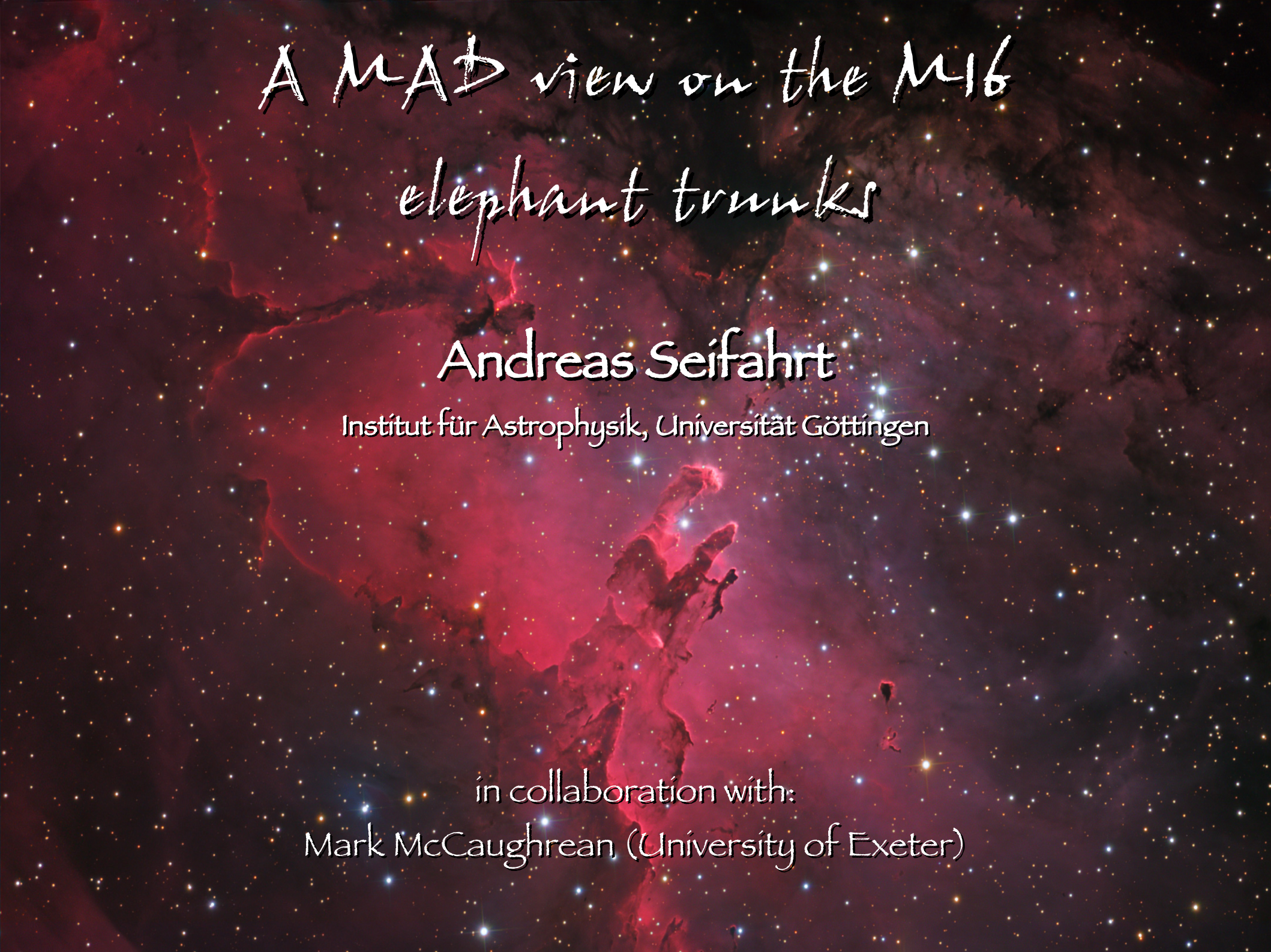


A MAD view on the M16 elephant trunks

Andreas Seifahrt

Institut für Astrophysik, Universität Göttingen

in collaboration with:

Mark McCaughrean (University of Exeter)

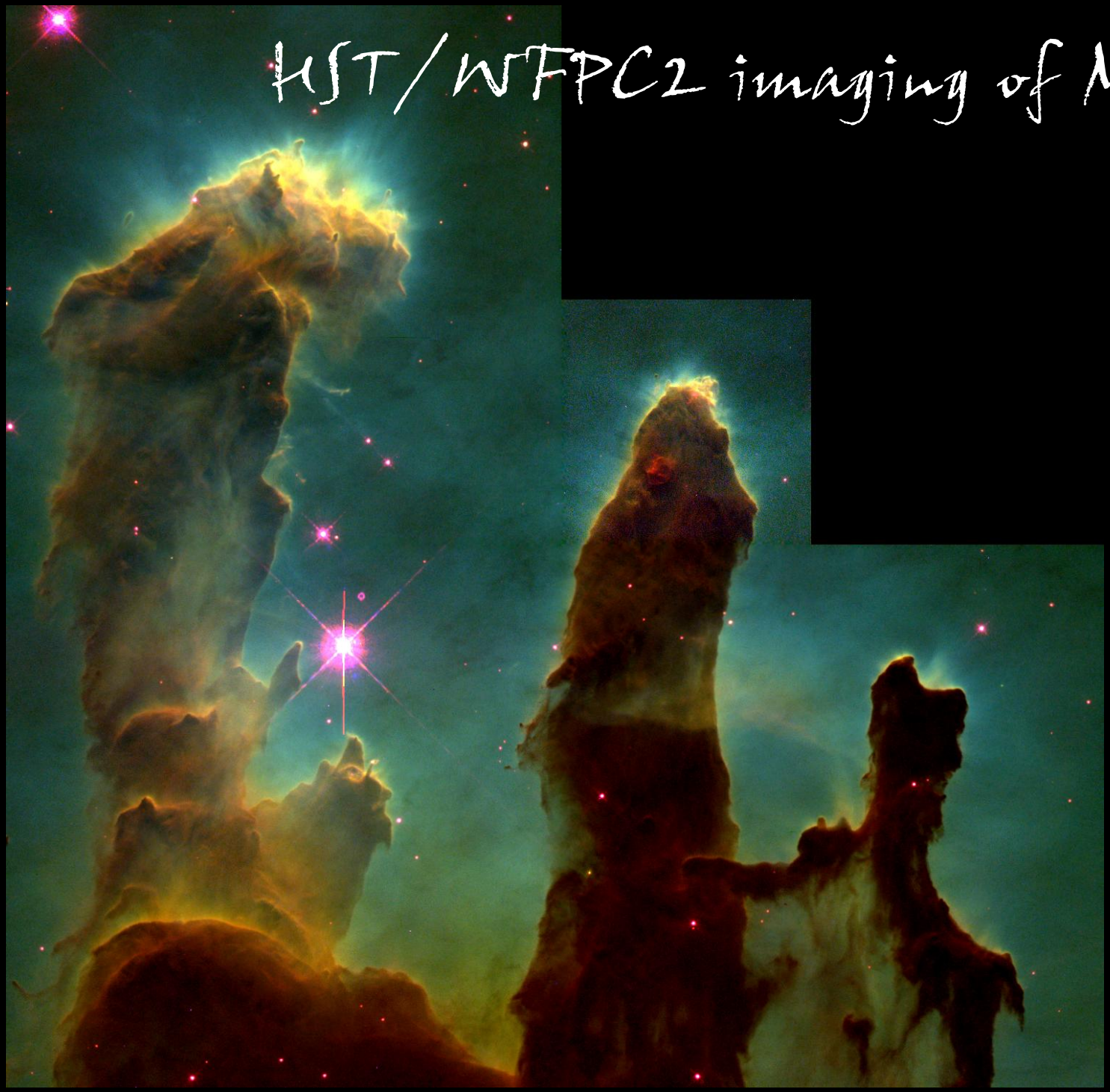
M16 (The Eagle Nebula) & NGC6611

Andreas Seifahrt

A MAD view on the M16 elephant trunks

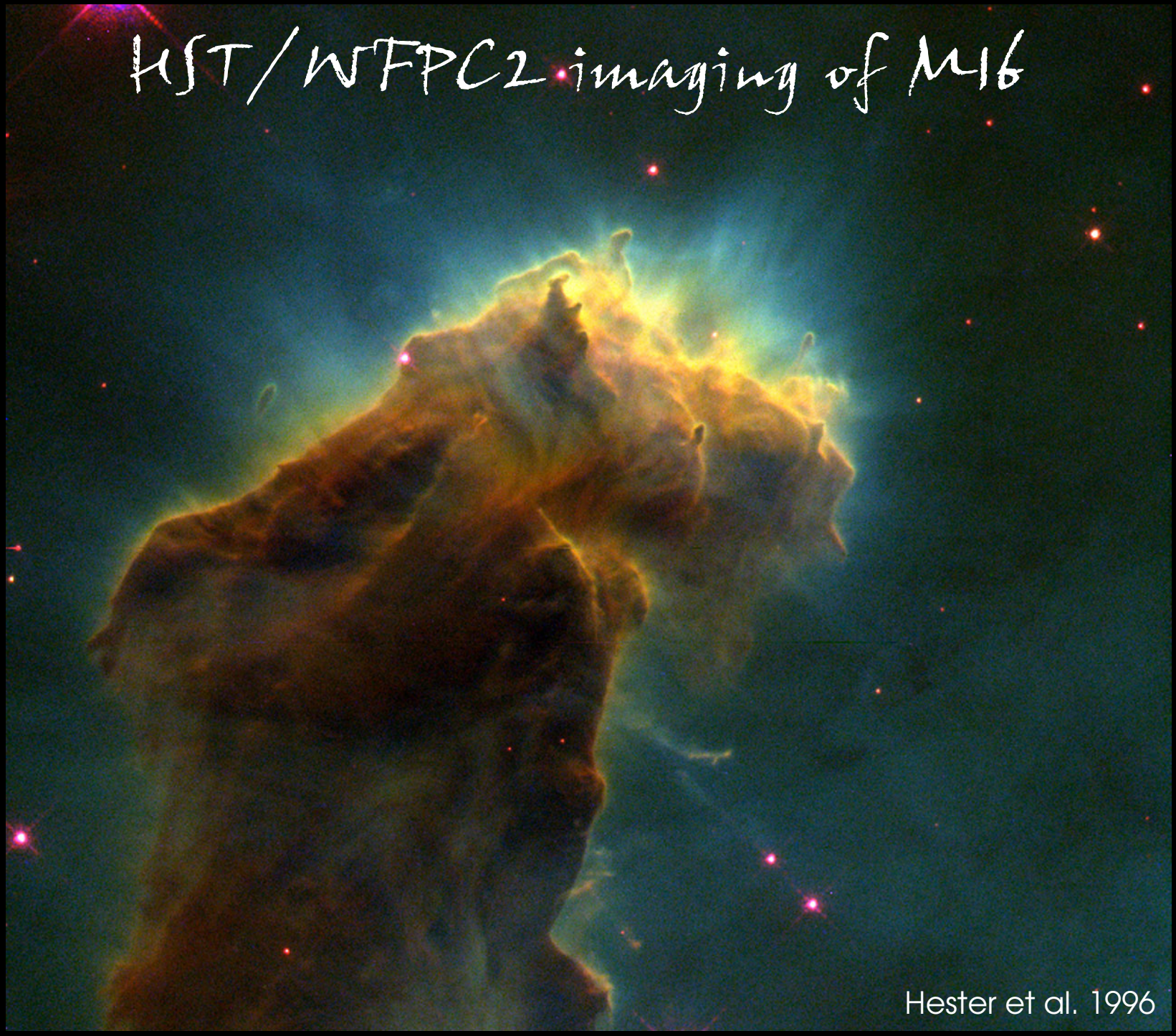
08.06.2009

HST/WFPC2 imaging of M16

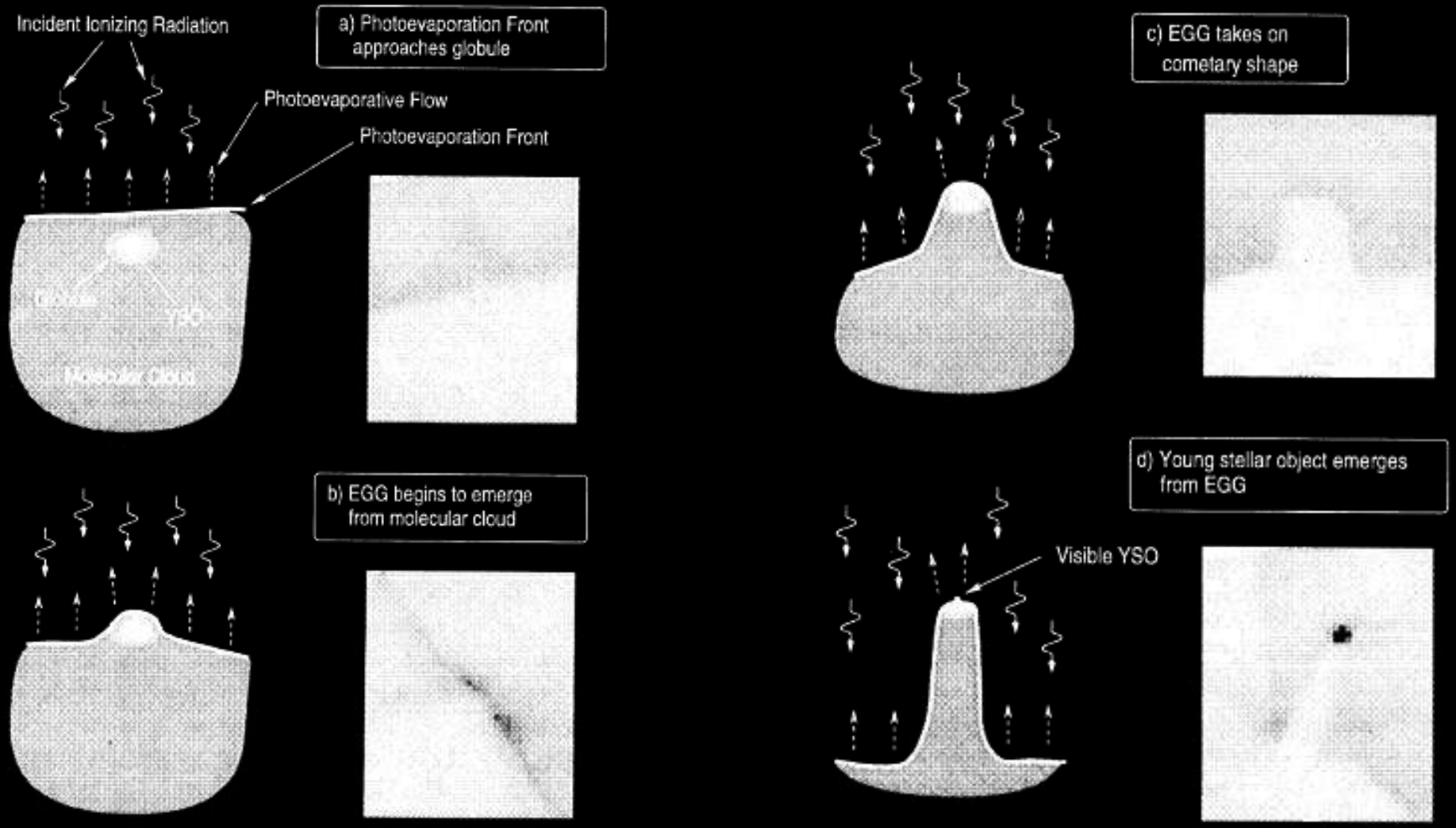


1995: HST/WFPC2 imaging in Hα, O(III), and S(II)

Hester et al. 1996

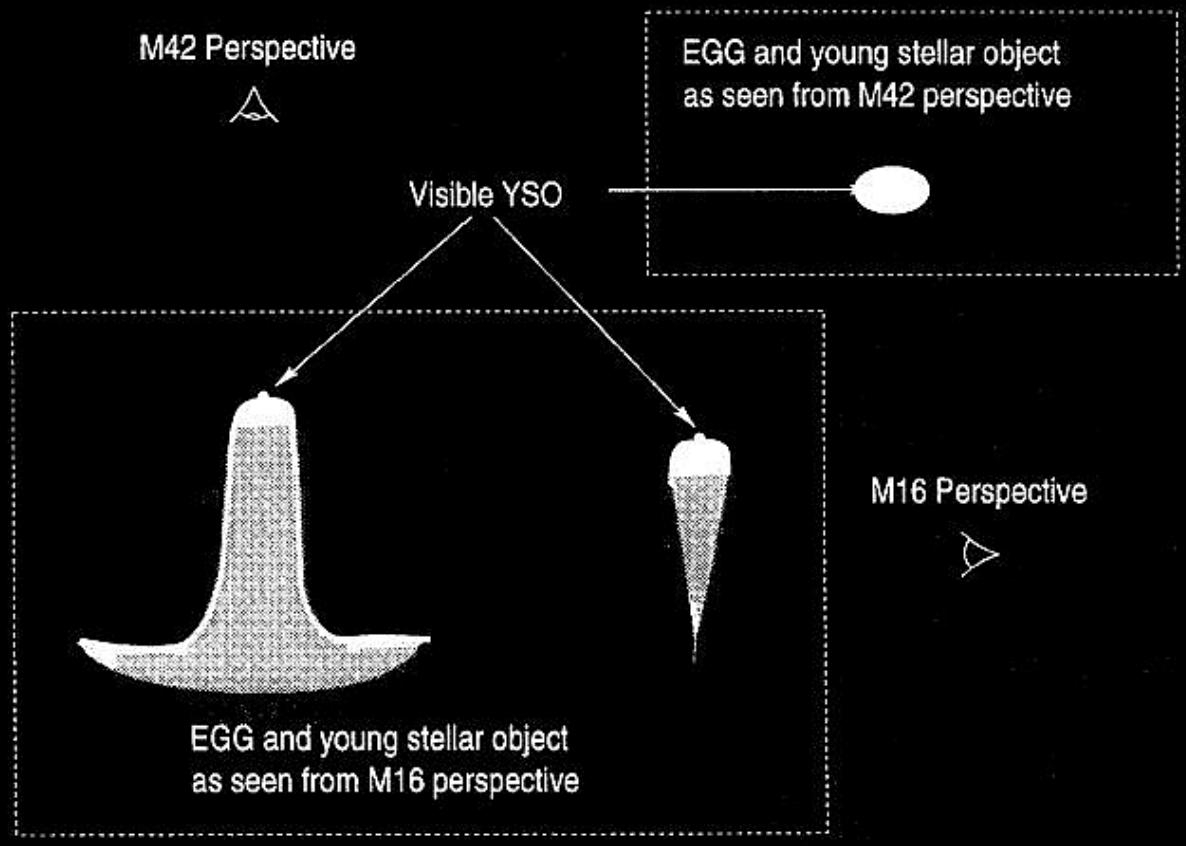

HST/WFPC2 imaging of M16
Hester et al. 1996

HST/WFPC2 imaging of M16



Hester et al. 1996

HST/WFPC2 imaging of M16



Hester et al. 1996

NIR imaging surveys in M16

Current benchmark in coverage, depth, and spatial resolution:

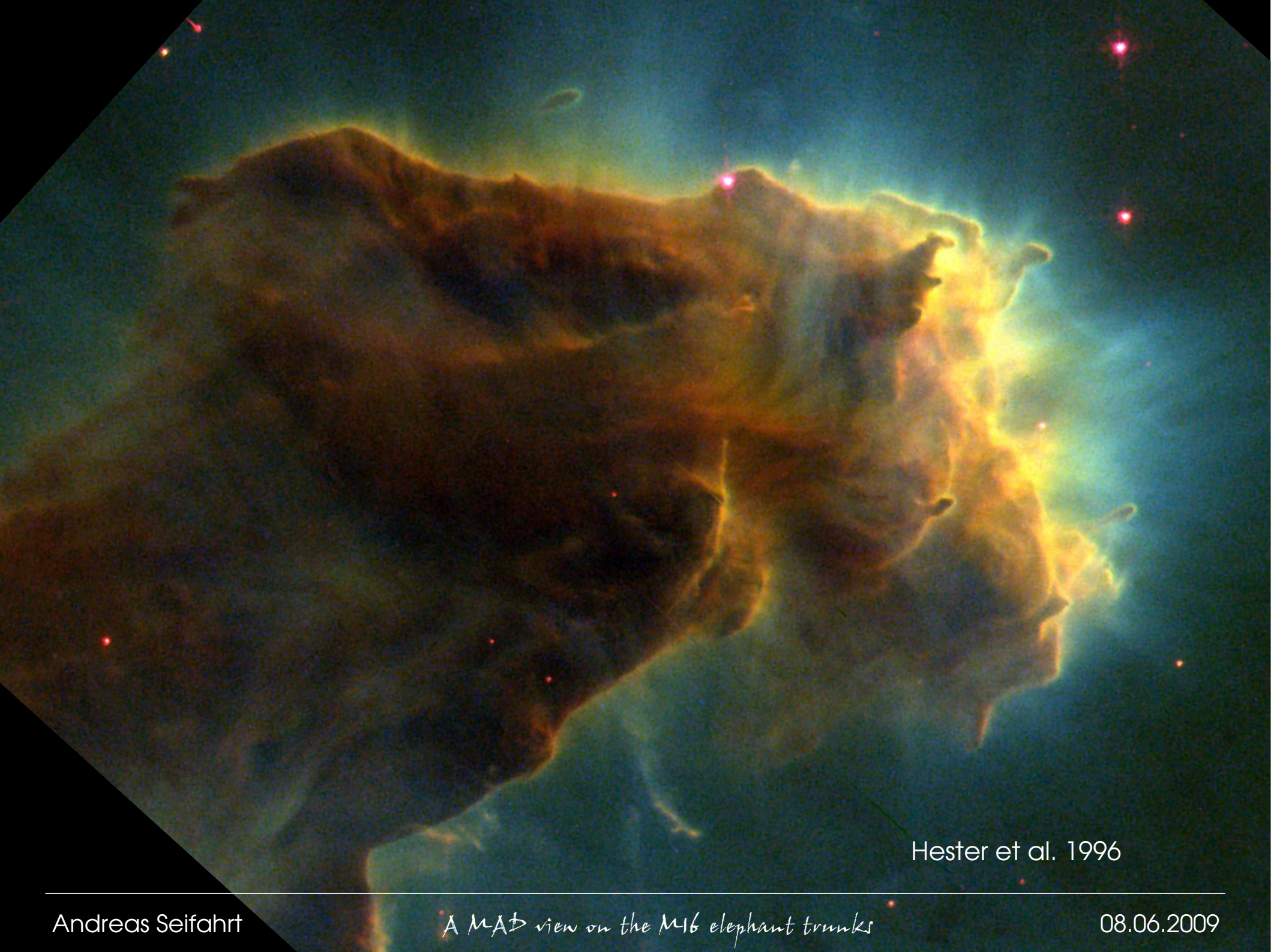
McCaughrean & Andersen 2002

ISAAC JHK mosaics of 9' x 9' FOV
Spatial resolution 0.3″-0.4″ FWHM
Depth (100s integration time) ~ 22.6^{m} – 20.4^{m} (JHK)


McCaughrean & Andersen 2002


McCaughrean & Andersen 2002


McCaughrean & Andersen 2002


Hester et al. 1996

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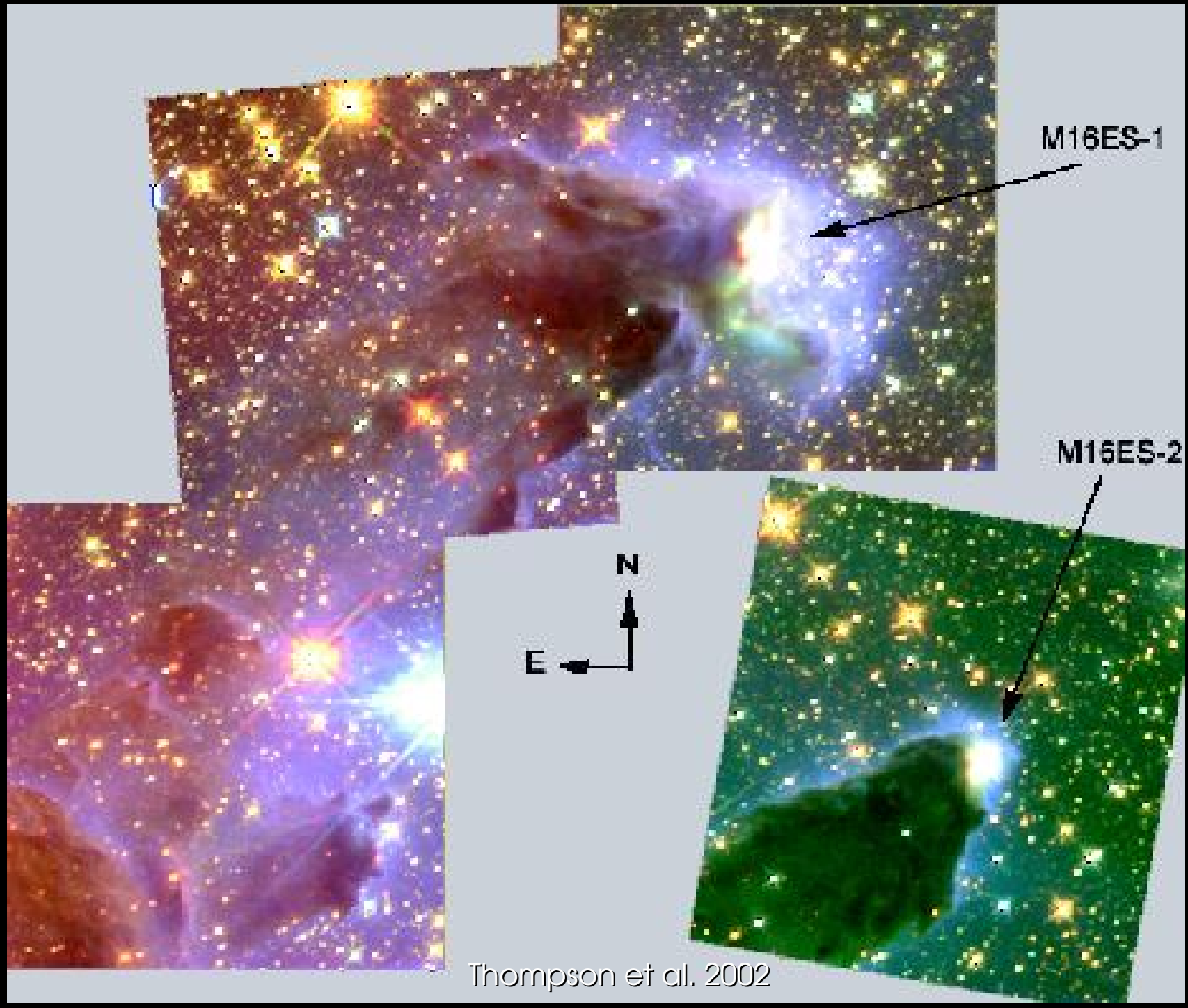
ISAAC JHK mosaics of 9' x 9' FOV
Spatial resolution 0.3″-0.4″ FWHM
Depth (100s integration time) ~ 22.6^{m} – 20.4^{m} (JHK)

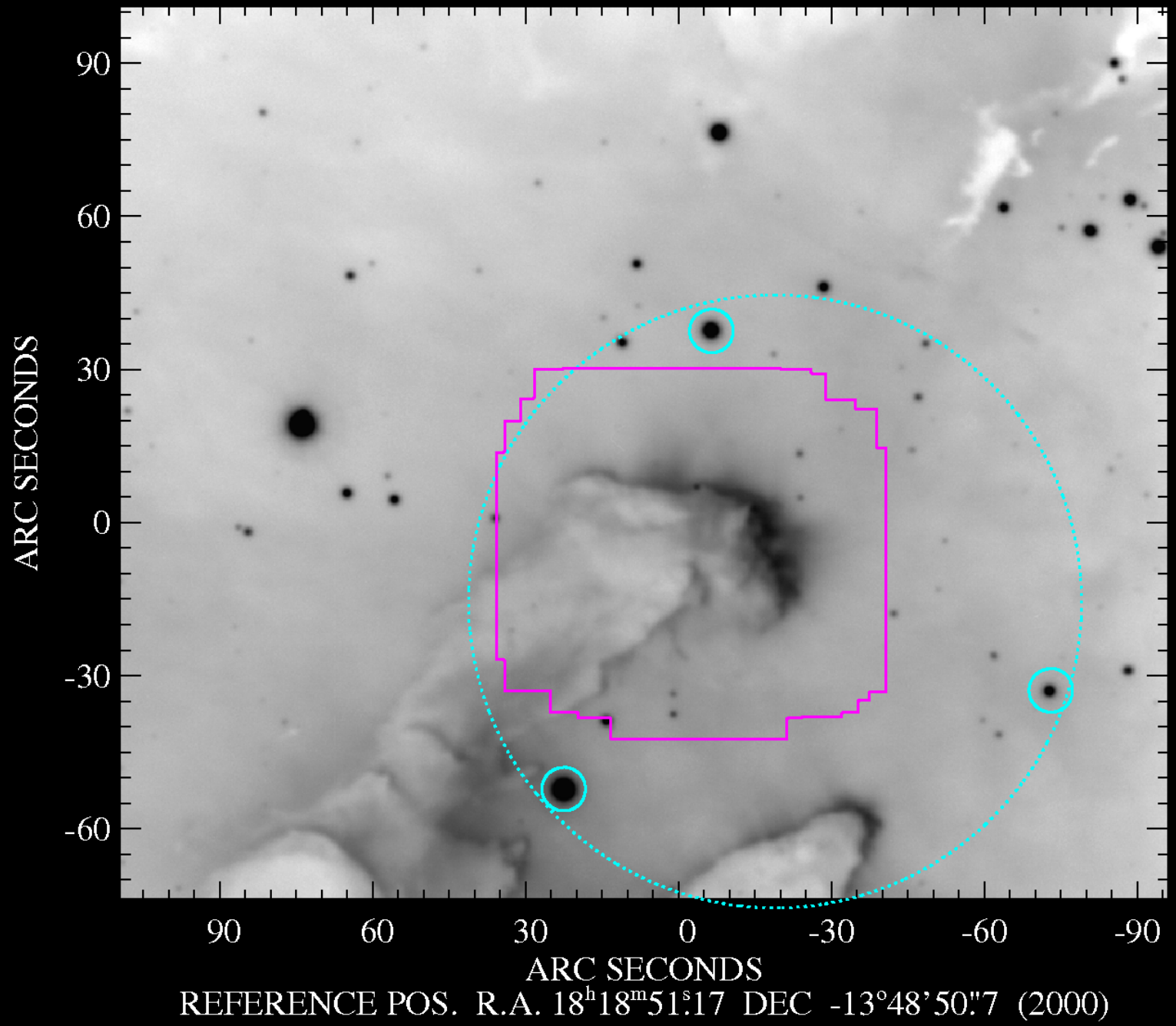
Result:

Only ~10% of all EGGs contain a protostellar source (as seen in JHK)

Problem: Depth and Confusion with background sources

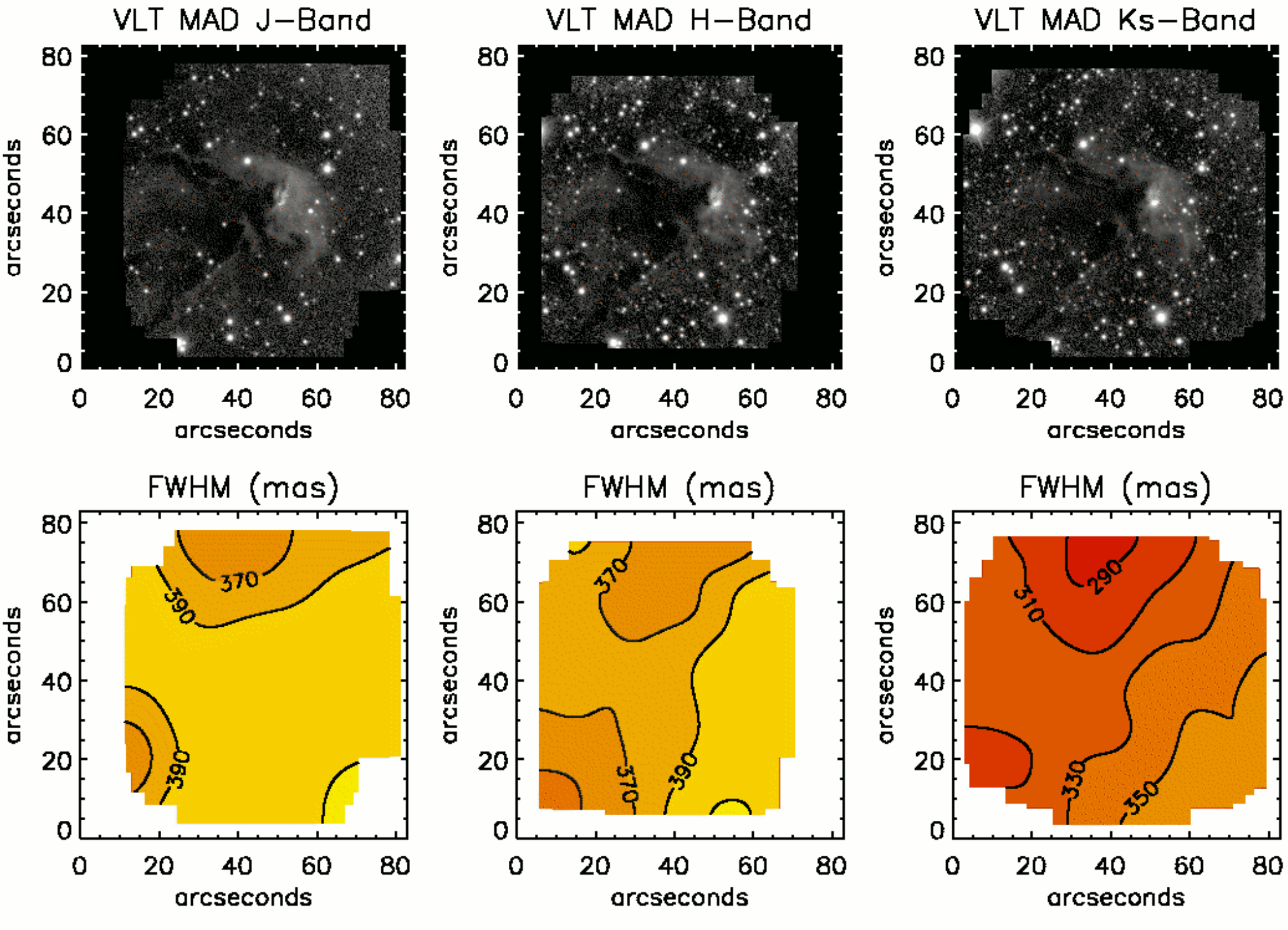


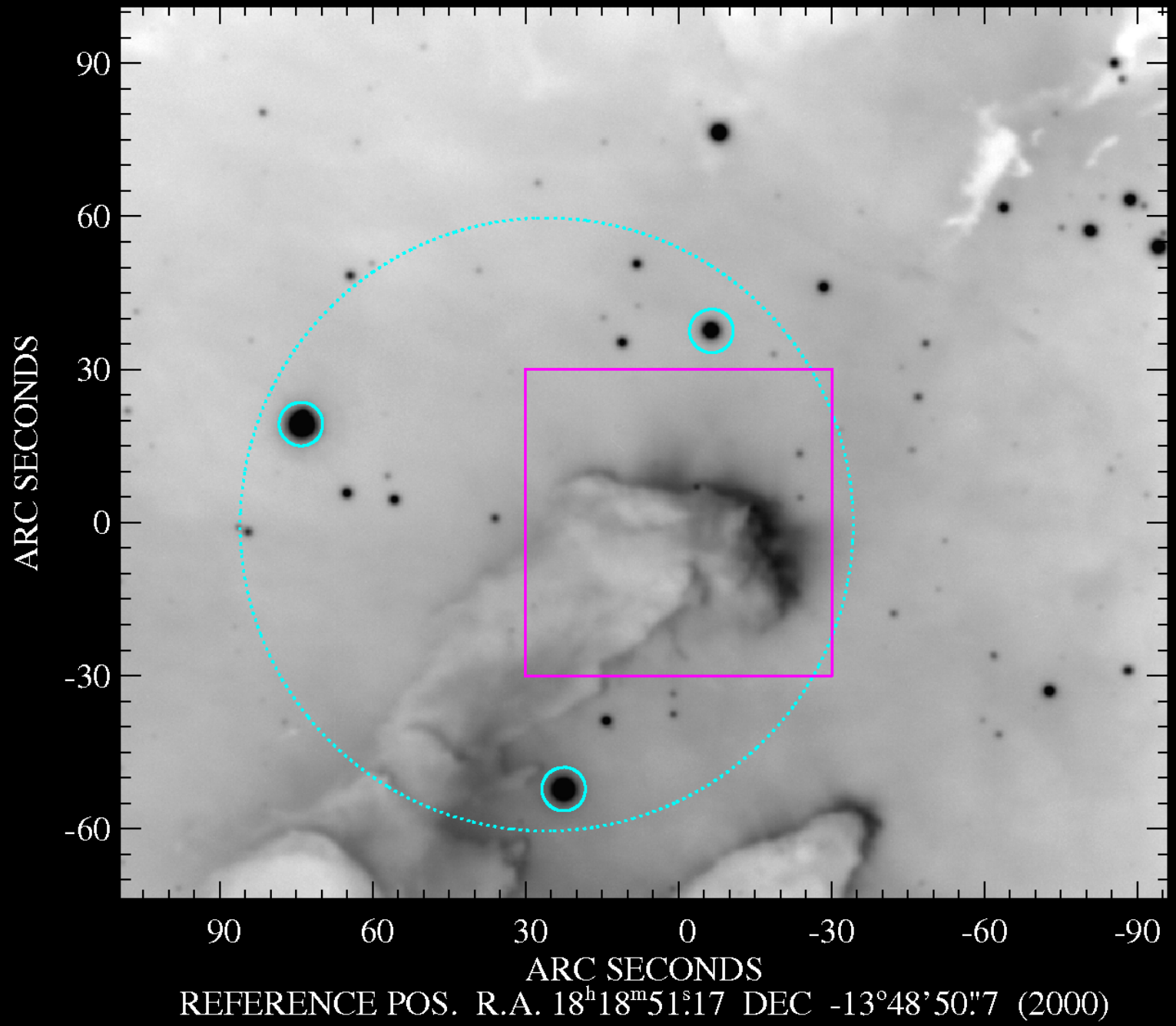
Thompson et al. 2002

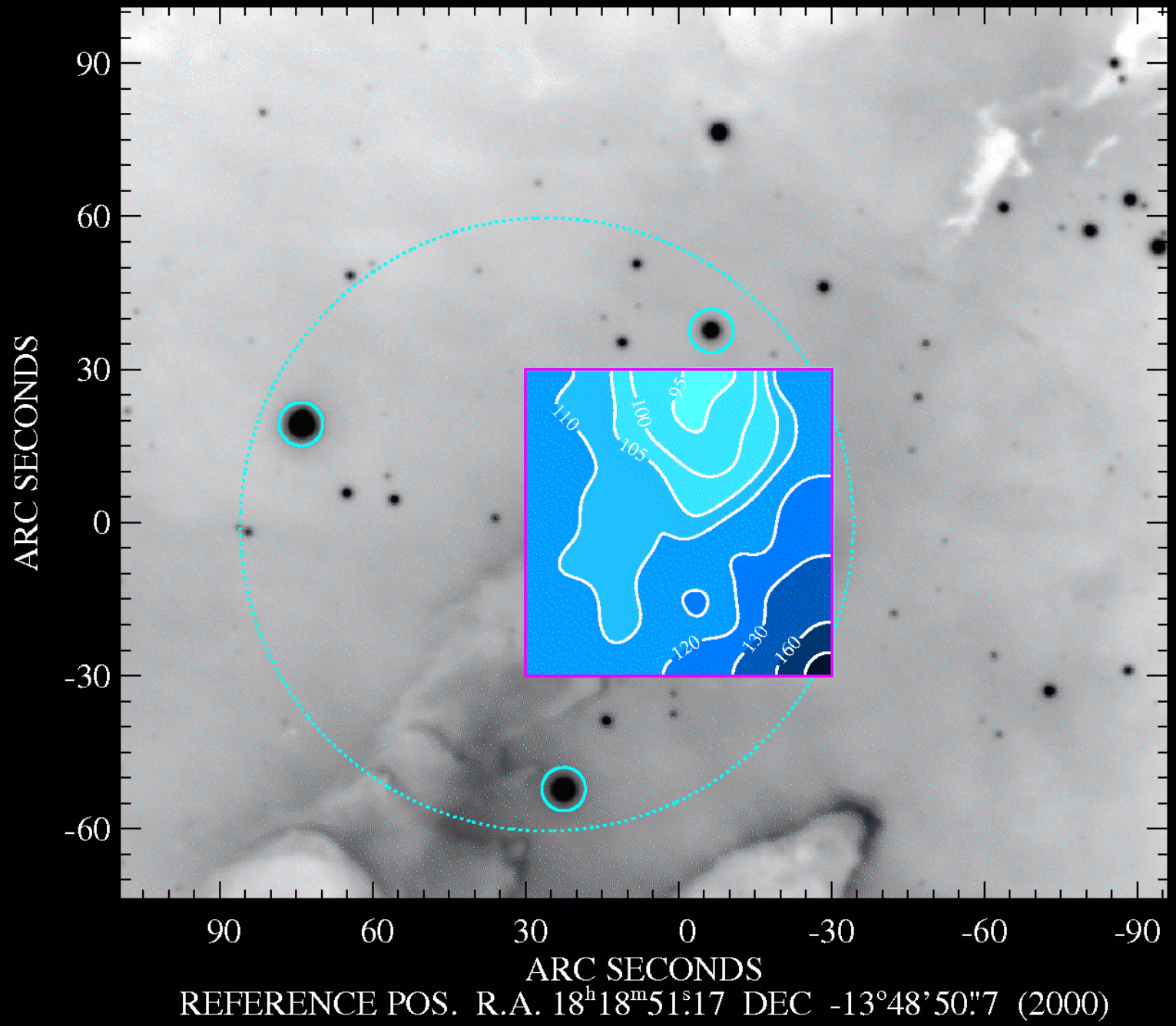

90
60
30
0
-30
-60
ARC SECONDS
90
60
30
0
-30
-60
-90
ARC SECONDS
REFERENCE POS. R.A. 18h18m51s.17 DEC -13°48'50".7 (2000)

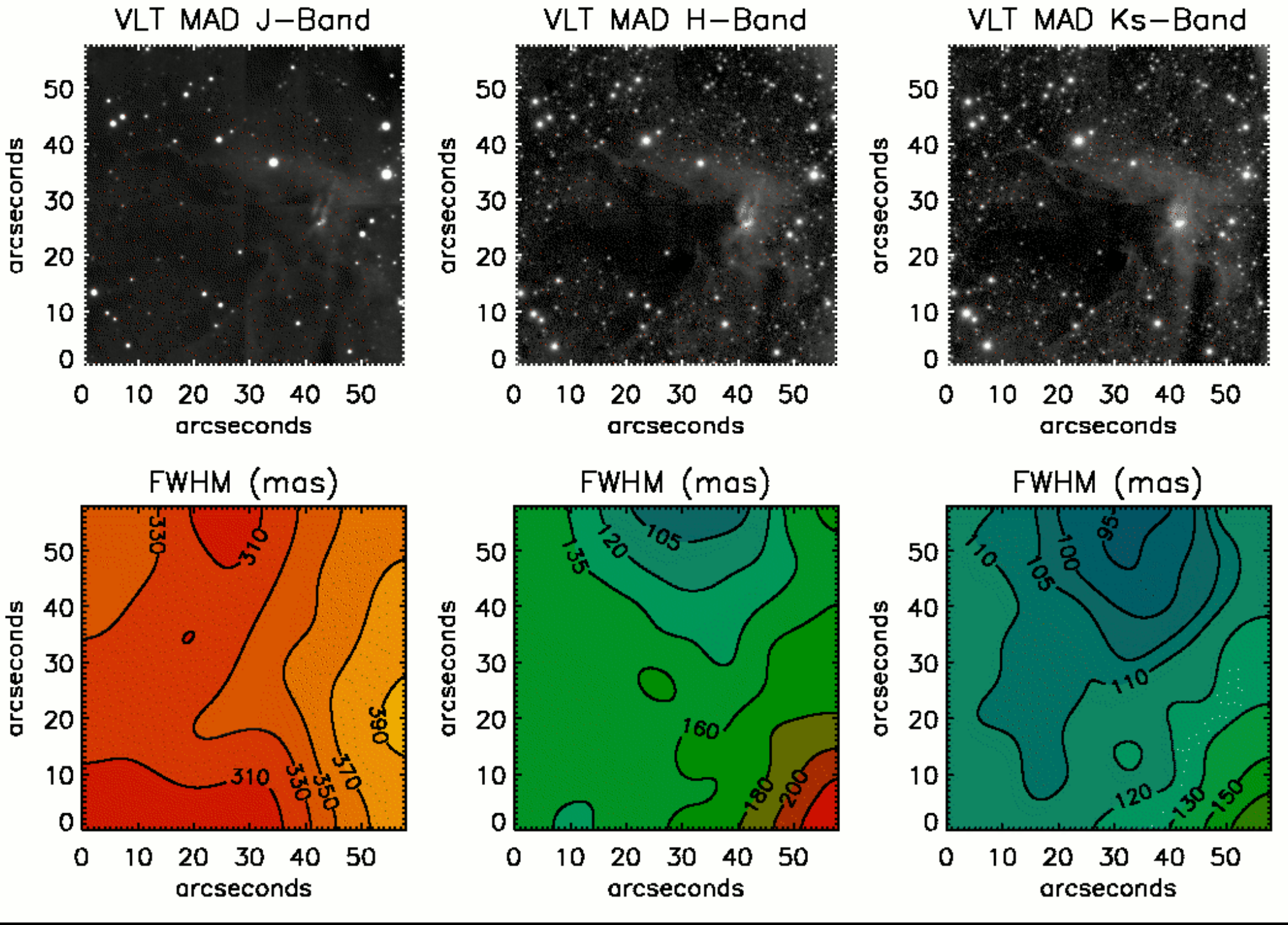

MAD sciene demonstration data
(JHK colour mosaic)


ISAAC JHK colour mosaic
McCaughrean & Andersen 2002


VLT MAD J−Band
VLT MAD H−Band
VLT MAD Ks−Band
arcseconds
0
20
40
60
80
FWHM (mas)
370
390
370
390
370
390
290
310
330
350

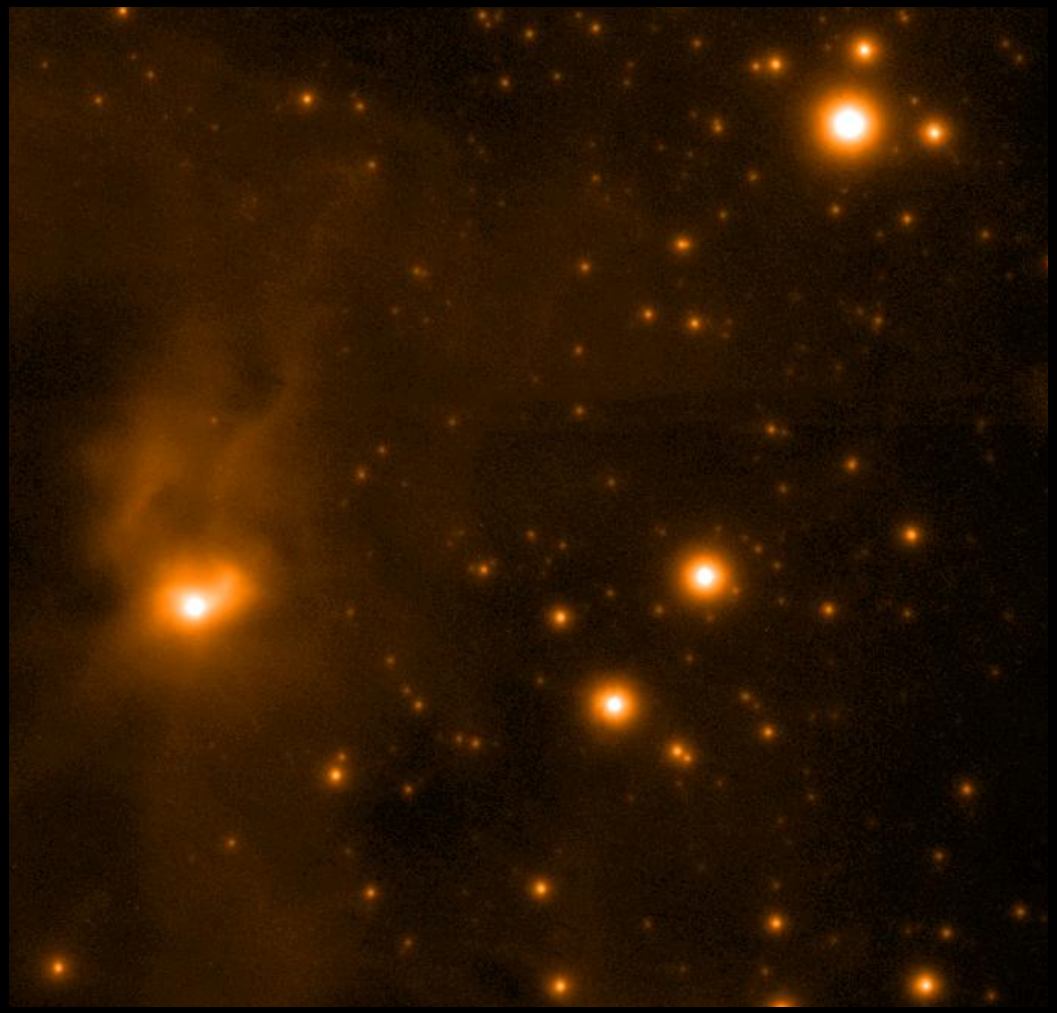

90
60
30
0
-30
-60
ARC SECONDS
90
60
30
0
-30
-60
-90
ARC SECONDS
REFERENCE POS. R.A. 18h18m51s.17 DEC -13°48'50."7 (2000)

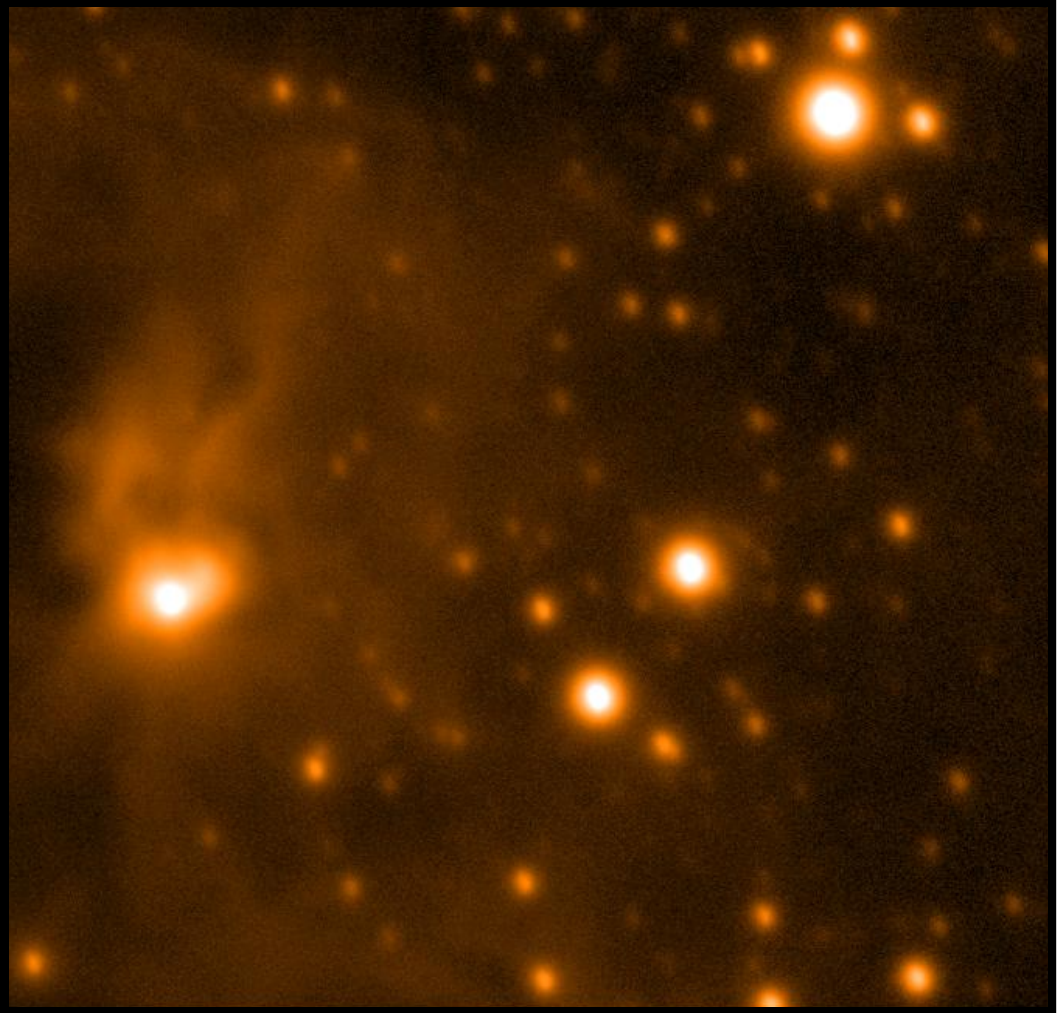

90
60
30
0
-30
-60
ARC SECONDS
95
100
105
110
120
130
160
90
60
30
0
-30
-60
-90
ARC SECONDS
REFERENCE POS. R.A. 18h18m51s.17 DEC -13°48'50".7 (2000)


VLT MAD J−Band
VLT MAD H−Band
VLT MAD Ks−Band
FWHM (mas)
FWHM (mas)
FWHM (mas)
arcseconds
arcseconds
0 10 20 30 40 50
330
310
0
310
330
350
370
390
135
120
105
160
180
200
110
105
100
95
120
130
150

commissioning (2007)

science demonstration (2008)



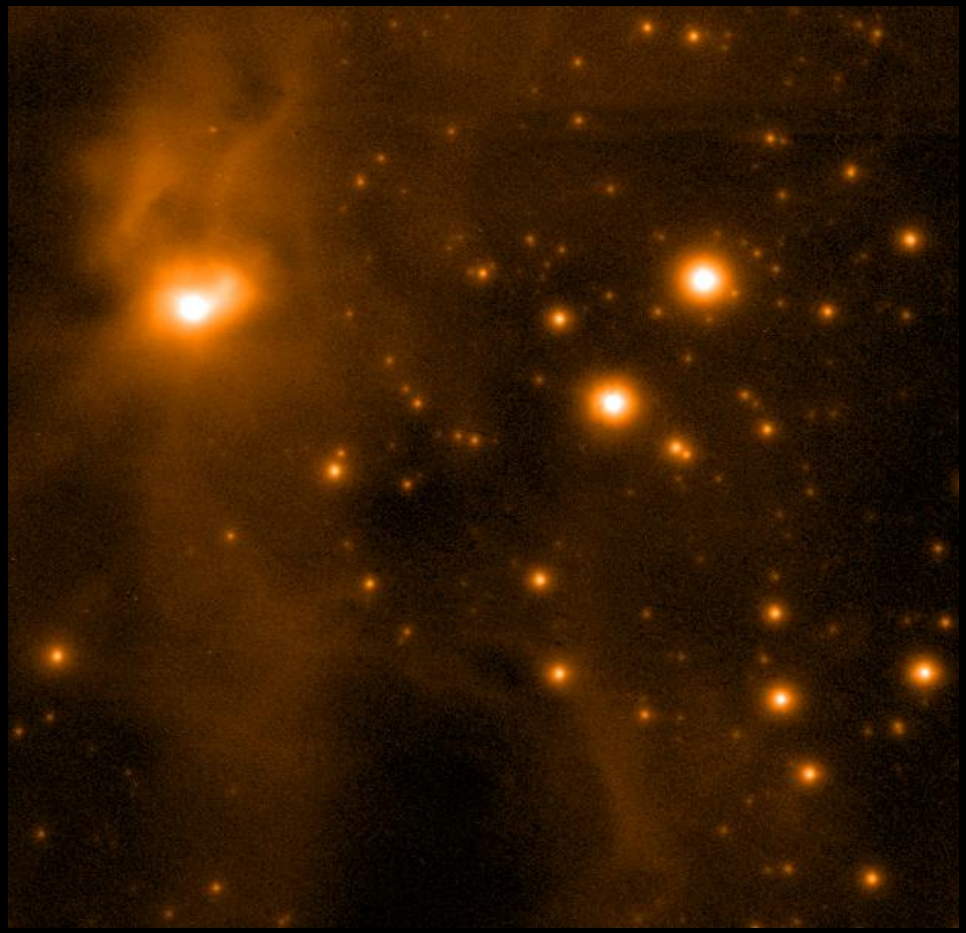


15 x 90s (1.5s DIT, 60 NDIT)
~100 mas FWHM

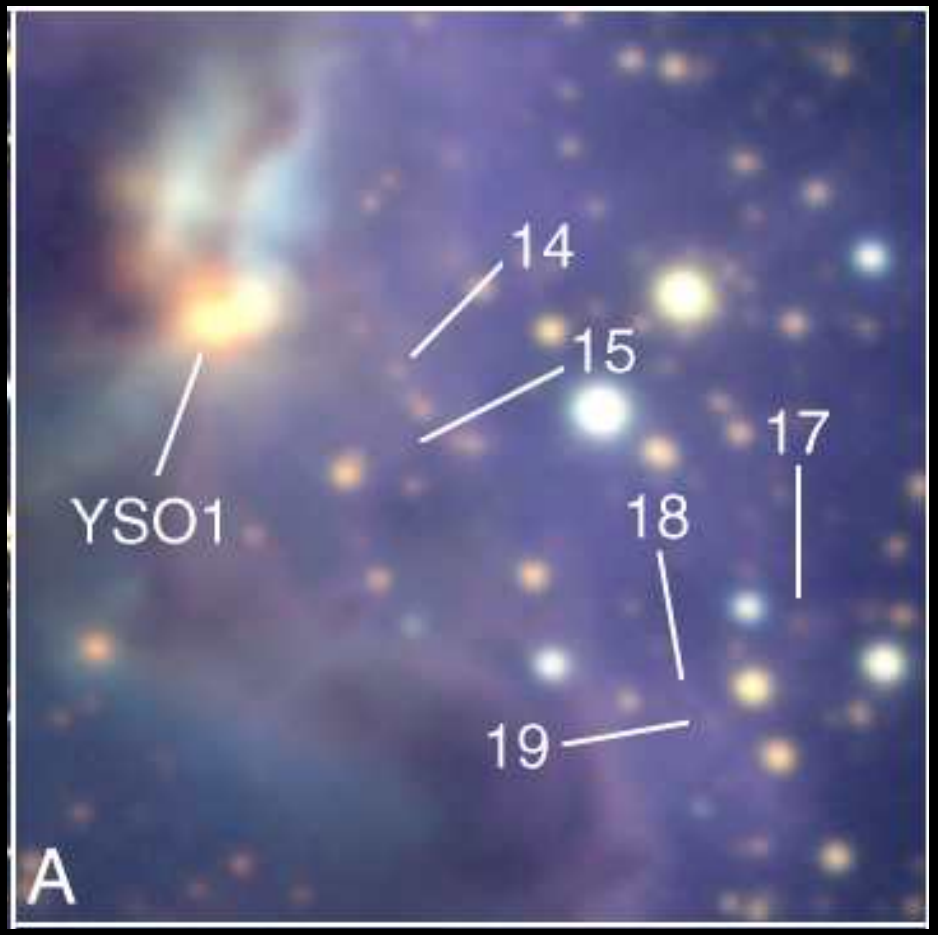
10 x 60s (2s DIT, 30 NDIT)
~350 mas FWHM

Same 'DIMM conditions' but other turbulence distribution.

MAD

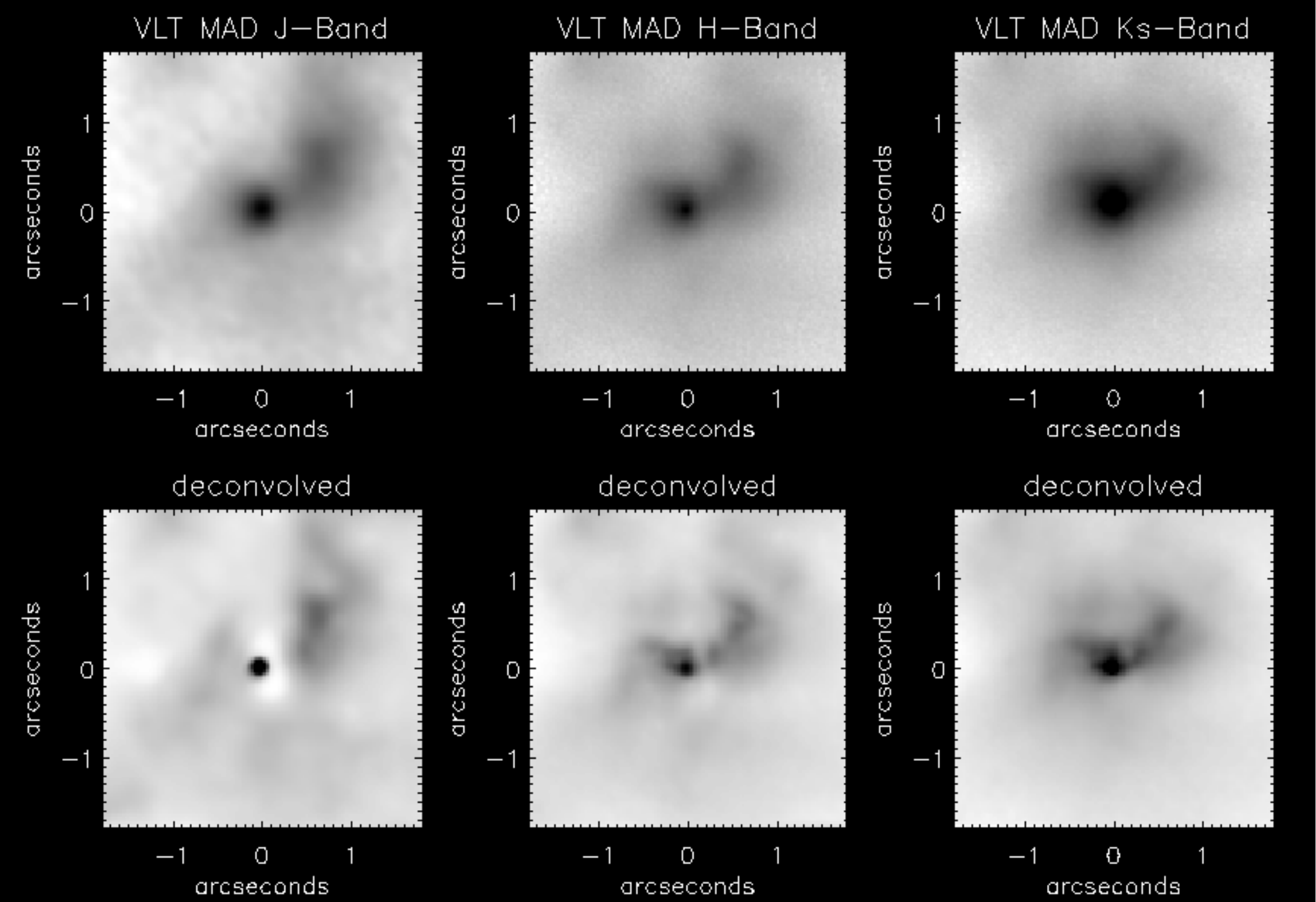


ISAAC



3 times smaller FWHM in Ks
~1 mag deeper

BUT: J band not better AND smaller FOV than ISAAC


VLT MAD J−Band
VLT MAD H−Band
VLT MAD Ks−Band
deconvolved
deconvolved
deconvolved
arcseconds
arcseconds
−1
0
1


Thanks for your attention!