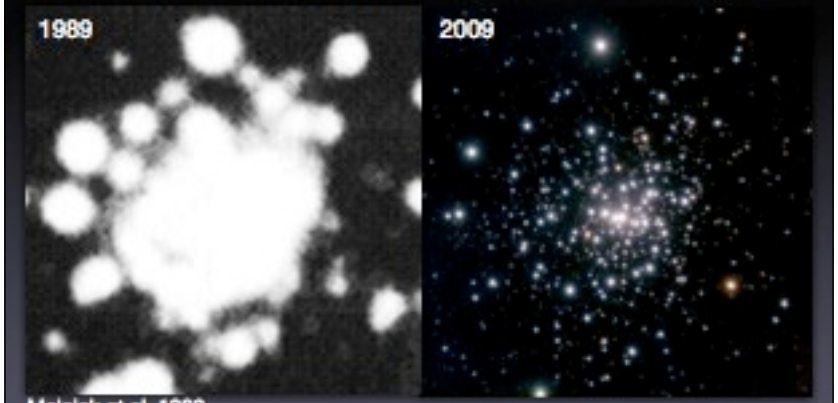
MAD Observations of NGC 3603



Melnick et al. 1989

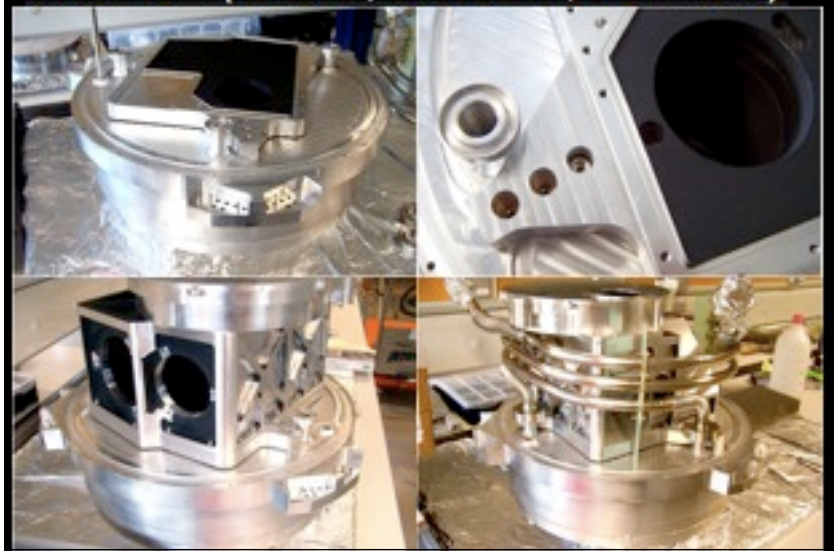
João Alves, Calar Alto Observatory

Science team:
J. Ascenso (CfA), H. Bouy (IAC)

CAMCAO team:
A. Amorim (U. Lisbon), J. Lima (U. Lisbon), A. Moitinho (U. Lisbon), F. Santos (U. Lisbon), J. Pinhão (LIP-Coimbra), J. Rebordão (INETI)

and the MAD team:
E. Marchetti, J. Kolb, S. Tordo, P. Amico, and all the rest of the ESO team

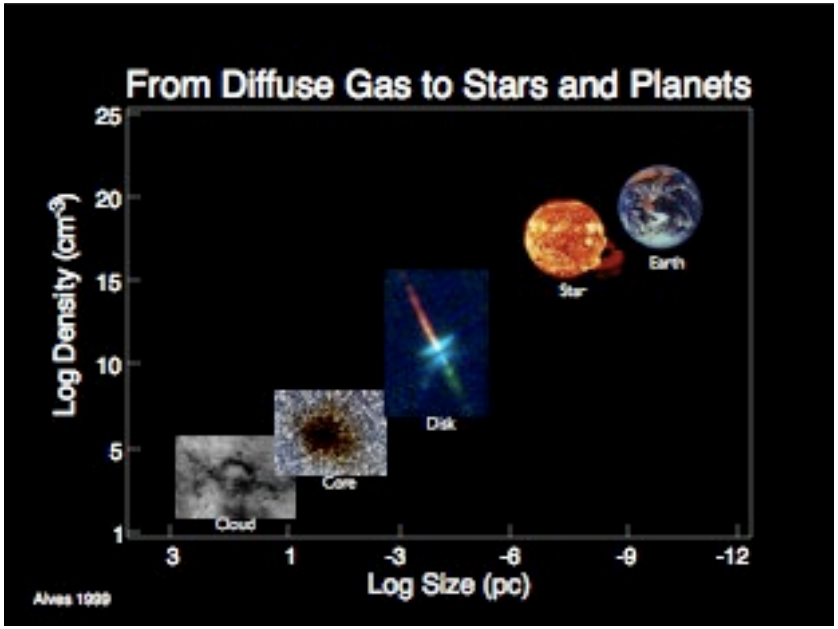
CAMCAO (U. Lisbon, LIP-Coimbra, INETI-Lisbon)

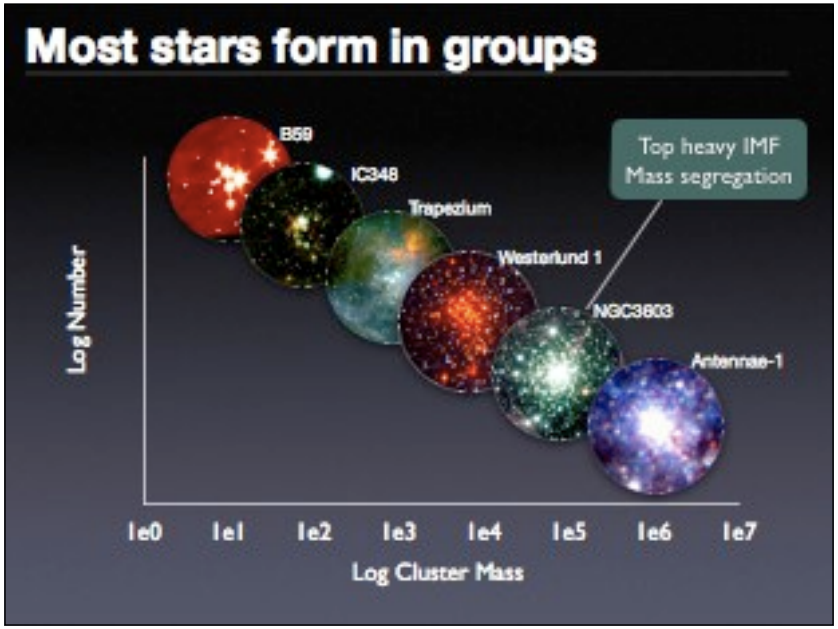


CAMCAO (U. Lisbon, LIP-Coimbra, INETI-Lisbon)

Jorge Lima and António Amorim

CAMCAO @UT3


From Diffuse Gas to Stars and Planets
Log Density (cm^{-3})
25
20
15
10
5
1
3
1
-3
-6
-9
-12
Log Size (pc)
Star
Earth
Disk
Core
Cloud
Alves 1999


Most stars form in groups
B59
IC348
Trapezium
Westerlund 1
NGC3603
Antennae-1
Top heavy IMF
Mass segregation
Log Number
1e0
1e1
1e2
1e3
1e4
1e5
1e6
1e7
Log Cluster Mass

NGC 3603

(Brandl et al. 1999)

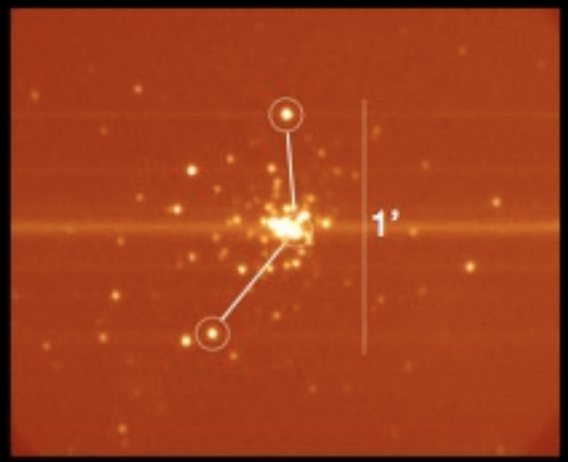
d ~ 6 kpc

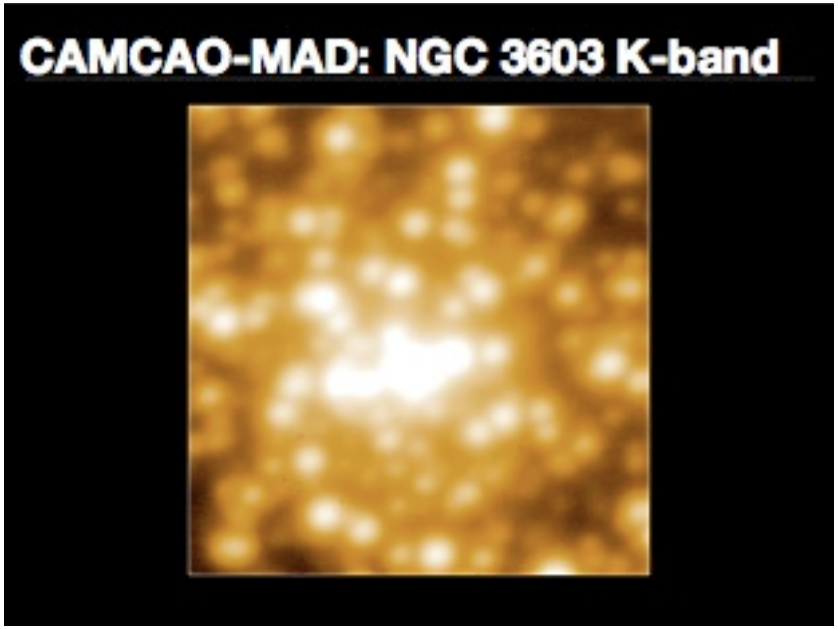
Sung & Bessel 2004
$-0.5 < \alpha < -1.2$ (HST)

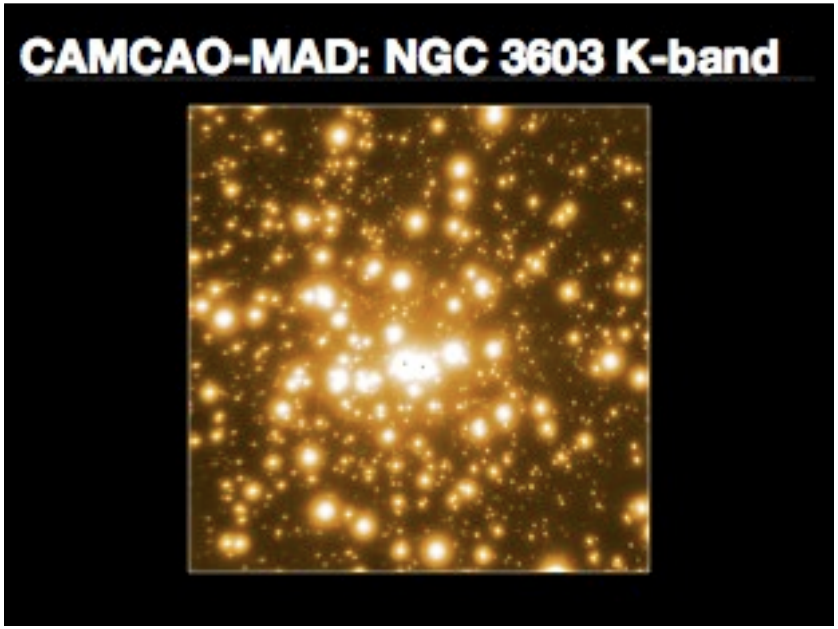
Stolte et al. 2006
$\alpha = -0.9 \pm -0.15$ (NACO)

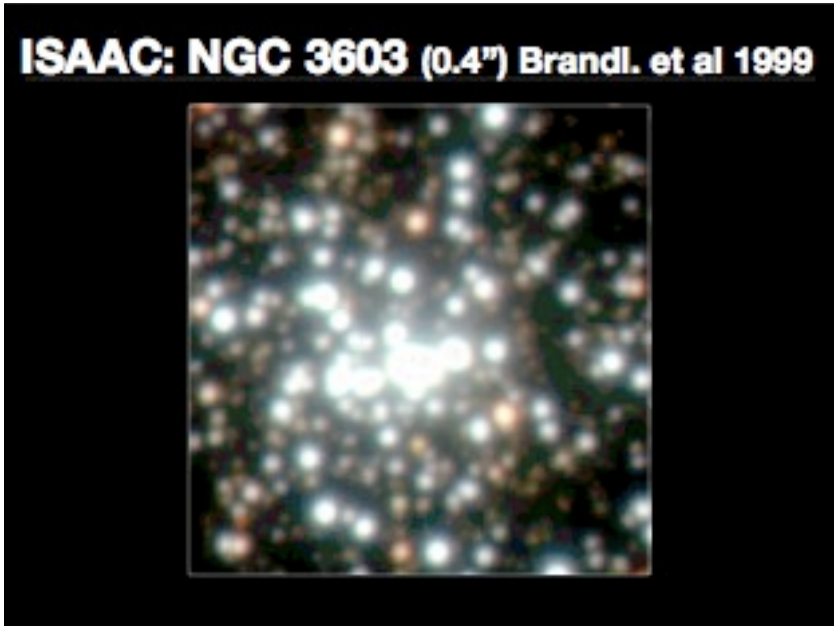
Harayama et al. 2008
$\alpha = -0.74^{+0.62}_{-0.47}$
(NACO)

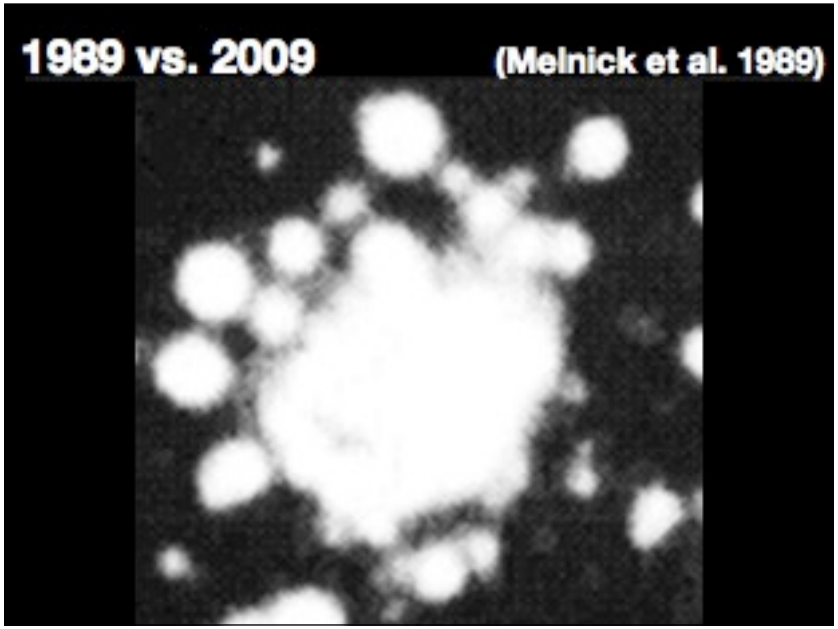
Observations

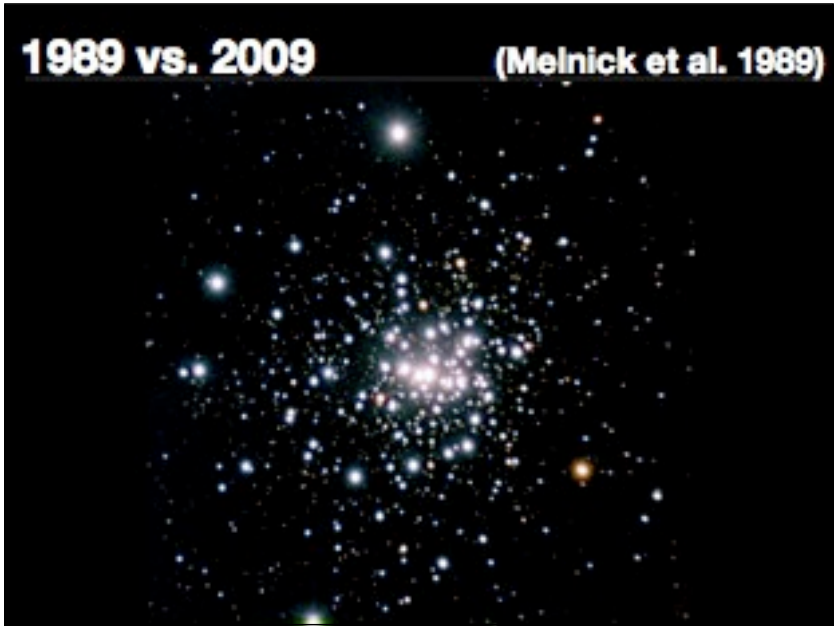


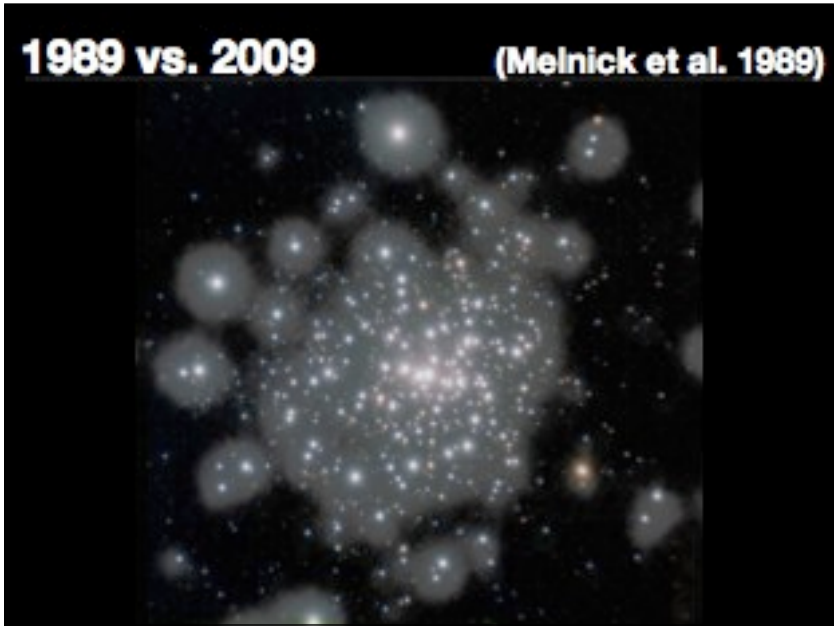

CAMCAO-MAD: NGC 3603 K-band

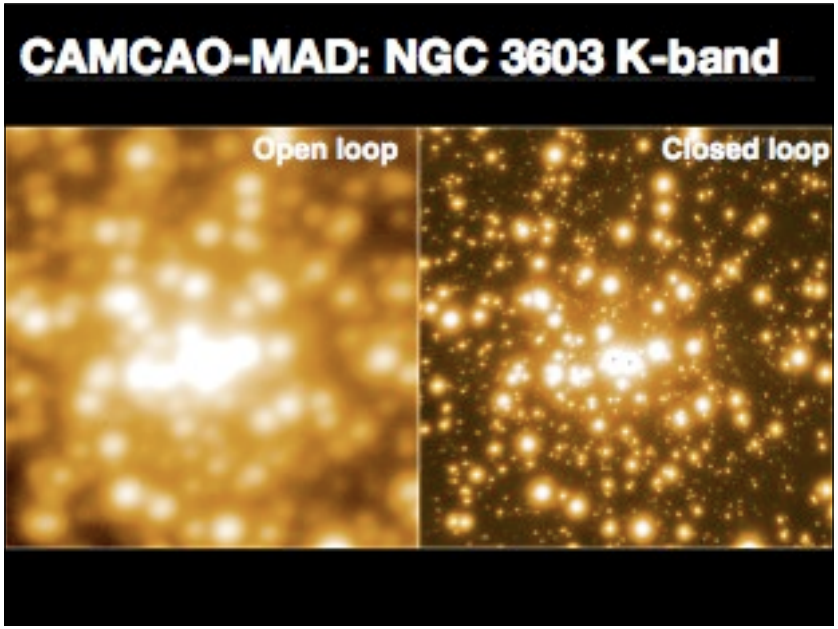

CAMCAO-MAD: NGC 3603 K-band

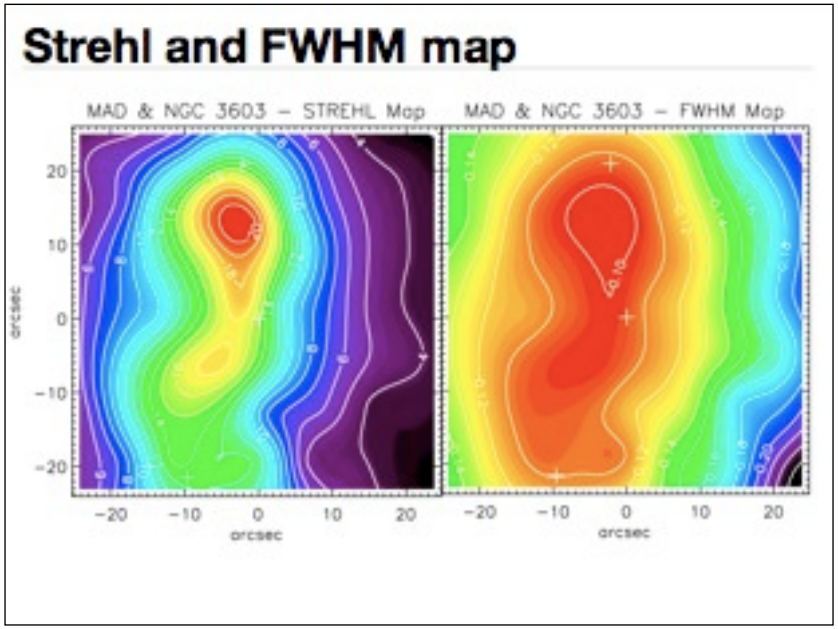

ISAAC: NGC 3603 (0.4") Brandl. et al 1999


1989 vs. 2009
(Melnick et al. 1989)

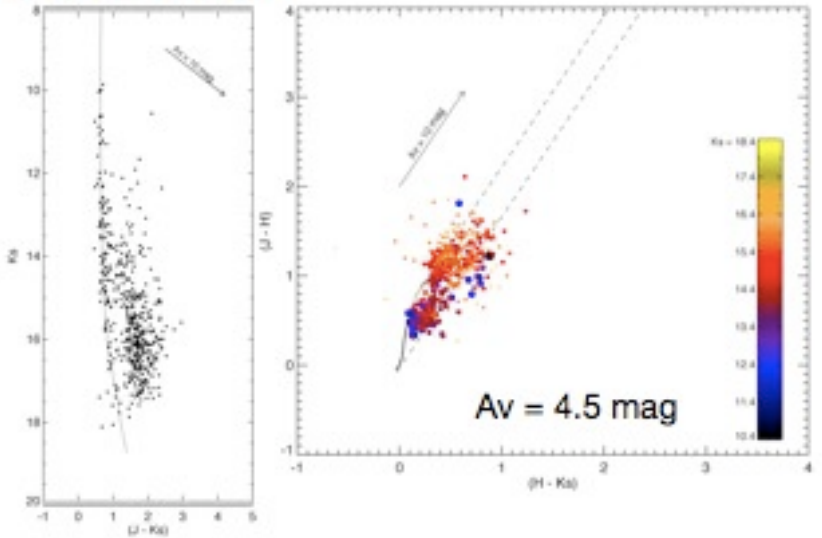

1989 vs. 2009
(Melnick et al. 1989)


1989 vs. 2009
(Melnick et al. 1989)

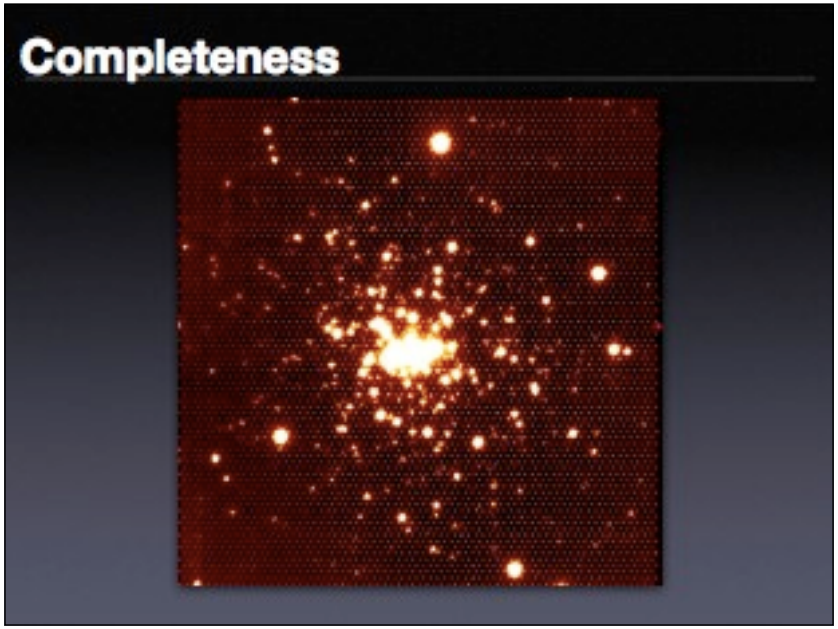

CAMCAO-MAD: NGC 3603 K-band
Open loop
Closed loop


Strehl and FWHM map
MAD & NGC 3603 – STREHL Map
MAD & NGC 3603 – FWHM Map
arcsec
arcsec
arcsec

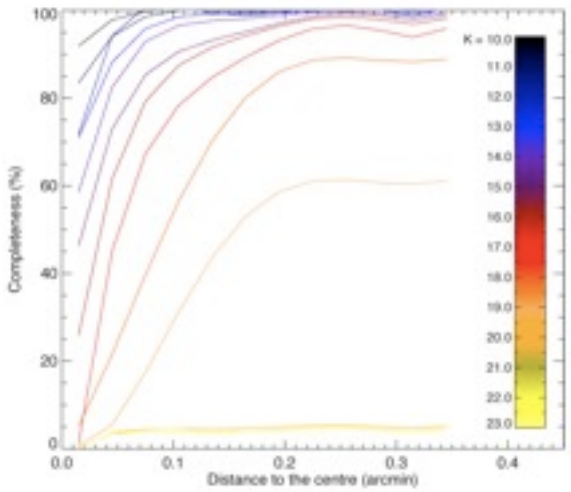
Photometry



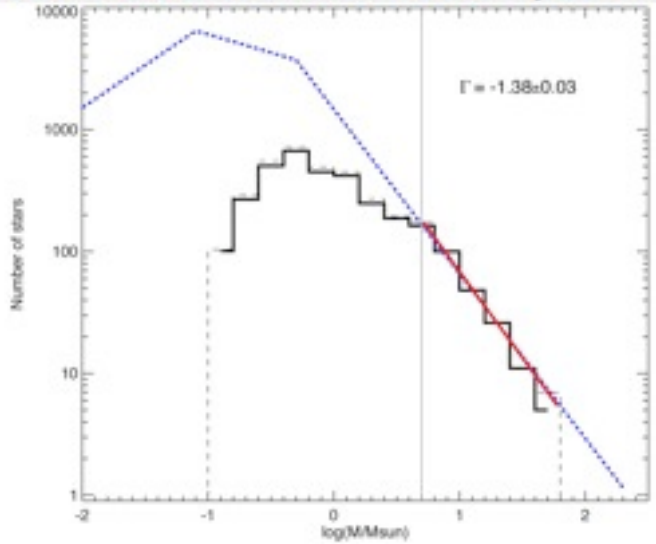
Completeness



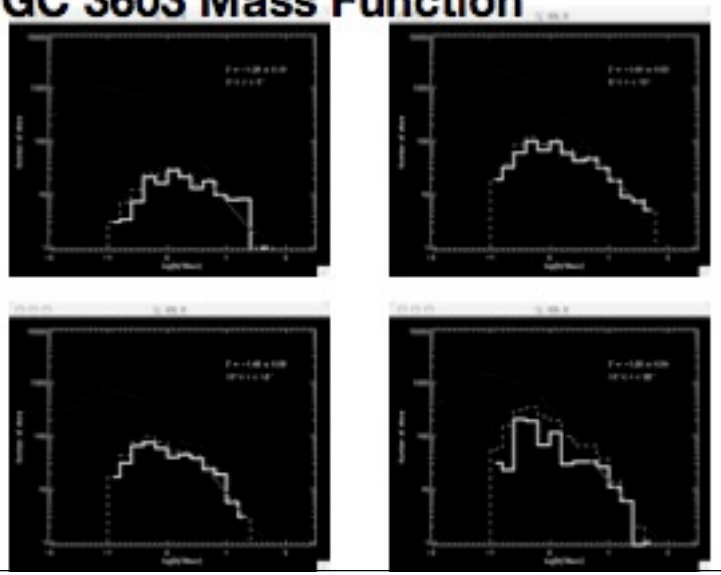
Completeness



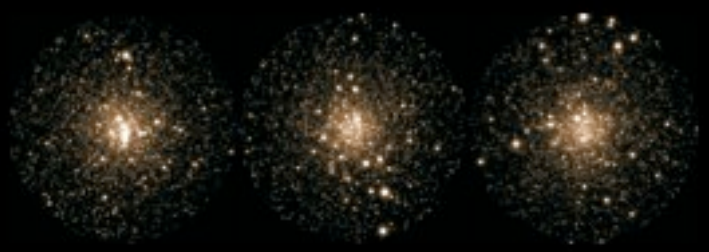
NGC 3603 Mass Function (2945 stars)



NGC 3603 Mass Function



Synthetic clusters (Ascenso, Alves, Lago 2008)



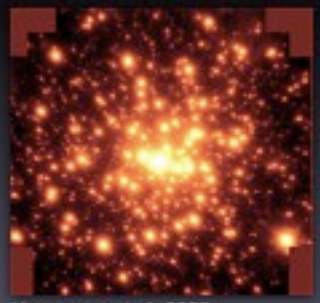
Position is independent of mass, *i.e.*,

:: no mass segregation on average

:: distribution of high- and low-mass stars is the same

No evidence for mass segregation in young clusters

NACO vs. MAD



Harayama et al. 2008

Alves et al. 2009

Summary

- MCAO works. Very well, actually.

- NGC 3603 IMF is Salpeter like and there is no evidence for mass segregation.

- We need MADMAX.