

# MATISSE – to First Light and beyond



Klaus Meisenheimer

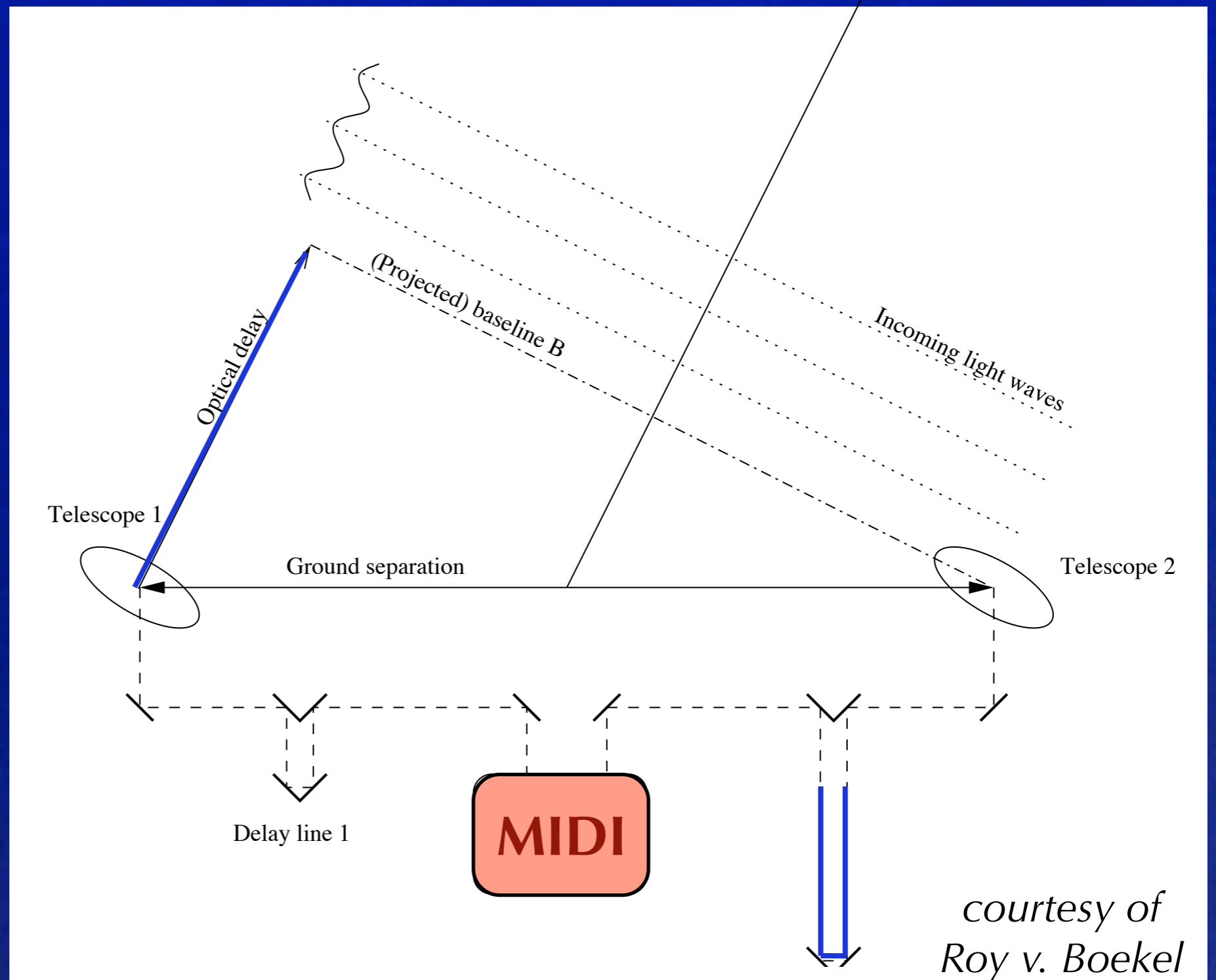
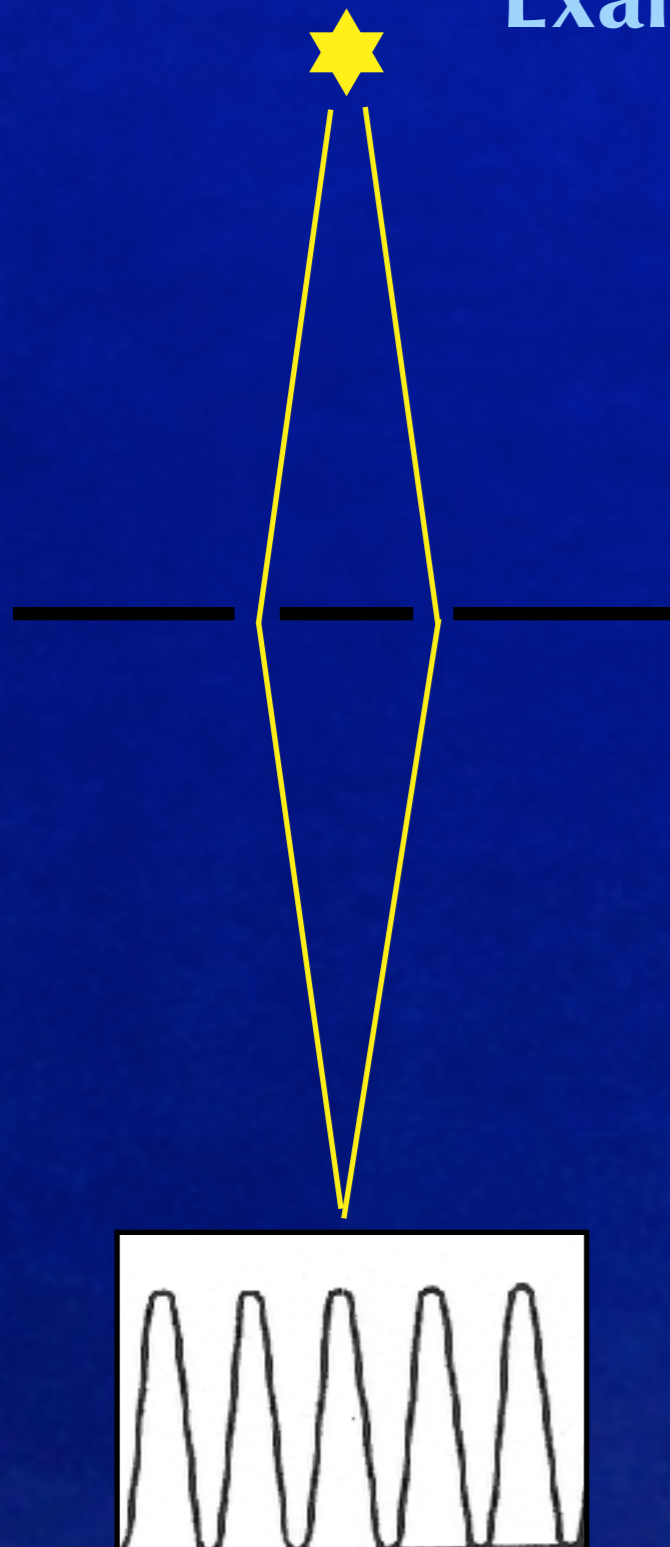
MPIA ATT 16-03-2018



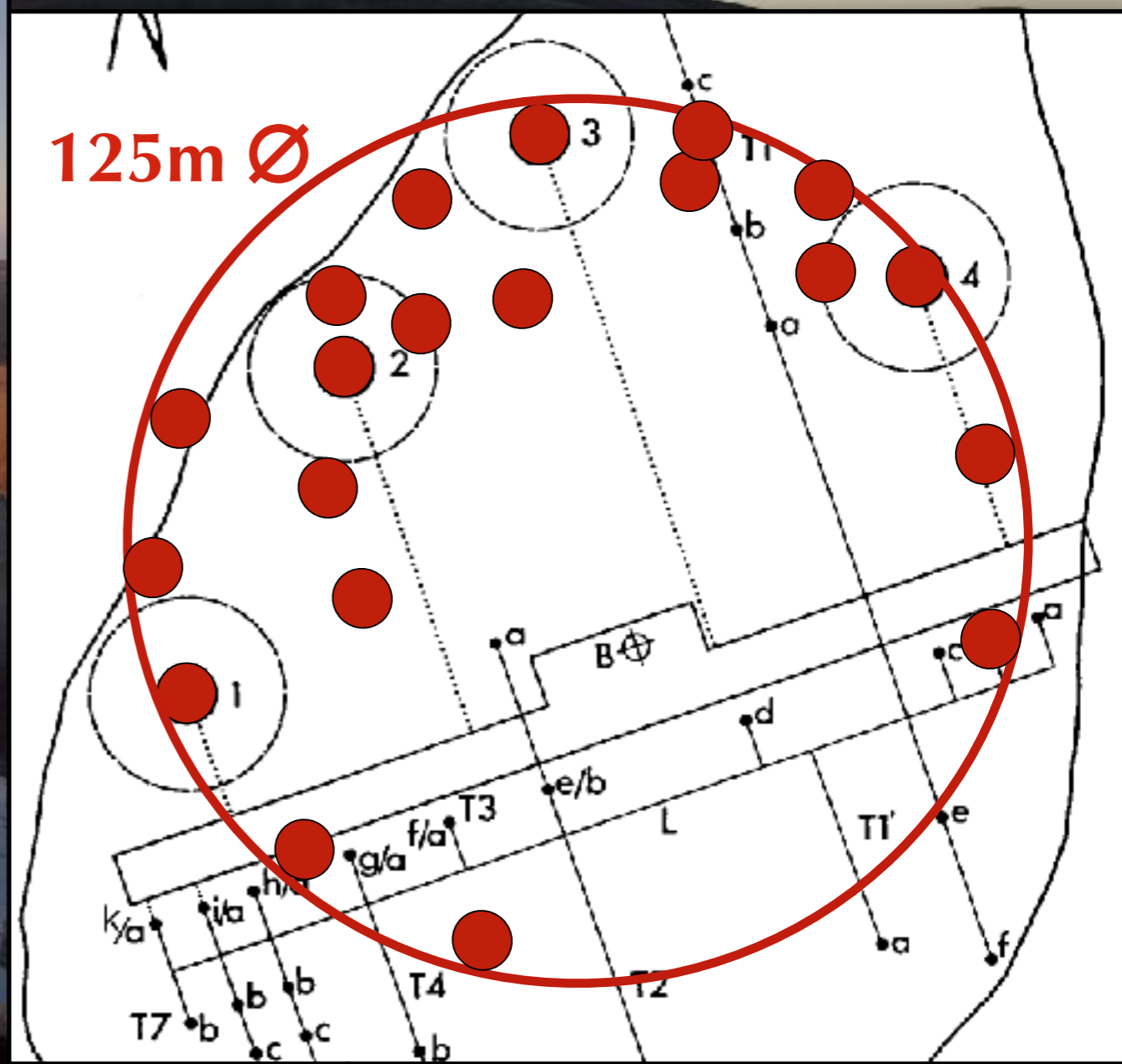
MATISSE

# Method: Infrared Interferometry

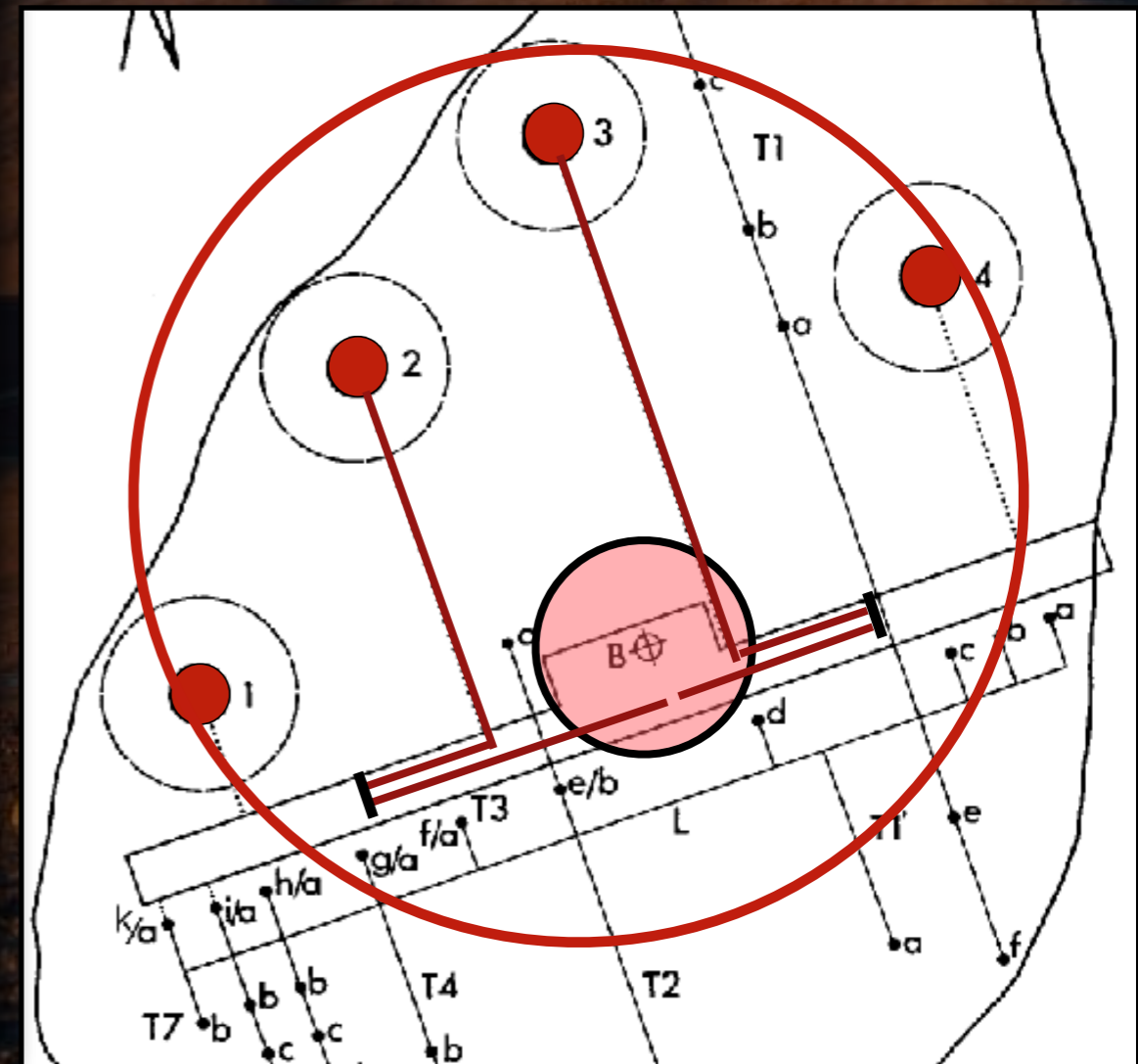
## Example: 2-telescope interferometer



# Very Large Telescope Interferometer – VLTI

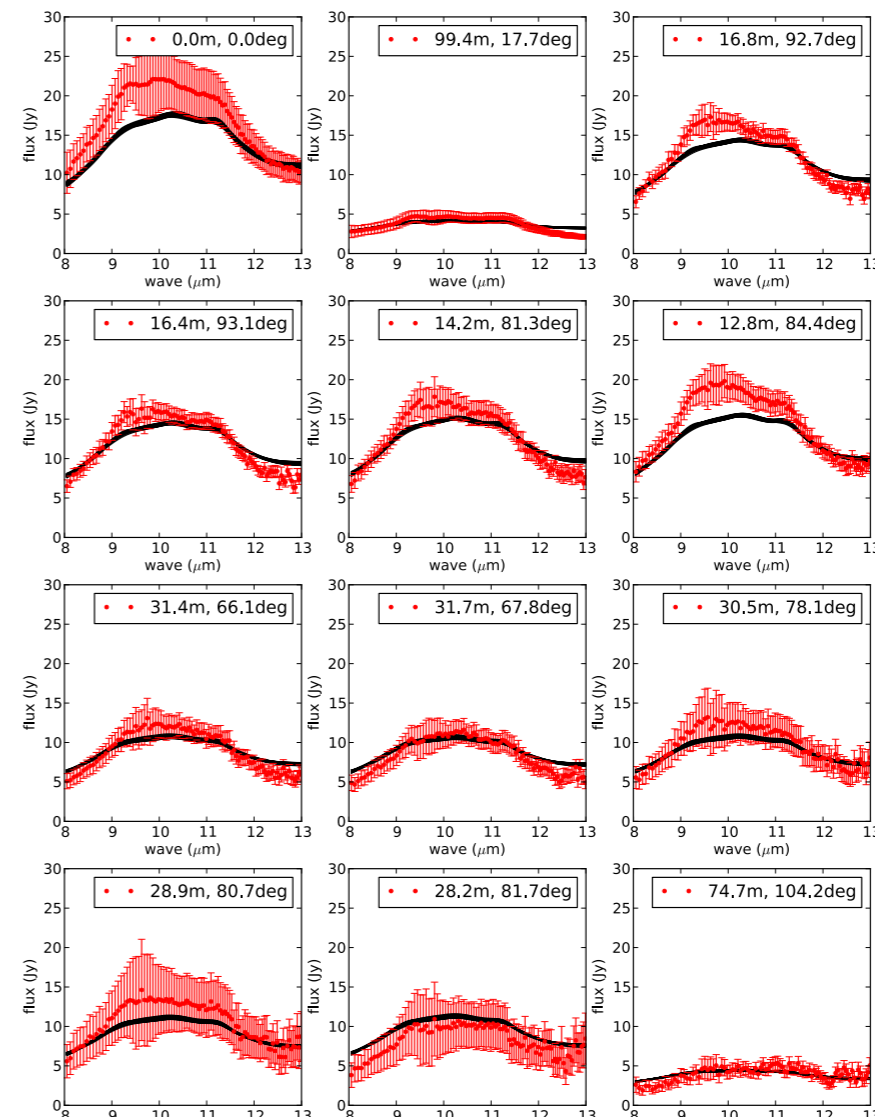
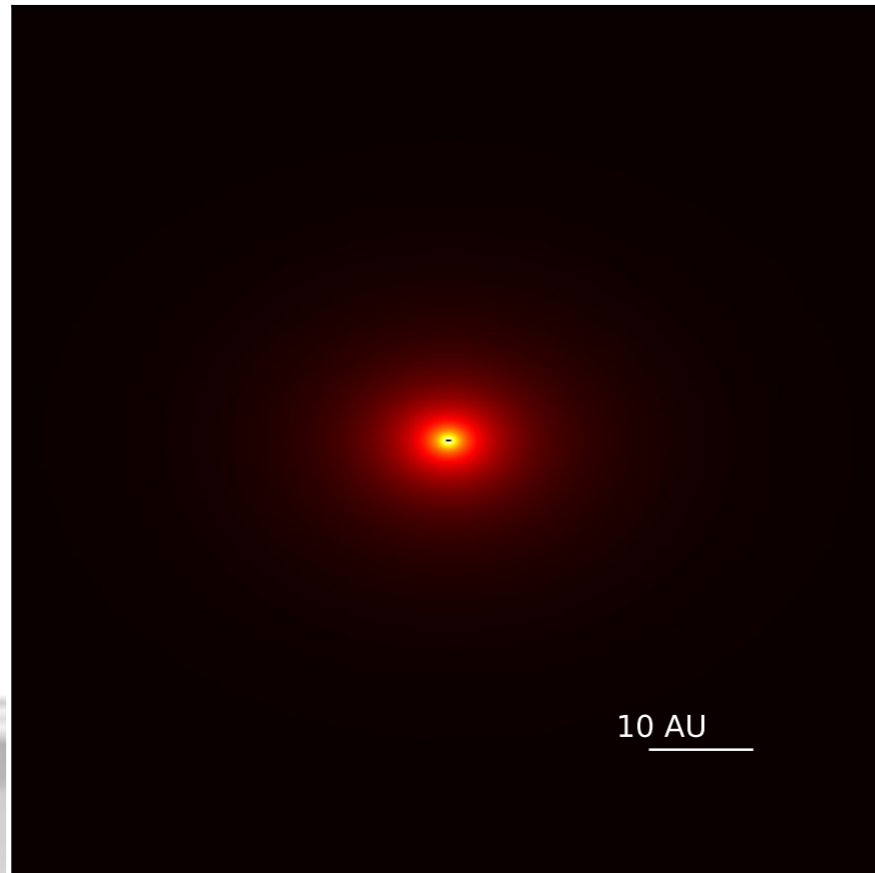


# Very Large Telescope Interferometer – VLTI



# MIDI observations of Herbig-star disk

HD 163296

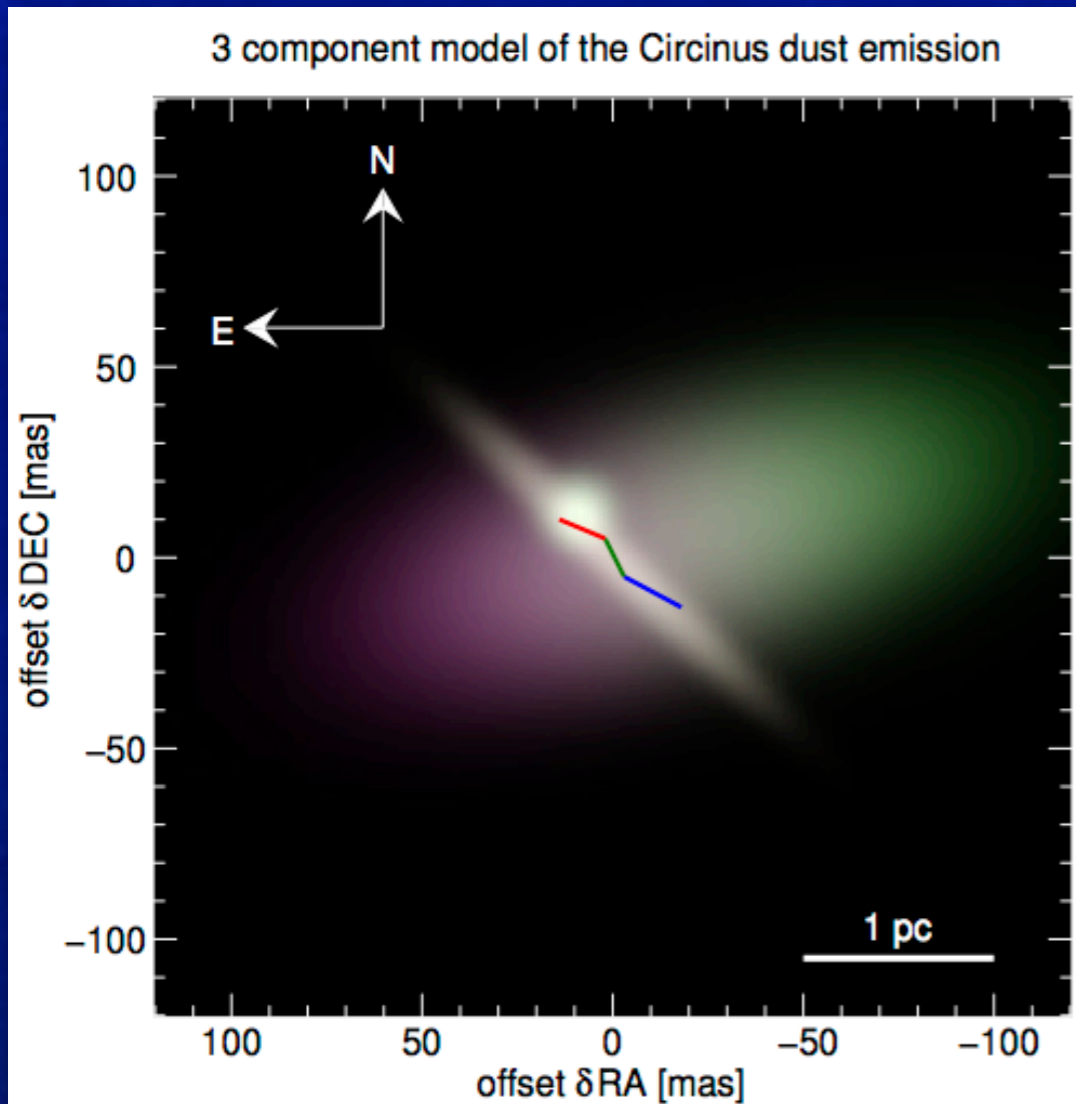


HD 163296: model image (*left*), fit to correlated fluxes (*right*)

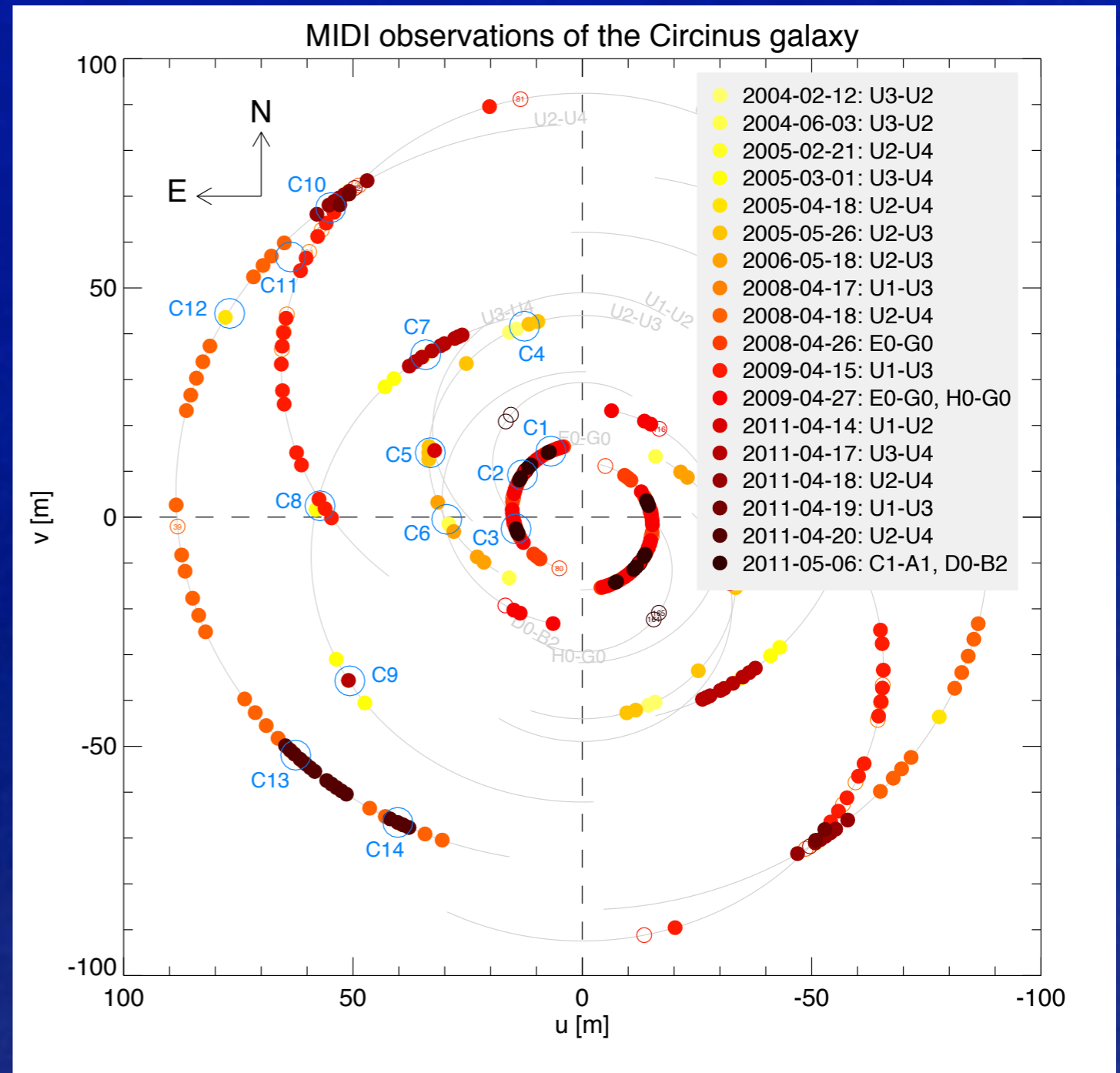
Menu, van Boekel, Henning, Waelkens 2014

# Blick in den Kern der Circinus Galaxie

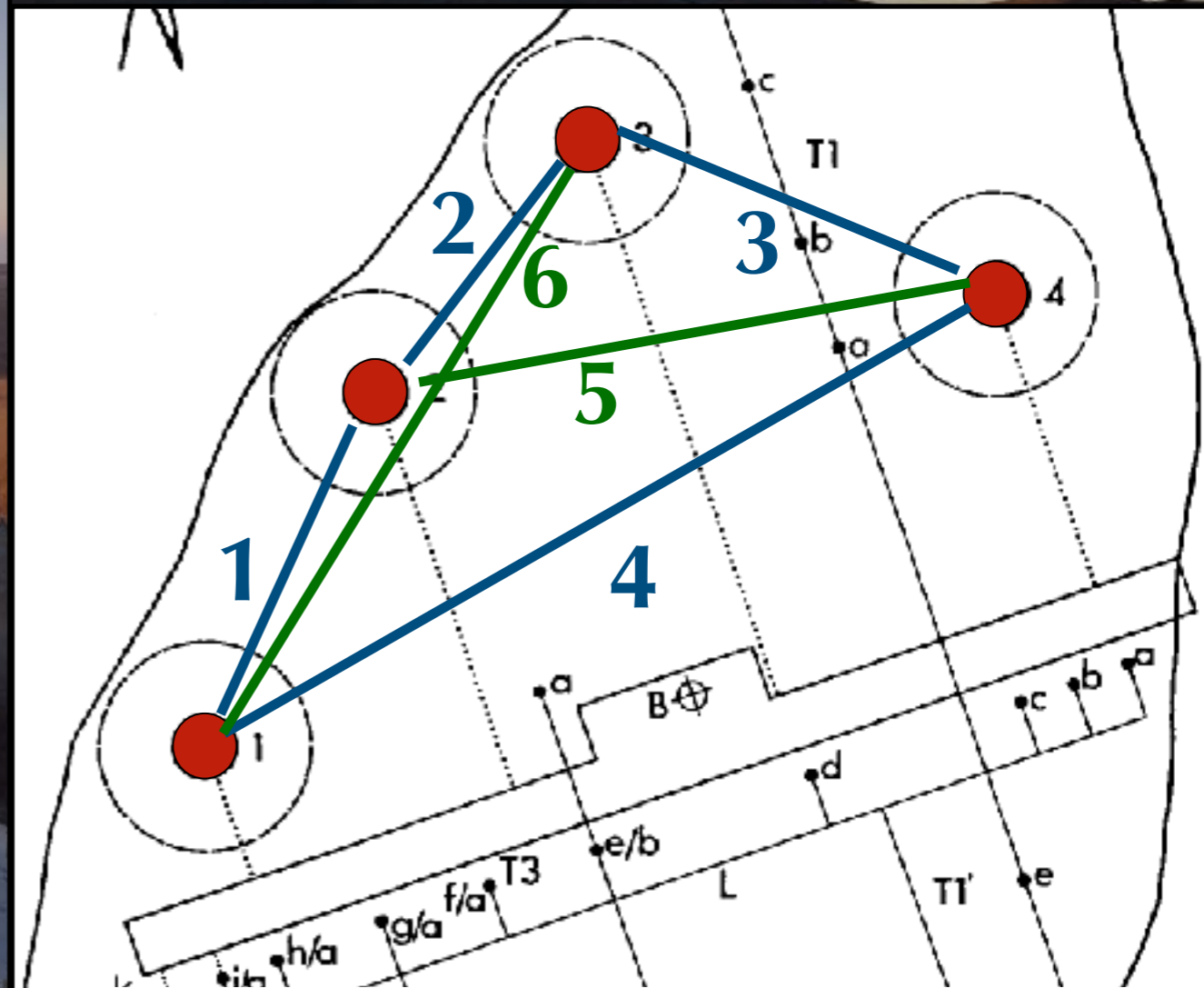
Beobachtungen 2004 – 2011



Tristram et al. 2014



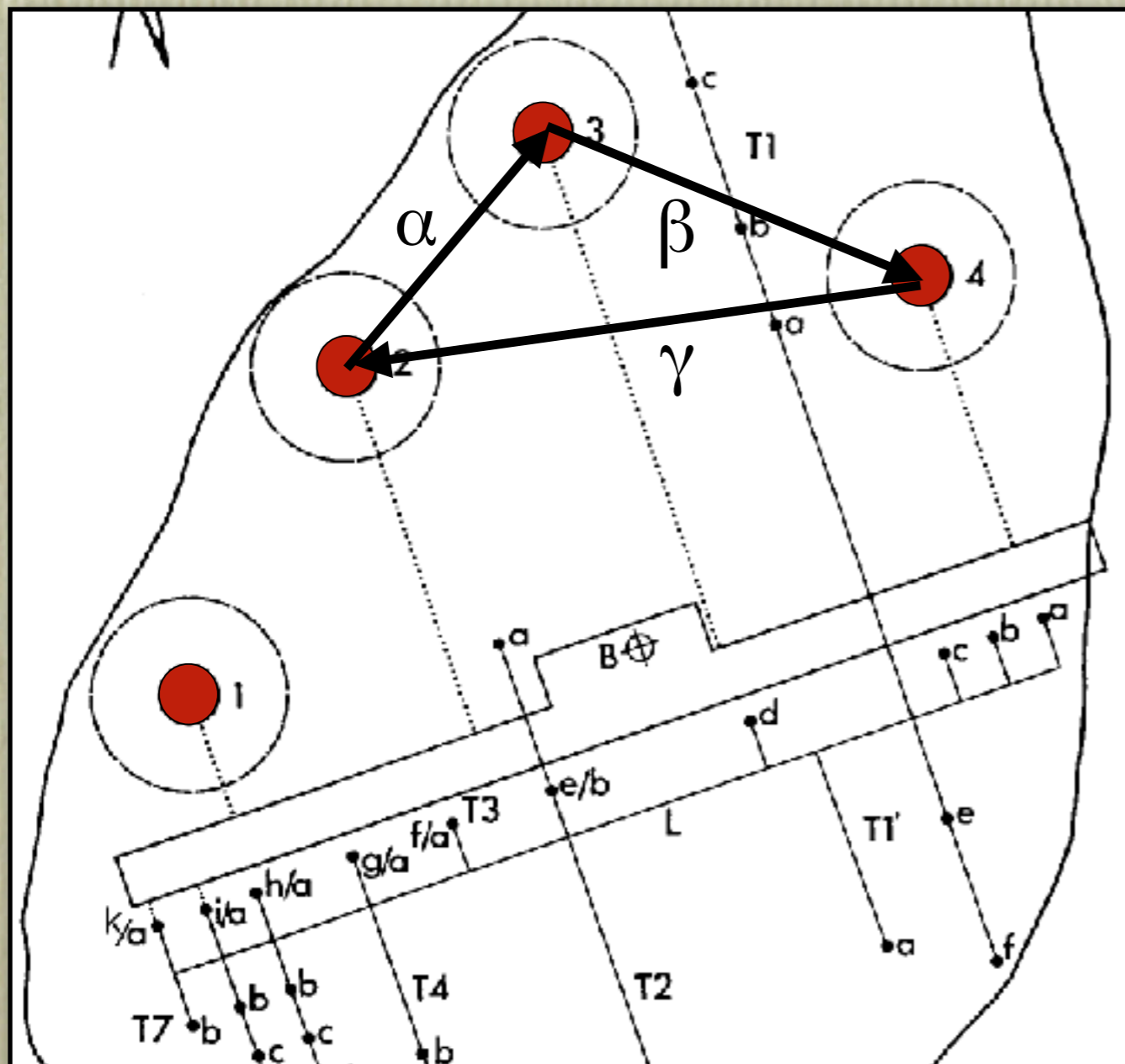
# Very Large Telescope Interferometer – VLTI



$$N \times (N-1) / 2 = 6 \text{ baselines}$$

# MATISSE – to First Light and beyond

To get images from interferometry you need **phases!**



“Closure Phase”:

$$\alpha + \beta + \gamma \stackrel{!}{=} 0$$



# MATISSE – starting point

18-11-2009 **PDR**

11-07-2011 **MoU** between

*INSU Paris, OCA + Uni Nice,  
MPIA Heidelberg, MPIfR Bonn,  
NOVA Leiden, Uni Kiel, Uni Wien*

**PI Bruno Lopez**

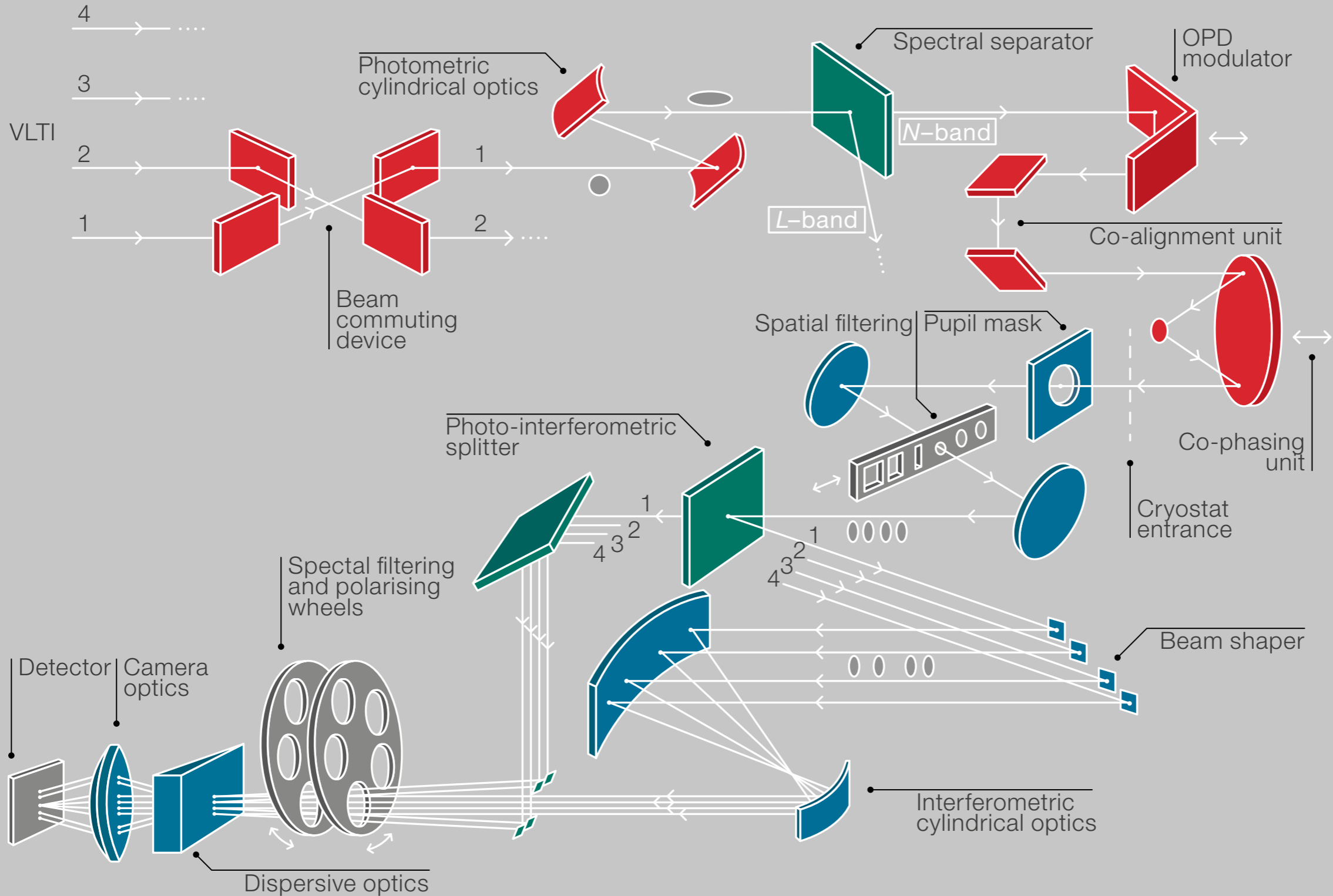
to study, construct and build  
MATISSE

26-04-2012 **FDR**

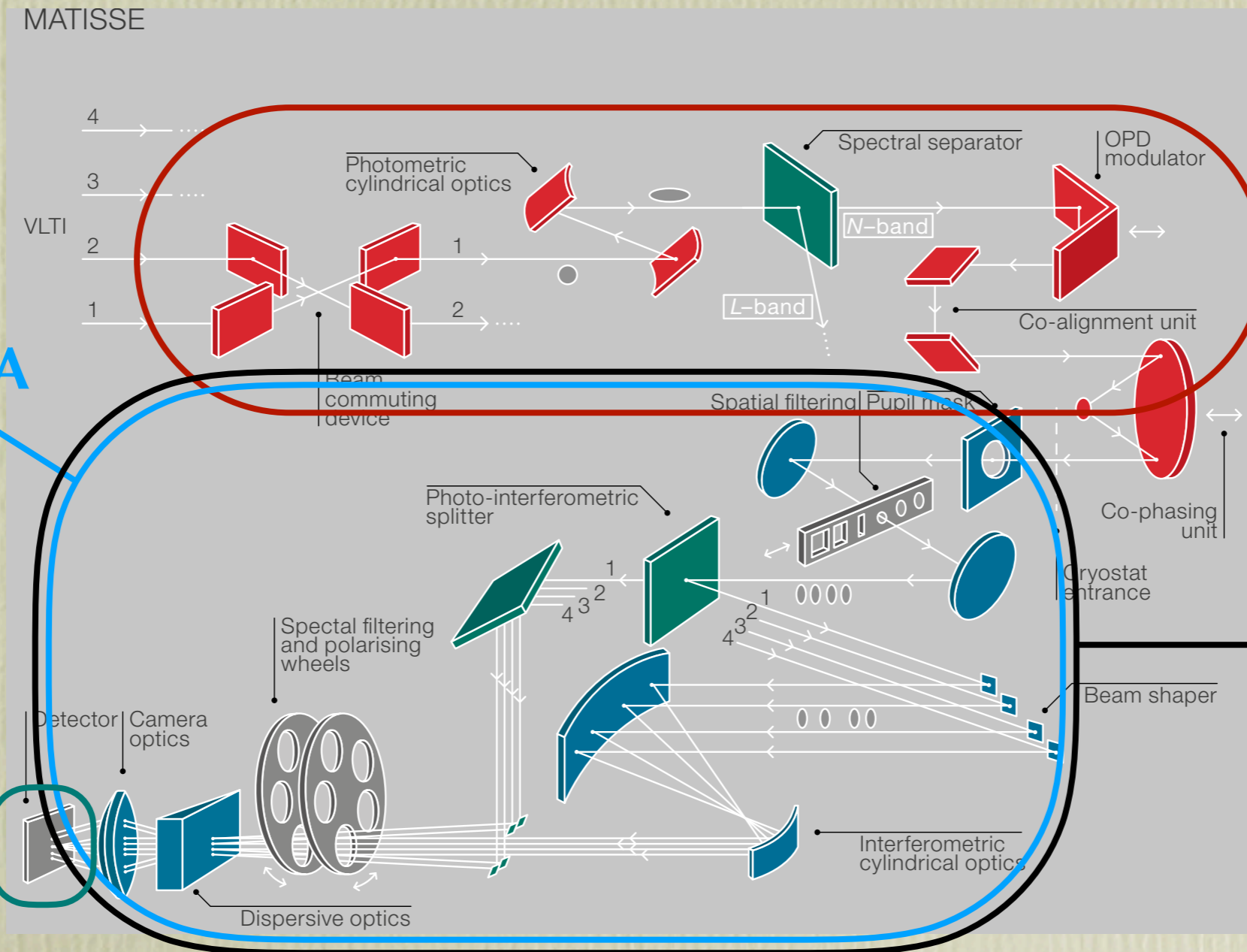
# MATISSE – optical layout



MATISSE



# MATISSE – Partner



**OCA Nice**

**Astron NOVA**

**MPIA**

**MPIfR,  
ESO**

# MATISSE – construction, integration, tests



2013 - 2014: Integration @ MPIA: Kryostats+Elektronics

2014: Integration Cold Optical Bench (COB) from NOVA

Ende 2014: Kryostats+COB+Elektronics —> OCA Nizza

2015: Integration with Warm Optical Bench, Alignment

September 2015: Air conditioning @ OCA Lab fails,  
Entrance windows + some boards damaged

März 2016: Lab accessible again, Alignment, Tests

12-09-2017: **PAE recommends shipping to Paranal.**

# MATISSE – packing and shipping to Paranaguá



# MATISSE – packing and shipping to Paranal



# MATISSE – packing and shipping to Paranal



# MATISSE – packing and shipping to Paranal





# MATISSE – packing and shipping to Paranal



# MATISSE @ Cerro Paranal



30.10. – 6. 12. 2017: Re-Integration in NIH



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# MATISSE @ Cerro Paranal



# MATISSE @ Cerro Paranal

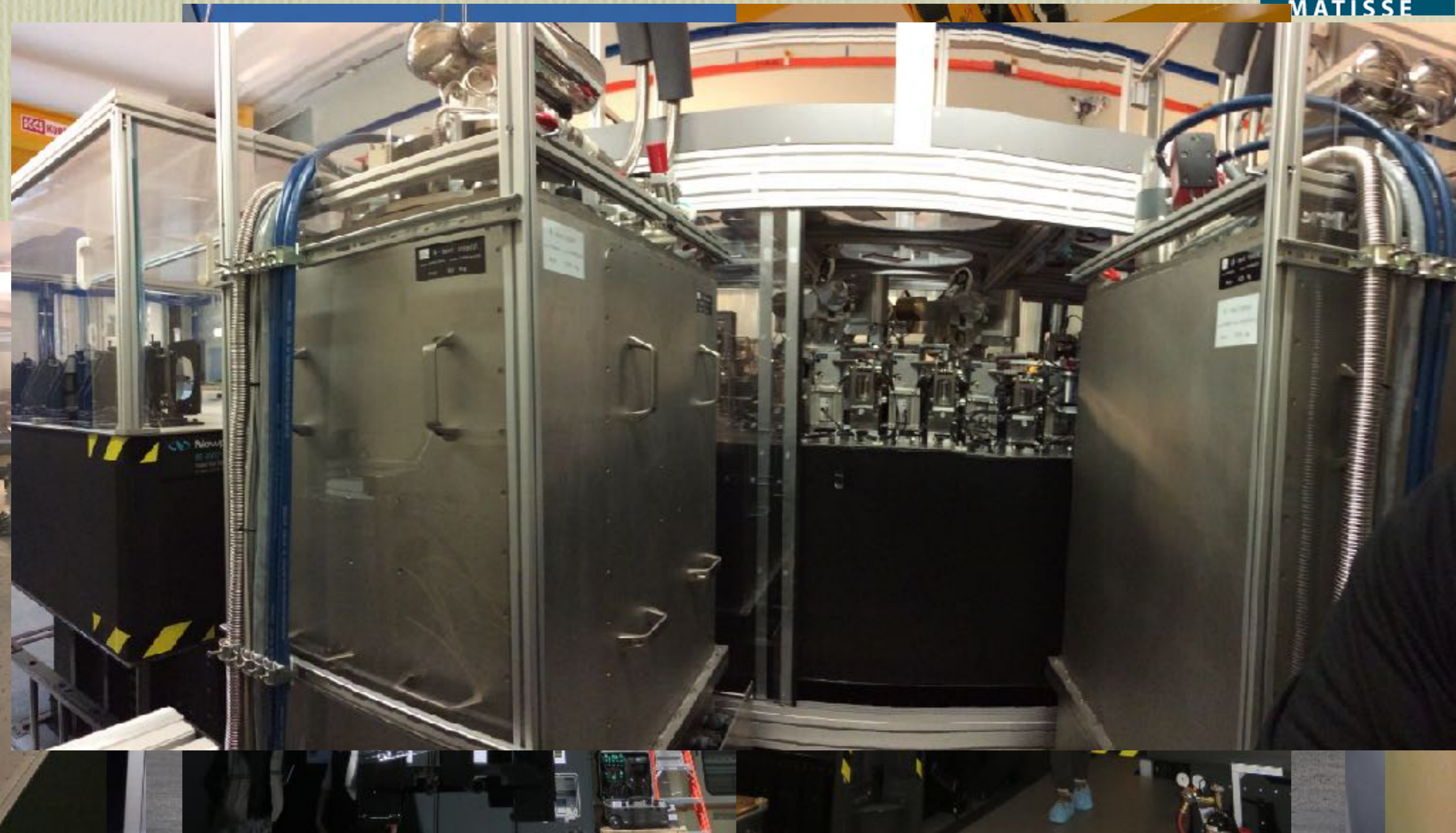


# MATISSE @ Cerro Paranal





# MATISSE @ Cerro Paranal



# MATISSE @ Cerro Paranal

30.10. – 6. 12. 2017: Re-Integration in NIH

7.12. Transport Kryostats + Electronics —> V

10. – 15. 12. Cool down and start operation

Christmas Break: Kept cool under ESOs super

10. – 15.01.2018: Abschluss-Arbeiten MPIA

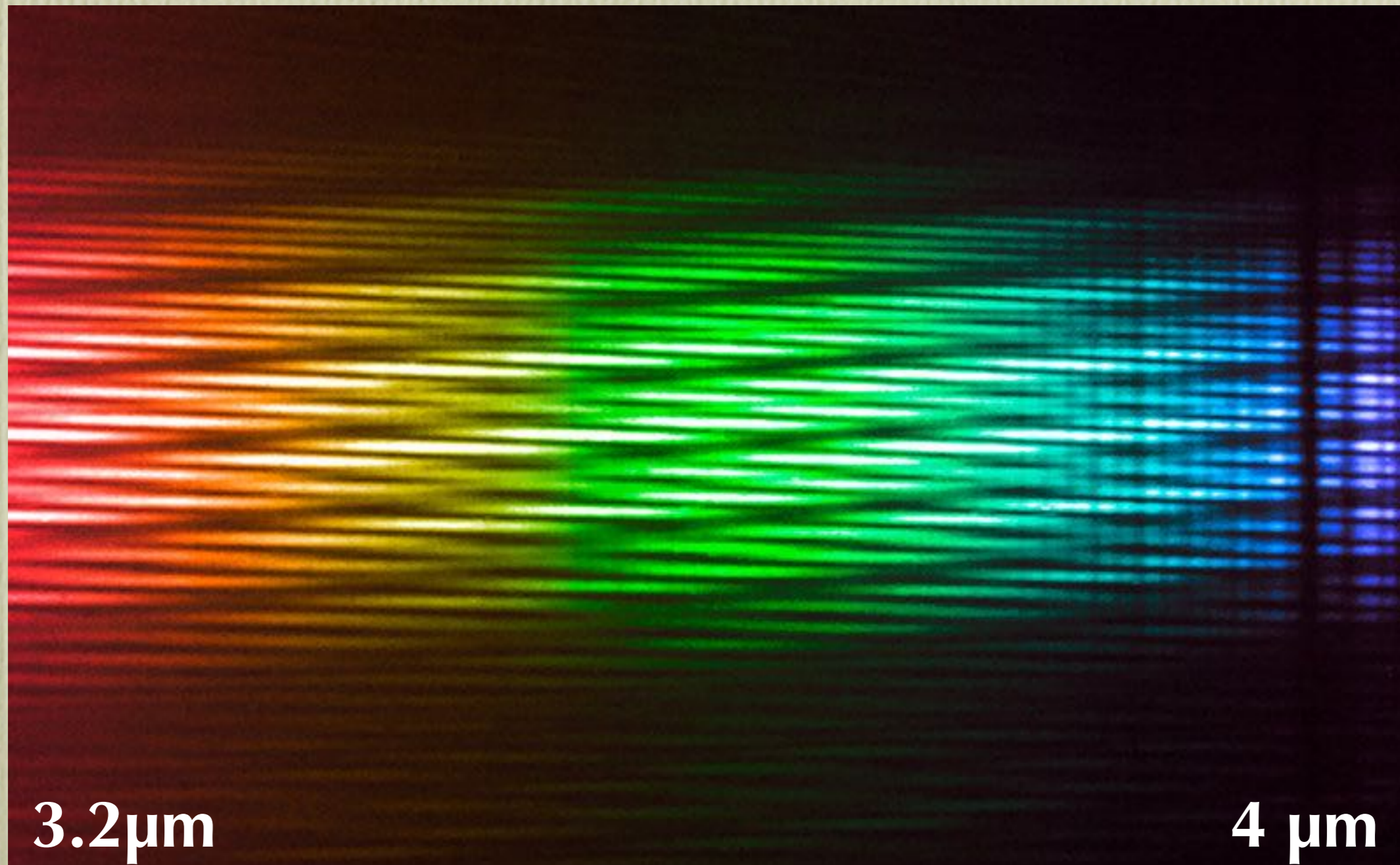
15.01.2018 PM Pierre Antonelli retires

16. 01. – 16.02.2018: Optical Alignment, T



# MATISSE @ Cerro Paranal

First Light: 18./19. Februar 2018



# The Future: 1. Commissioning



## Run

AIV\_Sky: 9. ... 26.03. ATs + UTs

in progress

1A<sub>1</sub>: 6.-12.05. 7n ATs

1A<sub>2</sub>: 19.-22.05. 2n ATs, 2 1/2n UTs ⇒ Bericht ⇒ ESO

1B: 8.-21.07. 9n ATs, 5 1/2n UTs

1C: 20.-24.09. 5n UTs

1D: p102 (1.10.2018 - 30.04.2019)

1E: p102

# The Future: 2. Science / GTO

Anfang 2019 (p102): “**Early Science**“ ?n ATs

Ab 1. 04. 2019: **Guaranteed Time Observations:**

MATISSE total: 37.5n 4UTs, 173n 4ATs

*MPIA Anteil: 26.3 %*

Wird von ***MATISSE Science Group*** entschieden.

3 Arbeitsgruppen:

YSOs/circumstellar disks (MPIA: Roy vBoekel)

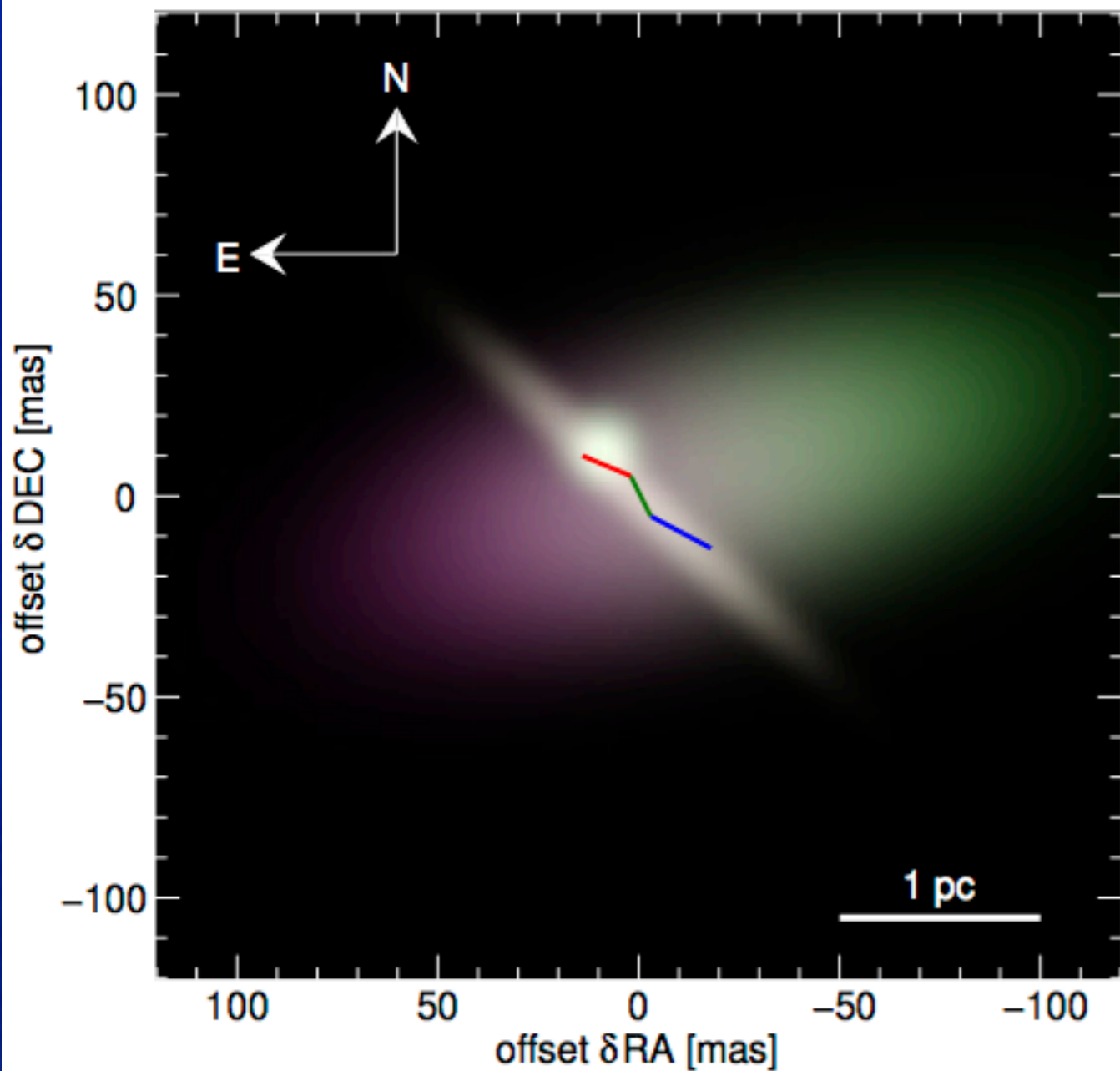
AGN (MPIA: K.M.)

Evolved Stars (none)

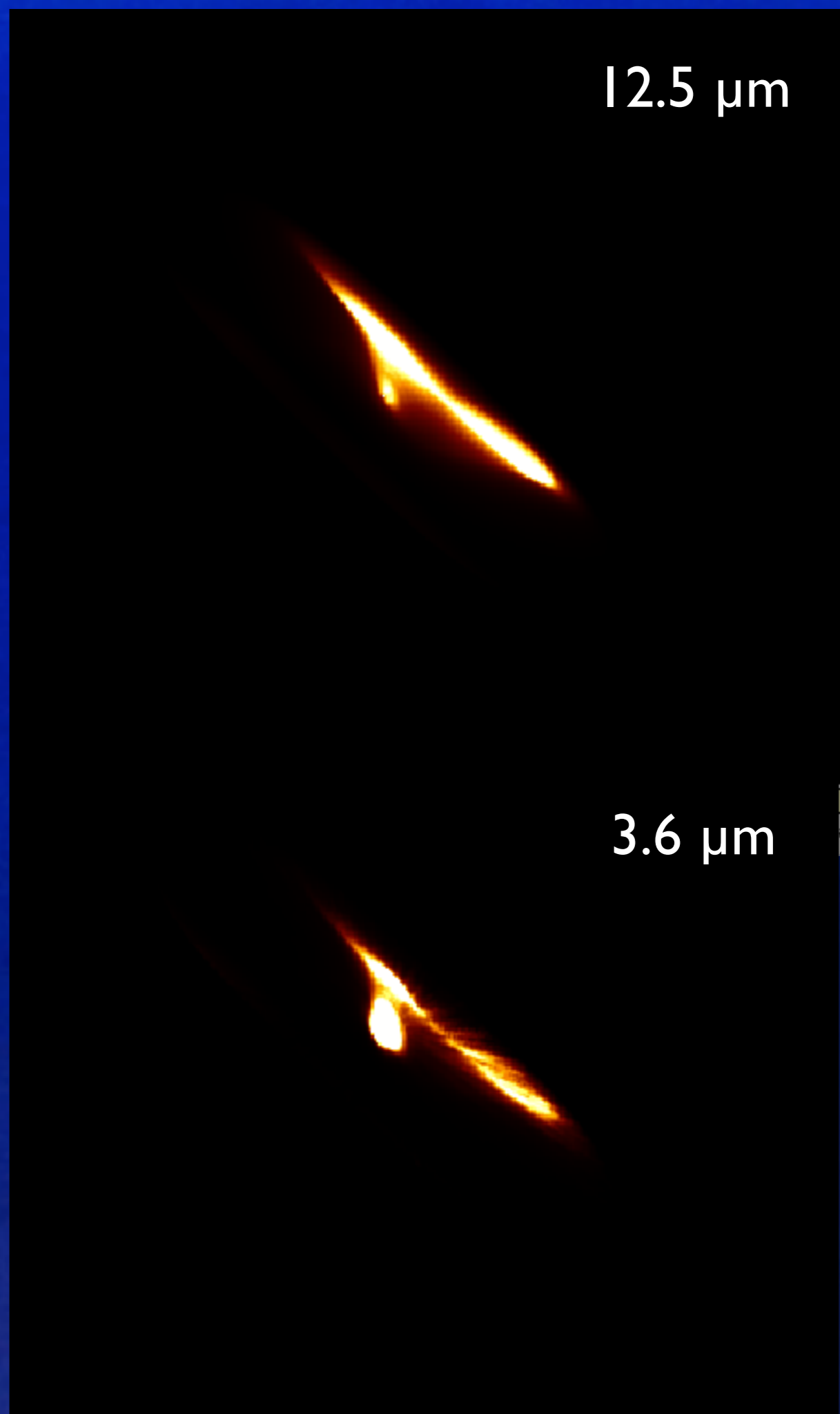
# Model Circinus galaxy

12.5  $\mu\text{m}$

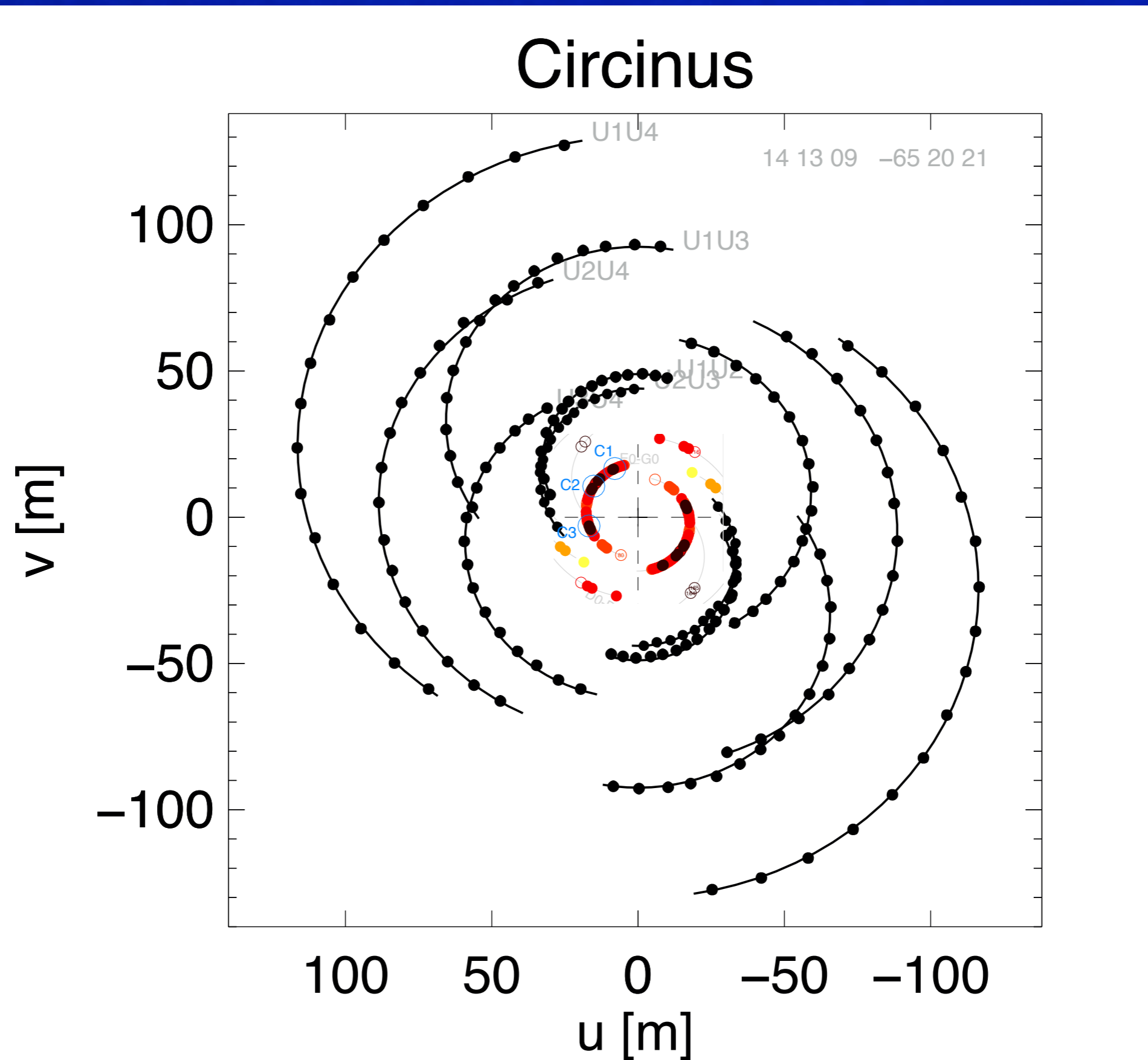
3 component model of the Circinus dust emission



3.6  $\mu\text{m}$

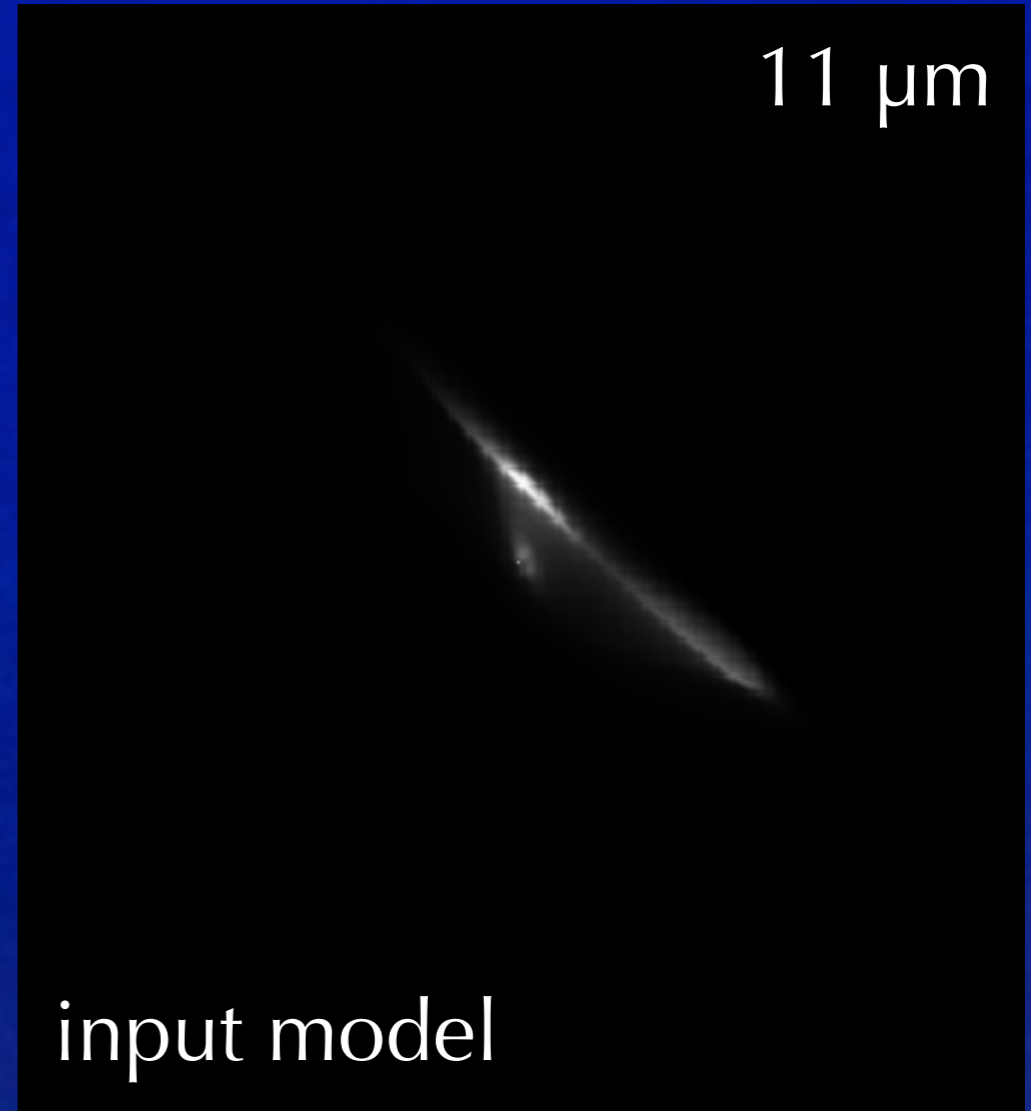


# MATISSE imaging of the Circinus galaxy



# MATISSE imaging of the Circinus galaxy

Simulate MATISSE data and try image reconstruction:

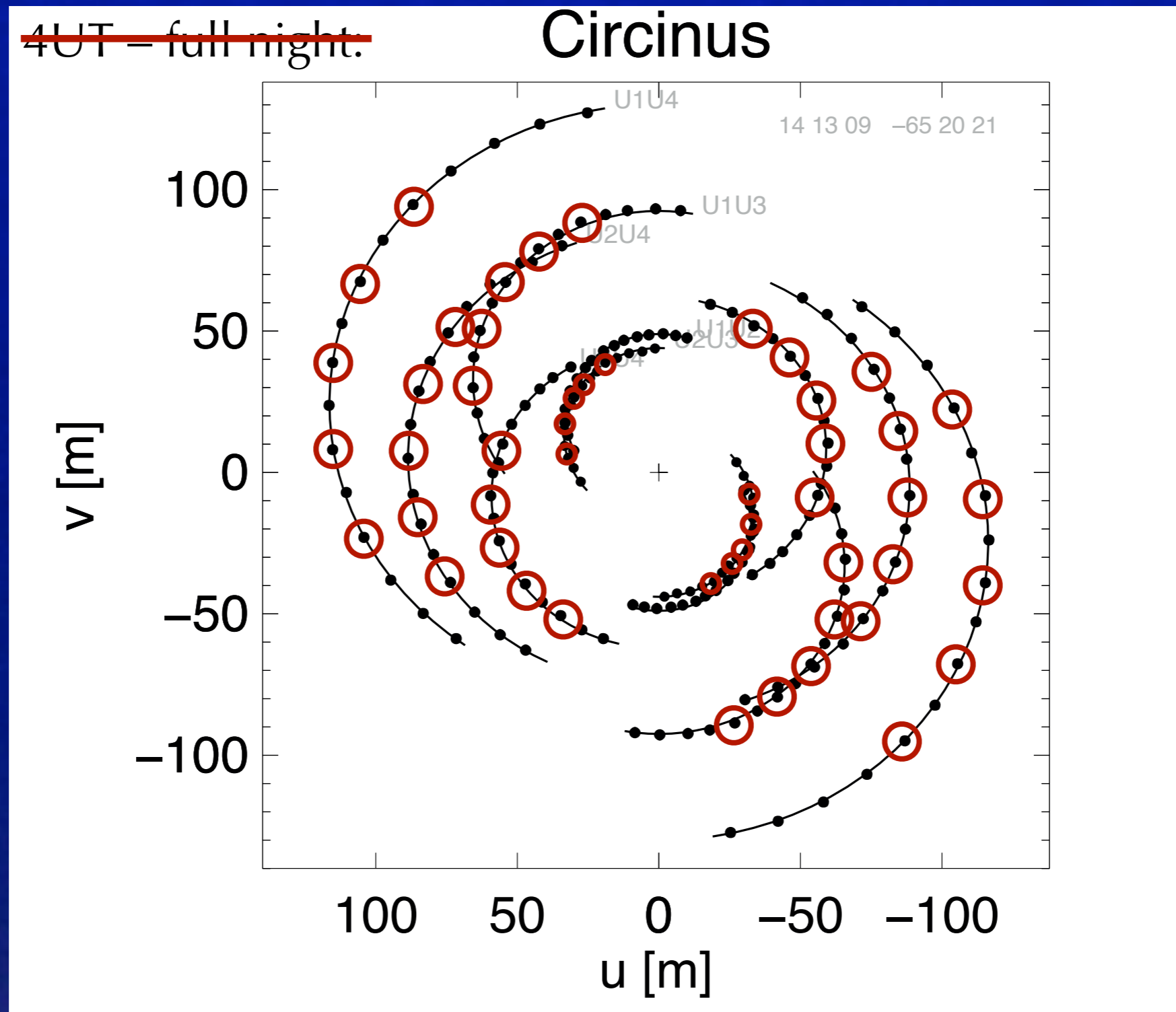


wisard tool (Gilles Duvert, JMMC)



# MATISSE imaging of the Circinus galaxy

uv coverage:



# MATISSE – to First Light and beyond



## **Thank you:**

Uwe Graser,

Michael Lehmitz, Werner Laun, Marcus Mellein,

Udo Neumann, Ralph Hofferbert,

Klaus Meixner, Tobias Maurer, Ralf Klein,

Tobias Adler