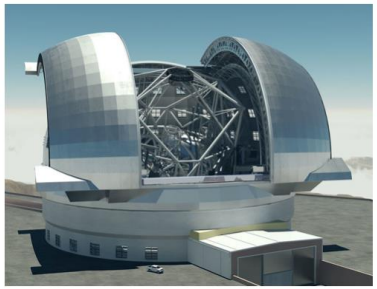
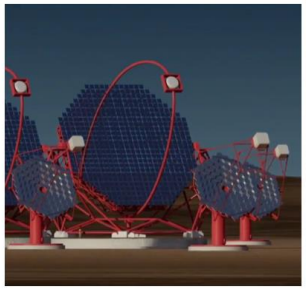
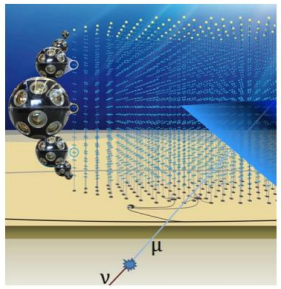





Opportunities within ASTERICS

How to contribute and to profit

Rob van der Meer – ASTRON, NL
ASTERICS PM

Introduction

- ASTERICS project
- Scope
- Objectives
- Work Packages
- Opportunities

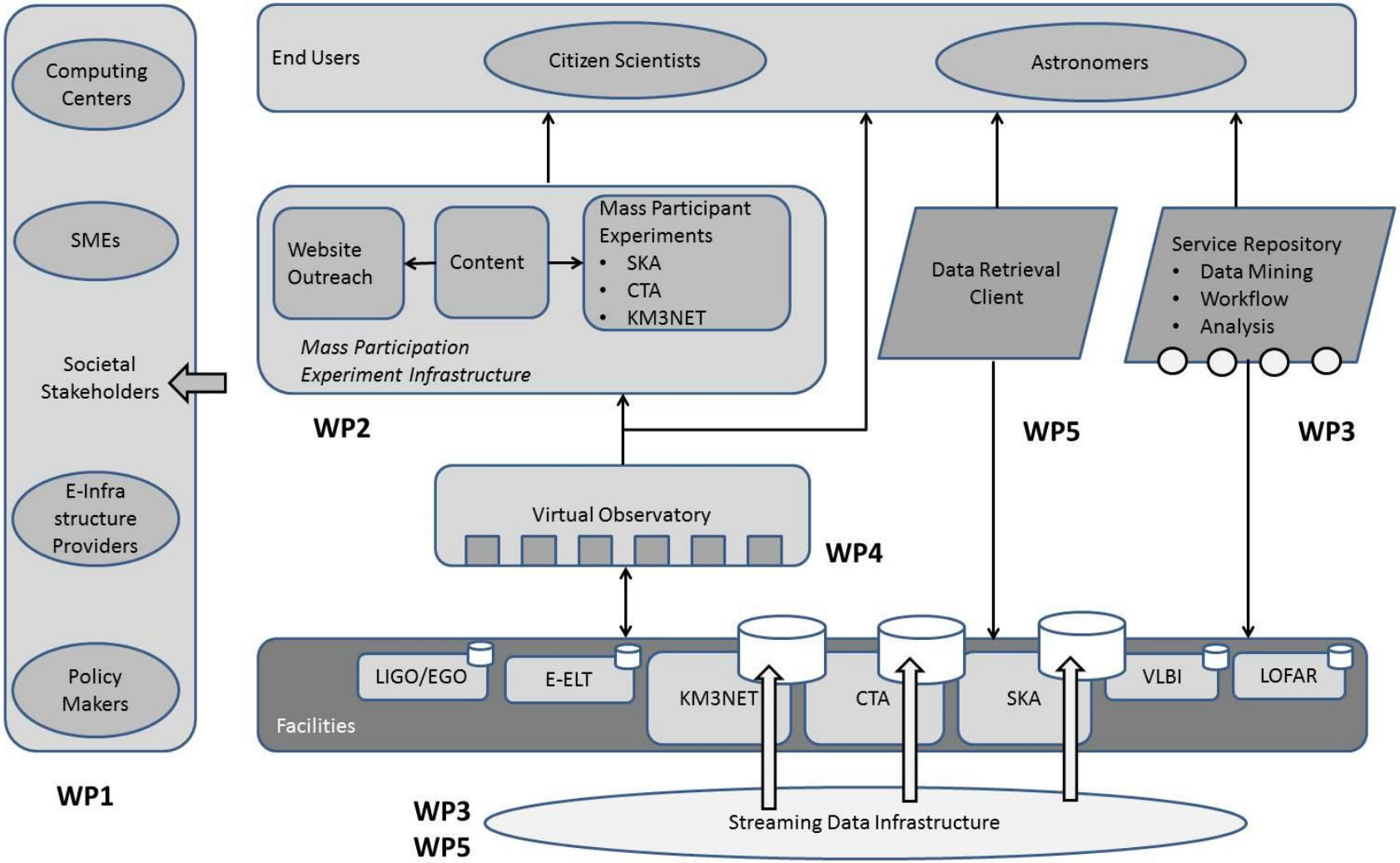
ASTERICS

- Astronomy ESFRI & Research Infrastructure Cluster
- Horizon 2020 Work Programme INFRADEV-4-2014/2015 Call – "Implementation and operation of cross-cutting services and solutions for clusters of ESFRI and other relevant research infrastructure initiatives"
- Focus of ASTERICS: SKA, CTA, KM3NeT, close links to E-ELT and EGO
- Funded at 15 M€ for 4 years
- 22 partners in 6 countries, representing a major collaboration in Astronomy/Astrophysics/Astroparticle Physics
  ASTRON, CNRS, INAF, UCAM, JIVE, INTA, UEDIN, UHEI, OU, FAU, VU, CEA, UVA, UGR, FOM, IEEC, IFAE, UCM, INFN, STFC, DESY, SURFnet

ASTERICS Scope

- Bring together astronomy and astroparticle physicists:
- ESFRI facilities:
  - Radio (SKA)
  - γ-Ray (CTA)
  - ν (KM3NeT)
  - Optical (E-ELT)
- Aspiring ESFRI facilities, e.g. Einstein Telescope
- Complimentary facilities, e.g. LOFAR, Euclid, LSST, VIRGO, LIGO, eVLBI, HESS, MAGIC, ANTARES, IceCube, etc.
- "Gathering critical mass… common solutions… cross-cutting activities… complementarity… interoperability… economy of scale"

ASTERICS overview



ASTERICS objectives "added value"

ESFRI projects	ASTERICS
Own design requirements	• Enable interoperability between the facilities • Minimise fragmentation • Encourage cross-fertilisation • Develop joint multi-wavelength/multi-messenger capabilities • Open-up the next generation of observatories to discovery and usage (and re-usage) • Generic approach to the data challenge
mature technology choices	• Identify areas of rapid technology development • Complementary and synergetic approach across the projects • Significant added value

ASTERICS objectives

ESFRI projects	ASTERICS
Own observations, exceptional individual science cases	• Coordinate and harmonise joint an efficient scheduling, operation and interoperability • Multi-wavelength / multi-messenger • Engage with society • Science 2.0 • Citizen science
Analyse own data	• Data integration across ESFRI facilities • Open standards • Adapt VO framework and tools • E-science infrastructures • Data mining • Co-development for s/w & h/w • Software libraries
Coordinate requirements, disseminate results, education, training	

Collaboration

- The close and direct involvement of ESFRI project and pathfinder staff is essential in realising the major ASTERICS ambitions.

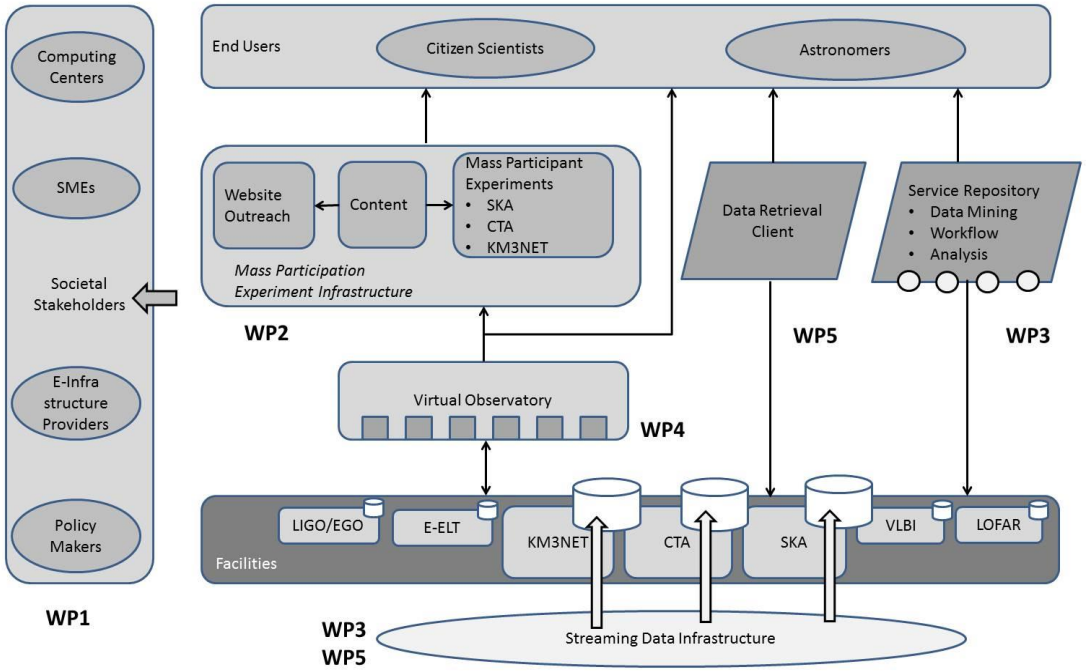
WP1 – Management

Project manager
Rob van der Meer

Coordinator
Mike Garrett

Project scientist
Giuseppe Cimò

Project Administrator
Emmy Boerma



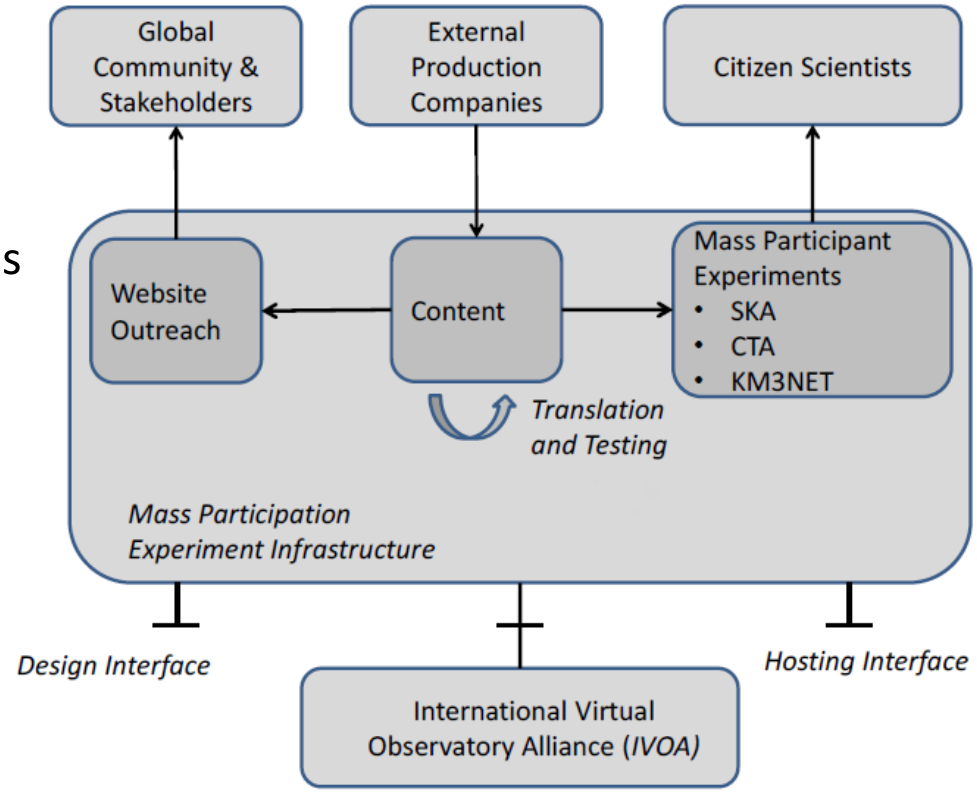
WP2 – DECS

- **D**issemination, **E**ngagement and **C**itizen **S**cience

Lead: S. Serjeant

Audiences:

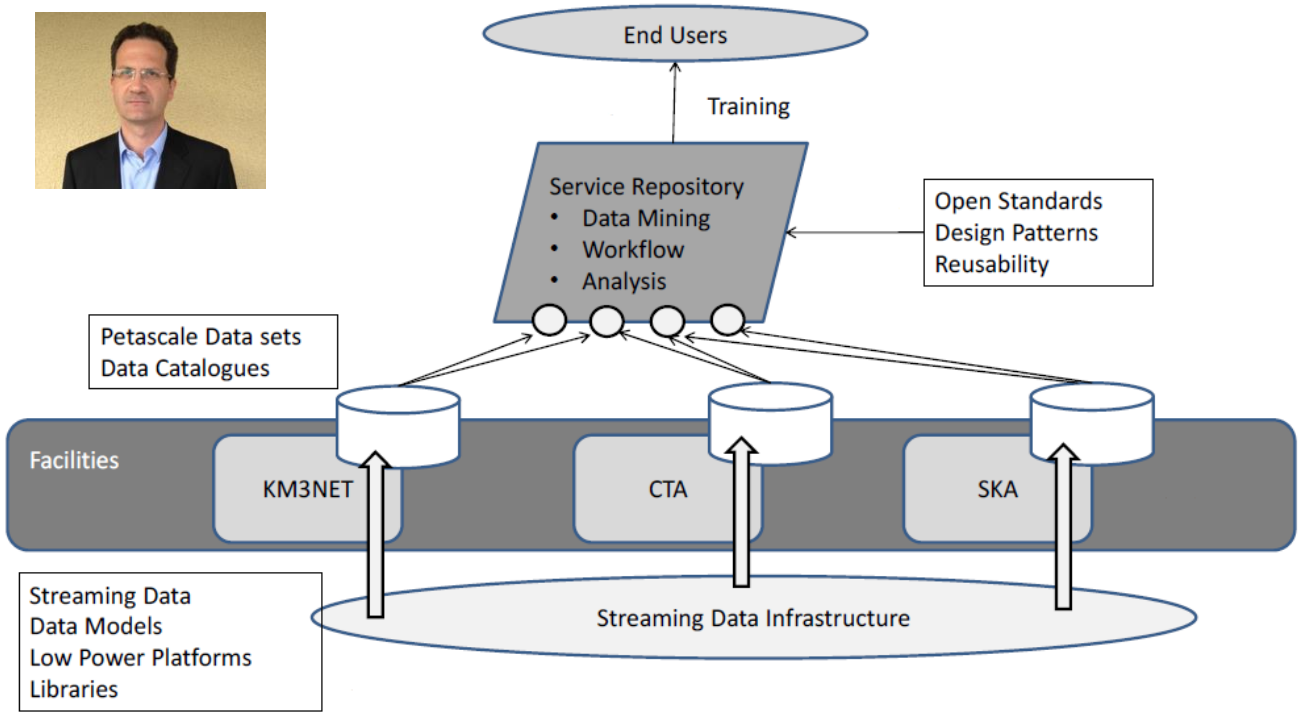
- scientific & technical communities
- academia
- private industry
- other public research centres
- SMEs
- policy makers
- general public



WP3 – OBELICS

- **Ob**servatory **E**-environments **Li**nked by common **C**hallenge**S**

Lead: G. Lamanna



Co-development for the robust, scalable, flexible handling and exploitation of the huge data streams and distributed petascale database systems

WP4 – DADI

- **D**ata **A**ccess, **D**iscovery and **I**nteroperability

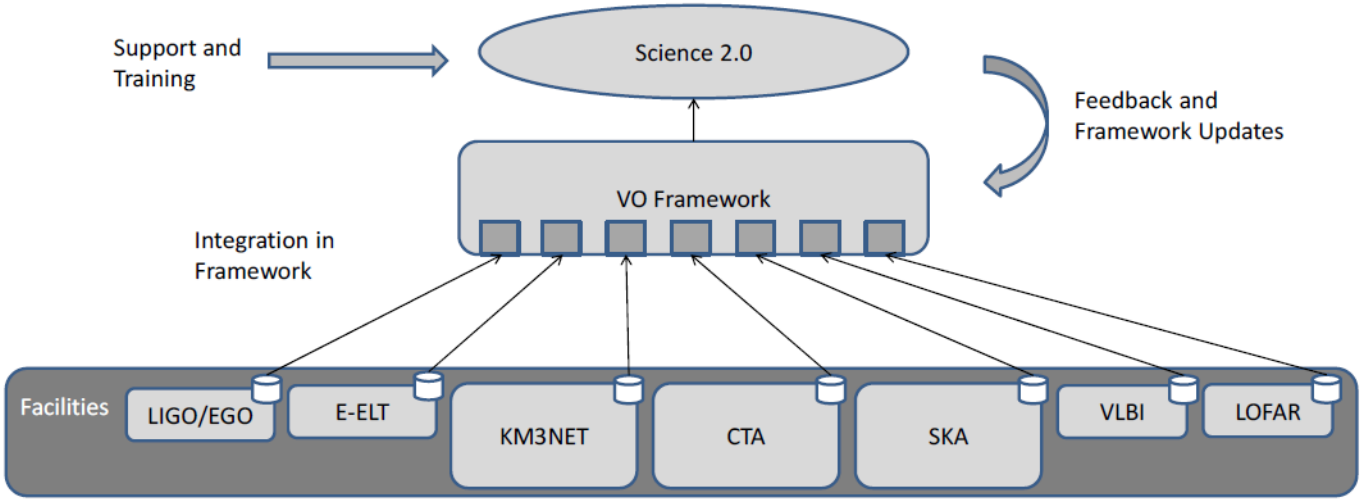
  Lead: F. Genova

Virtual Observatory

Evolution:

- Train & support
  - ESFRI staff
  - pathfinders
- Requirements
- Feedback
- Adapt

- Train



Virtual Observatory

- The VO can be seen as a kind of club of **data services** that all follow the same rules.
- International Virtual Observatory Alliance
  IVOA standards ←→ ASTERICS
- Interface between domain-specific & generic infrastructure
- New and archive data

Virtual Observatory

Visualisation with VO tools
IceCube-40 String data

Reference: R. Abbasi *et al*, arXiv:1104.5187, Phys. Rev. D 84, 082001 (2011)

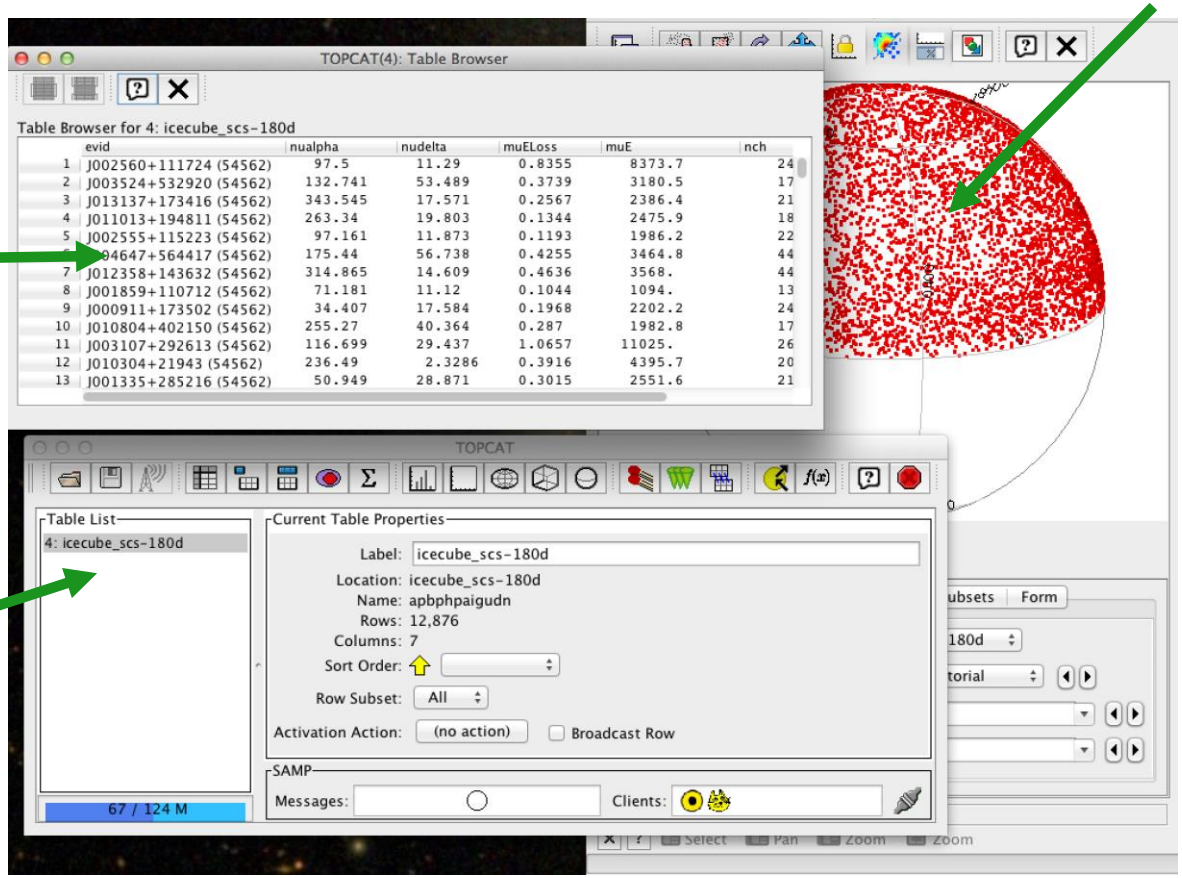
- 12,877 candidate neutrino events
- Event list managed using the Topcat VO tool
  http://www.star.bris.ac.uk/~mbt/topcat/
- Visualisation through the Aladin VO portal
  http://aladin.u-strasbg.fr/aladin.gml

Virtual Observatory

sky plot

view table

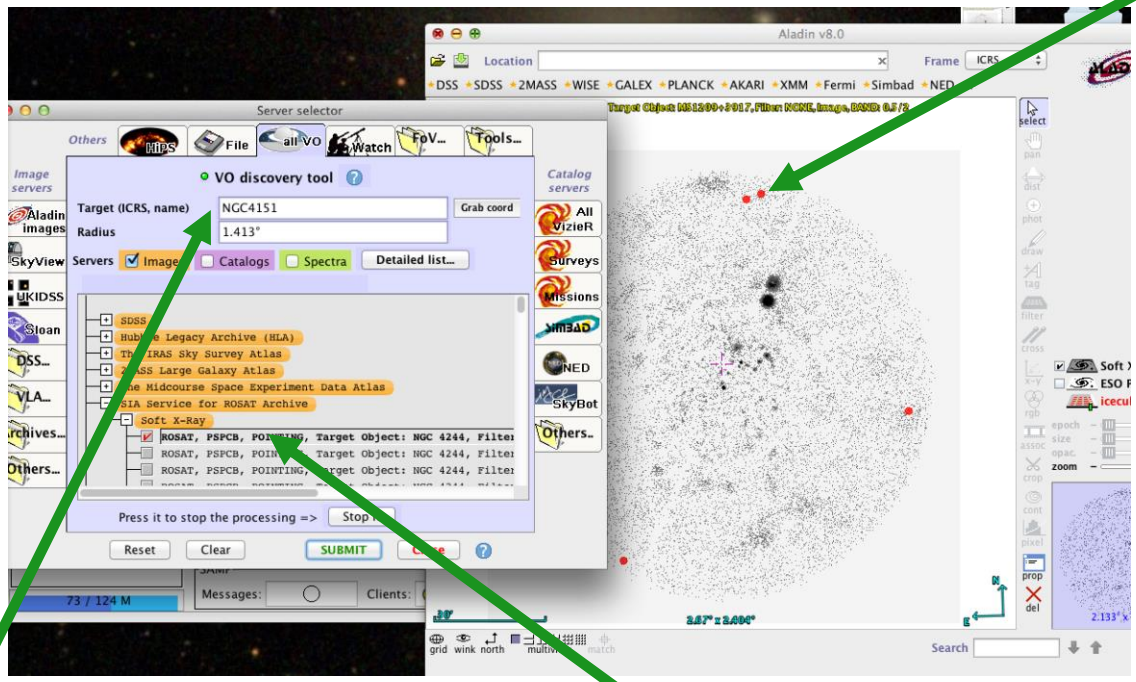
database loaded into Topcat



VO

broadcast table
to Aladin with SAMP

show neutrino events
overlaid on X-ray image



In Aladin, search for
images of NGC 4151

pick this ROSAT image

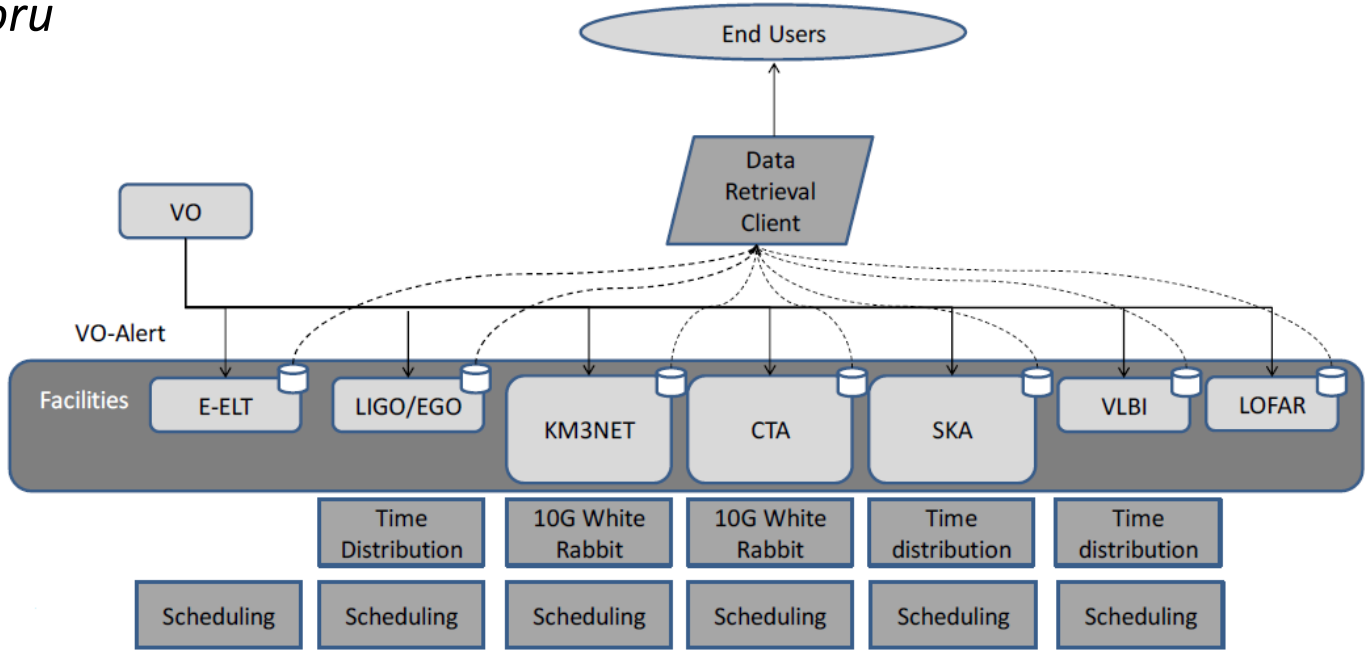
WP4 – DADI

Recurring ASTERICS events:

DADI technology Forum	17-18 Sept 2015, Strasbourg
ASTERICS European Schools open call to European Astronomers (PhD, Post-doc) 50 participants	Dec 2015
ESFRI Forum and training event network, share lessons learnt, discuss requirements, training	Dec 2015
Data provider Forum open to all European Data providers	Nov 2016, Heidelberg

WP5 – CLEOPATRA

- **C**onnecting **L**ocations of **E**SFRI **O**bservatories and **P**artners in **A**stronomy for **T**iming and **R**eal-time **A**lerts.
- *Lead: A. Szomoru*



- Technology development for fibre connectors; relaying alerts; data streaming software; data dissemination; advanced scheduling algorithms
- Builds on WRE (White Rabbit Ethernet) and the EC EXPReS/NEXPRES projects

Opportunities

- The close and direct involvement of ESFRI project and pathfinder staff is essential in realising the major ASTERICS ambitions.
- All workpackages have meetings to contact users, projects for input/output.

- www.asterics2020.eu