



ASTRONET: Strategic Planning and Coordination for European Astronomy

www.astronet-eu.org

Johannes Andersen
Chair, ASTRONET Board

Motivation and Aims

- Over the last 60 years, European astronomy has gone from backwater to leadership in several areas
- This has primarily happened through Europe-wide cooperation (ESO, ESA)
- To remain abreast in the next generation, this must be continued and strengthened considerably
- Efficient use of human resources is crucial, so **all** of Europe needs to be engaged in the future

The aim of ASTRONET is to develop the overall context that can assist national funding agencies and European organisations in taking science-based, rational, and coordinated decisions for the long-term benefit and cost-effectiveness of European astronomy.

What is ASTRONET?

A **consortium of funding agencies** for European astronomy to conduct a **pilot project** in strategic planning and coordination, modelled on the US Decadal Surveys and supported by the EC as an ERA-NET,

but:

- More comprehensive and longer-term (IT, HR, training)
- Adapted to European and global political realities
- Initiated by “the same” agencies that fund ESA, ESO, **and** the ‘national’ facilities
- Including all fields and aspects in a coherent picture
- Aiming to establish an ongoing process in the long term

What is ASTRONET NOT ?

- A new organisation or observatory
- A supranational decision-making body
- A lobbying organisation for big projects
- A source of big new money
- A branch of the EU or the ERC

Work Programme 2005-10:

- ✓ A 15-25-year **Science Vision** for European astronomy
- ✓ An **Infrastructure Roadmap** matching the Vision
- ✓ Involve **ALL** European communities in ASTRONET
- ✓ Initiate actions to start **implementing** the Roadmap
- Initiatives to improve transparency and coordination of planning and management procedures in European astronomy in a permanent way

All this done in partnership with the discipline- and action-oriented networks OPTICON, RadioNet, ASPERA,...

Science Vision Key Questions

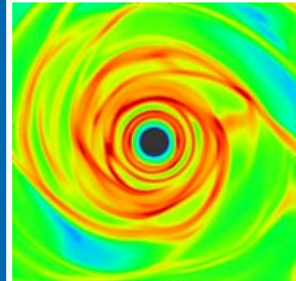
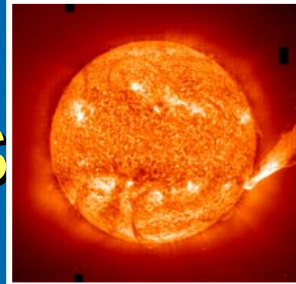
A: Do we understand the extremes of the Universe?

B: How do galaxies form and evolve?

C: What is the origin and evolution of stars and planetary systems?

D: How do we fit in?

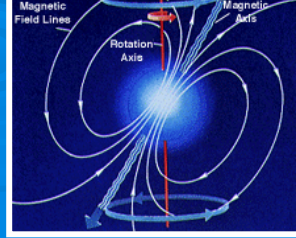
Done by astronomers, for astronomers...



Hubble Ultra Deep Field

NASA, ESA, S. Beckwith (STScI) and The HUDF Team

STScI PR024-07A



The Science Vision Report

A Science Vision for European Astronomy

*What is the origin and
evolution of stars and planets?*

How do galaxies form and evolve?

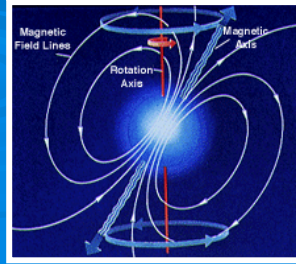
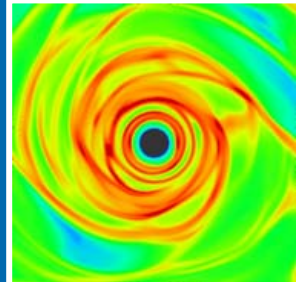
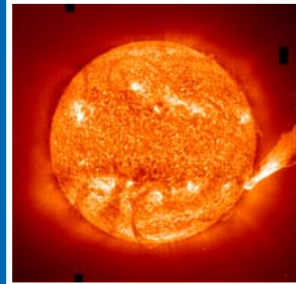
*Do we understand the
extremes of the Universe?*

How do we fit in?

28 September 2007
(Eds.: T. de Zeeuw et al.)

Available as PDF file at:
<http://www.astronet-eu.org/>

- **Large Symposium in Poitiers, January 2007**
- **Input via WWW & e-mail before and after**



The Roadmap: Key Fields

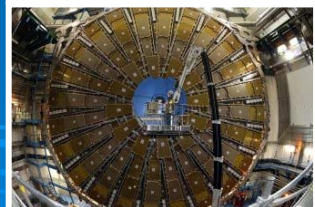
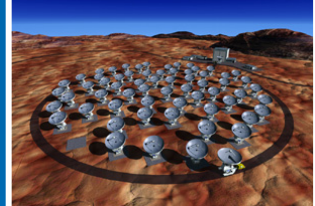
5 Disciplinary Panels (> 60 top-level scientists involved):

- A. High energy astrophysics, particle astrophysics, gravitational waves
- B. UV-Opt-IR and radio/mm astronomy (ground & space!)
- C. Solar telescopes, solar system missions, laboratory studies
- D. Theory, computing facilities and networks, virtual observatory
- E. Education, recruitment and training, public outreach

Large (>300) Symposium in Liverpool, June 2008

Input via WWW & e-mail before and after

Very valuable input from recent US experience!



The Roadmap Report

November 2008; M. Bode et al.



The ASTRONET Roadmap
A Strategic Plan for Europe
Executive Summary

Financial and Human Resources

A STRATEGIC PLAN FOR EUROPE

A useful roadmap must include realistic estimates of costs, technological readiness and available advice as well as information provided by the projects themselves has been used to assess the reliability of these data varies from project to project. For future space missions in particular, pre and merging internally or with global projects while this report was being prepared.

The resource estimates and scientific capabilities described here should therefore be regarded as a preliminary situation, based on the best information available to date. Known or estimated costs to throughout.

More surprisingly, despite a dedicated effort to obtain an overview of the present financial situation of European astronomy, this information remains quite incomplete. Budget numbers for ESO, ESA, and other agencies are easy to collect, but including universities and projects in individual nations as well as other sources of uncertainty. The demarcation between astronomy and other natural sciences such as astrophysics is another source of uncertainty. The Roadmap can therefore only give approximate total figures, based on pan-European estimates available today.

While ground-based and space-based projects are considered separately, as the funding procedures are often different, the Roadmap recommendations are all based on the global science vision.

Artist's impression of the European Extremely Large Telescope (E-ELT) during observations. In the background, the Milky Way is just rising above the horizon.



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The Role of Existing Facilities

The scientific role and operating cost of existing and approved facilities are also considered in the Roadmap. In space, several current missions are so successful that an extension of their operational lifetimes beyond those already approved is richly justified on scientific grounds. In a constrained environment, the selection of the missions that can be extended within available funds should be based on the scientific productivity of the mission and, for ESA-supported missions, the overall balance in the ESA programme.

On the ground, the existing set of small to medium-size optical telescopes is a heterogeneous mix of national and common instruments, equipped and operated without overall coordination. This is inefficient and, for example, impedes effective ground-based support for space missions. ASTRONET has therefore appointed a committee to review the future role, organisation and funding of the European 2-4 m optical telescopes within the context of the Roadmap, to report by September 2009.

Reviews of Europe's existing millimetre-submillimetre and radio telescopes will be undertaken shortly after, followed later by a review focusing on the optimum exploitation of our access to 8-10 m-class optical telescopes as we enter the era of the E-ELT. Together, these reviews will enable Europe to establish a coherent, cost-effective complement of medium-size facilities.

The four 8-m telescopes of the ESO Very Large Telescope (VLT), on Cerro Paranal in Chile.



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Who is in **ASTRONET** Today?

- Contractors: BMBF/DESY (DE), **CNRS** (FR, Coordinator), INAF (IT), NWO (NL), **ESO**, NOTSA (Nordic), NCBiR (PL), MICINN (ES), STFC (UK)
- Associates: **ESA**, FWF (AT), FWO+FRS (BE), BAS (BG), MSES (HR), IA-CAS (CZ), MPG, DFG (DE), ESF (EE), GNCA (GR), HAS (H), LAS (LT), FCT (PT), RSA (RO), SAS (SK), ARRS (SI), SRC (SE), SER (CH), UAS (UA)
- Forum members: DK, FIN, IS, ISR, NO, LV
- Total population: 550+ million in 29 countries

ASTRONET today does involve all of Europe!

Status and Achievements

- By an **independent process**, ASTRONET has identified **the same** top-priority **ground-based** projects as the ESFRI Roadmap; the same top-priority **astroparticle** projects as ASPERA (ranking may occasionally differ), and the same top-priority (larger) **space projects** as the ESA Cosmic Vision
- The large projects have been assessed wrt. **technological readiness** and **budget**, **prioritised**, placed in the scientific **and financial context** of the entire field, and **schedules** proposed
- An **agreed strategy and priorities** now defined for the **European participation in global-scale** projects (SKA, others, ...)
- One **common call** completed; a second call imminent
- A policy for the **future integrated use** of all the European 2-4m telescopes has been developed **AND** agreed by the owner agencies(!)
- **This was declared impossible, but HAS NOW BEEN DONE ! 😊**

Summary of ASTRONET-1

- ASTRONET has reached **more** than its already ambitious **initial goals**, both in strategic planning and in involving all of Europe
- This provides the basis for **more effective European participation** in bilateral and global projects
- A first **REAL** milestone has been reached with the **decision** to equip and operate the 2-4m telescopes as an **integrated system** in the future
- Reviews with similar aims are under way as regards the existing radio telescopes, laboratory astrophysics and astrophysical software systems; 8-10m telescopes and (sub)mm facilities to follow
- Much of this happens in **de facto coordination** with the US and others
- **An irreversible process has been successfully launched!**

ASTRONET-2

Yet, the process has only started: A huge task remains to consolidate and develop the common coordination process and proceed to the implementation of specific common projects.

ASTRONET has therefore been awarded a new ERA-NET contract for 2011-2014, with a commitment to:

- Monitor and promote a **staged implementation** of the Roadmap (continuing reviews and proactive follow-up)
- Promote integration of **new MS** in mainstream astronomy

ASTRONET-2 and Beyond

Many activities in ASTRONET-2 will continue beyond 2014:

- Developing organisational homes for European projects or the European share of global project for which no natural European host exists (unlike the E-ELT, which is an ESO project). ASTRONET includes the agencies relevant to the SKA; the CTA also includes DoE-like partners in ASPERA, so coordination is needed here
- Maintain contact to counterparts in **global partner countries**
- Prepare **update** of Roadmap (& Science Vision?) in ~2015
- Establish this as a **permanent coordination activity** by 2015