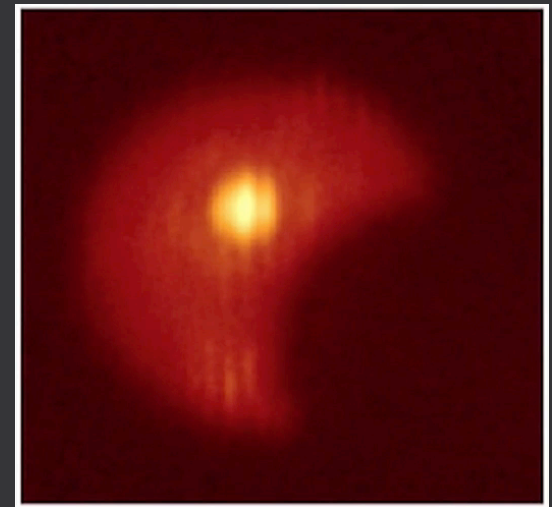
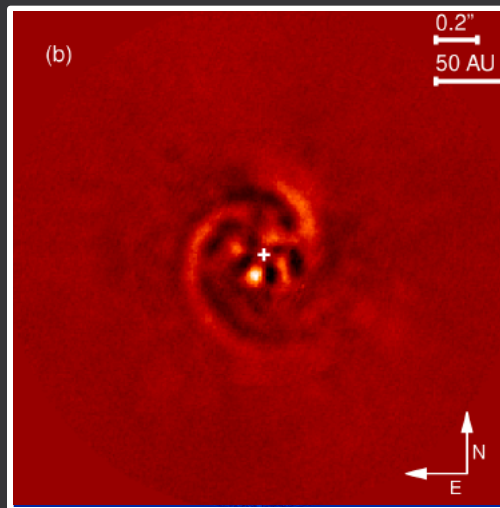
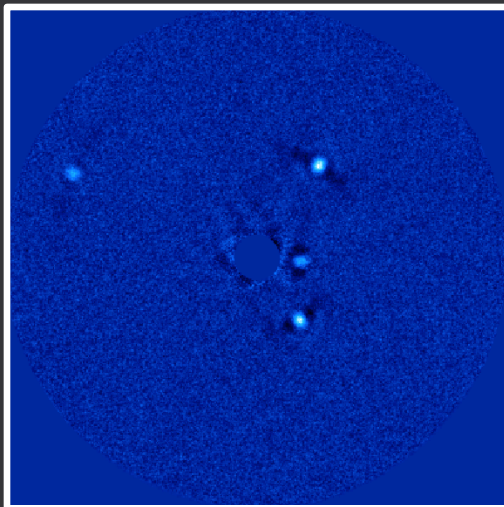
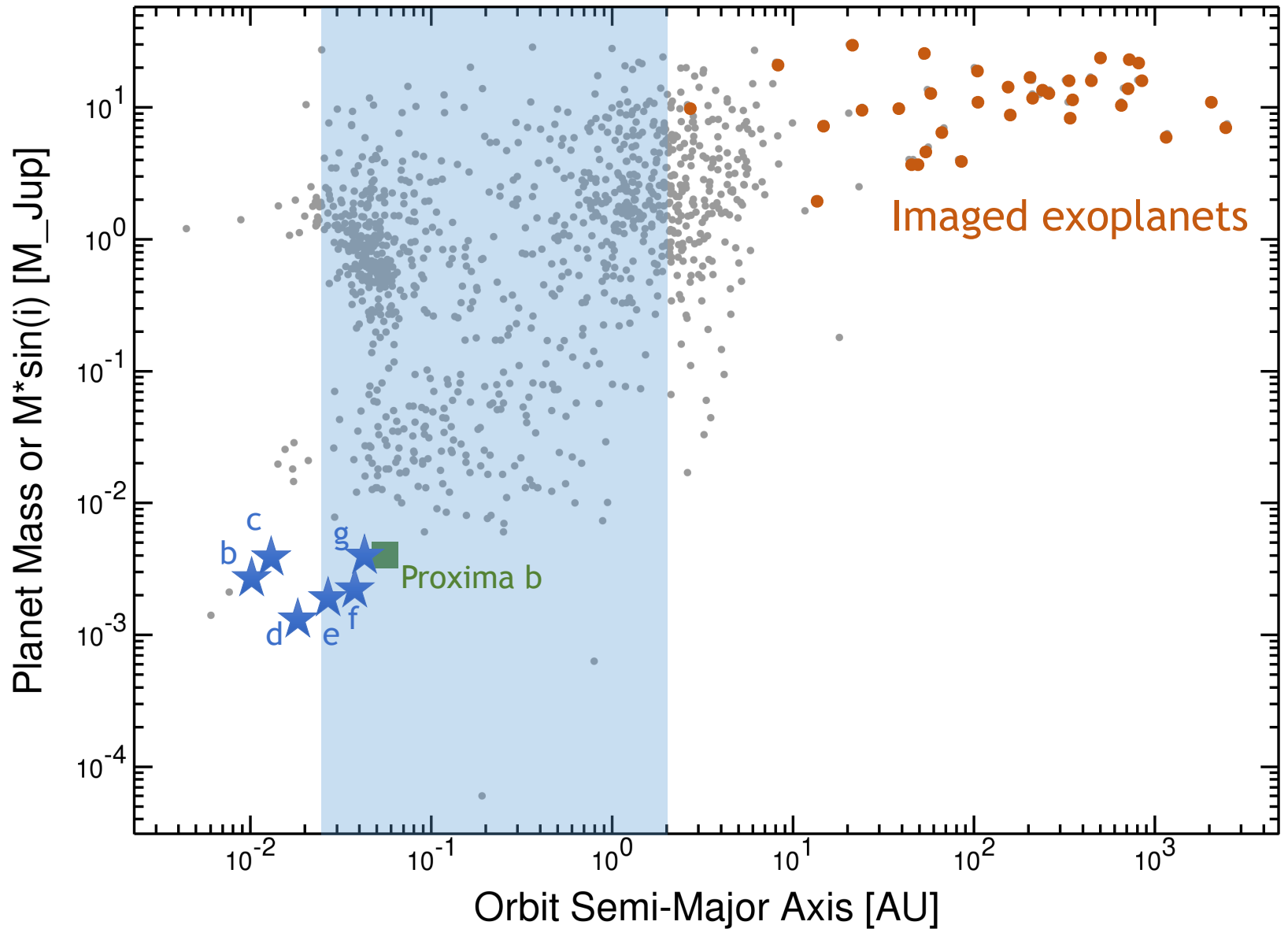


# Coronagraphy and Interferometry

Imaging the sky at high contrast and high-angular resolution



# Known exoplanets

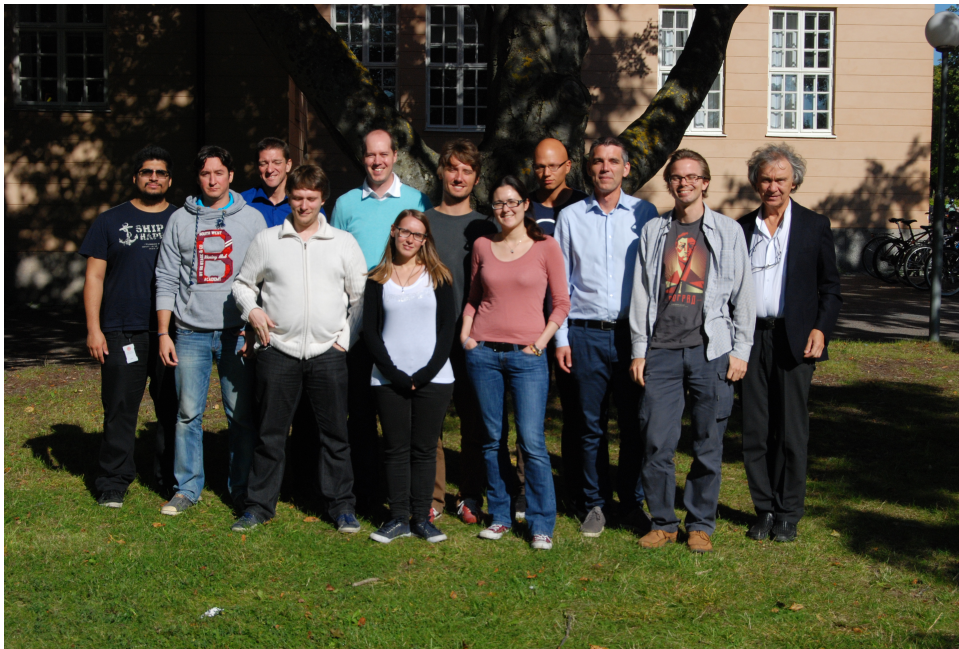




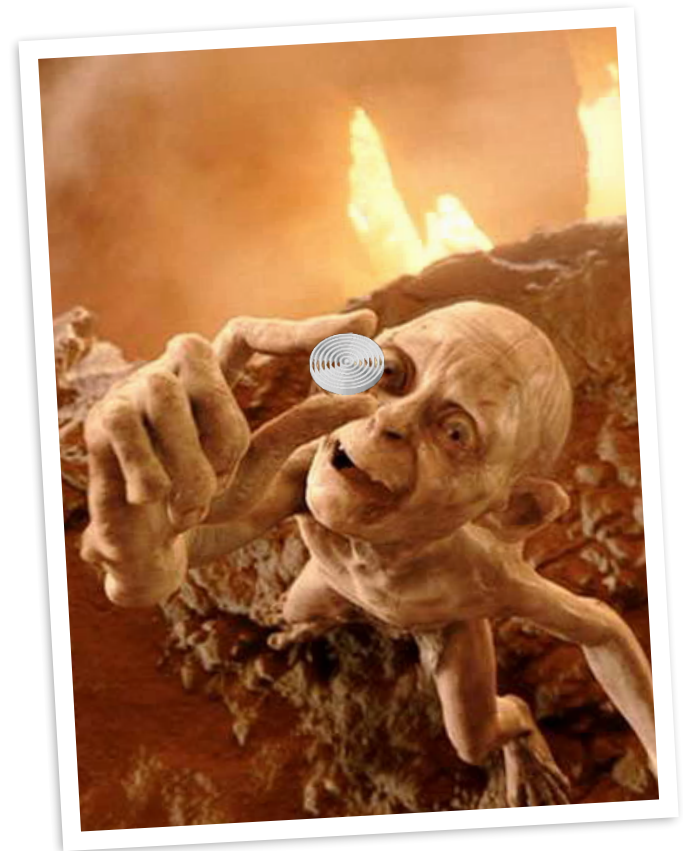
# Coronagraphy



(AEOS AND HOLOLAB)



<http://www.vortex.ulg.ac.be>



VORTEX





# Main activities

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- Exoplanets and disks
- Image processing
- Coronagraphic instruments
- Phase mask design
- Optical testing
- Wave front sensing
- Advanced coronagraphs

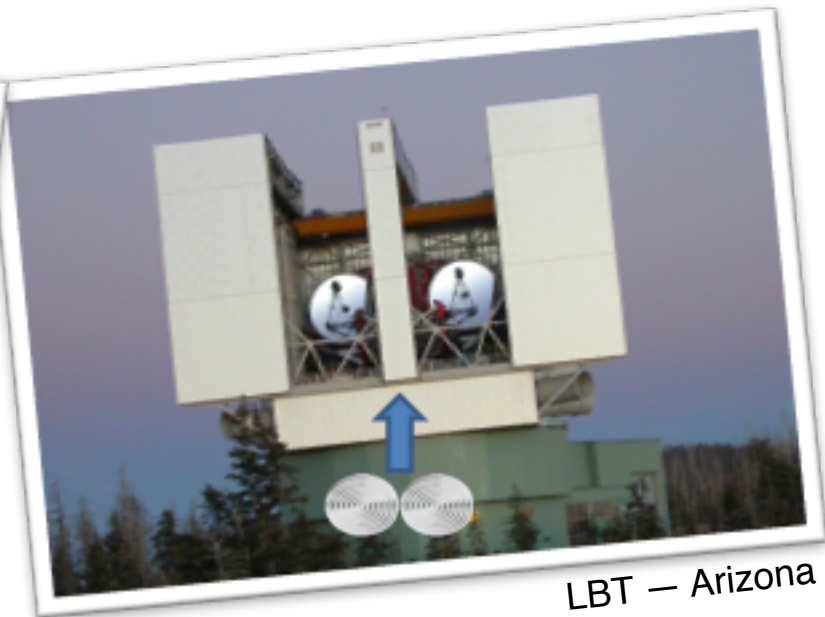
# Ground-based observations



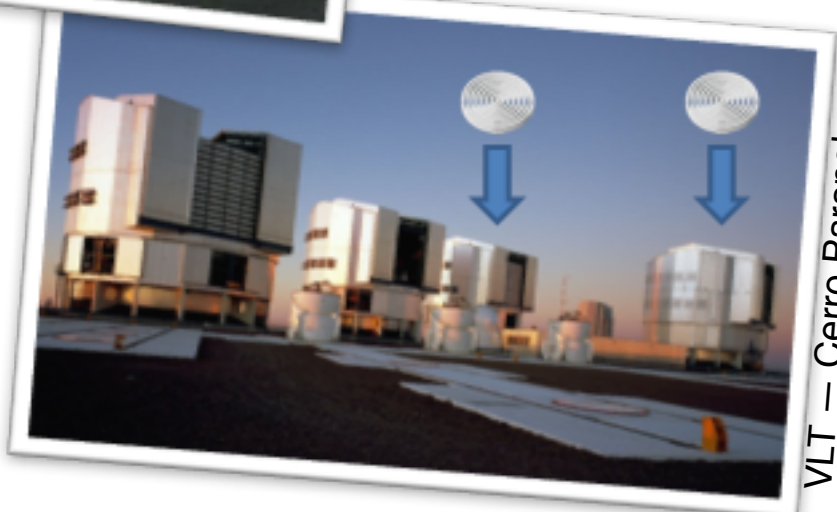
VORTEX



Keck — Hawaii



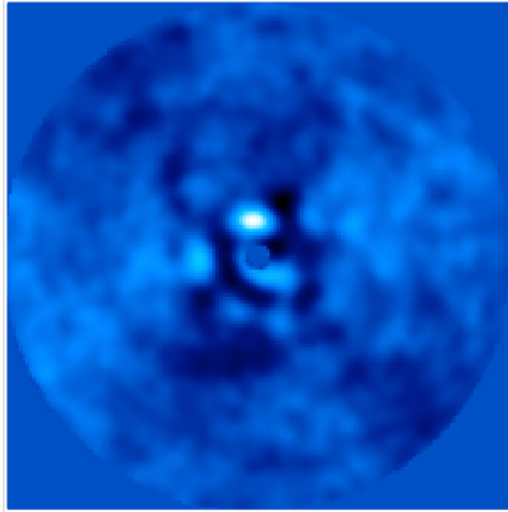
LBT — Arizona



VLT — Cerro Paranal

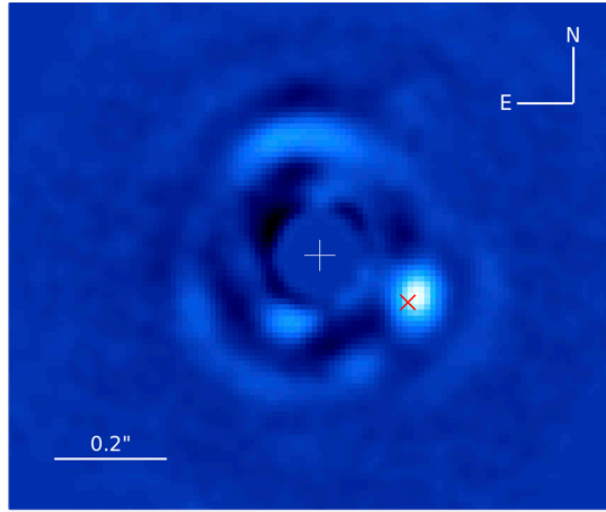
# Science highlights

HD 169142 @ VLT/NACO



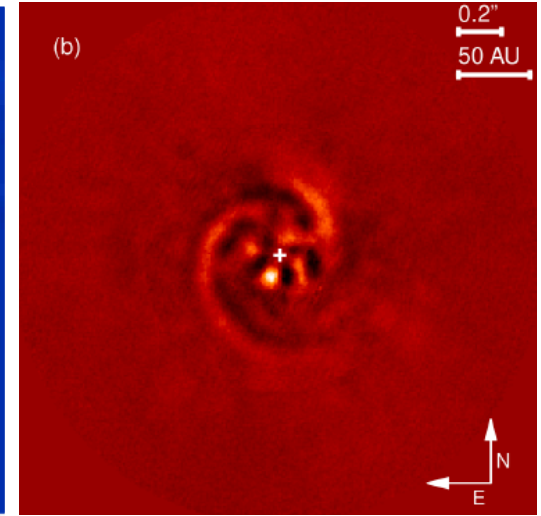
Biller et al. (2014), Reggiani et al. (2014)

HIP 79124 @ Keck/NIRC2



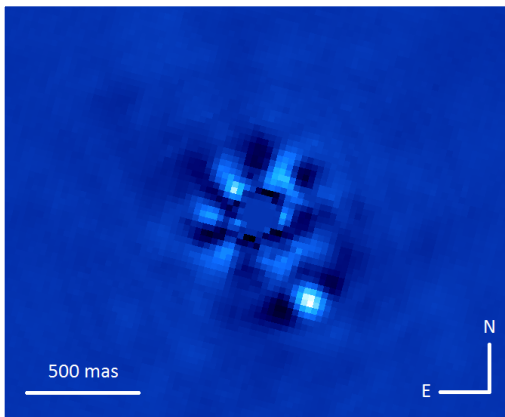
Serabyn et al. (2017)

MWC 758 @ Keck/NIRC2



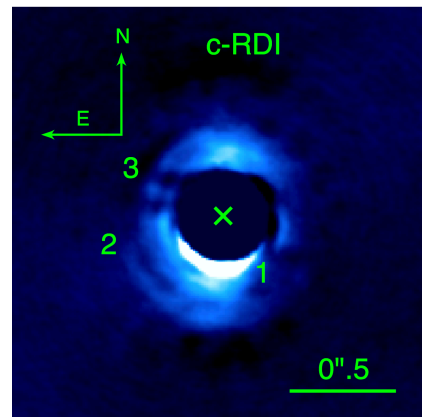
Reggiani et al. (subm.)

Beta Pic @ VLT/NACO



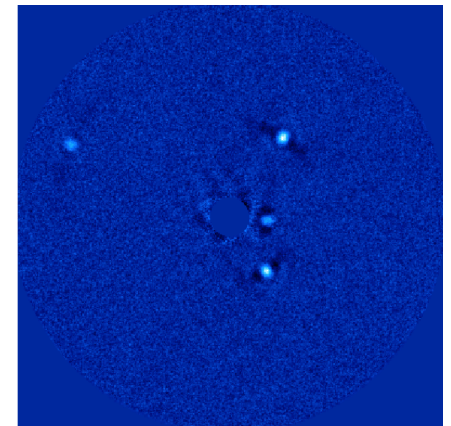
Absil et al. (2013)

HIP 1\*\*\*\*\* @ Keck/NIRC2



Choquet et al. in prep

HR8799 @ LBT/LMIRCam



Gomez et al. (2017)

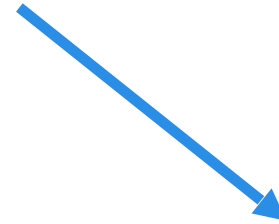
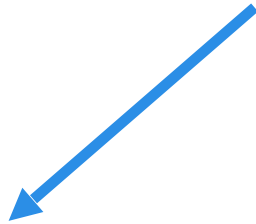




# Near-term future

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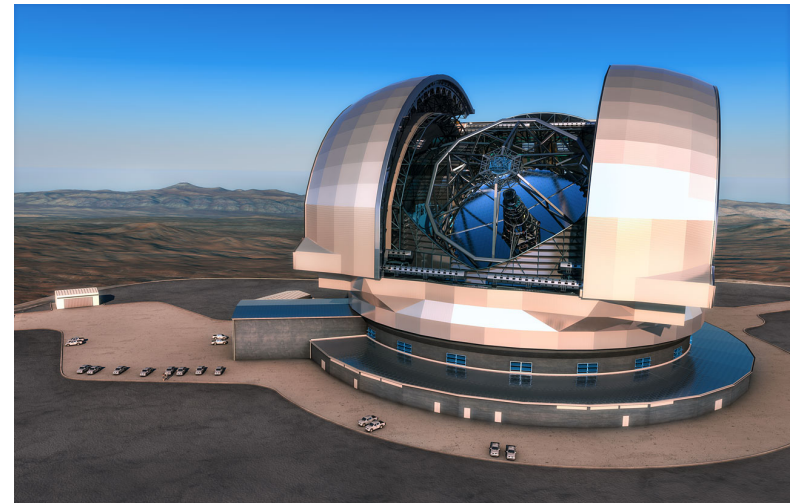
## Towards imaging rocky planets



### **VLT/VISIR**

Search for HZ planets around  
 $\alpha$  Cen A&B

(part of the Breakthrough Initiatives)



### **ELT/METIS**

Search for HZ planets around  
nearby MS stars



# Interferometry



J. Surdej



O. Absil



E. Gosset



D. Defrere



L. Marion



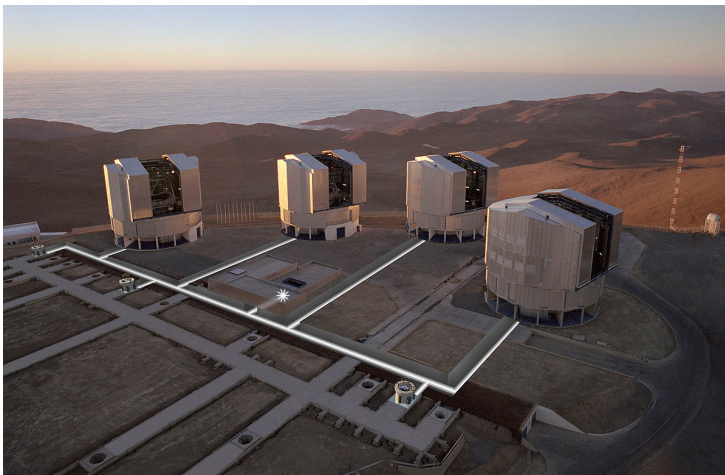
M. de Becker



Diameter of Jupiter measured by Interferometry from the roof of the Physics building (Nov. 2016)

# Main activities

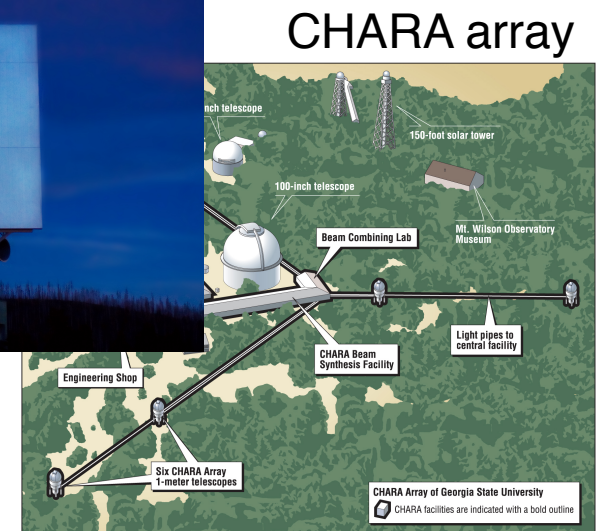
- Exoplanets, disks, stars
- Advanced data reduction
- Instrumentation



VLT Interferometer



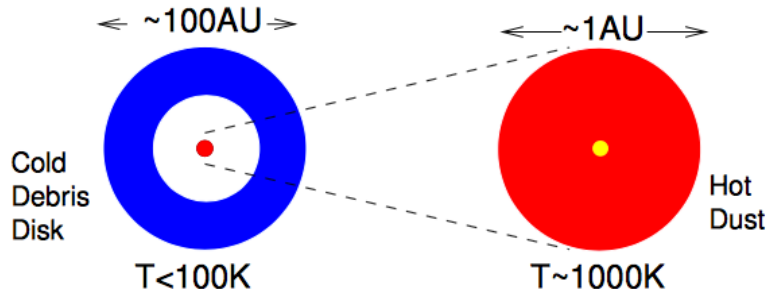
LBT Interferometer



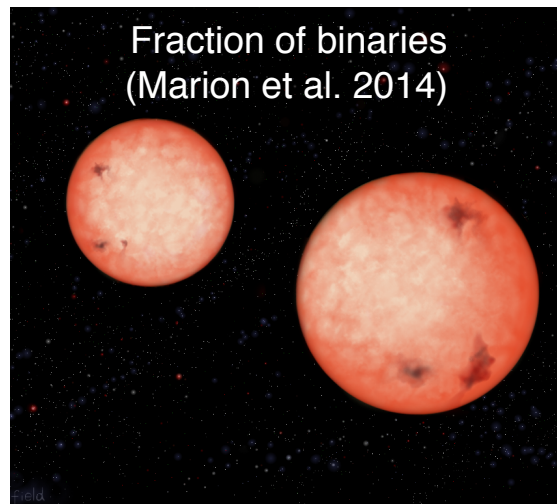


# Science highlights

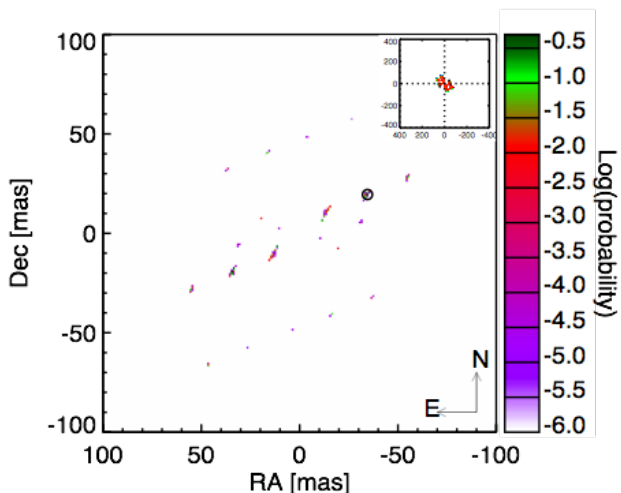
Prevalence of exozodiacal dust  
(e.g., Absil et al. 2013, Nunez et al. 2017)



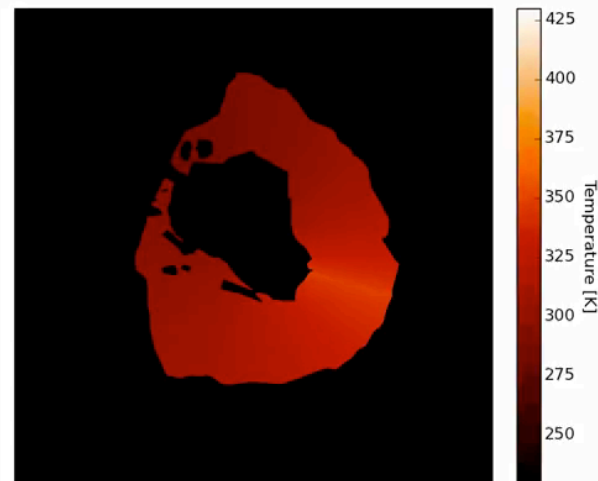
Fraction of binaries  
(Marion et al. 2014)



Orbit of massive star binaries  
(e.g., de Becker et al. 2012, Gosset et al. in prep)



$\Delta T = 0$  Days



Io's volcanic activity  
(e.g., de Kleer et al. 2017)



# Near-term future

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- Second-generation VLTI instruments: GRAVITY (since 2016) and MATISSE (2019)
- New VLTI instrument to study planet formation and HZ of nearby MS stars:



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[Participants](#)

[Venue](#)

[Accommodation](#)

[Contact](#)

2-3 OCTOBER 2017

## HI-5 KICKOFF MEETING

Hi-5 is the name of a new instrumental project for the [Very Large Telescope Interferometer](#) (VLTI). The main objectives of Hi-5 are to study at high-contrast and high-angular resolution nearby planetary systems (forming exoplanets and exozodiacal disks) and bright extragalactic objects (AGNs) in the L and M bands (3 to 5 microns). The possibility to do high-contrast interferometric observations in the L and M bands with the VLTI has recently emerged due to developments in integrated optics, an essential component of current VLTI instruments operating at shorter wavelengths (such as PIONIER and GRAVITY). The goal of the kickoff meeting will be to officially start the Hi-5 project and to plan upcoming activities and collaborations in order to bring the instrument at the VLTI on relatively short timescales. The meeting will take place at the [University of Liège](#) (downtown) on October 2 and 3 2017 (more info [here](#)). If you want to participate in this meeting, please [contact us](#).

<http://www.biosignatures.ulg.ac.be/hi-5/index.html>

# Long-term future

- Planetary atmospheres
- Biosignatures
- Prevalence of life

