

Status of Interferometry Planning in Europe

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with input from
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Future Directions for Interferometry
Tucson Arizona, Nov 13-15, 2006

European landscape

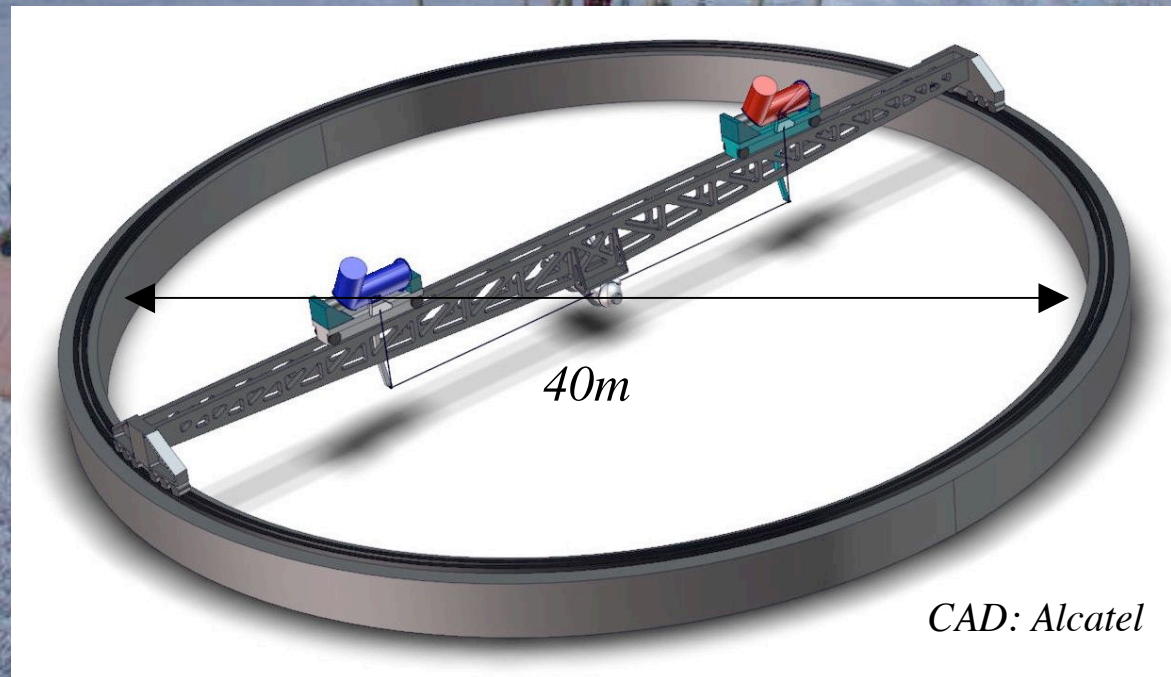
- ESO
 - ◆ 11 member states (not identical to European Union)
- Expertise Centers in
 - ◆ Leiden, NL (NEVEC)
 - ◆ Grenoble, F (Jean-Marie Mariotti Center)
 - ◆ Heidelberg, D (FRInGe)
- European Interferometry Initiative (EII)
 - ◆ Partners in 14 countries + ESA and ESO
- Arena Network → Aladdin
 - ◆ Partners in 7 countries + ESO
- National funding agencies (CNRS (F), PPARC (UK), MPG (D) etc.) provide support for projects ranging from fiber experiments like OHANA over in-kind support to MROI to a 50% share of the LBT

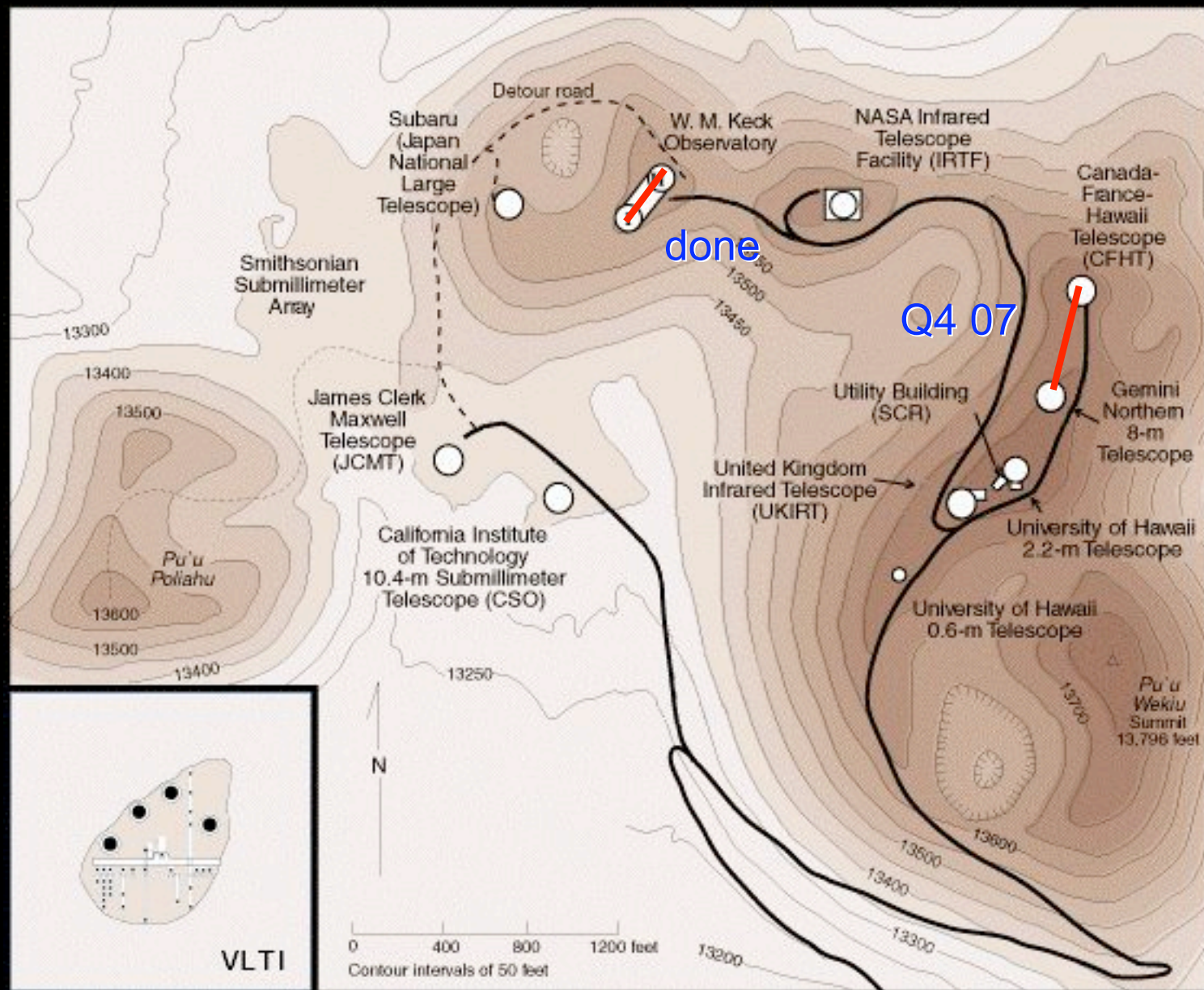
European Interferometry Initiative

- Maintain & reinforce european interferometry
- Generate a long term european vision
- Integrate new countries
- Education/exchange of students/scientists
- Make the VLTI an end-to-end service instrument
- Joint Research Activity
 - ◆ Advanced instruments → 2nd gen VLTI instruments
 - ◆ off-line data reduction software (→ JMMC)
 - ◆ Technology development (fibers, IO, detectors etc.)
- Network Activity
 - ◆ Visitor programme, initiate science case and prepare for next generation facility
- Marie-Curie Programme
 - ◆ 4 summer schools, no.1 on data reduction in June, 3 more on circumstellar disks, AGNs and PRIMA

ARENA Network: Aladdin@Dome C

- ARENA is a European networking activity aimed at “fostering optical and infrared astronomy in Antarctica, and primarily at Dome C”
- Aladdin is a 2-telescope, L-band interferometer discussed within this network





Magdalena Ridge Observatory Interferometer

- MROI is a project by the New Mexico Institute of Mining and Technology
- In-kind support by University of Cambridge, paid for by observing time
- The MROI is a 6-element array initially in the near-infrared with a baseline of 400m
- Time frame is about 2010
- In Phase II, 4 more telescopes and an optical capability will be introduced depending on new funding.

LBT

- 2 x 8.4 m
- single mount
- 12 focal stations
- deformable secondary

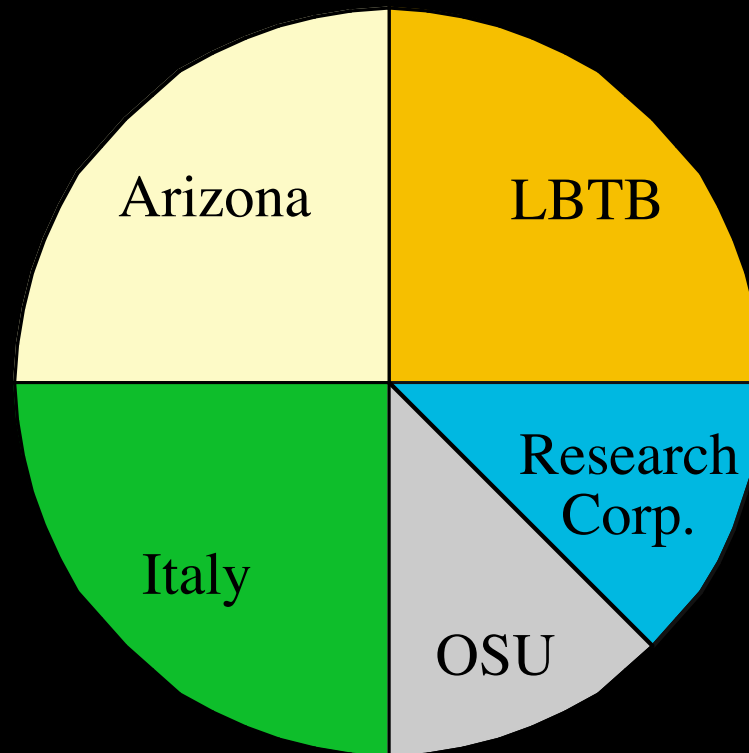
First Light Sept `05
Second Light Nov `06
Coherent Ops Late `08

University of Arizona
Research Corporation
Ohio State University

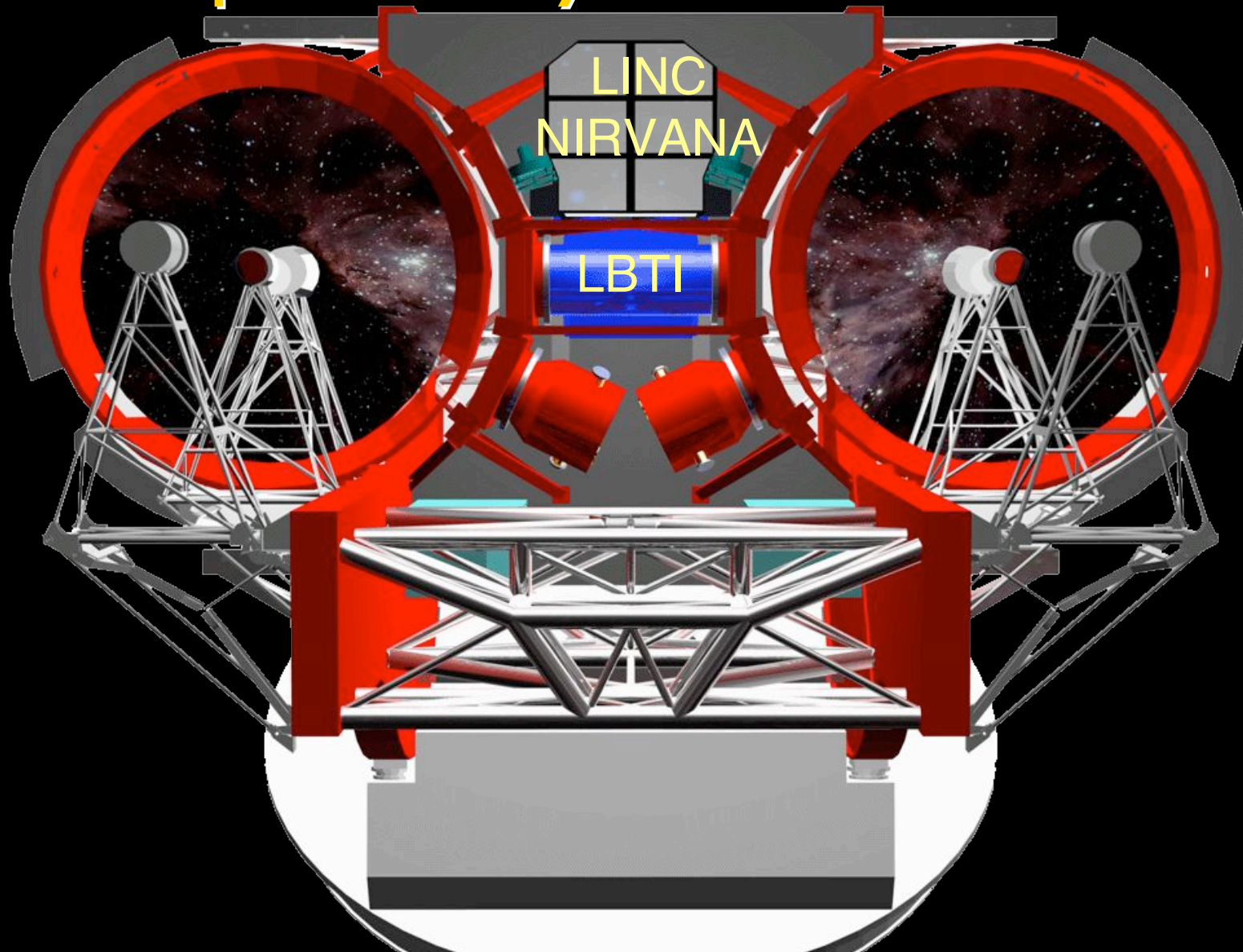
Instituto Astrofisico
di Arcetri, Firenze

MPIA, Heidelberg
MPIE, Garching
MPIfR, Bonn
AIP, Potsdam
LSW, Heidelberg

The LBT: A European – USA Collaboration



LBT Pupil Geometry



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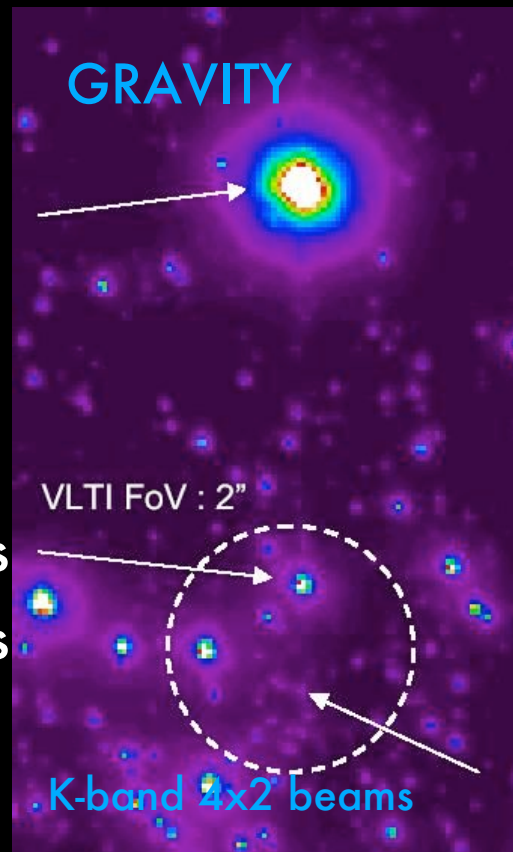
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VLTI Status

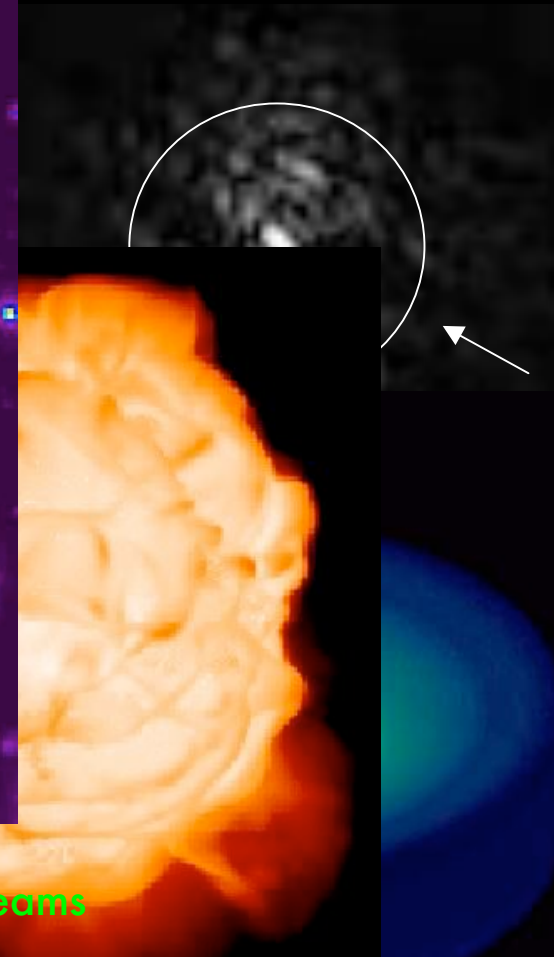
- MIDI in Science Operations since Apr 04
- AMBER since Oct 05 (ATs from Apr 07)
Many modes not yet offered (J band, FINITO)
- FINITO progressing (OPD rms: 100nm ATs, 250nm UTs)
- IRIS (IR tip-tilt) * fully functional
- First fringes AMBER with 3ATs
- AT4 on site

Mid Range - 4x4 VLTi

- PRIMA on 4 UTs
- PRIMA on 4 ATs
- 4-beam FSU
- 4 DDL
- 4-beam science instrument



1-2.5 μ m 4-6 beams



Ready for operations in 2012

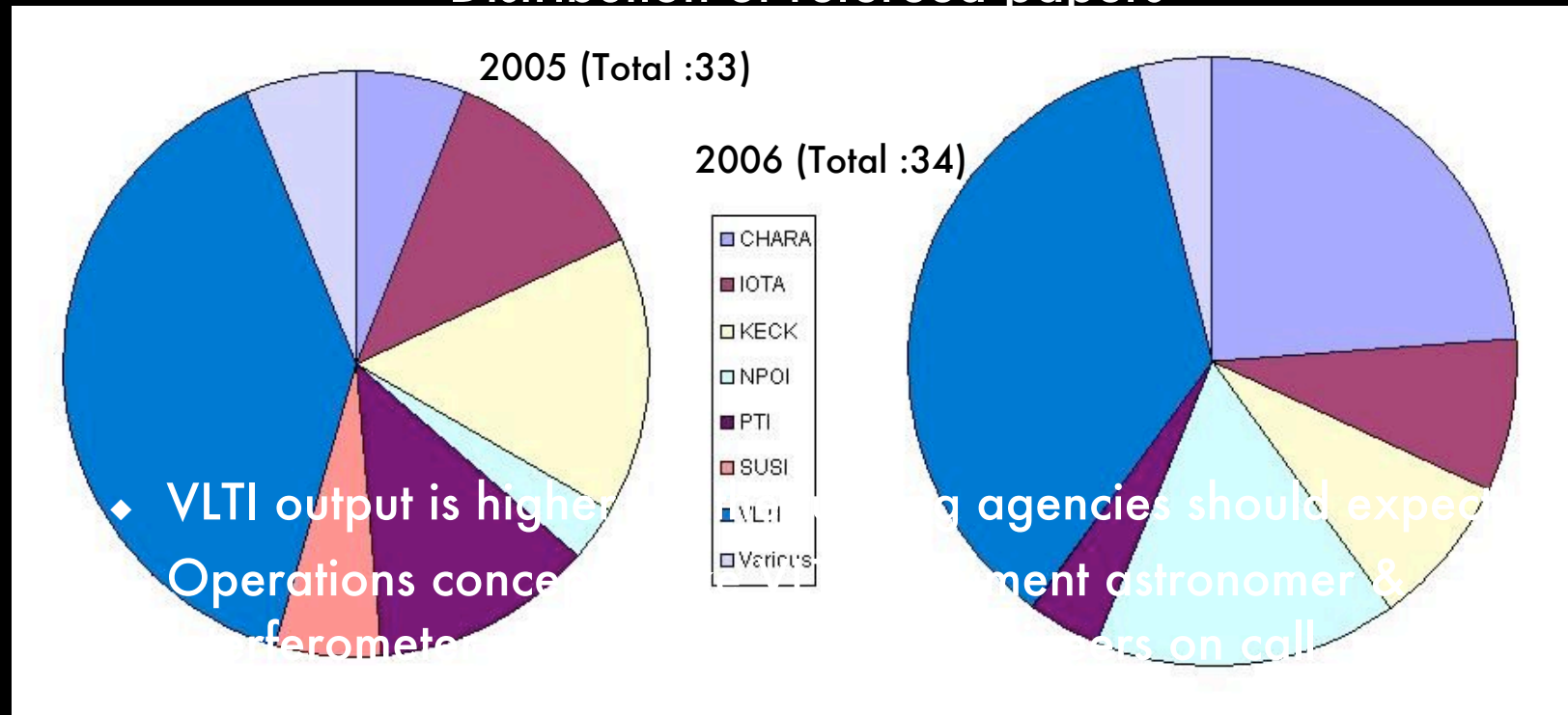
Then what?

3-20 μ m 4 beams

20mas
(d=140pc)

Strategy decision: expert machine vs facility

Distribution of refereed papers



- ♦ About half the observations in service mode
- ♦ Call for proposals twice a year
- ♦ Note wide spread of authors: the first 34 refereed VLT papers had 19 different first authors from 10 countries
→ the community is heavily involved

Future Facility: The Overwhelmingly Large Array – La OLA

Assumption:

A km array with a reasonable number (12) of reasonably sized (8-12m) telescopes in the near to mid infrared



Cost:

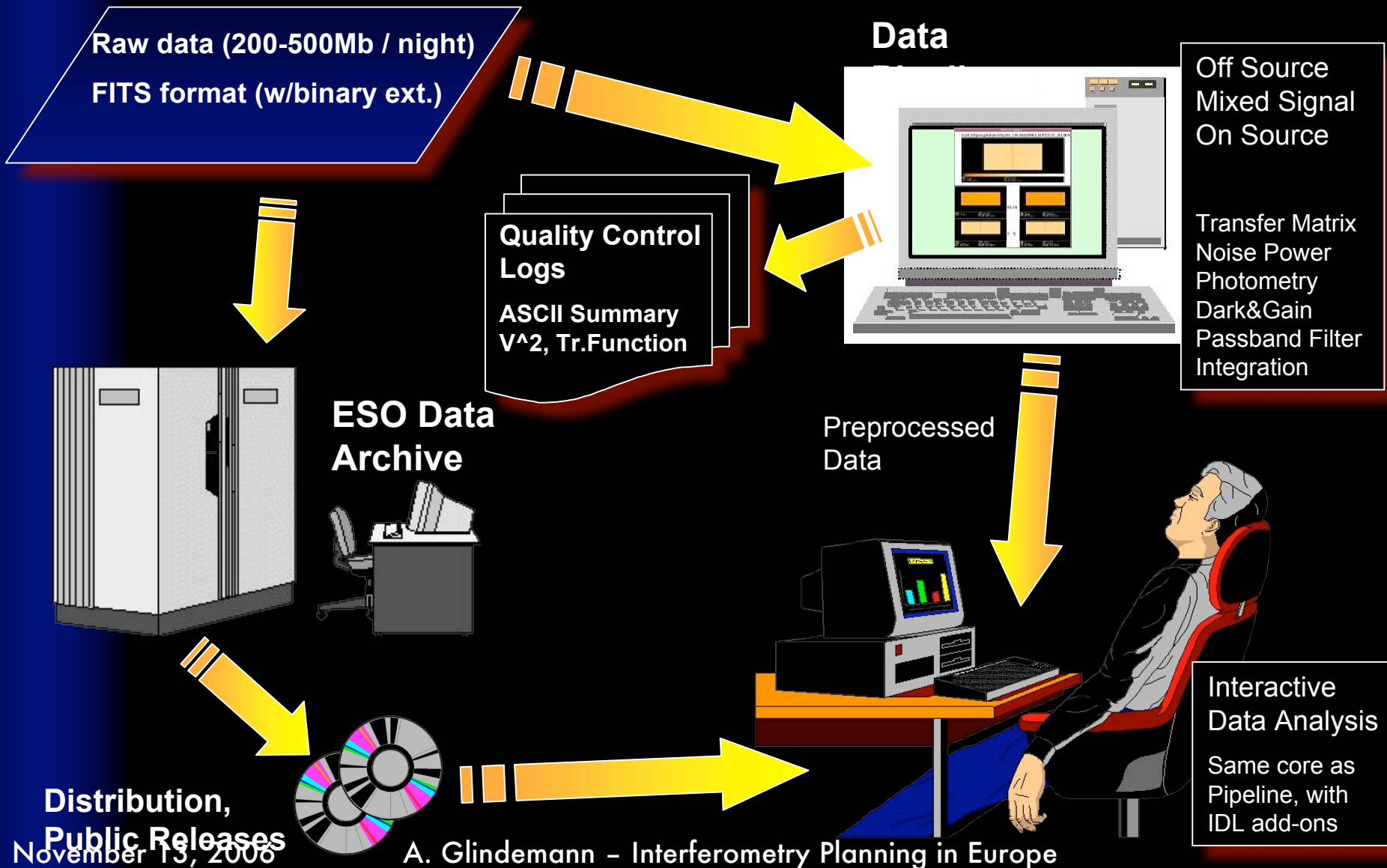
- 12-m telescopes at 65 M€ → 780 M€
(alternatively 8-m telescopes at 40 M€ → 480 M€)
- Delay Lines 25 M€
- Everything else (Instrumentation, AO, Fringe trackers, computers, operation) 100 M€
- Thus: 600-900 M€ plus 600 FTE
(compares to 85 M€ plus 300 FTE for VLTI)

Remark: ESO being busy with ALMA and ELT has neither the money nor the manpower to do this.

Conclusions

- European astronomers are involved in a number of interferometry projects ranging from 'owning' them to contributing to experiments or observatories.
- By 2012 these projects will be in their final configuration.
- A strategic decision has to be taken between going
 - for small(ish) individual arrays or
 - for a large facility with a project volume like ELT or TMT
- Assuming that the current arrays are scientifically successful and despite the stiff competition for the money by ELT, TMT and ALMA,
a large OLA-type facility in 15 years should be the goal.

VLTI Data Flow System



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