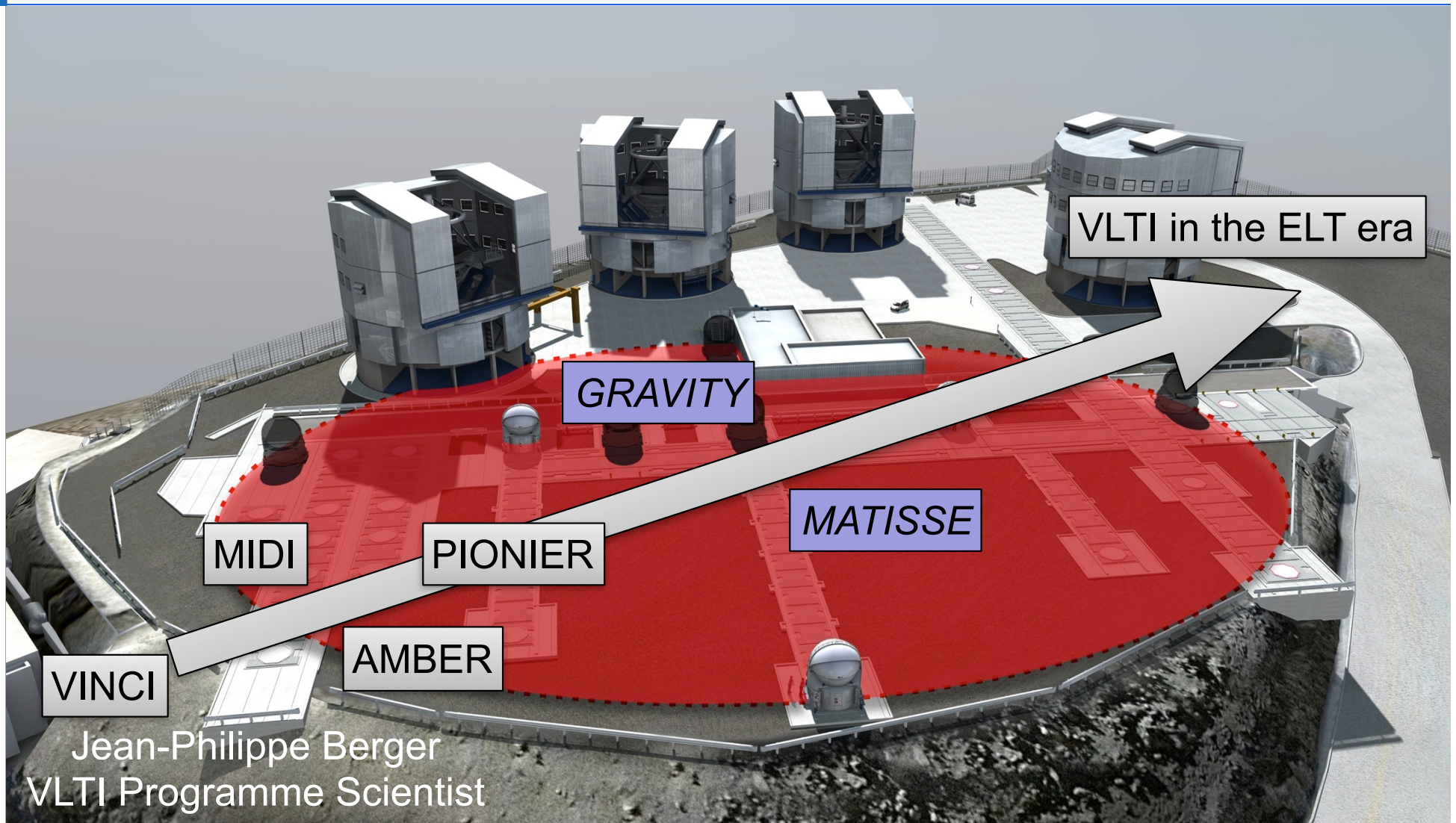


VLTi in the next decade



Michel Dugué (OCA)

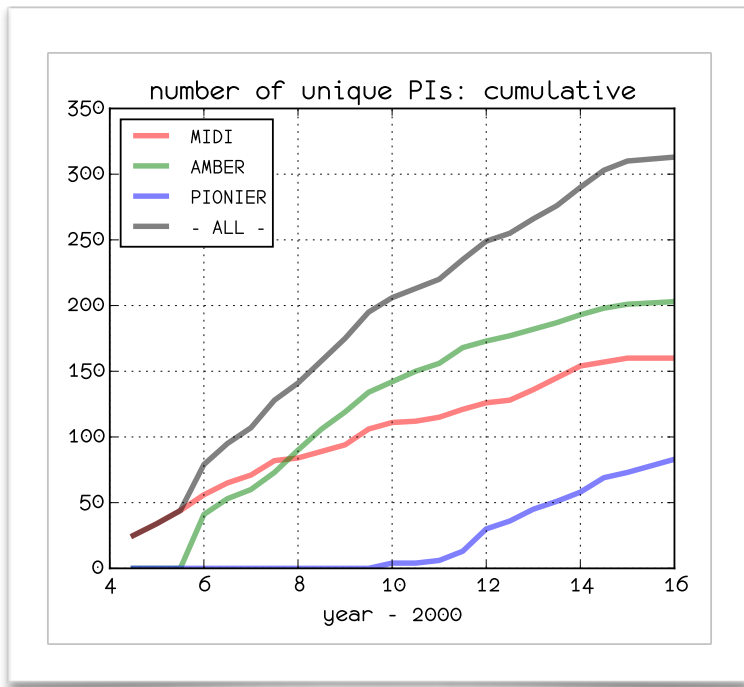


Stan Stefl (ESO)



Olivier Chesneau (OCA)





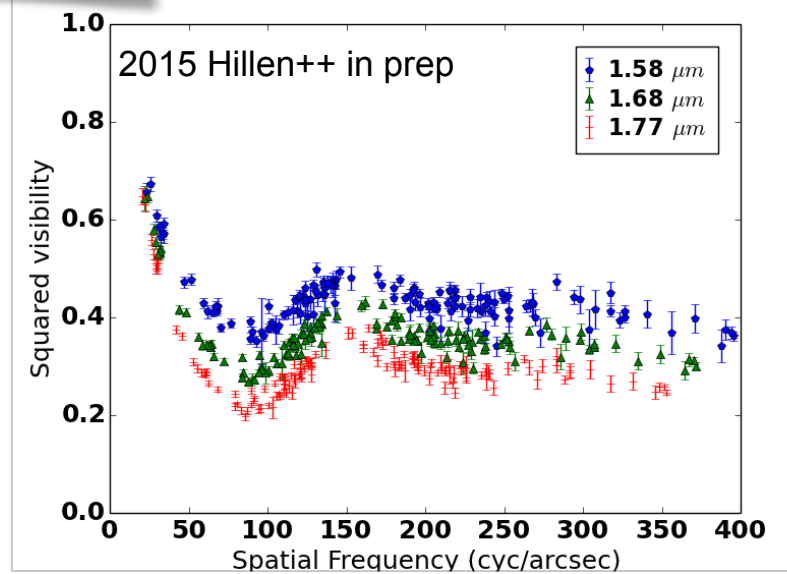
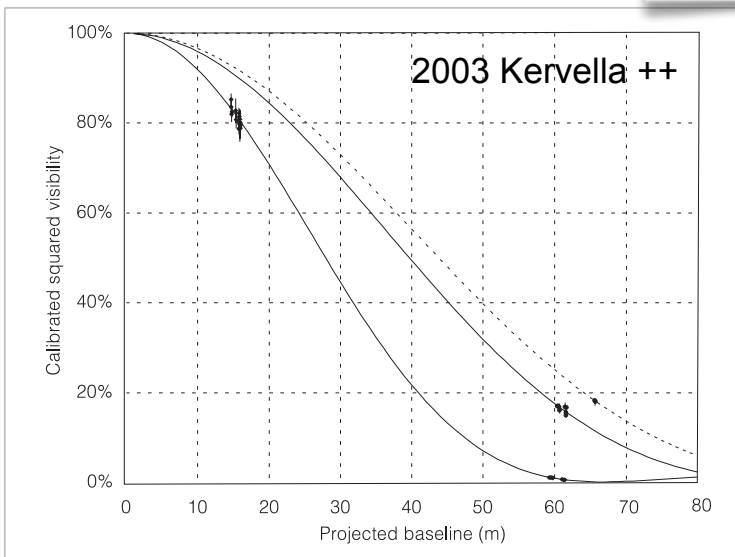
HIGHLIGHTS SINCE LAST VLT COMMUNITY DAYS

The VLTI went from snapshot to imaging

SNAPSHOT



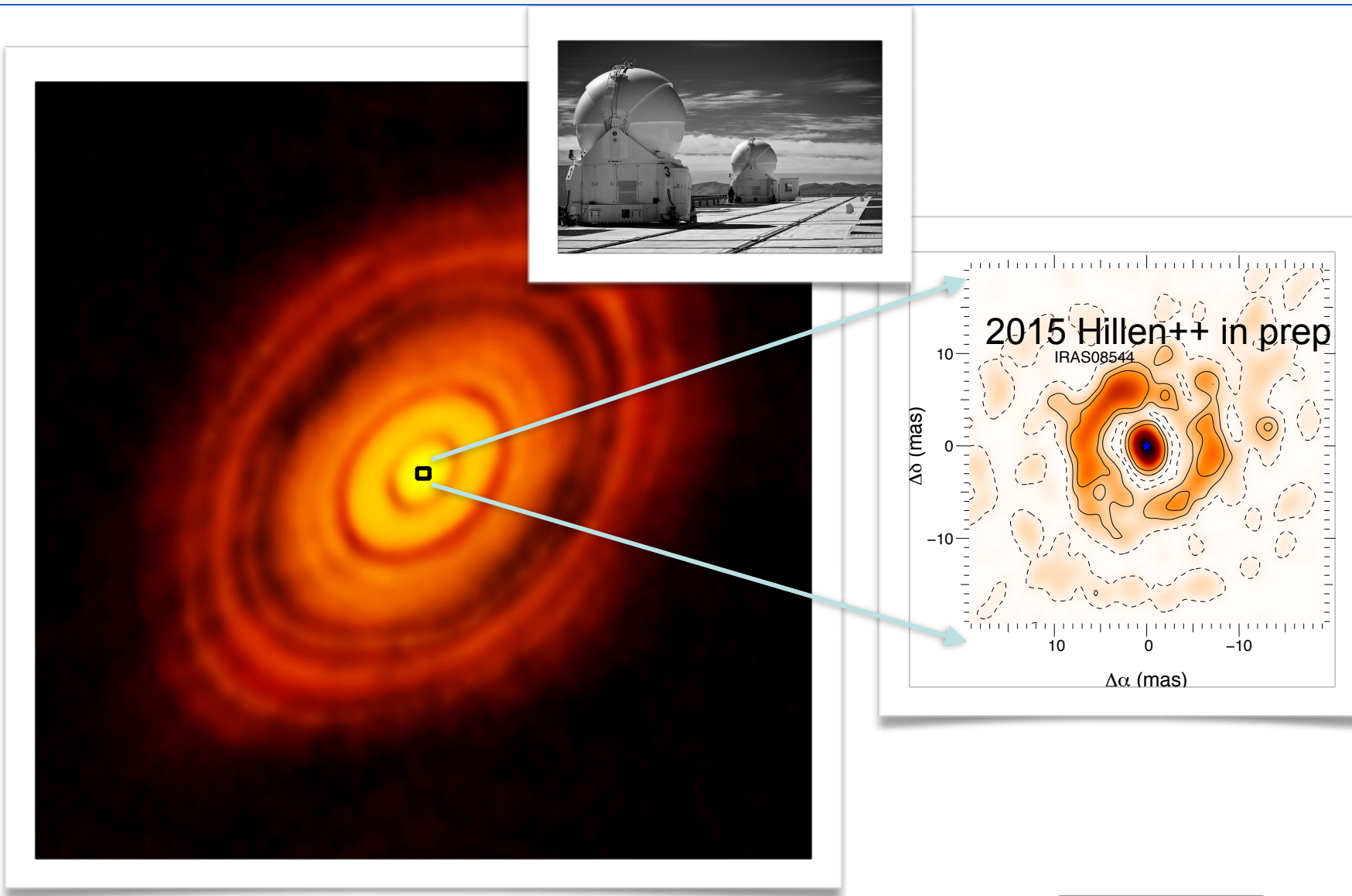
IMAGING



BUT ... uv coverage still a limitation

Highlights

The VLTI went from snapshot to imaging

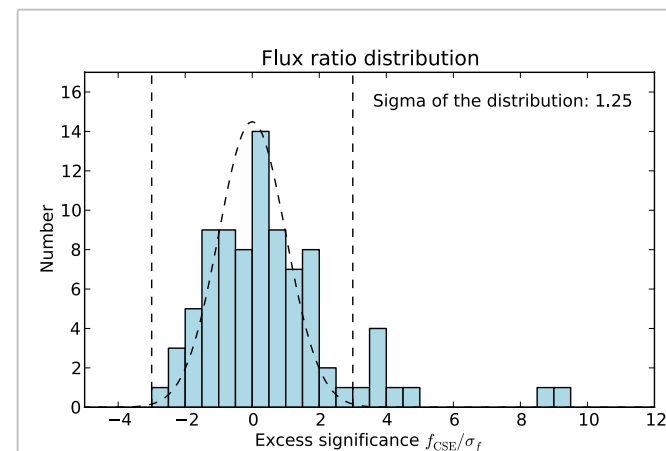
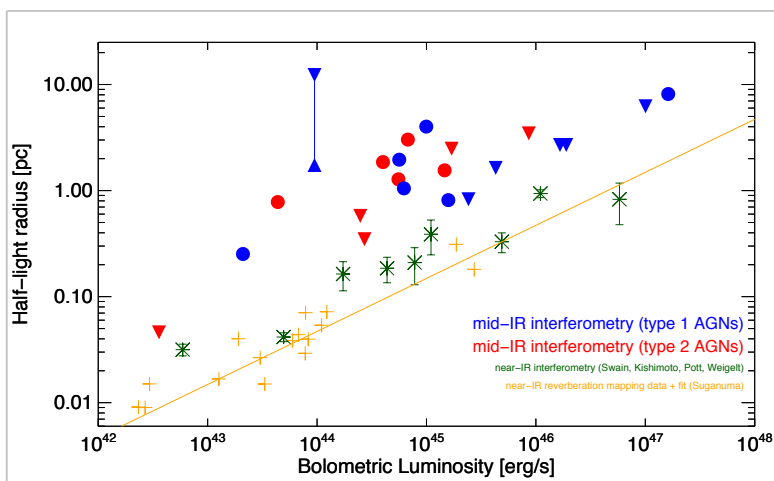


CAUTION: not the same object Highlights

Highlights: science

Efficiency: First surveys with $N > 100$ objects

Ertel et al. 2014, Sana et al. 2014



Grenoble January 2014

Sensitivity in the absence of phasing

First AGN, Herbig AeBe & T

Tauri surveys

Burtscher et al. 2014, Anthonioz et al. 2015, Menu et al. 2015

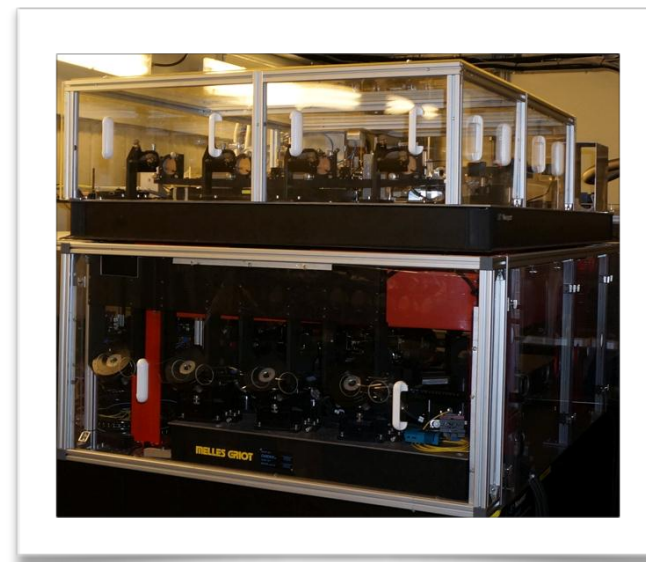
Highlights

Highlights: the VLTI project



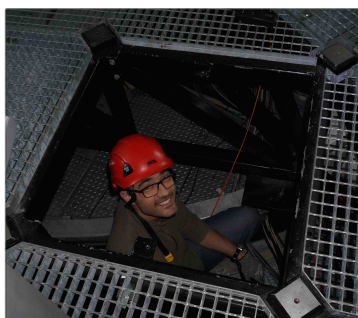
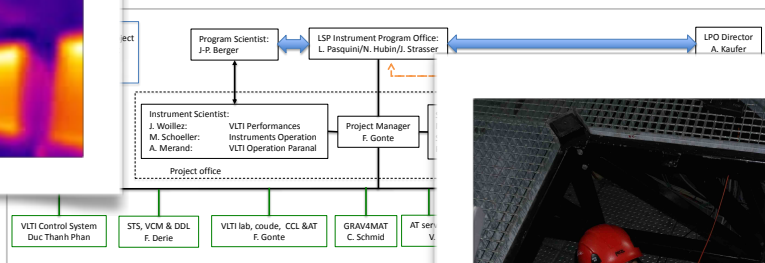
PRIMA was discontinued

PIONIER is fully operated by ESO
+ data reduced by PI (Lebouquin)



VLTI infrastructure project was
created (F. Gonté PM)

Highlights

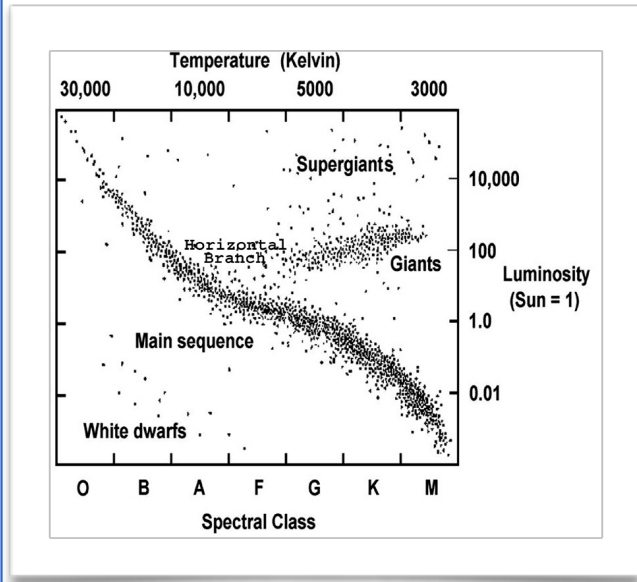




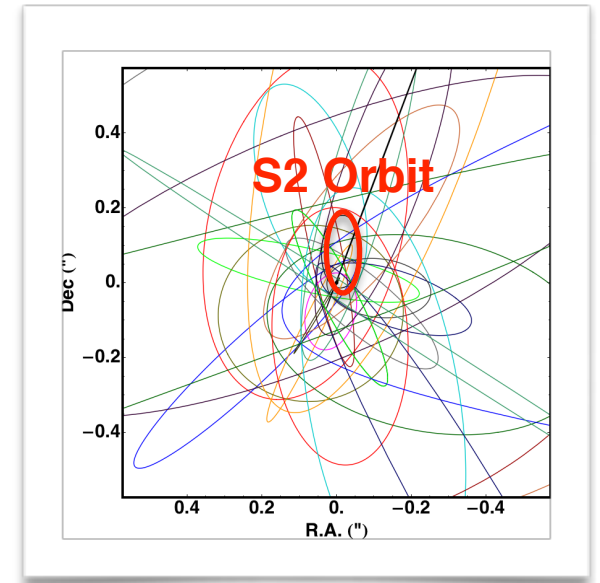
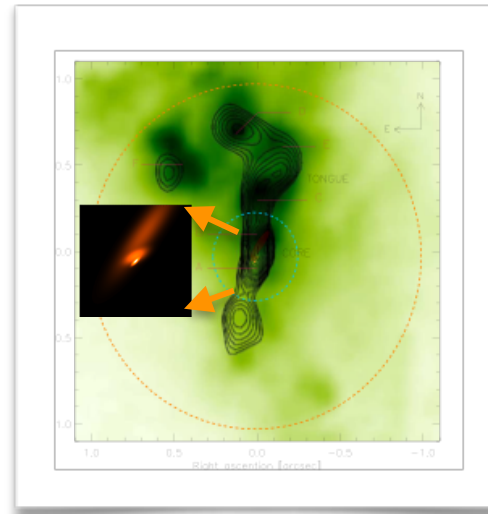
CHALLENGES FOR THE DECADE

The scientific ambition is multiple

Understand the structure of AGN nuclei



Understand how stars evolve and interact with their environment

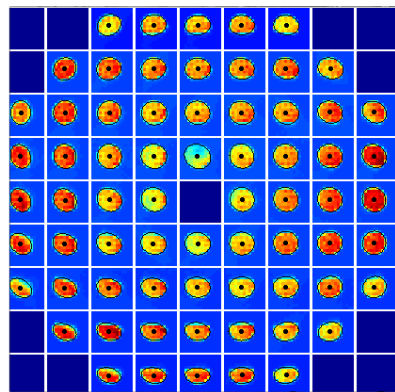
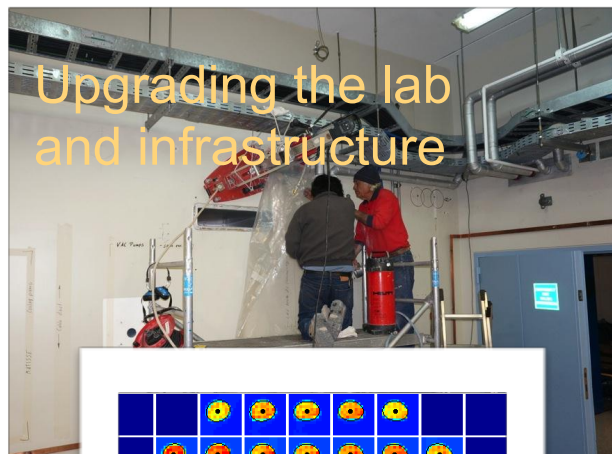
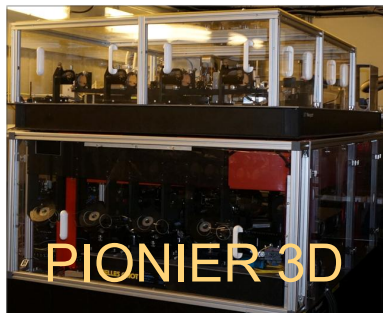


Understand GRAVITY

Combination of surveys, detailed imaging & astrometric campaigns

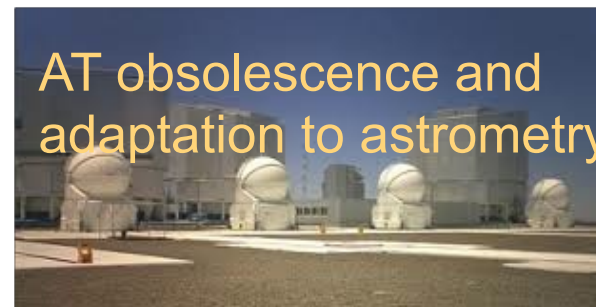
Challenges for the decade

Upgrade the infrastructure

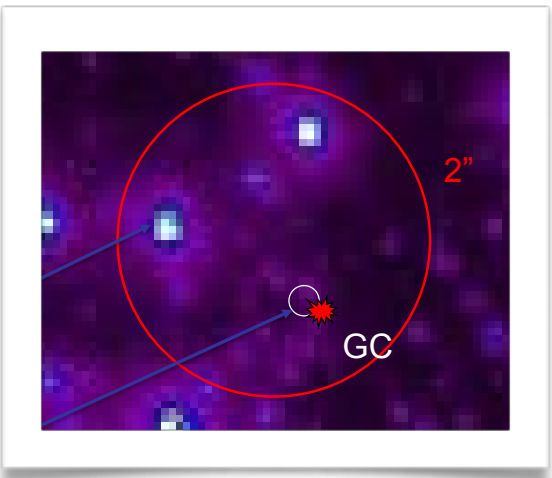


Contribution to CIAO

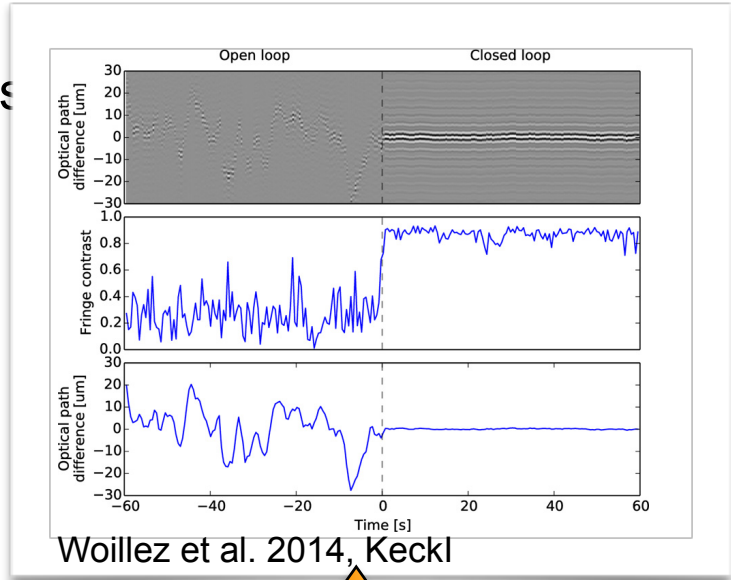
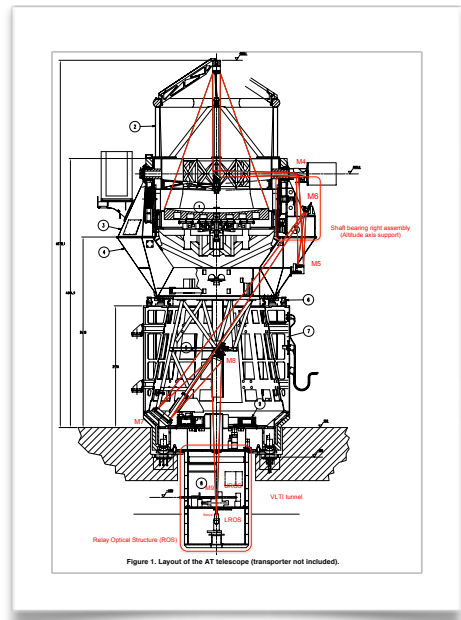
MIDI decommissioning



Challenges for the infrastructure



NAOMI: Adaptive optics
for the VLTI
PDR review May 21st



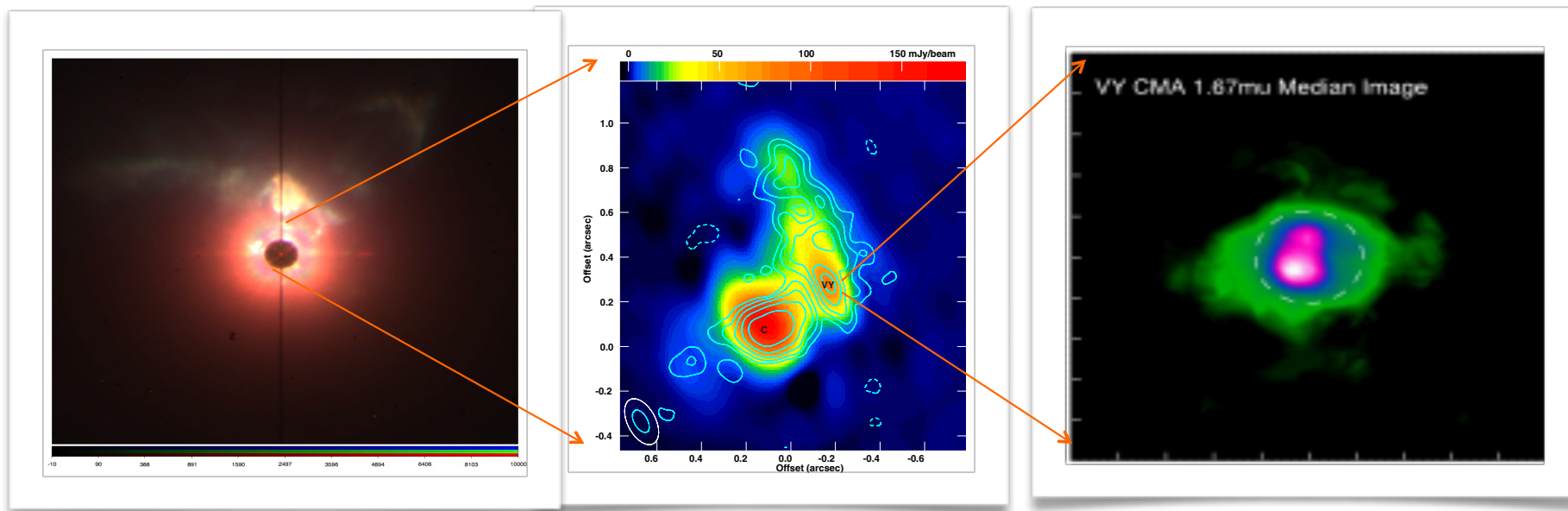
ENABLE Astrometry/ Phase
referencing
Gravity

PHASING the array:
GRAVITY for MATISSE phase
the array
Phase A June 29th

Challenges for the decade

Expand the user base and join synergies

Develop VLTI expertise centers: Provide VLTI users with support in preparing their proposals, reducing their data and reconstructing images



SPHERE

ALMA

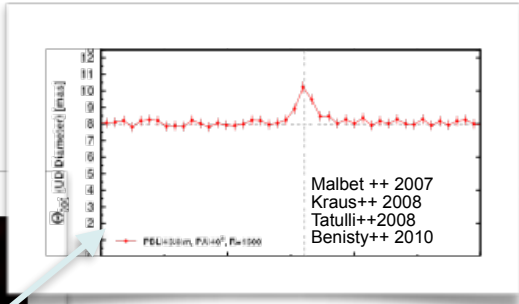
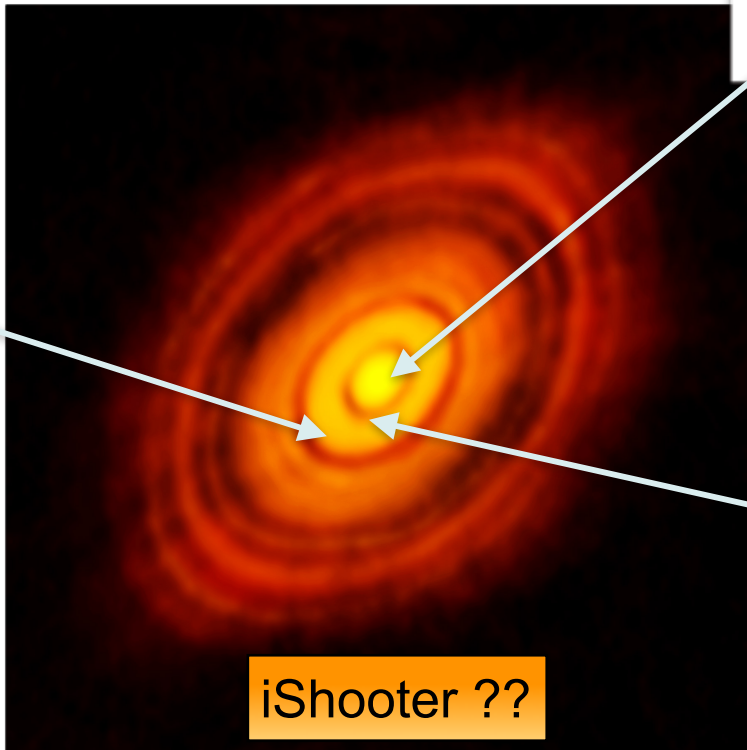
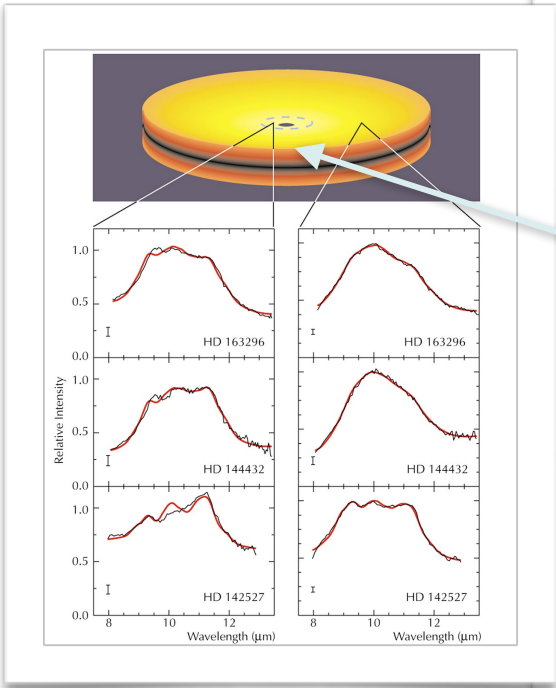
PIONIER

Challenges for the decade

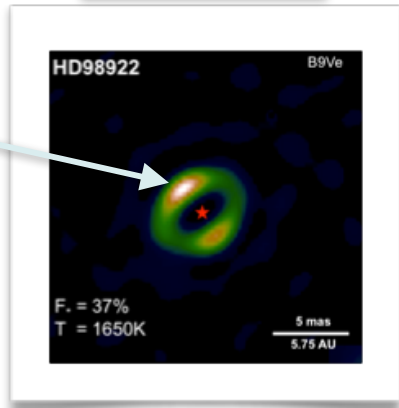
Couple imaging and spectroscopy and use **simultaneously** the VLT instruments

GRAVITY

Leinert ++ 2004
Van Boekel ++ 2003



PIONIER



MATISSE

Challenges for the decade

Timeline

- 2015-2020:
 - Finish the infrastructure upgrade (->2019)
 - Make GRAVITY (offered october 2016?) and MATISSE (offered october 2017) a success
 - Establish expertise center(s)
- 2015-2016: A roadmap for VLTI



THE ROAD TO A POST MATISSE/GRAVITY ROADMAP

Goal of the roadmap

- Establish the scientific pertinence of VLTI in the “ELT era”
- Identify key scientific areas where VLTI is unique
- Single area killing case vs. workhorse
- Identify key scientific areas where VLTI can act in synergy with other facilities (e.g PLATO)
- Define an instrumental/infrastructure roadmap to reach this goal (technological readiness)

Steps

- Epoch 1: Make GRAVITY & MATISSE a success
- Epoch 2: Third generation instrument(s) with limited infrastructure upgrade
- Epoch 3: Infrastructure upgrade



Key areas of scientific strength for VLT

AREAS of strength

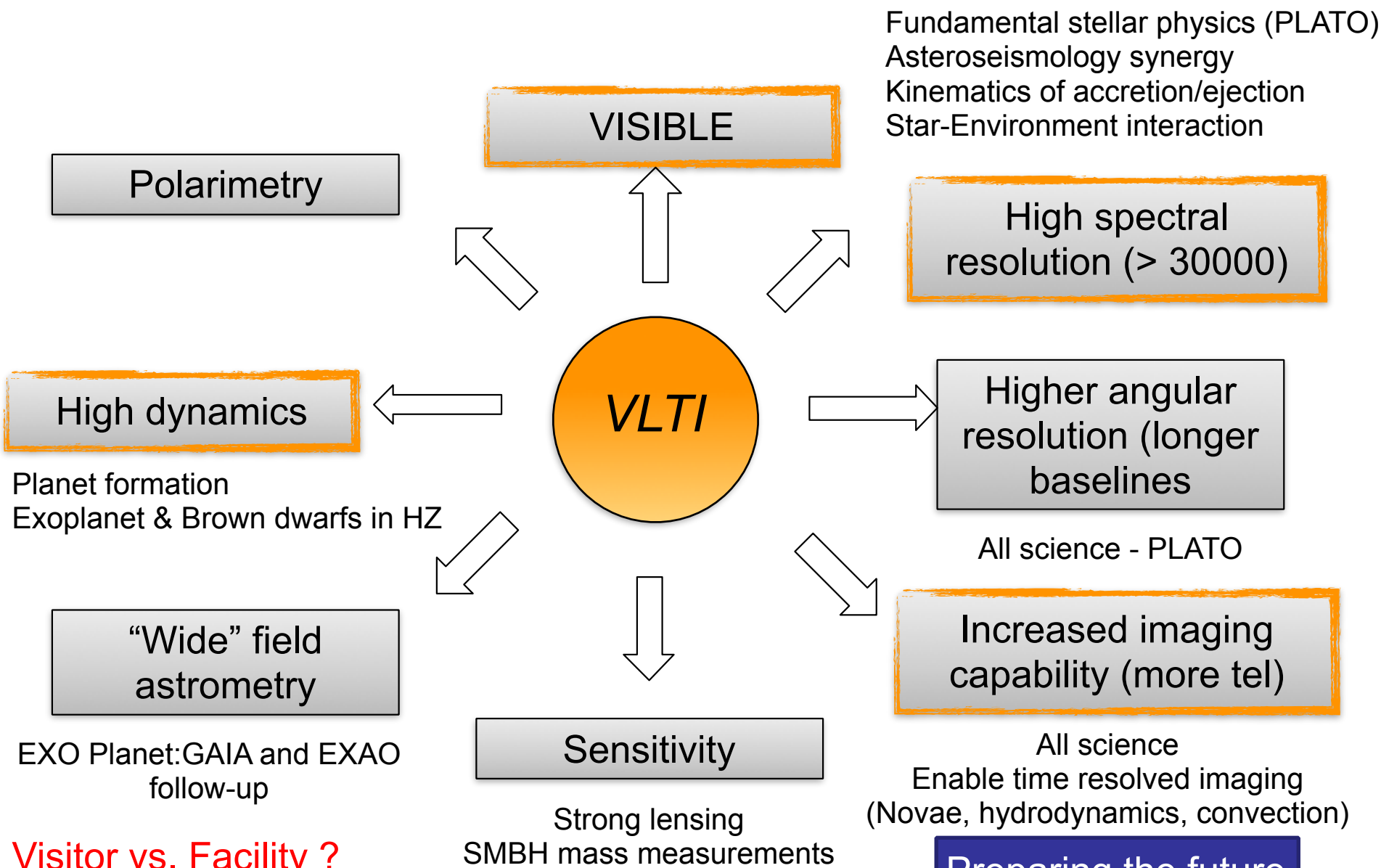
- Fundamental stellar physics including rotation, pulsation ...
- How do stars and planetary systems form?
- How do stars enrich galaxies?
- How do massive stars form and interact with their environment?
- How do SN progenitors work?
- Binaries from birth to death.
- Do we understand SMBH interaction with host galaxy
- The galactic center

Global approach
vs single object
approach

AREAS to investigate

- Improvement of the cosmological distance scale;
- Ground based astrometric follow-up of exoplanet detections (post-GAIA);
- Characterisation of host stars in the context of exoplanet and asteroseismology transit missions (e.g PLATO);
- Constraints on strong lensing.
- Microlensing

Establish the instrumental roadmap



Visitor vs. Facility ?

Preparing the future

Roadmap work structuration

