VO diffusion for CTA

The Cherenkov Telescope Array

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Laboratoire Univers et Théories

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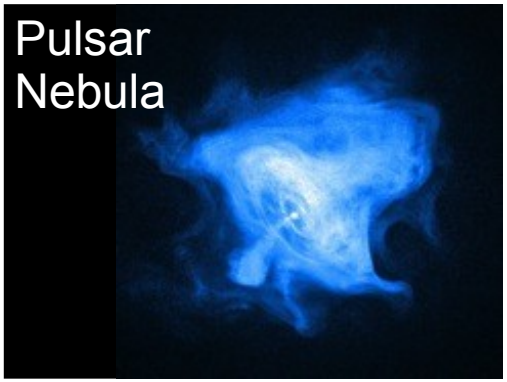
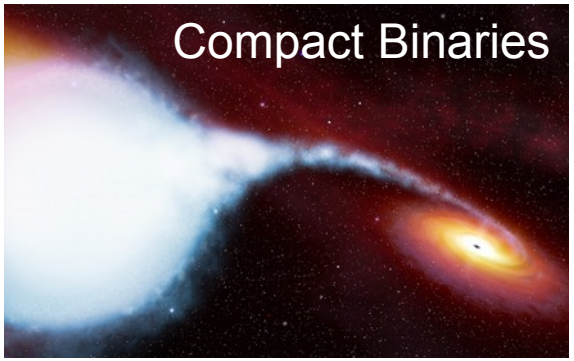
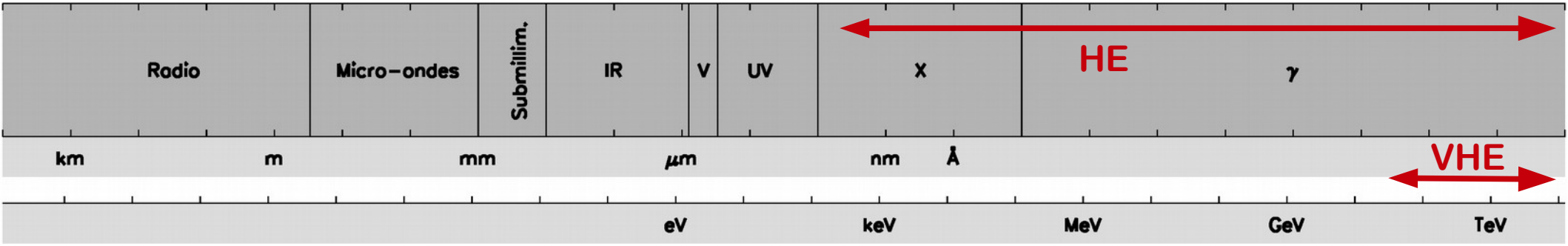
High Energy Astrophysics



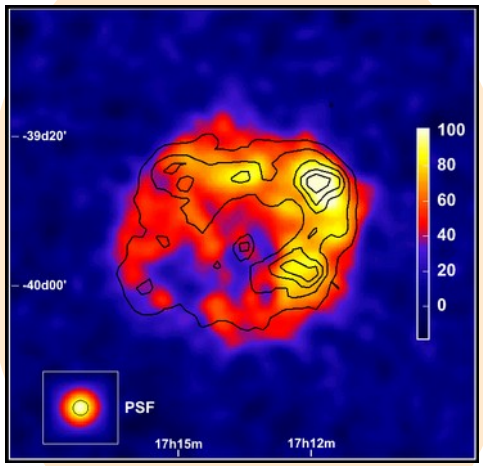
- Violent, transient, non-thermal phenomena
- Matter under extreme conditions
- Particle Acceleration
- Fundamental Physics
- Role of Black Holes in the structuration of the Universe



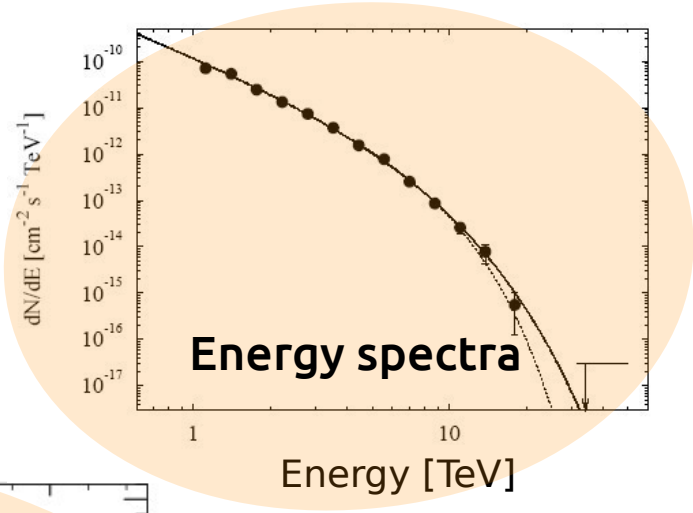
Very high energy data

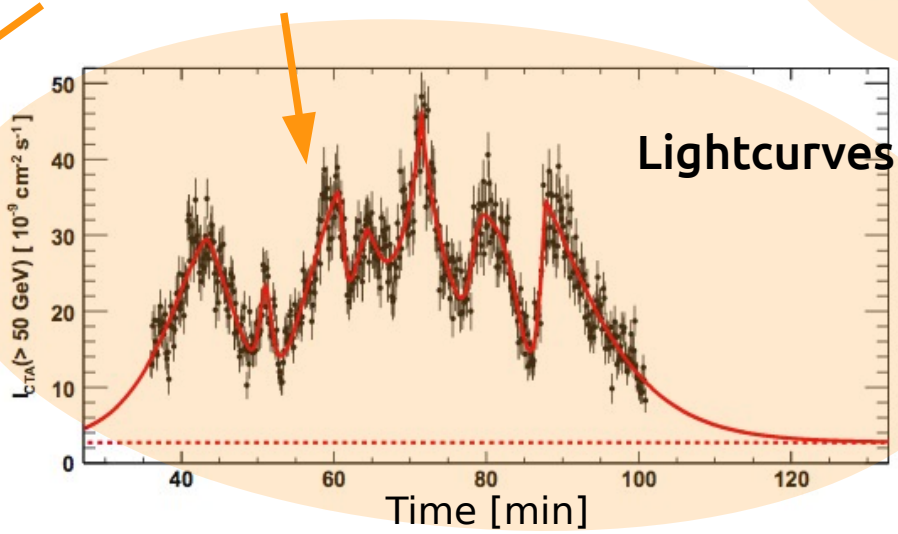


- Several orders of magnitude
- Photon counting
- Low count statistics, high background
- **Event lists**
  (coordinates, time, energy)



Images

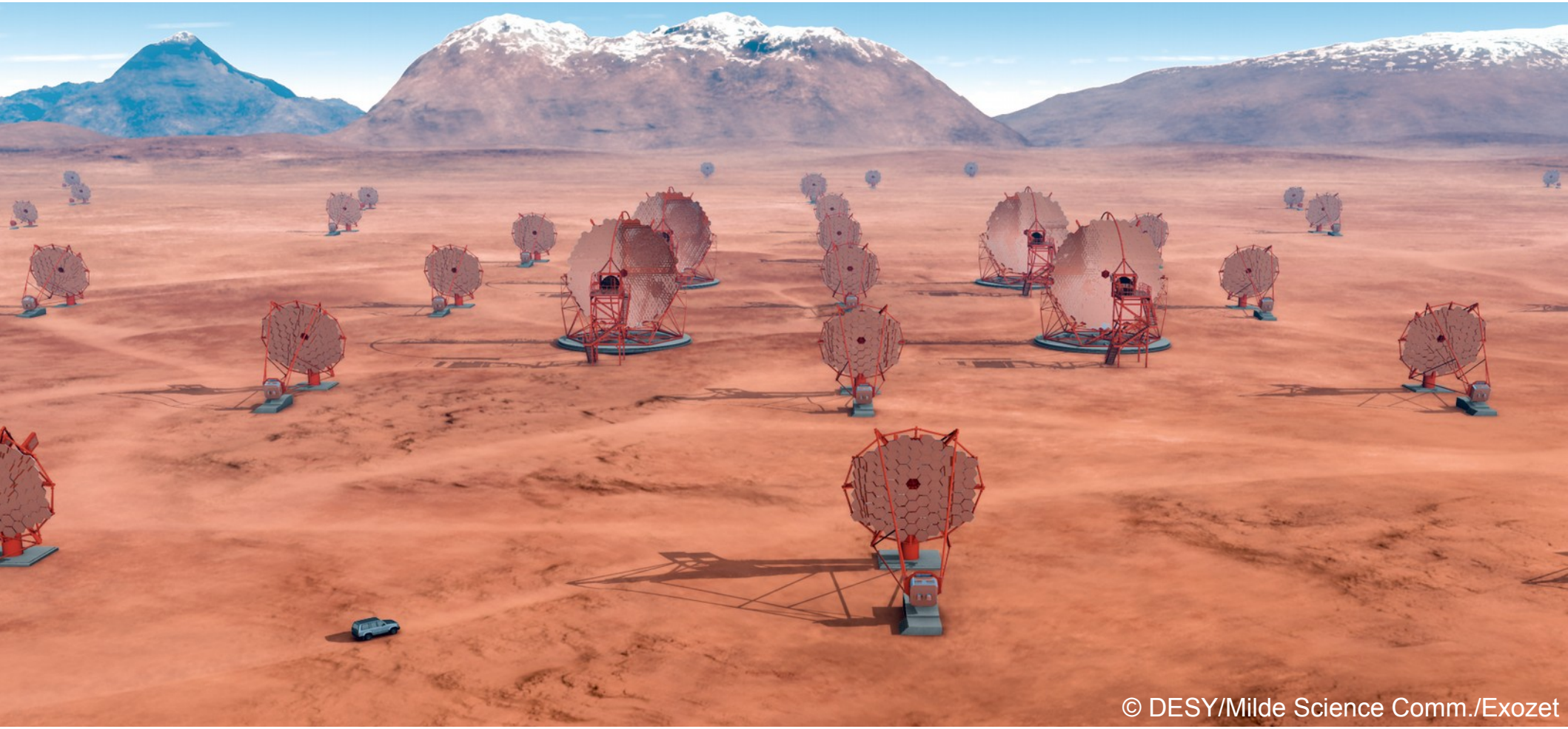




cherenkov telescope array

Observatory

- Two arrays of **100 (South)** et **20 (North)** telescopes (4, 12 et 24 m in diametre)
- Current experiments: H.E.S.S., MAGIC, VERITAS
- But CTA will be an **open observatory**
- First time for this energy domain



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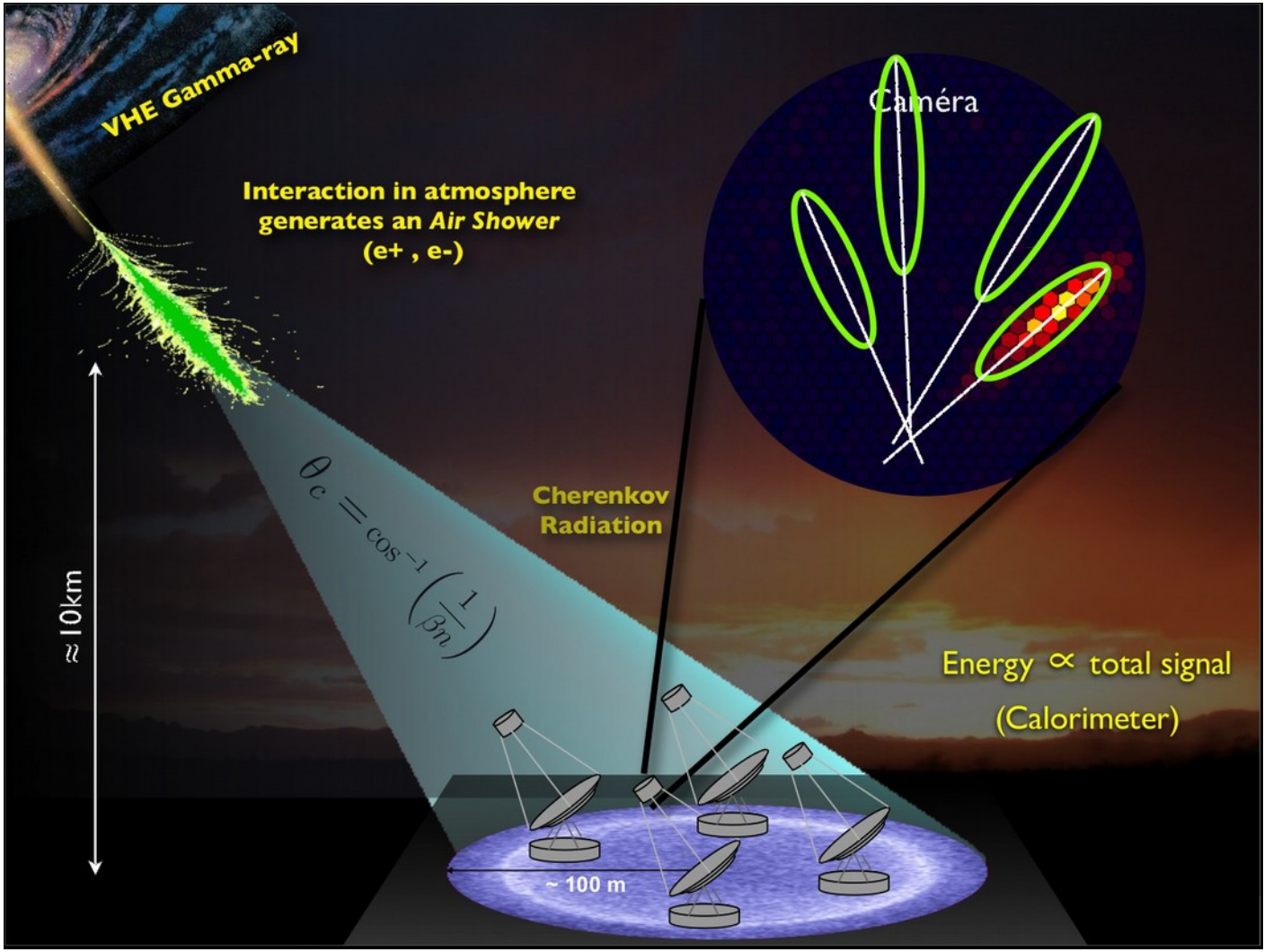
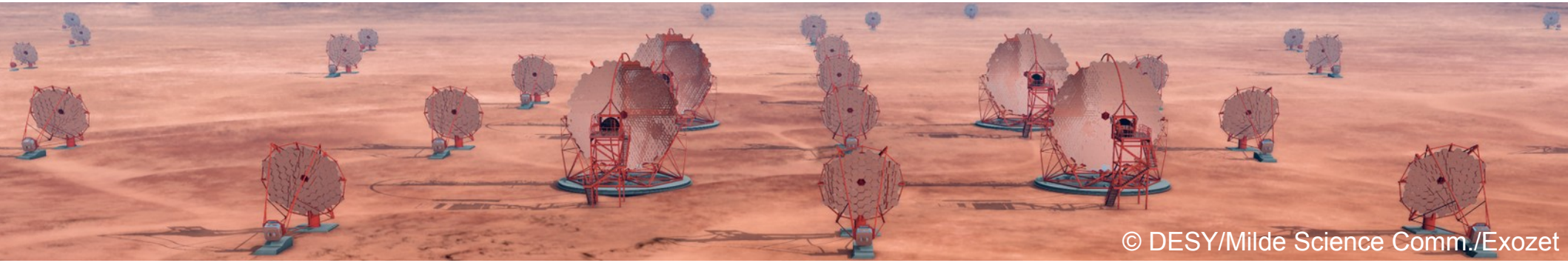
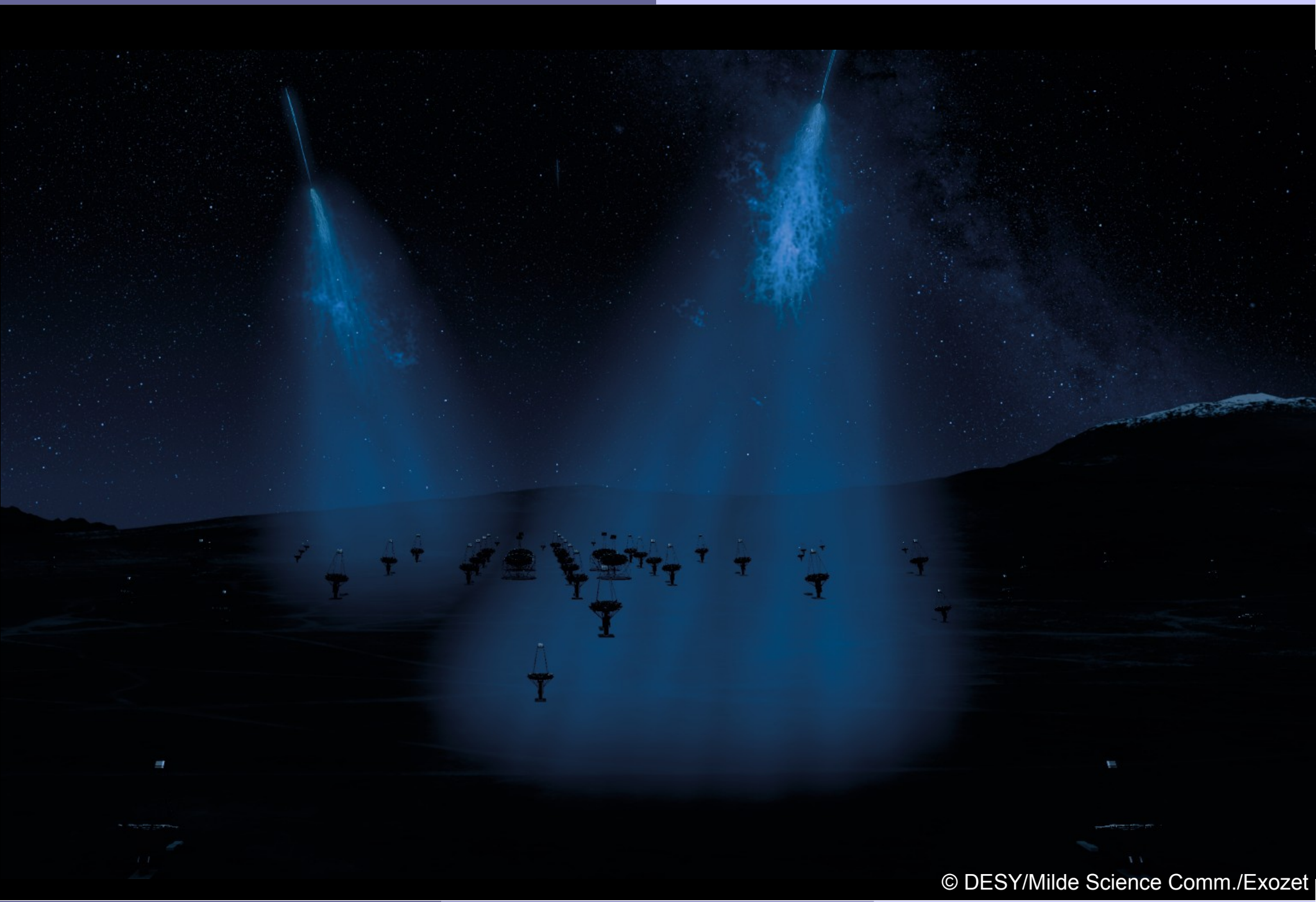
cherenkov telescope array

Observatory

- Event Reconstruction:
  photon, particle shower,
  Cherenkov light
  (faint, few nanoseconds)
- Atmosphere = calorimetre
  Simulations, assumptions
- Complex Metada,
  need to be structured



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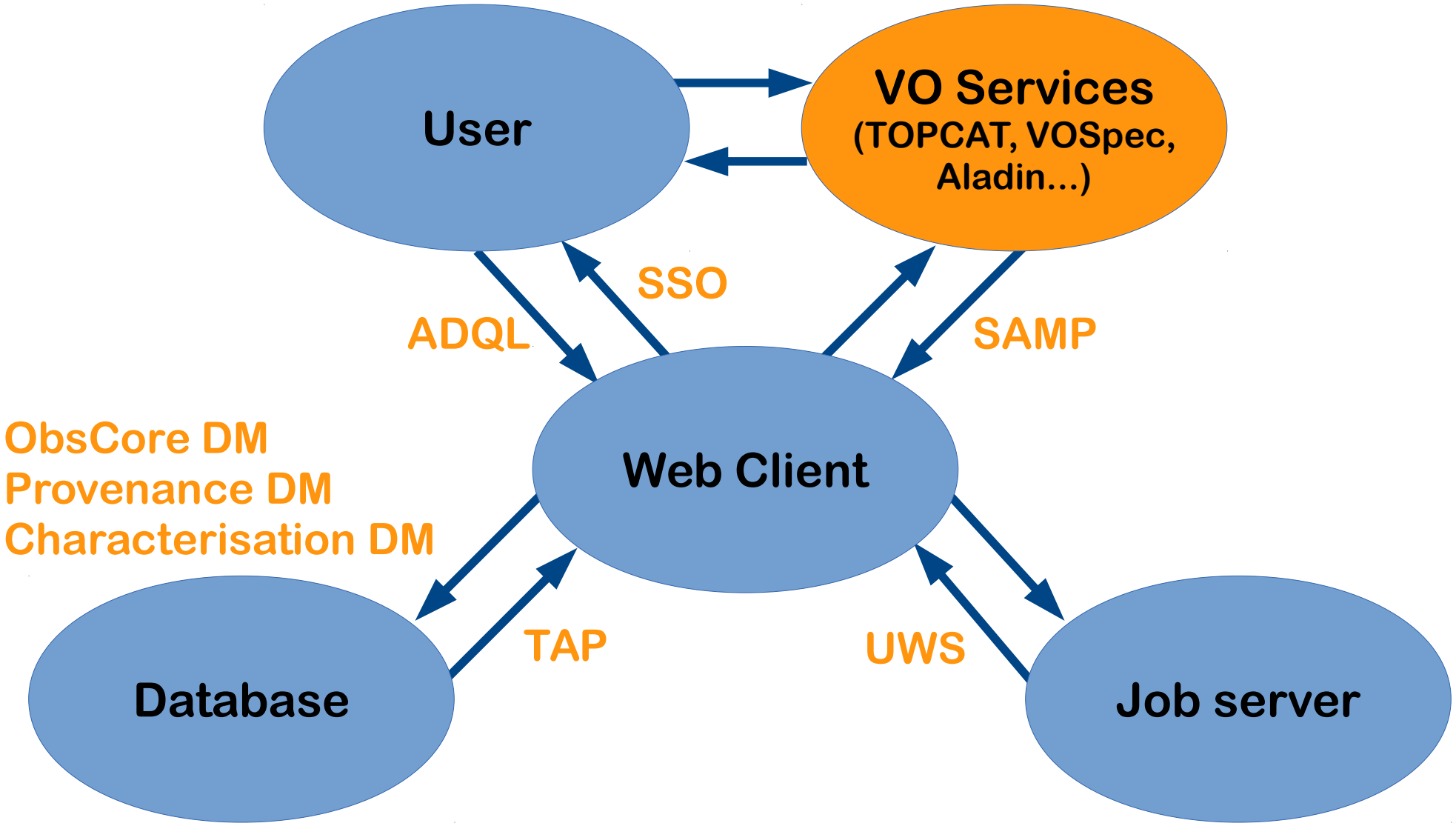
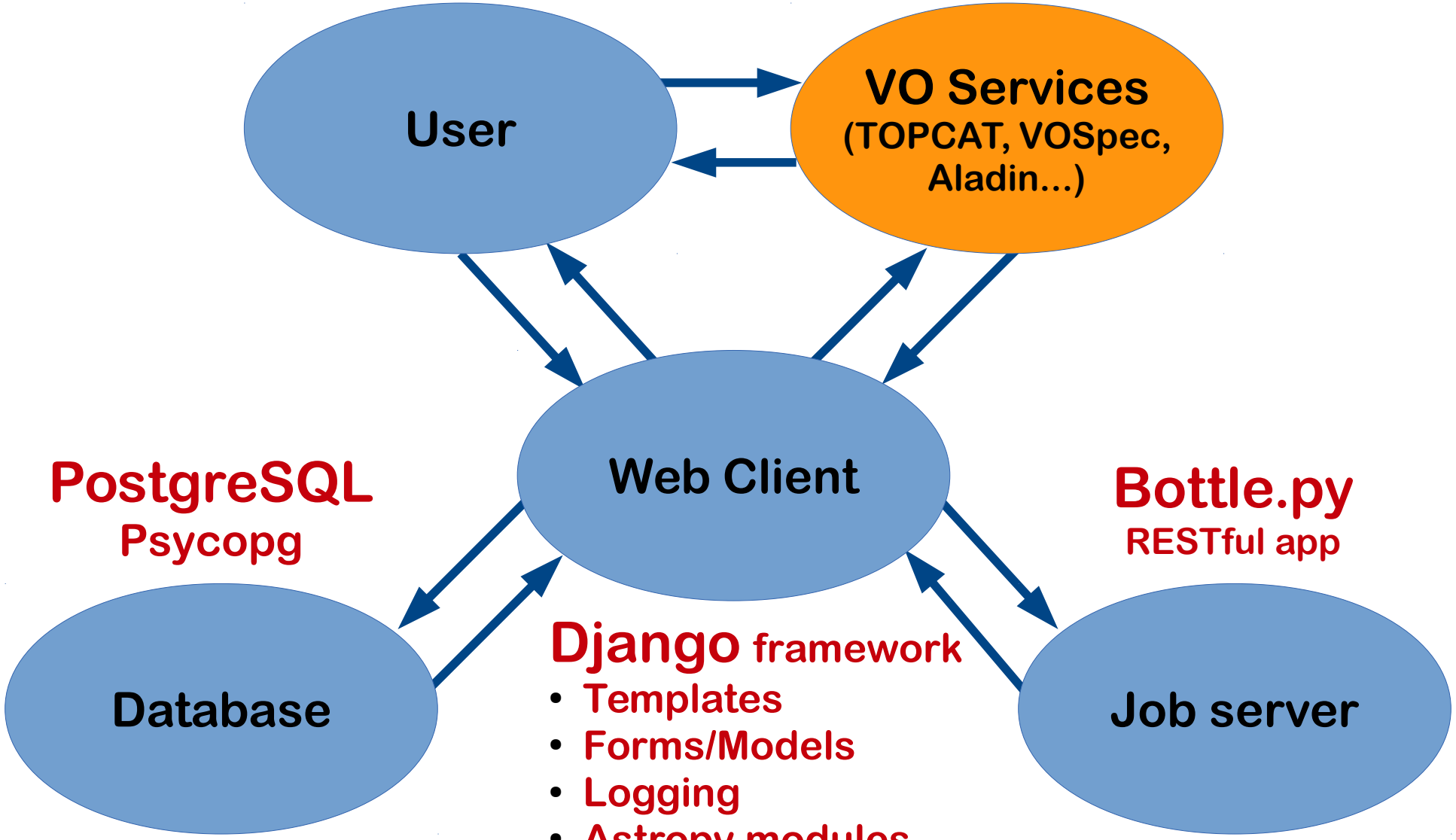
VO data access prototype



A Python based solution

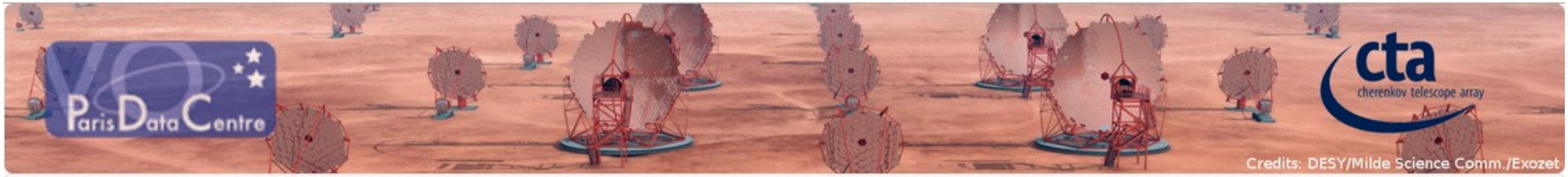


Django framework

- Templates
- Forms/Models
- Logging
- Astropy modules
- Lots of possibilities !

Web Client

http://voparis-cta-client.obspm.fr



CTA Data Distiller | Search | Help | CTA login

Search Datasets | Search All Tables

Search Datasets

Source name	Crab Nebula
Source RA (deg)	83.633
Source Dec (deg)	22.514
Search radius (deg)	0.001
Resource type	Event Lists

Submit Reset

- Django, jQuery, BootStrap3
- Name resolver
  Simbad through Sesame
- Builds and Sends ADQL queries

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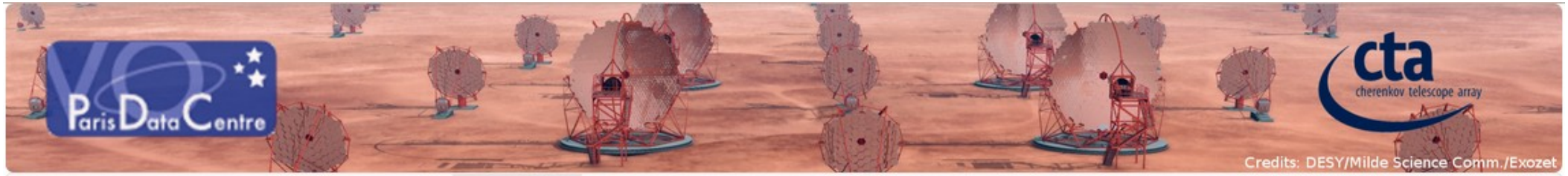

CTA Data Distiller | Search Datasets | Results | Job List | Selected Job | JS9 | Authentication: Sign out user

Search | Analyse | Visualisation

SAMP

Interop (SAMP)
Send Result Table
Send Selected Data

Results

show/hide query

```
SELECT * FROM cta.vo_obscore as o WHERE 1 = intersects(o.s_region, circle('ICRS', 83.63308333, 22.0145, 0.001))
```

ADQL query

Send

ObsCore fields

Search

UWS

	dataproduct_type	obs_collection	obs_id	target_name	s_ra (deg)	s_dec (deg)
☐	eventlist	1	23592	Crab Nebula	82.01333618164062	22.01444435119629
☐	eventlist	1	23559	Crab Nebula	85.25333404541016	22.01444435119629
☐	eventlist	1	23526	Crab Nebula	83.63333129882812	22.51444435119629
☐	eventlist	1	23523	Crab Nebula	83.63333129882812	21.51444435119629
☐	eventlist	3	5003499	CrabNebula	83.28087615966797	21.784133911132812

Showing 1 to 5 of 10 rows 5 records per page

<< < 1 2 > >>

Analysis tools
Create Count Map(s)
Extract Spectrum

Plotting tools
TOPCAT
Aladin
VOSpec
SPLAT

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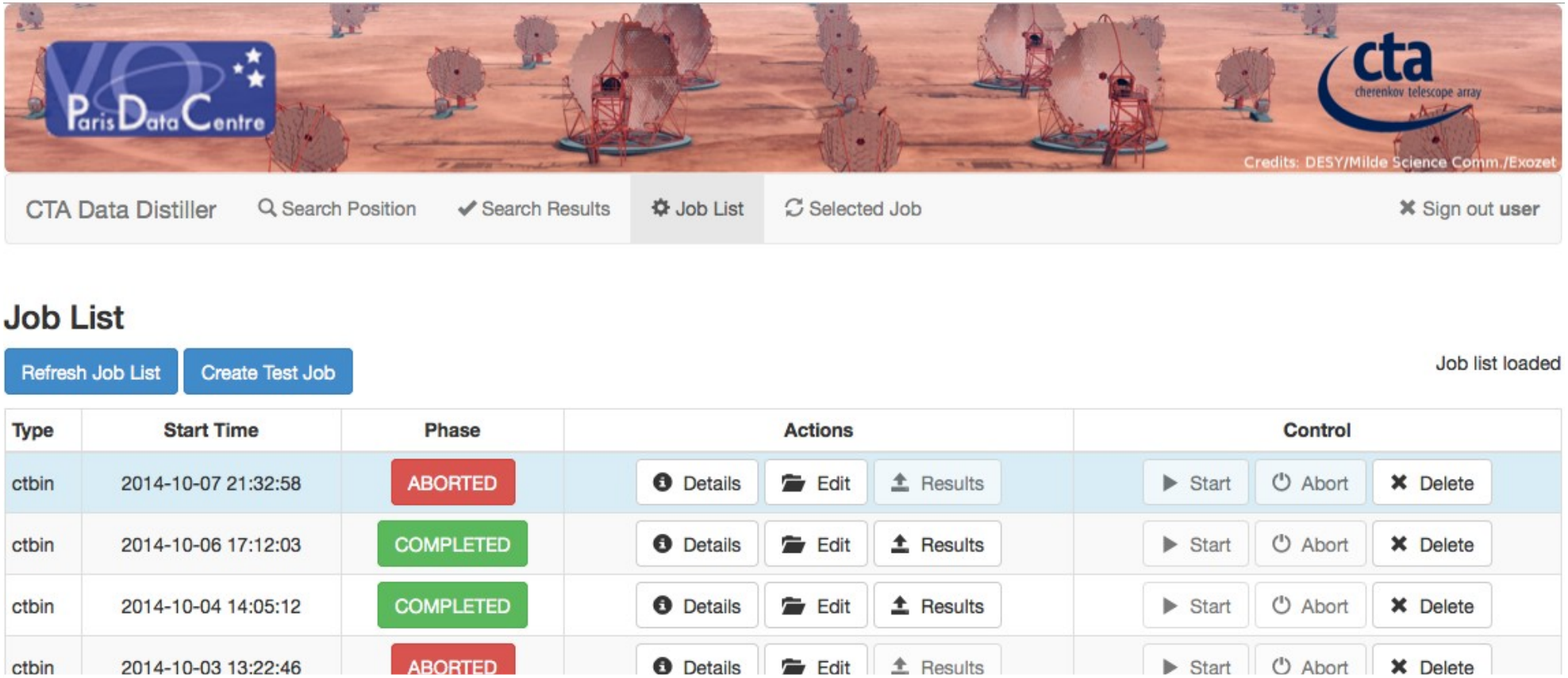
Web Client – Universal Worker System



- UWS v1.0 server (voparis-uws.obspm.fr)
- JavaScript client using WADL Job Description Language
- Job sent to a generic cluster (tycho.obspm.fr)
  (using SLURM as batch queue)