

# VLT Interferometry Expertise Centres

Making optical interferometry more accessible  
to non-expert users

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# European Optical Interferometry: What is Achieved

- 15+ years of use of Optical Interferometers,
- 10 years for current multiuser facilities.
- VLTI, 4 8-m Telescopes: unique!

Seen from Europe:

ESO/VLTI has been running VINCI, MIDI, AMBER and PIONIER.

. . . and CHARA has been running FLUOR and VEGA

We have learned from these instruments!

Instrument: recombiner PLUS array facility!

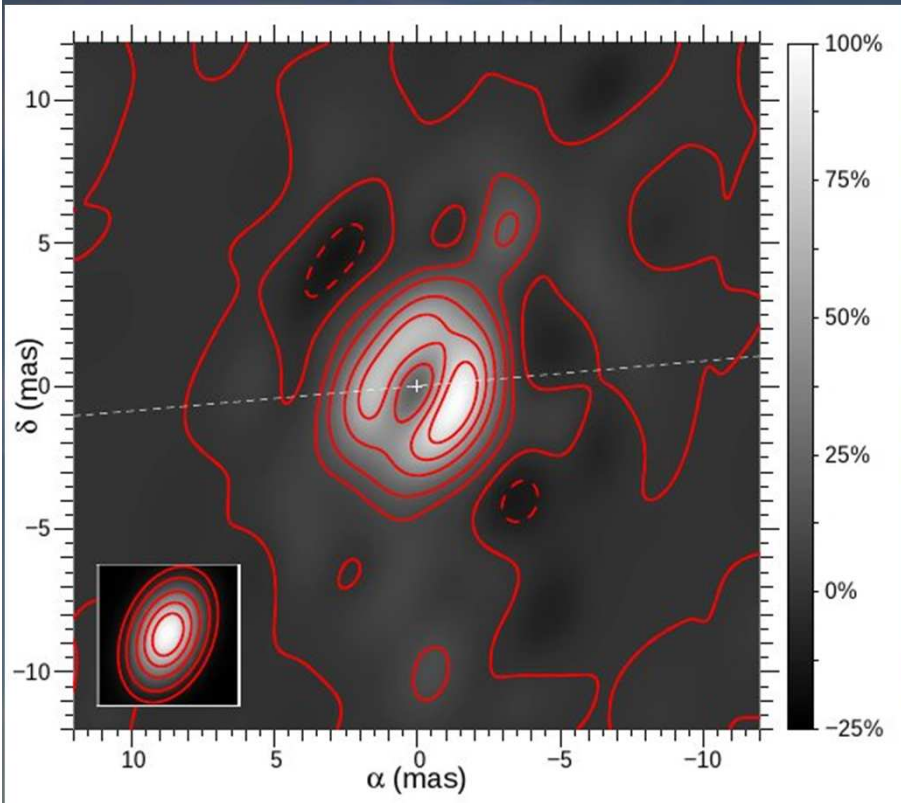
# What is Achieved

- The community of specialists has structured itself:  
EII, JMMC in France, etc.
- VLTI Schools every 2 years + workshops

## Software Tools for all uses:

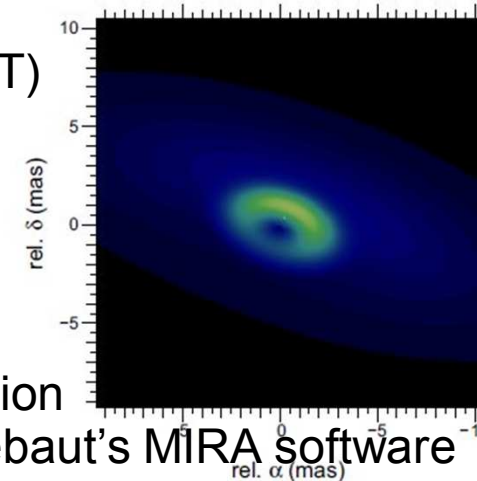
- Simulation
- Observation
- Data reduction
- Model fitting
- Image reconstruction.
- *Polychromatic* image reconstruction.
- Even hints of user support here and there.

# What is Achieved: focus on Image Reconstruction



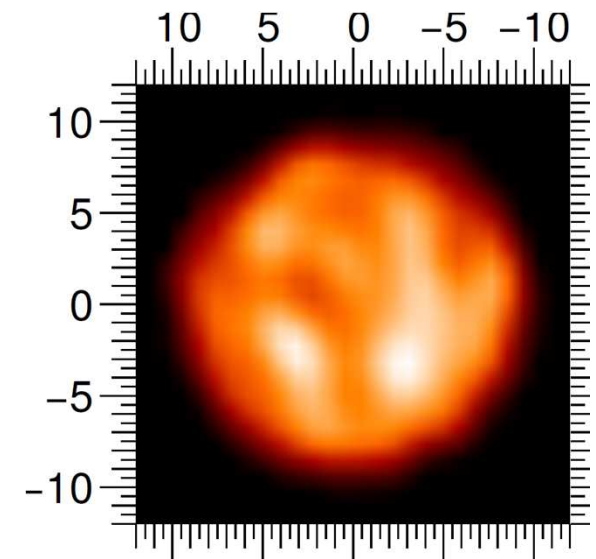
HD 62623, Bry line, F. Millour et al 2014,  
AMBER (3T) + MIRA (E. Thiébaud)  
+ SelfCal adaptation by F.M.

MWC 158,  
PIONIER (4T)  
Kluska et al  
2014  
Semi-  
Parametric  
Image  
Reconstruction  
With E. Thiébaud's MIRA software

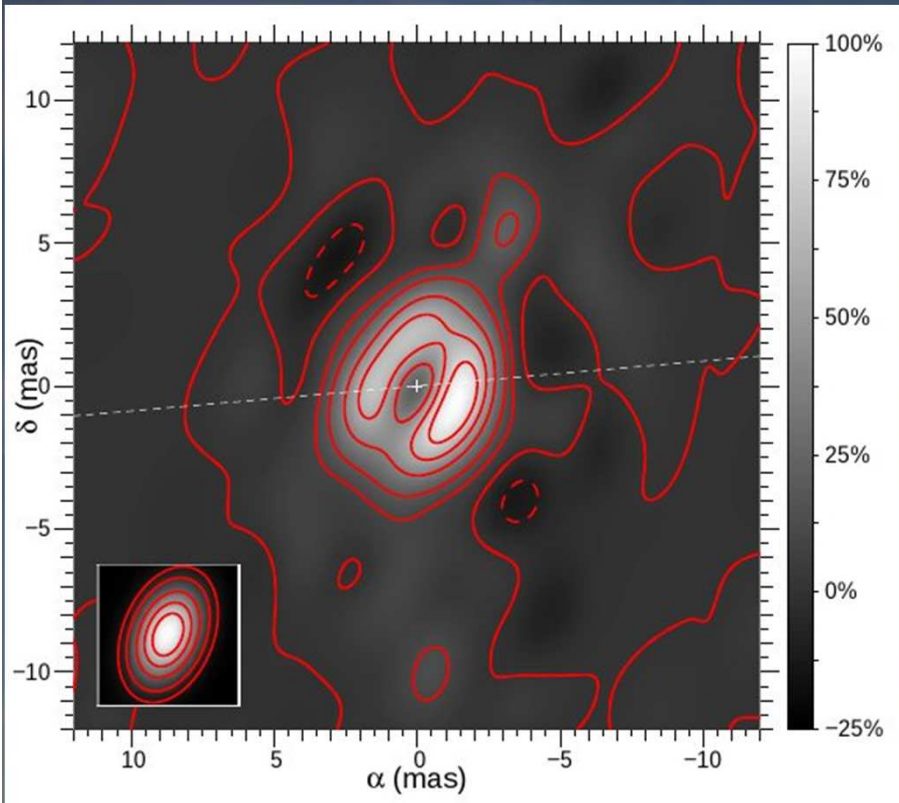


PI GRU,  
Pionier 4T  
Palladini et al 2015

MIRA



# Intermission



HD 62623, **Br $\gamma$  line**, Millour et al 2013,  
AMBER + SelfCal

**3 Telescopes**

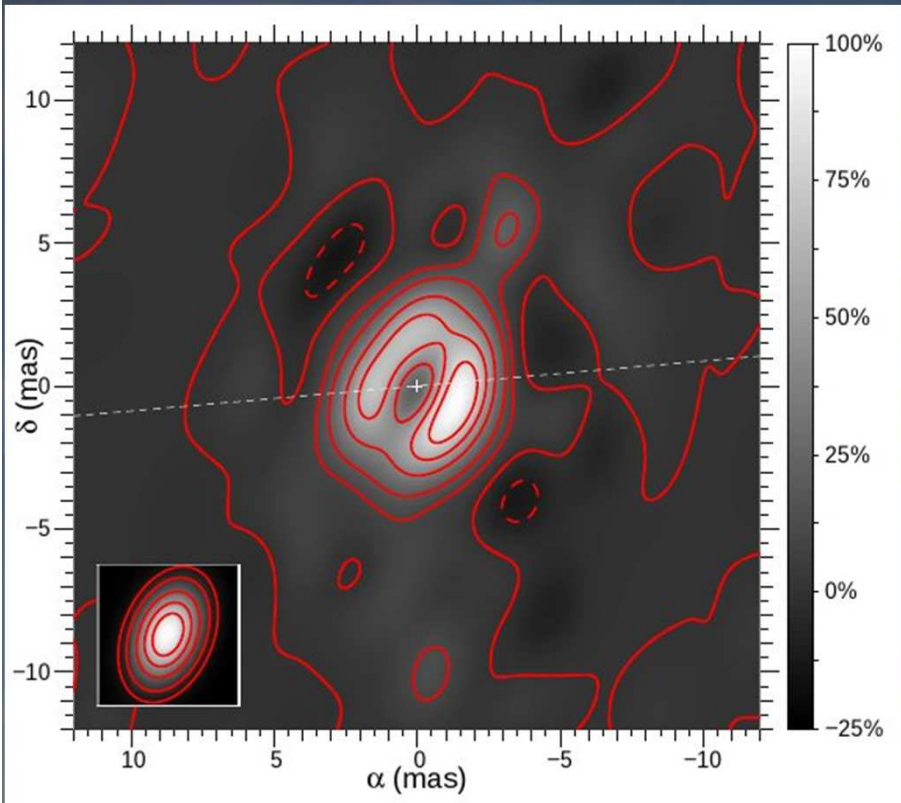
6/29/2015

EWASS 2015

**JMMC**

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# Intermission



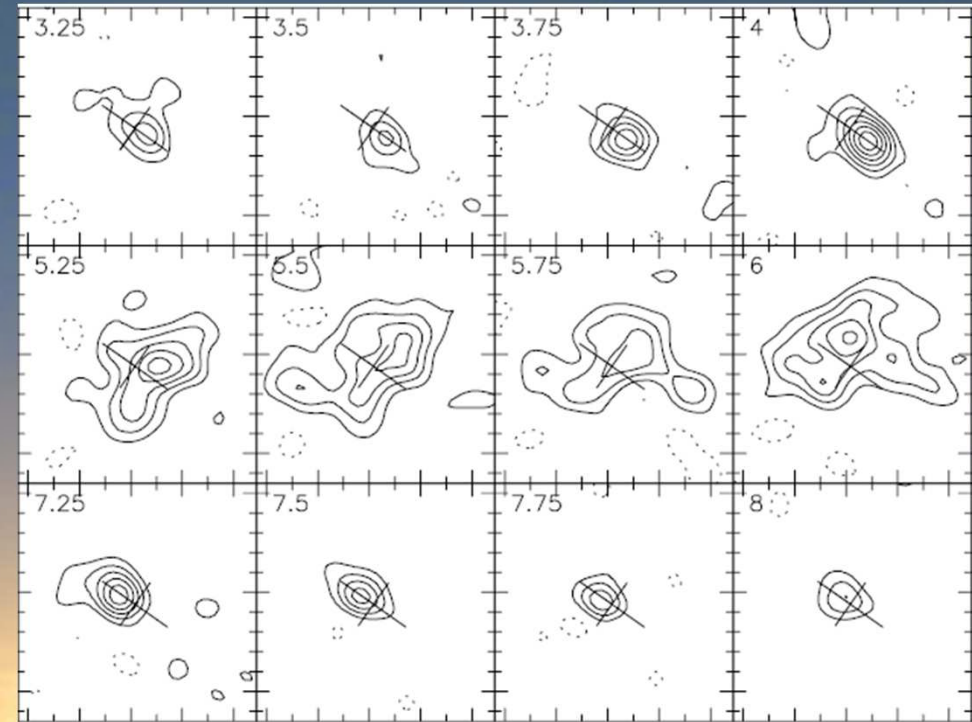
GM Aur

CO J=2-1 line

Dutrey & al, 1998

4 Antennas

Plateau de Bure



HD 62623, Bry line, Millour et al 2013,  
AMBER + SelfCal

3 Telescopes

# What's coming

## The Second generation of instruments:

- VLT / MATISSE : 2017
- VLT / GRAVITY : 2016
- CHARA / FRIEND
- ...

Second generation means also:

More reliable, 4T, (double beam), instruments with 10 years insight from AMBER, MIDI...

But also

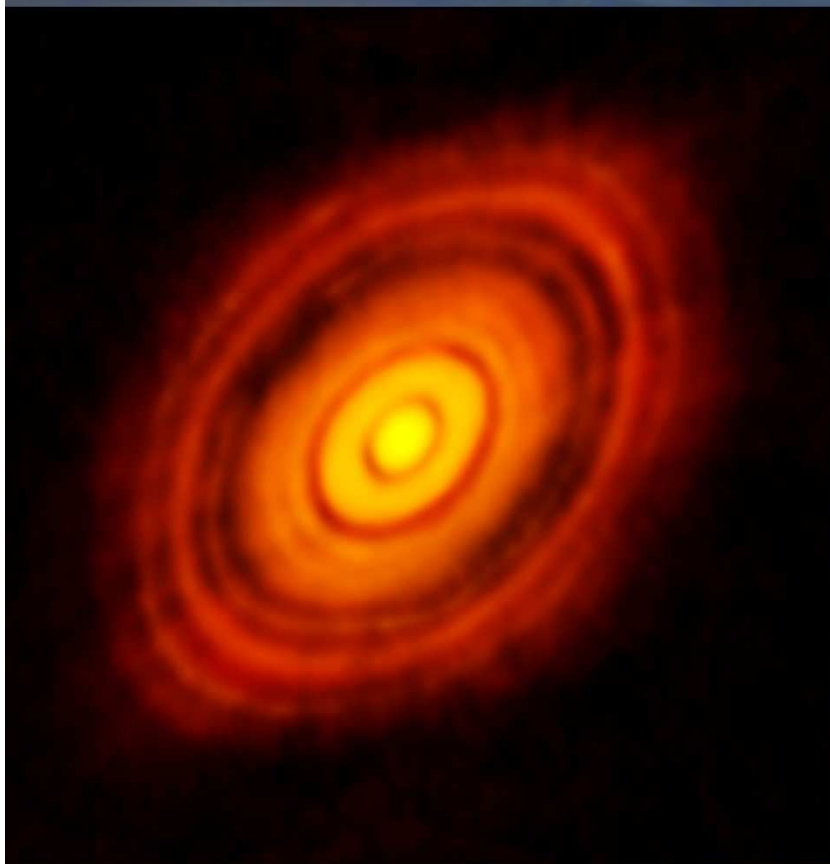
Enormous improvement of VLT Infrastructure

Soon reliable piston-free AO and cophasing/coherencing .

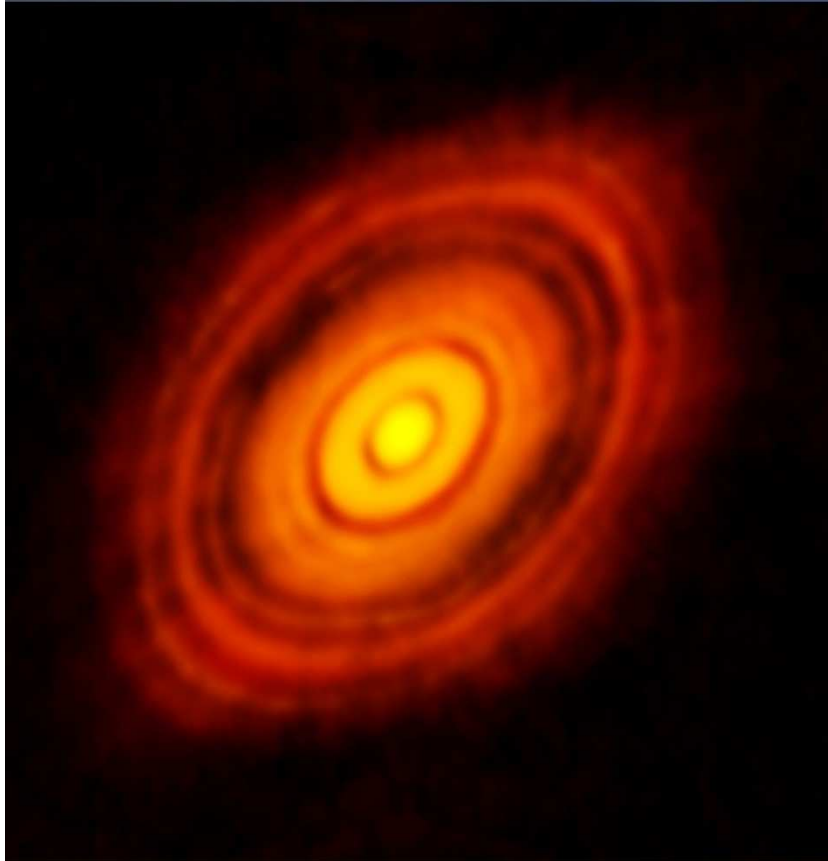
# What is Expected



# What is Expected



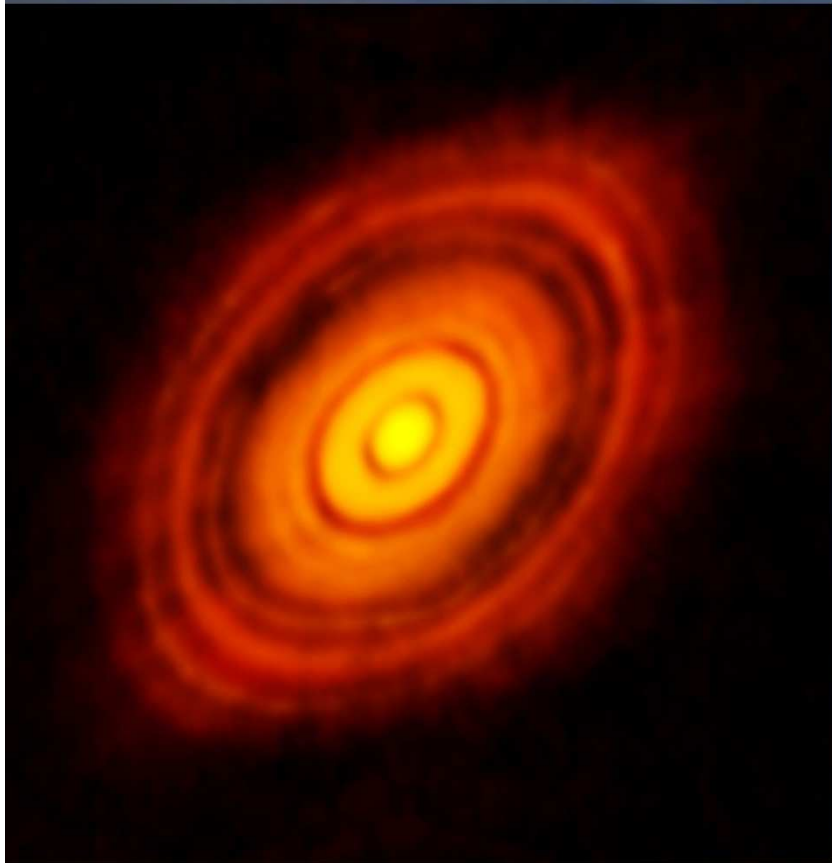
# Oops!...



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NOT QUITE!



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- + Image reconstruction (CASA)
- + Self-Cal (baselines 12 Kms)
- + Work by ALMA experts in ARC Nodes

# VLT Expertise Centres

Idea: help people outside the small community of 'experts' to exploit this unique "instrument".

- Based on the example of ALMA's Regional Centres.
- Idea hangin' around for a few years,
- Firstly presented at VLT Community Meeting Grenoble 2013
- Since then:
  - France (through JMMC) made a proposal to ESO end 2014
  - EII efforts to have other countries build their regional centre.
  - Last seen:
    - discussions with ESO (Jan 2015)
    - Meeting of involved people from ESO, France, Germany, Portugal, Netherlands yesterday at EWASS



# VLT Expertise Centres (VECs)

**Operate a Helpdesk = mail address, response within 3 days.**

**User support with proposal preparation:**

- by means of face-to-face meetings + dedicated workshops (+ through the Helpdesk).
- [help to] write Observing Blocks for P2PP and /or dedicated advice

**Data Reduction**

- Face-to-face help with data reduction, including expert support in data processing for specialised observing techniques.

**Archives (30% of ESO publications)**

- Help in archival research, including assistance in identifying and using the data products suitable for user's scientific projects.

**Data Interpretation**

- Face-to-face assistance for data interpretation (image reconstruction "reliability")
- Custom image reconstruction or other treatment by mutual agreement with VEC expert.

# VLT Expertise Centres (VECs)

## Instrument followup

- Reporting to ESO/consortia about instrument health as seen by users+VEC experts.
- Can propose improvements to pipelines

## Community Animation

- Facilitate science coordination between VEC users, i.e. providing space for small meetings, putting people with similar interests in contact if mutually desired etc. (? Resources ?)
- Community preparation through lectures, tutorials, etc.
- Close interaction with the community and regular updates on VLT/instruments (VLT Community Days and other events, newsletter, webpages).

## Outreach

Outreach to the general public (general=not yet converted to O!).

# WHO?

Preferably continuity of activity of colleagues involved in the instruments or their commissioning

Will need long and close interaction with instrument's "life" at VLT --- to be kept "up to date"

+ Special ESO fellowships 1year Paranal + 3 years VEC duties?



# HOW?

Contrary to ALMA, THIS IS NOT FUNDED ANYWHERE (ESO, CONSORTIA)

At the moment, only France agrees to secure a few of its “CNAP Astronomers” duties on this project:

Could start within JMMC with contributions of:

Nice (MATISSE)

Lyon (Image reconstruction)

Paris (GRAVITY)

Grenoble (matisse, gravity, PIONIER, JMMC tools)

*Formal return from french CNRS and Obs. Directors in November.*

Seeding elsewhere (Porto, Heidelberg+Köln, Cambridge, Leiden) if funding is secured.

-> European funding only if european-level activity?

# And now advertising...

## The Global Database of Optical Interferometry:



First version released today!

Goals:

[oidb.jmmc.fr](http://oidb.jmmc.fr)

- > **Promote, preserve** OI data and centralise its access
- > **Connect** data users with observing teams
- > Interoperability with the VO tools

Contents:

- Already ~5000 calibrated science-ready OIFITS
- Including all calibrated PIONIER data since 2011
- Weekly updated observation logs from CLIMB, CLASSIC and VEGA (since 2006)
- + your data!