EGI for Astronomy and Astrophysics

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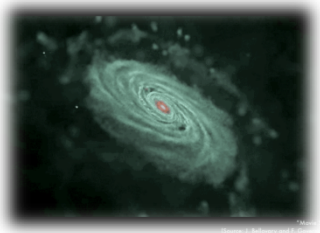
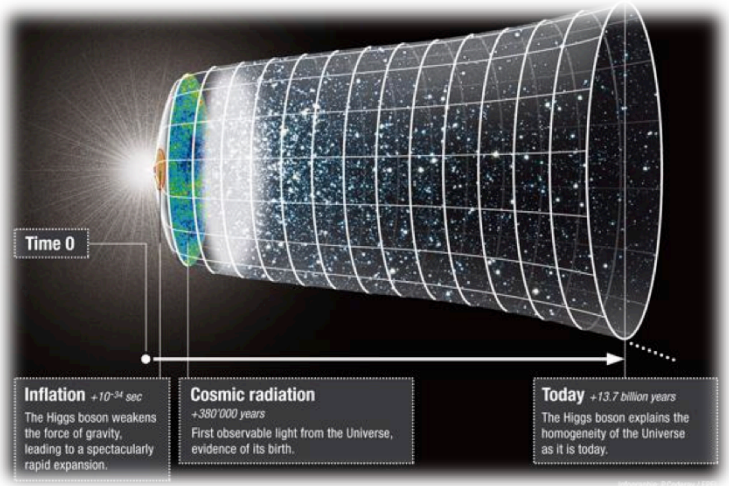
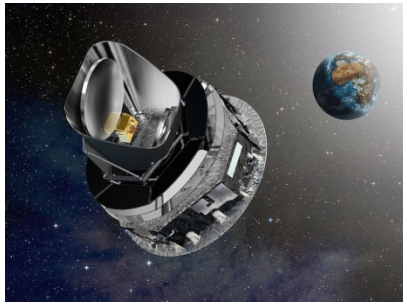
A&A Community

- Collection of **heterogeneous**, distributed, scientific (sub)-communities
- Study the different scientific aspects of formation and evolution of the **Universe**
- Commonalities in terms of technological challenges and requirements
  - Computing (HTC but also HPC)
  - Demanding in terms of data

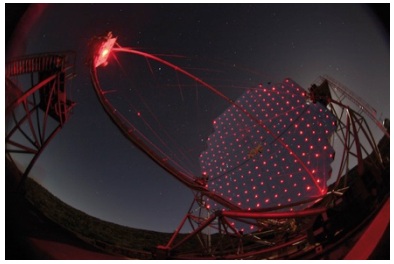


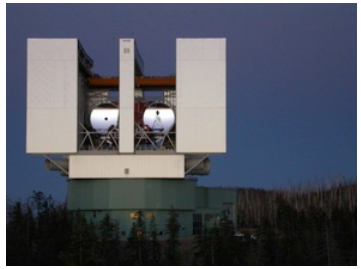


A&A Heavy User Community



- Research communities:
  - Radio Astronomy, Gamma Ray Astronomy, Helio-physics, Stellar Astrophysics, cosmology….
- The A&A Virtual Organizations
  - 10 with
  - about 500 users
  - about 80000 cores
  - about 100 TB storage
  - More in other VOs





- A light weight coordination
- The A&A **Heavy User Community**
- Identify commonalities and common technical solutions.

A&A Challenges

- **Data sharing**: Virtual Observatory standard - Astronomical data and service infrastructure;
- **Integrating** infrastructures and resources (HTC, HPC);
- Hide **complexity** of the infrastructures and allow end users to focus on scientific aspects.

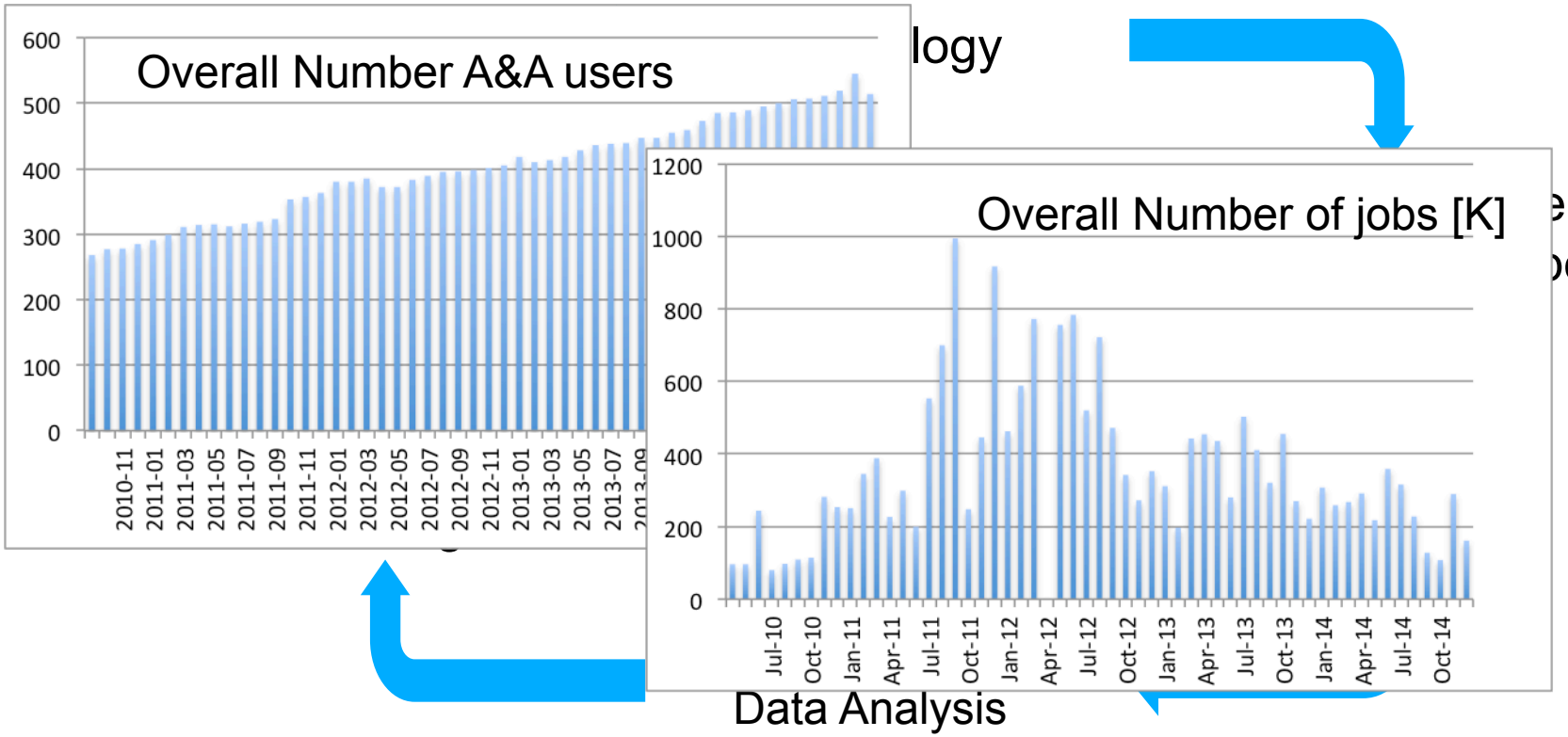
eScience approach

federated (virtual) research environments and computational resources

A&A in EGI-InSPIRE

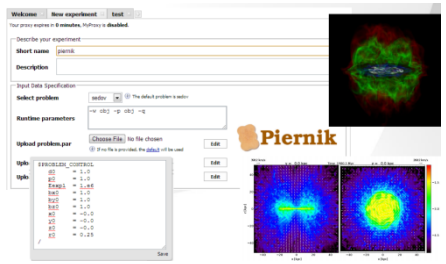
- Partnership in EGI-InSPIRE to develop and maintain services and tools (WP SA3, Task 5) and prepare their long term sustainability
  - Visualization tools (VisIVO)
    - Use of GPUs and Visual Analytics service
  - Interoperability services of different DCIs (HPC)
  - Interoperability of DCIs and Data Distributed Infrastructure (Virtual Observatory)
  - Access and update BaSTI database
    - the largest archive of Stellar Evolutionary Tracks.
    - HTC resources **impossible to achieve** without EGI.
- Cherenkov Telescope Array Virtual Team
  - Challenge simplify access to resources.
  - Technology study focused on authentication and authorization and Science Gateways.

The value of EGI for A&A

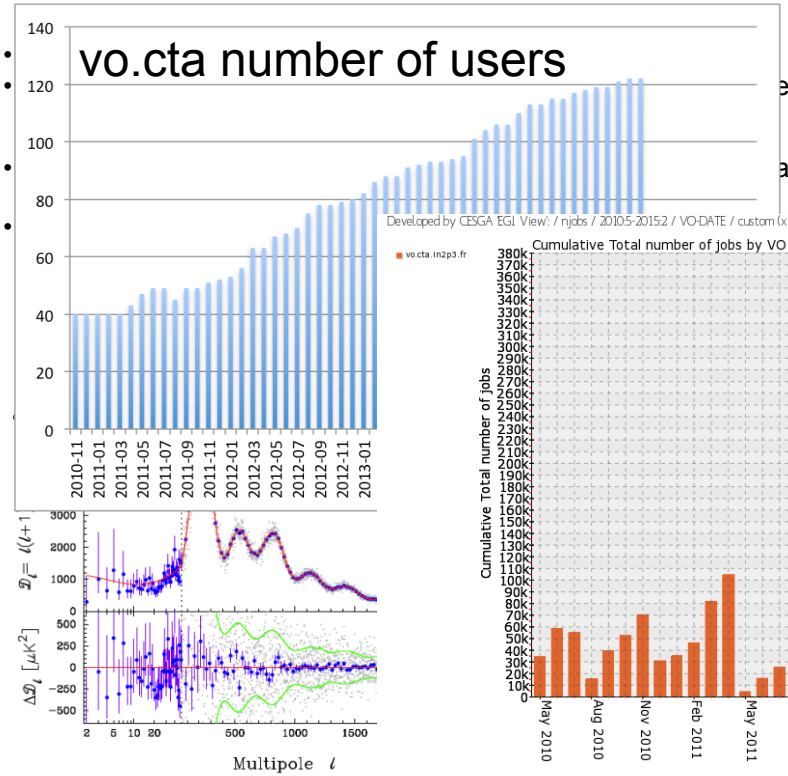


EGI for A&A

- **Science gateways** as a framework to integrate Applications and services for A&A (8 SGW)
  - SCI-BUS / Science Gateways/ EGI MOU
  - ER-flow / User Communities Applications/ EGI Partners
  - AstroGrid-PL: InSilicoLab for Astrophysics (PL NGI)
- Trans-national **federations** and initiatives
  - STARnet / Trans-national Federation of thematic astronomical Science Gateways (EGI Resources and Services)
- Services: Visualization, database access
- Interoperability between eInfrastructures: EuroVO data and services cloud.



Success Stories



- **CTA:**
  - open observatory to a wide astrophysics community
  - explore our Universe in depth in Very High Energy

uires large HTC

More success stories

- **CTA portal**: prototype by Cyfronet and INAF
- **SKA pathfinder**: Evolutionary Map of the Universe a deep survey of the sky (10mJy/beam) to be carried out at 1.4 GHz with the Australian SKA Pathfinder (ASKAP).
- **STARnet** science gateway federation
- A&A services: e.g. AstroGrid-PL or BaSTI
- Engagement of A&A **Data Centers**: science gateways for data services baed on cloud
- Interoperability with International Virtual Observatory:
  - **Canadian Data Center** federated Cloud for Astronomy
  - IVOA Grid and Web Services working group
- Astro-WG and Astro-CG in OGF
  - Astro-CG as an international forum where the A&Acommunities and projects
    - Meet and bring their experiences and advances
    - Learn about technology advances
  - Liaison with the Virtual Observatory

A&A in 2015 and beyond

- **Federation** of science gateway for different projects and services.
- **Dedicated** computing and storage will increase in 2015 (800 cores and 100TB storage, cloud, national funding)
- An integrated **virtual research environment**
  - solutions for data sharing, visual analytics, data mining and for supporting collaborations
- Integrated solutions for data and computing (EGI fed cloud and Virtual observatory cloud interoperability)