Hunting the early signs of planet formation with PIONER/VLTi

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Young stellar objects

- Stars surrounded by protoplanetary disk
- Inner parts:
  - accretion
  - ejection (jets, winds)
  - planetary formation
  - dust sublimation
  - inner gaseous disk
- Need for high angular resolution

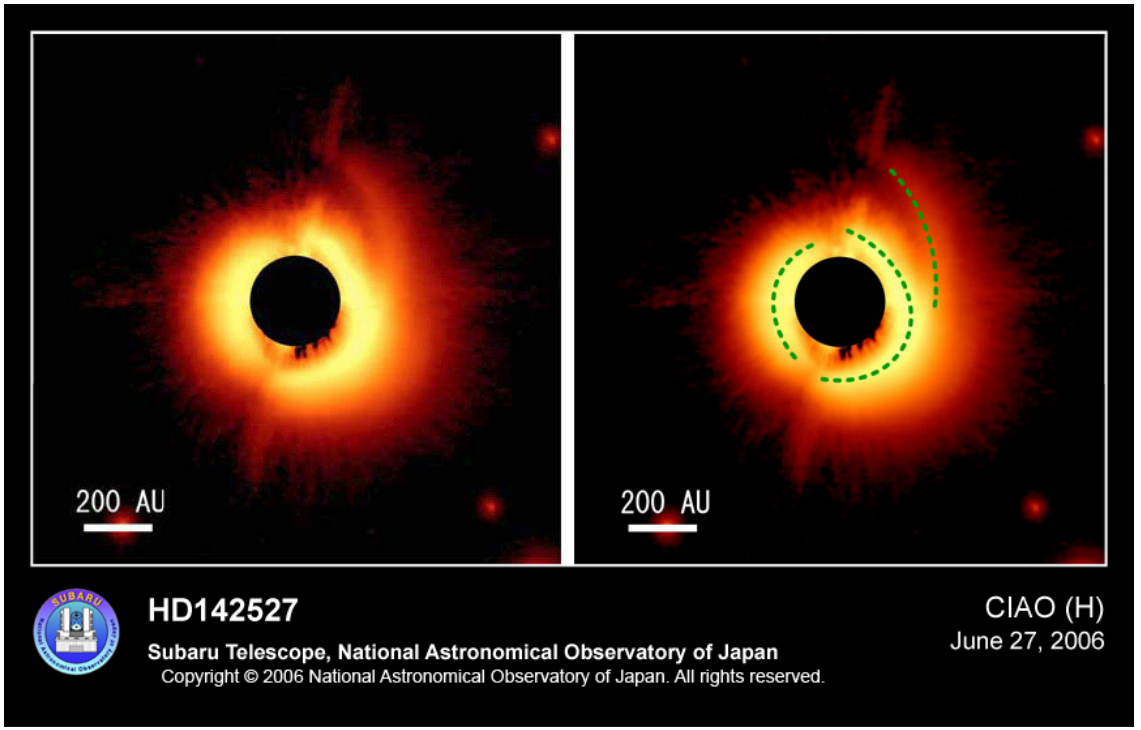

Figure 1 : HD 142527 image from Subaru Telescope

Signs of planet formation

- Dust trapping vortex
- Spiral density waves

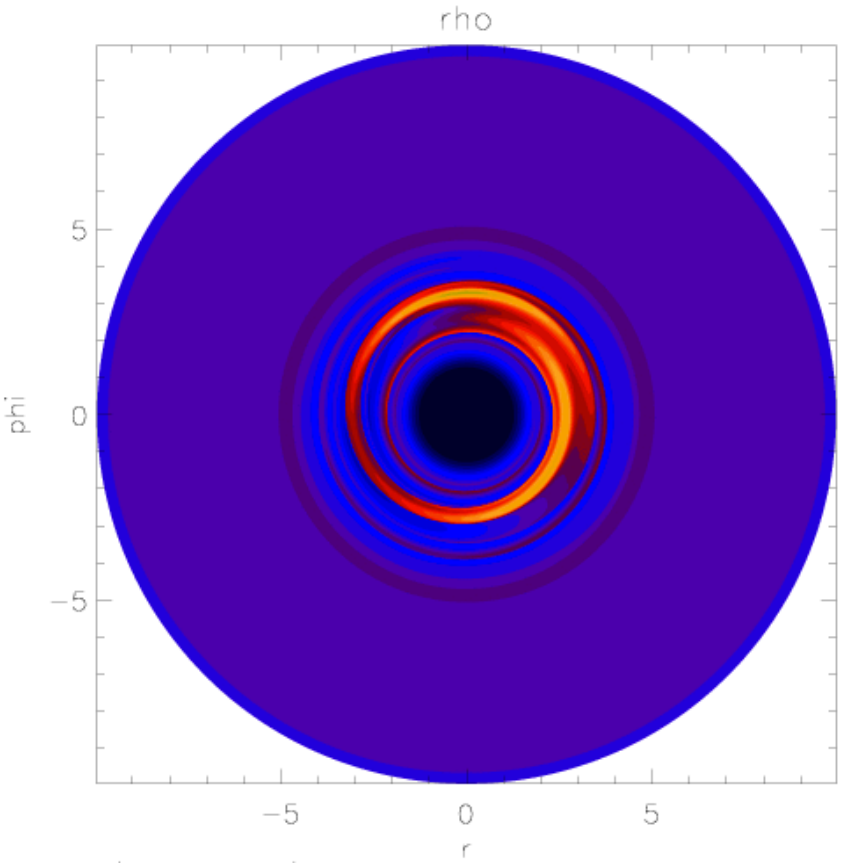

Figure 2 : Density plot (Meheut et. al. 2010)

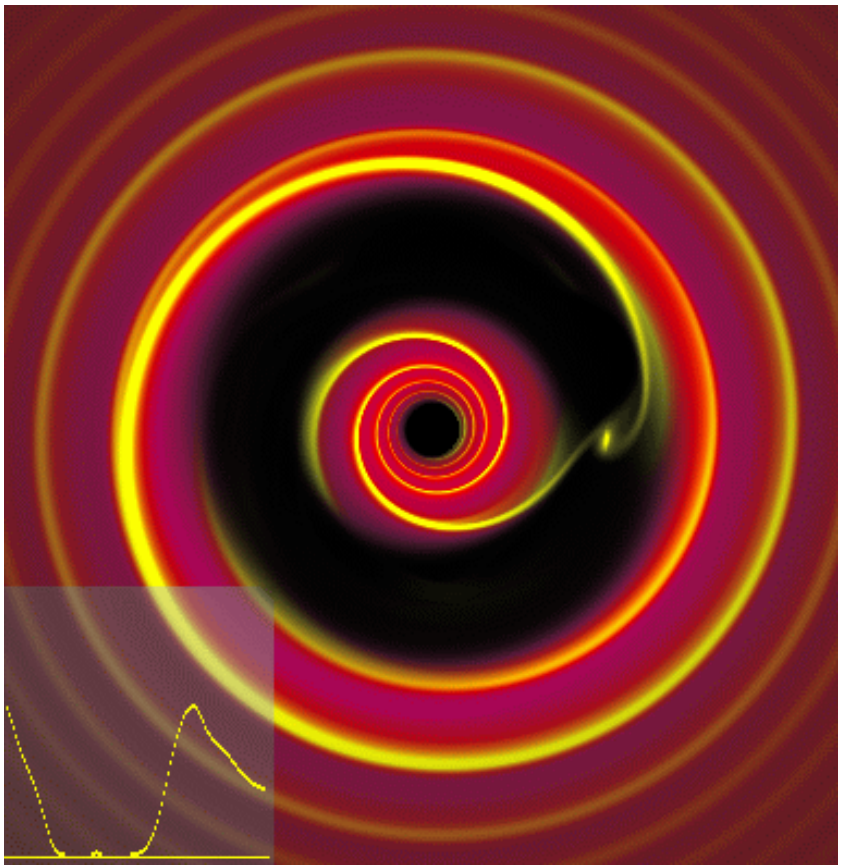

Figure 3 : Density plot (Armitage & Rice 2005)

High angular resolution

- Herbig Ae/Be stars
  (bright and resolved enough)
- Derive main disks characteristics
  - radius
  - inclination
  - position angle
  - temperature
- Inhomogeneities
  - monitor
  - discover

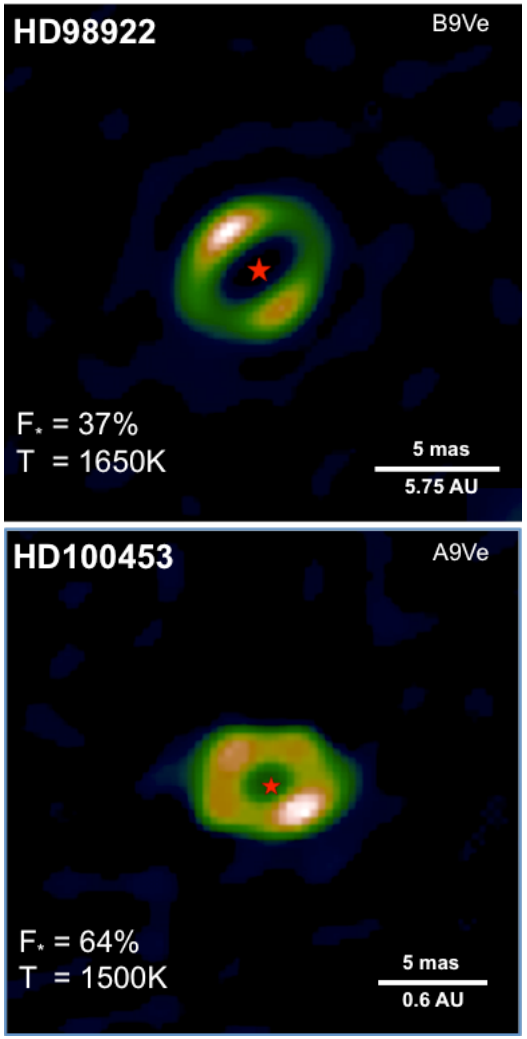

Figure 4 : Reconstructed images of Herbig stars

Observations

PIONIER:

- 4 telescopes
- High sensitivity (H>8)
- ATs: 3 baseline configurations
- H band: small spectral dispersion (3 channels)

Imaging:

- 10 targets
- CAL-SCI-CAL sequence $\rightarrow$ 30 minutes
- 3pts on small configuration $\rightarrow$ 2n
- 4pts on intermediate and long configurations $\rightarrow 2\times 3n$