

Data Centre Alliance - Science



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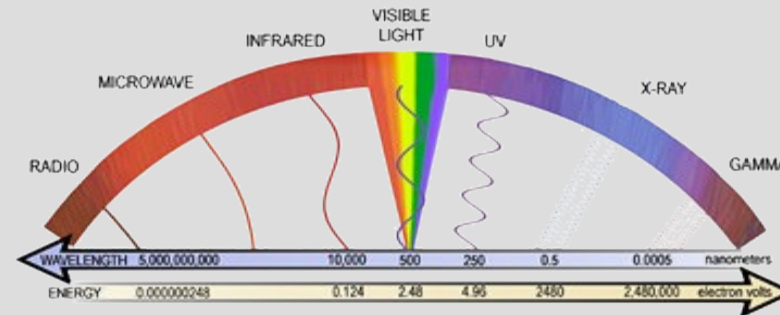
Outline

- **Science vision for DCA**
- **Internal Science Team**
 - **Role**
 - **Challenges**
 - ***Making it happen***

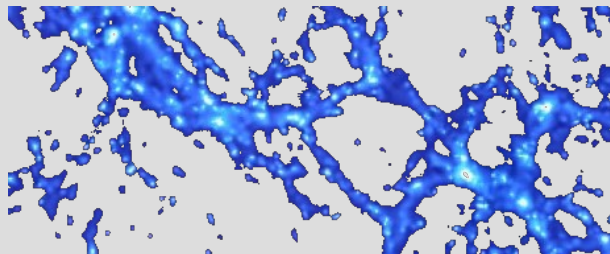
Science Vision for DCA

Combining and accessing astronomy data and services for better science

- Multi- λ Astronomy



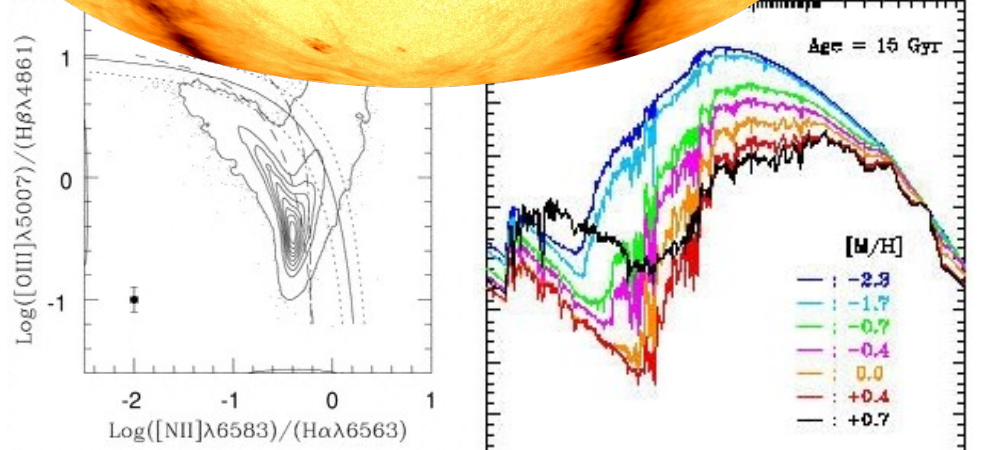
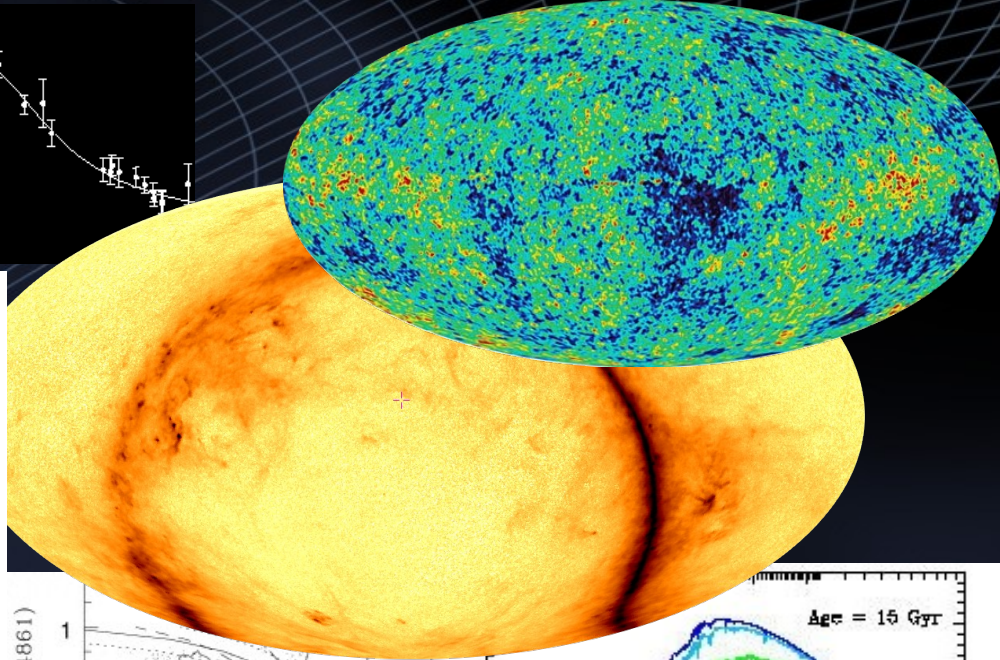
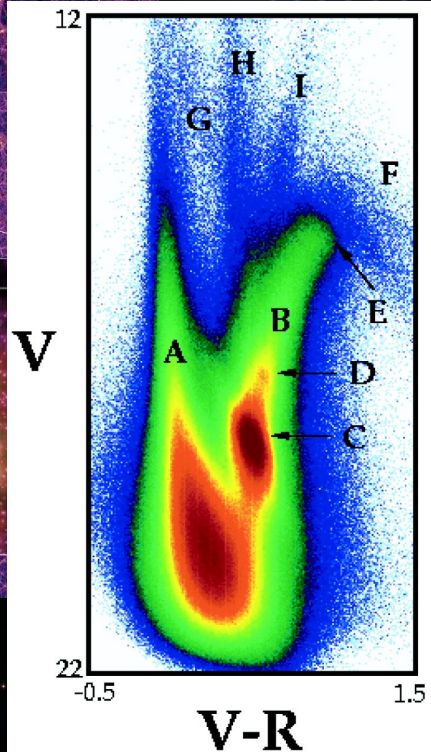
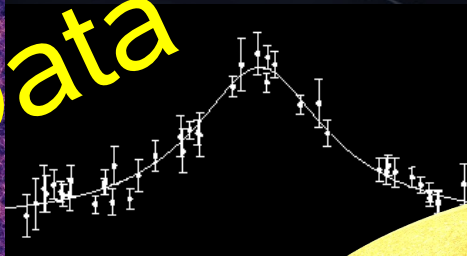
- VO as a discovery tool: Statistical analyses on large N multi-d data sets



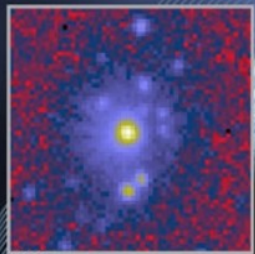
- Compare data to simulation data
: Virtual Observations

Diversity of Data

Millennium Run
10,077,696,000 particles



Messier 81



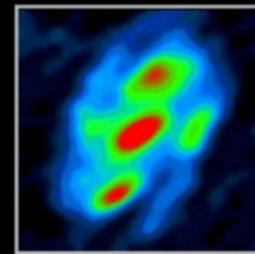
X-Ray (ROSAT)



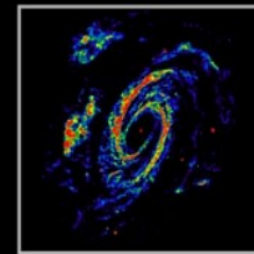
Ultraviolet (ASTRO-1)



Visible (Robert Gendler)



Infrared (IRAS)

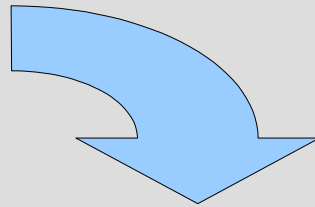


Radio (VLA)

Current issues for multi-archive use

At present, using data from:

- Different archives
- Different instruments
- On-line services



Requires:

- learning specific user interfaces
- access and download procedures
- data access tools
- making data scientifically compatible

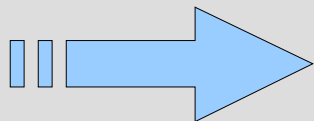
Goals for providing data in the VO

- **Data Access**

- *Simultaneous across archives*
- *Transparent interfaces*

- **Federation of multi- λ archives**

- *possibility of applying analysis and statistical tools to entire data and service grid*
- *scientifically valid data aggregation*



interop standards

DCA Internal Science Team

- Appointed by DCA Board
- Scientists from the partners (8)

Role:

- Global scientific coherence of DCA activities
- Highlight scientific drivers to motivate DCA take-up
- focus on both immediate and long term scientific benefits

Activity:

- Motivate DCA uptake by engaging data centres – communicate, demonstrate
- *Hands-on* science team
 - Get involved in workshops and tutorials
 - provide real science examples
 - testing and using services
- Be proactive in getting feedback
 - interact with real science users

Activity:

- Science linkage across Work Packages
Data Centres - Theory – Compute Grid
- Implement strategies, priorities, science verification proposals defined by the Euro-VO Science Advisory Committee (SAC)
 - High impact return
 - SAC members involved

Challenges:

- To get Data Centres to allocate resources
 - minimum service required before VO publishing is of benefit: an archive, a modeling service
- To get Data Centres to produce ***Science-Ready-Data***

Challenges:

- Scientific interoperability
 - Need to follow the scientific integrity of the data through the VO publishing process
- Check the data description is sufficient for
 - combining data scientifically
 - units ▪ calibrations ▪ photometric systems
 - uncertainties ▪ resolutions ▪ PSFs ▪ apertures
 - sampling ...
 - access and use with VO tools

- **Making it happen:**

- At least 2 meetings per year
- First meeting/telecon ASAP
- Follow-up meeting/telecon Nov 24
(after Nov 22 SAC meeting)

- **Requests / suggestions:**
- Who are the Data Centres? - census ASAP
 - Include in the census:
 - request science contacts,
 - science readiness
 - level of existing / planned services
- Early preparation of tutorials for 2007 DCA workshop to ensure maturity

Reference sources

- Spectrum figure: Modified from <http://www.spacetoday.org/DeepSpace/Telescopes/GreatObservatories/Chandra/ChandraSpectrum.htm>
- N-body simulation figure: Modified from Astronomy magazine, Jan 26, 2005. Institute of Theoretical Physics, University of Zurich
- Multi-d data mining figure from: <http://www.roe.ac.uk/~rgm/sc4devo/9richard-holbrey-mdv.pdf>