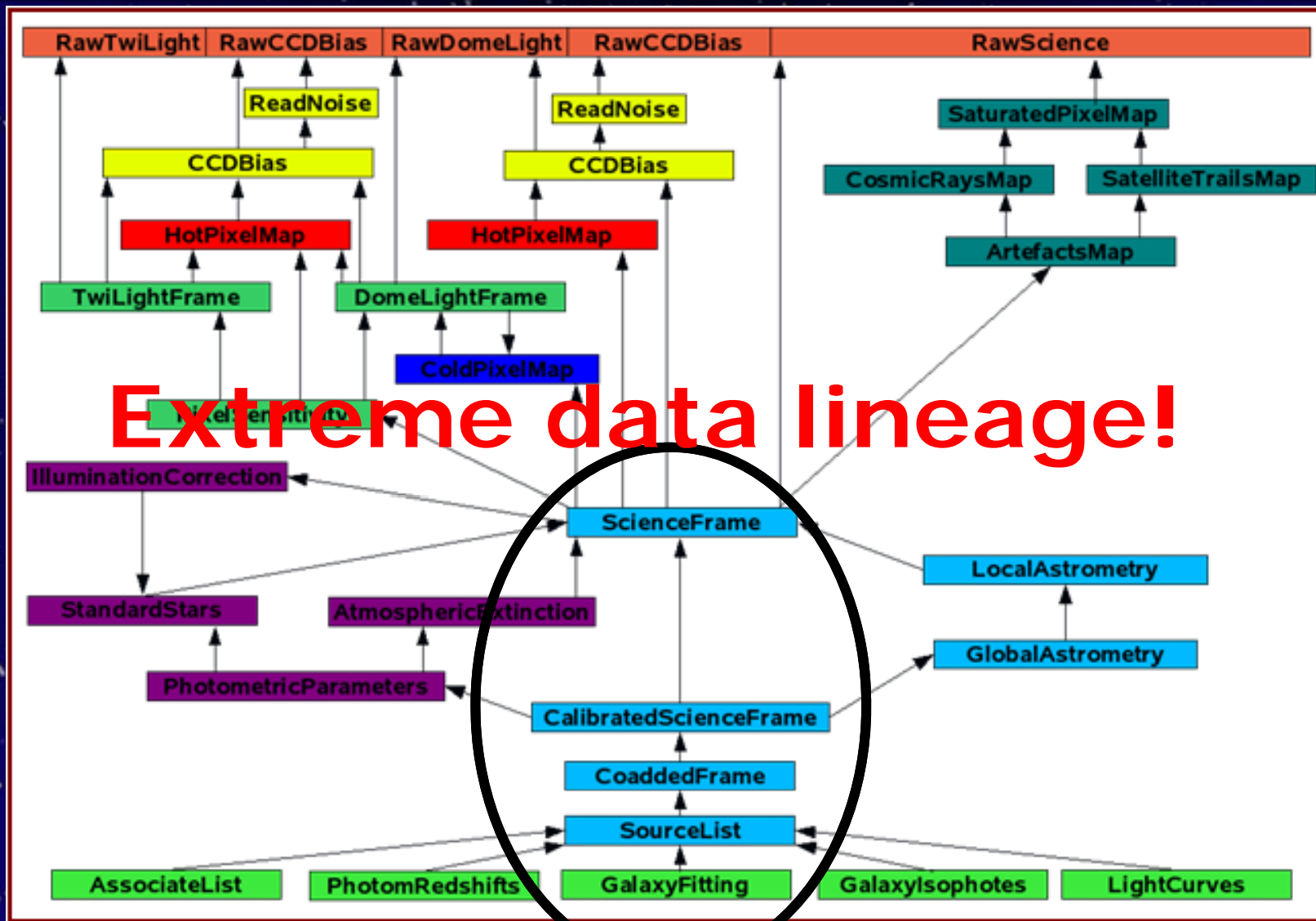
-VST - Virtual Survey Telescope



TARGET diagram

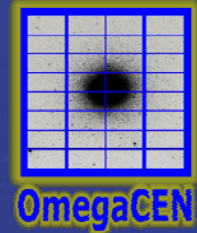


OmegaCEN



EGEE:

Astro-WISE: Services



RadioFrame

Total number of rows selected : 538 from project-context : WENSS

Instrument	NAXIS1 [pixel]	NAXIS2 [pixel]	creation_date	filename	frequency [MHz]	globalname	polarization	process_status	quality_flags	is_valid
WSRT	1024	1024	1990-01-01 00:00:00	WN65198H.fits	326.96835					
WSRT	1024	1024	1990-01-01 00:00:00	WN65242H.fits	326.92478					
WSRT	1024	1024	1990-01-01 00:00:00	WN70013H.fits	327.26329					
WSRT	1024	1024	1990-01-01 00:00:00	WN70026H.fits	327.44923					
WSRT	1024	1024	1990-01-01 00:00:00	WN70104H.fits	327.46524					
WSRT	1024	1024	1990-01-01 00:00:00	WN70130H.fits	327.44923					
WSRT	1024	1024	1990-01-01 00:00:00	WN70313H.fits	327.48713					
WSRT	1024	1024	1990-01-01 00:00:00	WN70351H.fits	327.22136					
WSRT	1024	1024	1990-01-01 00:00:00	WN75132H.fits						

```
Shell No. 2 - Konsole
Session Edit View Bookmarks Settings Help
aitken@awe
Python 2.3.5 (#4, Aug 15 2005, 11:45:46)
[GCC 3.4.3 20050227 (Red Hat 3.4.3-22.1)] on linux2
Type "help()", "copyright()", "credits()" or "license()" for more information.

Welcome to the Astro-WISE Environment

|20-NOV-07 All header handling has been changed from Eclipse to DARMA.
Please see the Issues post for details.
|18-OCT-07 Astrometry settings are now more strict and fallback settings
for preastrom have been added. Astrometry Troubleshooting
HOW-TO added related to new settings.

Importing Astro-WISE packages. Please wait...
Initializing Distributed Processing Unit...

Current profile:
- username : awevriend
- database : db_astro_wug_astro-wise.org
- project : AWWVRIEND

awe> context.set_project('LOFAR')
awe> query = RadioFrame.instrument.name == 'LOFAR'
awe> print len(query)
50
awe> for radioframe in query :
...
print radioframe.filename
...
Radio-WRIEND-LOFAR---1.0.0-19900101000000-48.69---Extracted-----54335.3987434-bb4542cef23b2de915d
1290d8da09020bd45b0ec.fits
Radio-WRIEND-LOFAR---1.0.1-19900101000000-51.19---Extracted-----54335.4150117-284b28d2012045d4f35
0-19900101000000-38.09---Extracted-----54441.4874298-1d5ce0a23bd90a621e4
900101000000-48.7496948242---Collapsed-----54334.6400480-95efa4483dcd357
fits
```



Aladin v1.2

Server selector

Astro-Wise databases

Target: 2 -27

Radius: 1.0

Collection: ESO-V

- PDS B1630 477- G 18 5.2 +15.2 *
- PDS B2449 416- G 20 3.3 +13.3 *
- PDS B4697 416- G 12 2.8 +12.8 *
- PDS B4697 416- G 18 3.0 +13.0 *
- PDS B4697 416- G 20 3.3 +13.3 *
- PDS B2449 416- G 18 3.0 +13.0 *
- PDS B2449 416- G 12 2.8 +12.8 *
- PDS B5847 477- G 18 5.2 +15.2 *

Reset Clear History SUBMIT Close

Target Processing

Contact Write-Jan Vriend DB User awvriend@kew

Help Getting Started

Project ALL Instrument WFI State

Specify Target

Specify a period and click show. For the selected period all available observations will be shown. Each block corresponds to one or a set of observations with a specific filter or observing block. Click on a block to get an overview of the possible targets.

Period selection

You can also specify manually.

Year 2003 Quarter <none> Month <none> Week <none>

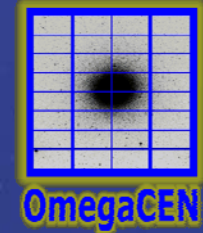
Optional

Filter	Group by	Filtering
<none>	Filter	<input checked="" type="checkbox"/> Flagged data
	Observing Block	

Show

EGEE: Lofar

Astro-WISE: Grid Computing



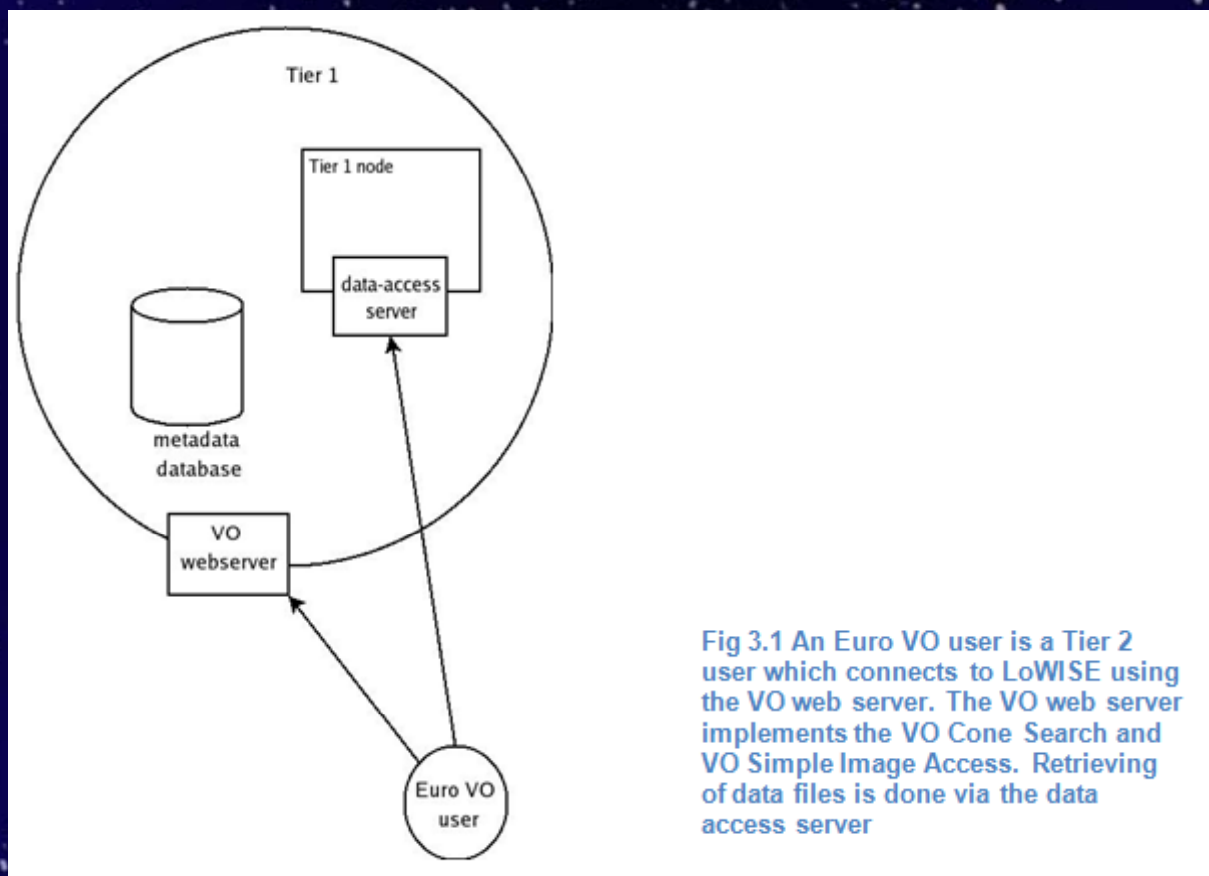
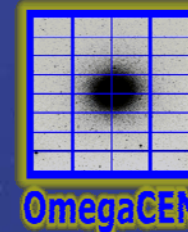
A screenshot of the Astro-WISE web interface in Mozilla Firefox. The browser address bar shows "http://process.astro-wise.org/Process". The page has a navigation menu on the left with sections: Contact (Willem-Jan Vriend), US user (awabelikov), Help (Getting Started), Project (KIDS), Instrument (OCAM), and State (1. Preselect Target, 2. Specify Target, 3. Select Target(s), 4. Process or Query). The main content area is titled "Preferences" and lists settings: Default query depth (1), Default Process depth (1), Default Single DPU (dpu.astro.uni-bonn.astro-wis...), and Default Parallel DPU (dpu.hpc.rug.astro-wise.org). There are checkboxes for "Query view : show process options", "Query view : show popup info", and "Start with graphical input". "Submit" and "Cancel" buttons are at the bottom. A footer note says "page generated 2008-02-05 19:03:12.966274 generation time 0:00:00.066107 For optimal experience use firefox browser".

–selection of Target in Astro-Wise

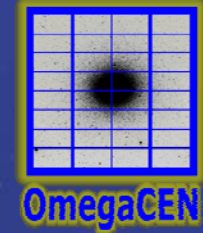
–storage element defined a priori

–EGEE computing

LoWise and Euro-VO



NA4 areas of work



- Improve integration with EGEE
 - Authentication
 - Use of Grid certificates through whole chain
 - Portable client tools
 - Computing
 - Portability of software (Python)
 - Coherent and fast execution of subtasks
 - Storage
 - SRM interfaces to Lofar archive
 - StoRM ?