

OPTICON

The Optical Infrared Co-ordination Network for
Astronomy.

ELT Activities

John Davies



OPTICON ELT meeting. Marseille
November 2003.



What is OPTICON?

In the European Union's 5th framework programme (2000-2004) OPTICON is a thematic network bringing together various national funding agencies and users with common interests in optical-infrared astronomy.

PI. Gerry Gilmore, Institute of Astronomy, Cambridge

PS. John Davies, UK Astronomy Technology Centre,
Edinburgh



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OPTICON Objectives/Deliverables

Produce coherent, Europe-wide, proposals on projects of common interest such as :

- Very large telescopes, deliverable is a science case for an ELT
- Virtual Observatories
- Access to large databases
- Common data standards
- Future of 1-4m telescopes
- Interoperability
- Co-ordinated Instrumentation developments
- Exploitation of spacecraft data



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OPTICON Accomplishments

- AVO contract from EU
- Astrowise contract from EU
- EURO-3D contract from EU
- EU funds for feasibility study of elite fellowship scheme
- A coherent and widely supported approach to FP6 (including co-ordination with Radionet and AVO).



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In April 2003 OPTICON applied to the European Union FP6 programme for funding as an Integrated Infrastructure Initiative (I3) and was awarded 19.2 million Euro (with matching funds = 40 Million).

Contract negotiations are underway for an early 2004 contract start.



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OPTICON in FP6

- Networking via working groups similar to the present OPTICON network. (2.5 Million)
- Trans-national access to night-time and solar telescopes (aka COMET). (5.5Million)
- Joint Research Projects (11 Million)



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Structure

OPTICON Board (~20 partners +JRA Chairs and others) sets overall strategy and priorities at annual meeting. Chairman A Omont.

Oversight committee (~8 agencies) make the detailed decisions, especially about money, 6 monthly.

Cambridge (Gilmore) is co-ordinator and chair of oversight committee.

Project Office (JKD) supports board, runs some networks

Access Office (IAC) runs telescope grants

JRA's and some networks have internal management



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Joint Research Projects

- Technical studies for Adaptive Optics: 11M
- Includes developing adaptive secondary MCAO on the VLT
- Developing fast optical and IR wavefront sensors
- Investigating new 'smart focal planes' and VPH gratings
- Plus supporting near-IR interferometry via VLTI



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OPTICON I3 Networking

- **Structuring European Astronomy (JKD)**
- Interferometry working group (A. Quirrenbach, Leiden)
- Telescope Directors Forum (J .Davies, UKATC)
- Fellowships and large scale projects (J-L Puget)
- Lasers and site testing in La Palma (J Burgos + 1)
- Round tables with Radionet, ALMA, NGST etc_



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ELT Working Group: History

- In FP5 it was a working group chaired by R Gilmozzi.
- Leiden meeting in May 2001 did groundwork for science case, but a final, published document never crystallised
- Turku in Summer 2002 meeting made progress on technical/programmatic aspects
- Today is an FP5 meeting- FP6 contract has not started yet



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ELT Working group:Future

- Proposed as stand alone network but EU referee indicated that the number of networks should be reduced, so ELT, HTRA, UV-Net, Interoperability/AVO , future software and key technologies combined as ‘Structuring European Astronomy’
- I expect the ELT WP to operate quasi-autonomously as a sub-group of the structuring network and be convened by I. Hook
- OPTICON will fund element of Isobel’s salary directly and provide support, through national partners, for travel to meetings etc. (order of 150,000 Euro over 5 years)



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ELT WG in FP6

The contracted deliverables are:

- An annual meeting to update the science case
- Smaller meetings to interact with the ELT design study
- A web interface to the activity



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International Status of ELTs

Extremely/European Large Telescope

- In US Caltech+AURA joined Aug 18 into a 50:50 public:private \$80M design study for a TMT (T= ten (keck) tWenty thirty): Canada equal partner
- Canada has requested national funding C\$150M first cut: probable success
- Australia attempting fundraising
- Japan is establishing a national office, and priority ordering of new projects



• 30-m assumed maximum possible aperture with Keck technology: cost=US\$750M

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The ELT design study

- A separate proposal to a different instrument in the FP6 programme for a design study
- Multi faceted activity, PI Gilmozzi, managed by Phillipe Dierickx. Project scientist Salinari, deputy Hook.
- Design study strongly endorsed by OPTICON, but not an OPTICON deliverable.



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European Large Telescope ELT

- Several national projects united into one ELT Design Study proposal -> EC
- Design-independent issues
- One 'point design' continues: OWL
- Supplementary aspects funded (Opticon → adaptive optics, science case, etc)
- Uses industrial scale to break cost scaling law → 65-m costs US\$750M



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Other activity

- OECD meeting, December 1/2
- ESO Council strategic plan development
- Trans-atlantic dialogue underway
- (US policy is to be international)
- Timescales to match ALMA, [JWST??]
- Science meeting, Berlin, May 2004



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Complementary approaches

- TMT is technical limit of proven technology
- 65m OWL is lower limit of new approach
- No national astronomy money from NSF or ESO until ALMA is funded, 2010?
- Step to `CERN-scale' astronomy!!!
- Only MCAO (real-time atmospheric turbulence correction) yet identified as on the critical path, though instruments a challenge!



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ELT status

- Clear international agreement to build it
- Design work now, for 2015+ operation
- Still some funding issues.... Still partnership issues
- An ELT will happen
- Do you want to help shape it? Science team open to all
- www.astro-opticon.org;
- Science organiser: I. Hook (Oxford) imh@astro.ox.ac.uk

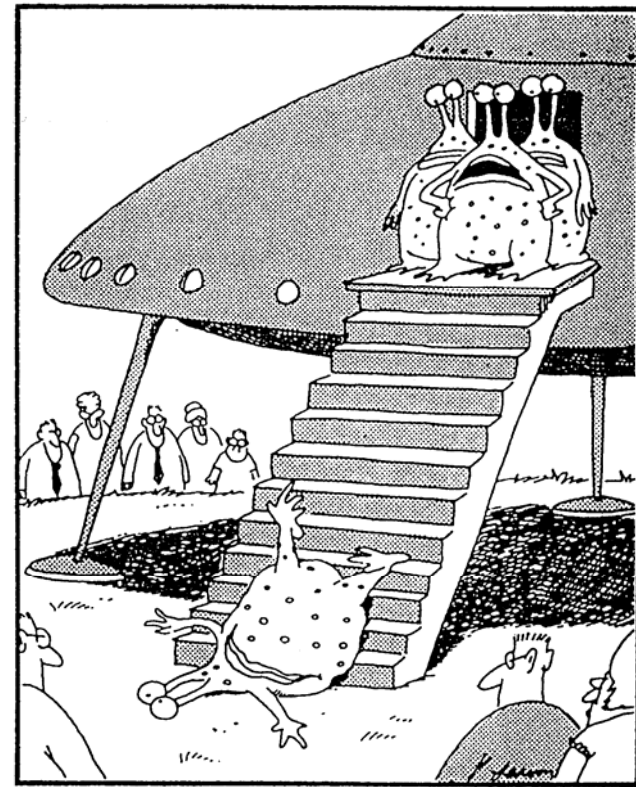


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Science goals

The big questions:
What are the laws of nature?
What is the Universe made of?
Are we alone?
How did it start?
How will it end?



"Wonderful! Just wonderful! ... So much for instilling them with a sense of awe."

Extending discovery space to
the distant and faint Universe
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Immediate science case goals

- NOW: A short top level summary (1-4 pages) of the key science drivers, plus images/simulation: for ESO Council, funding agencies, governments, OECD
- FEB 04: The 20pp(tbc) overview case to support the design study proposal: written for scientists
- 2007: An eventual `blue/red/... book', a major detailed justification for full funding
- Continuing technical work, to lead the detailed design study
- Involving the whole community, to develop support: for the ELT to happen soon, it must be `obvious' it is what the community supports



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What OPTICON needs from this meeting

- Progress towards the FP5 deliverable. Specifically we need some high visibility web-pages, handouts etc ASAP.
- A few key projects and publicity of them to make the case for the design study proposal (to justify matching funds)
- An agreed plan for how the WG will operate in FP6, for JKD or IH to present to the OPTICON board in April. This should address how the science case will evolve, how it will interact with the design study (however it is eventually funded) and how the deliverables will be delivered.



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