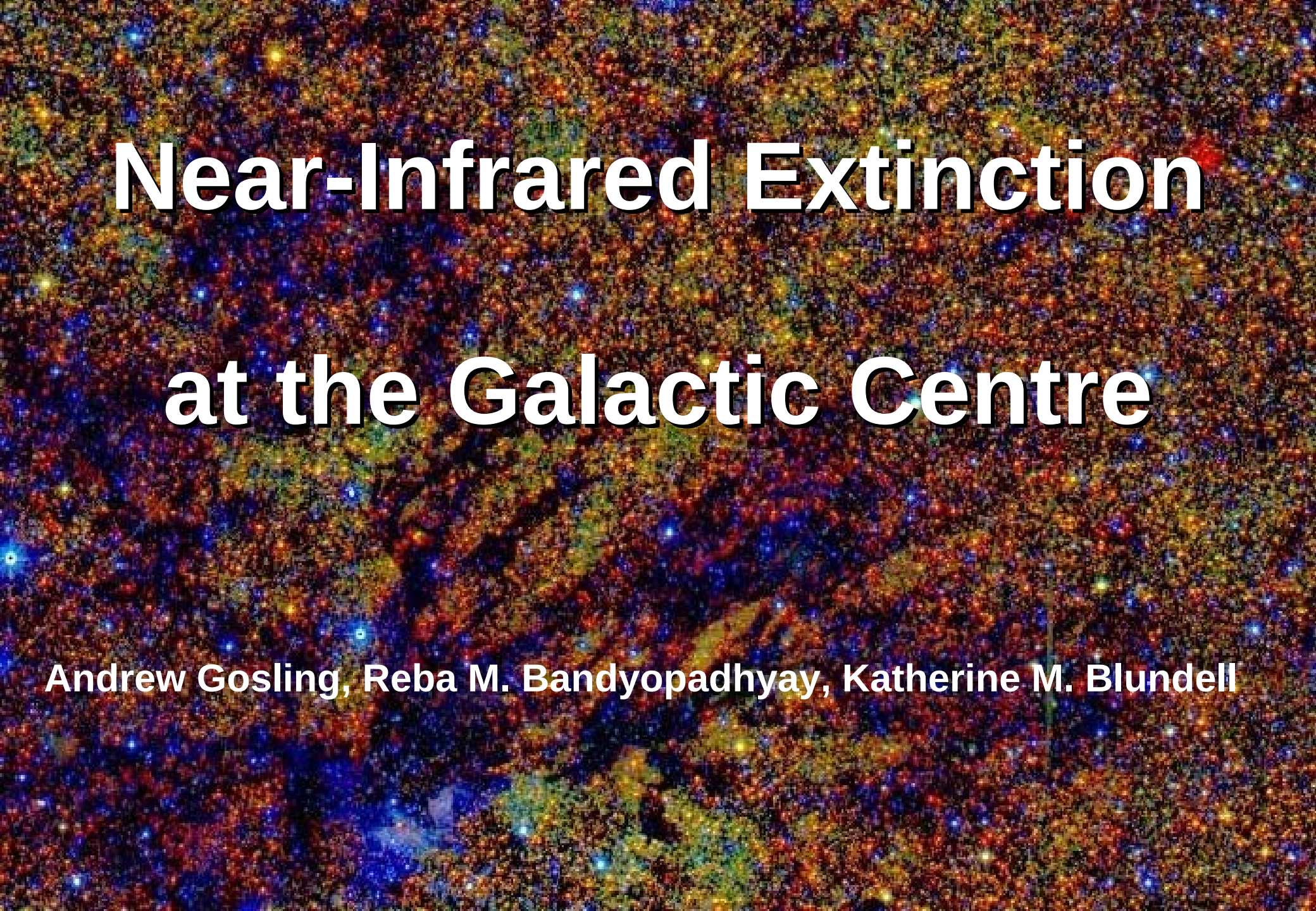
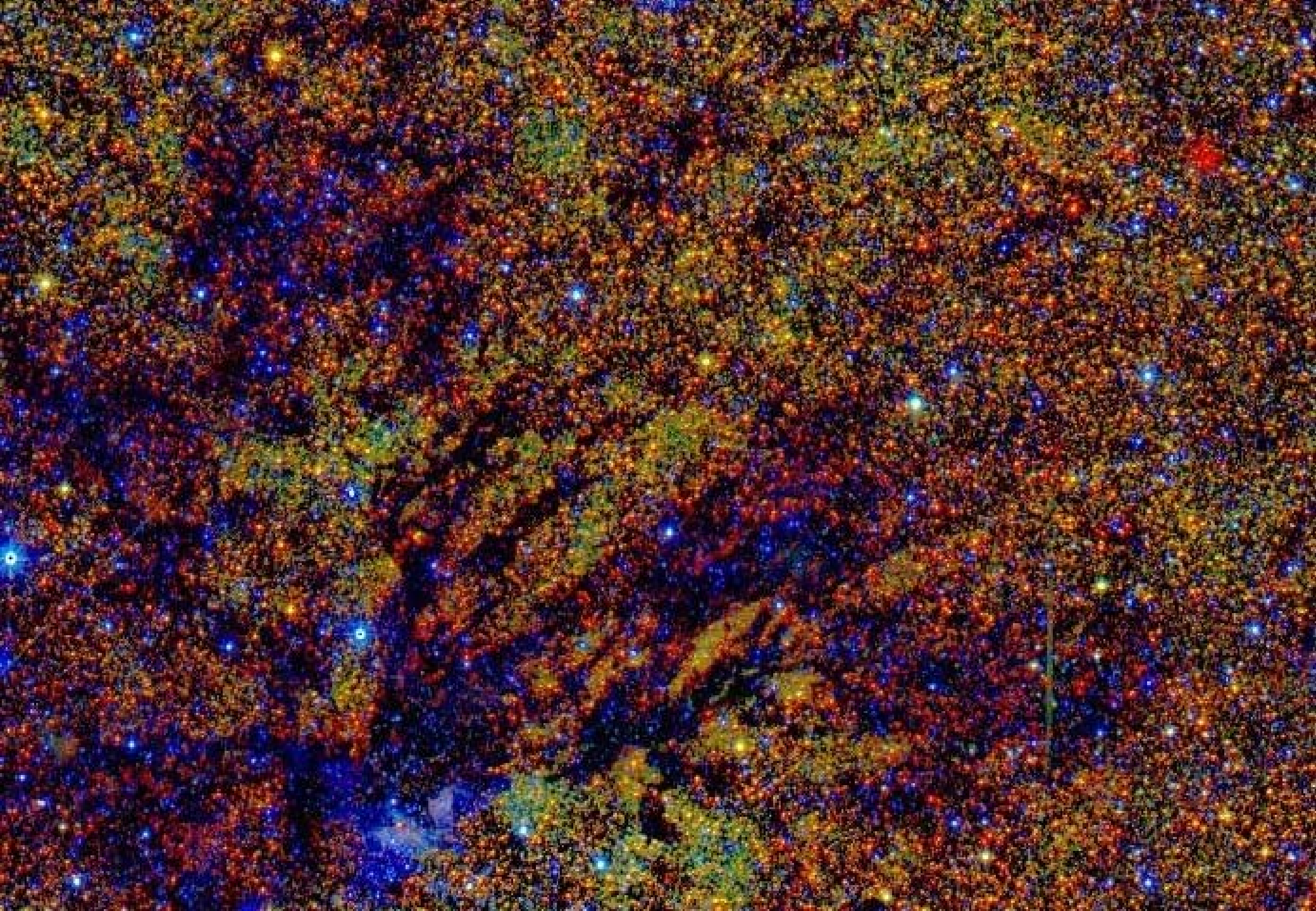
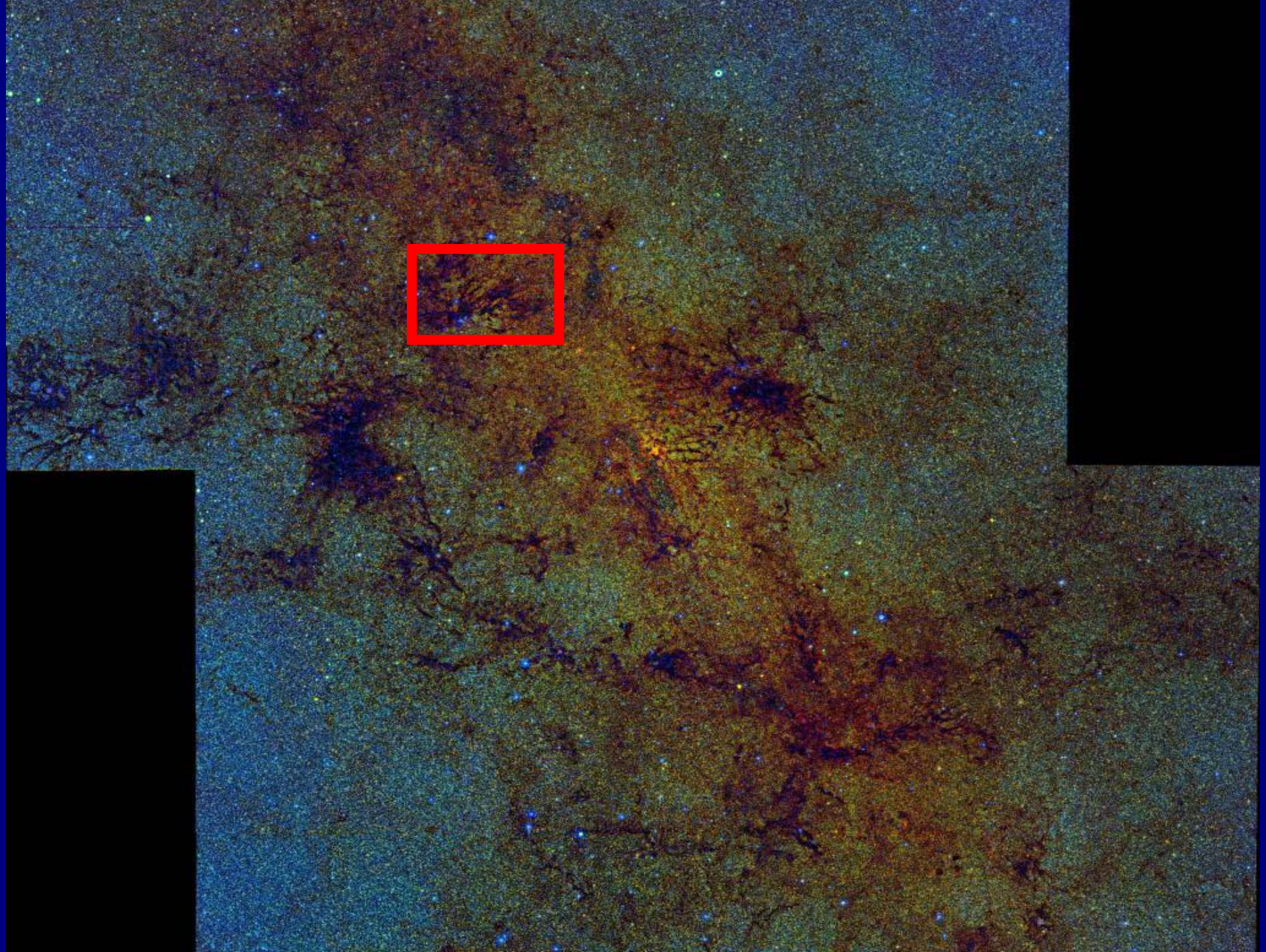
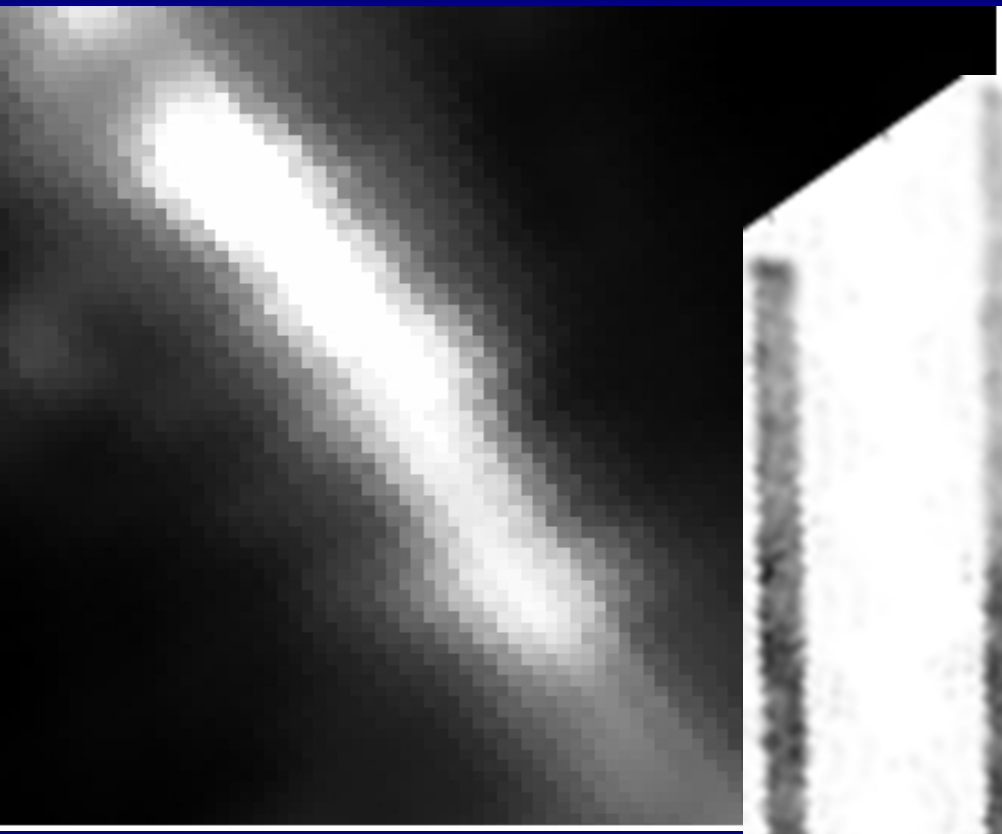


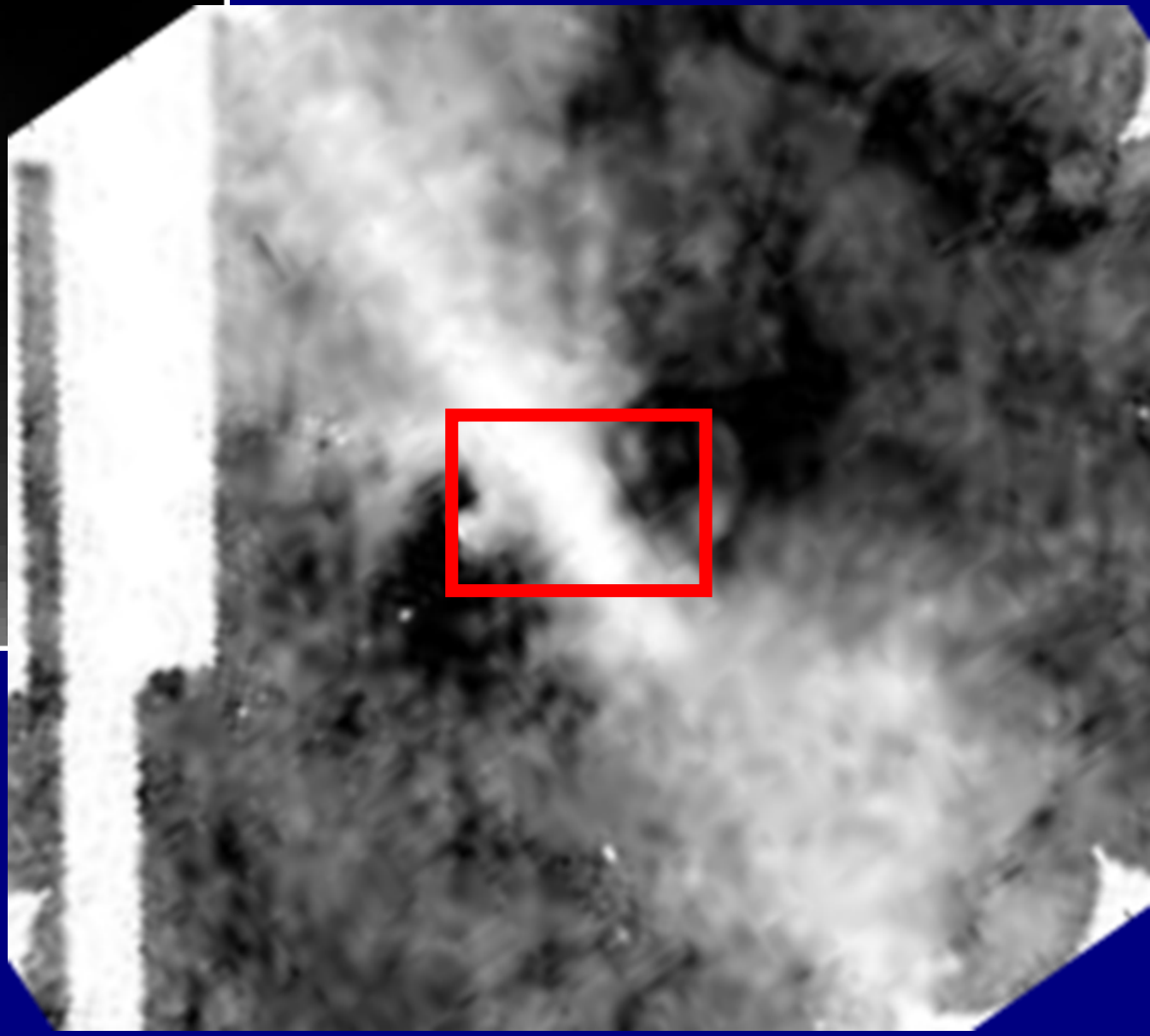
Near-Infrared Extinction at the Galactic Centre

Andrew Gosling, Reba M. Bandyopadhyay, Katherine M. Blundell









$$R_\lambda = A_\lambda / E(B\text{-}V)$$

Extinction law is varying

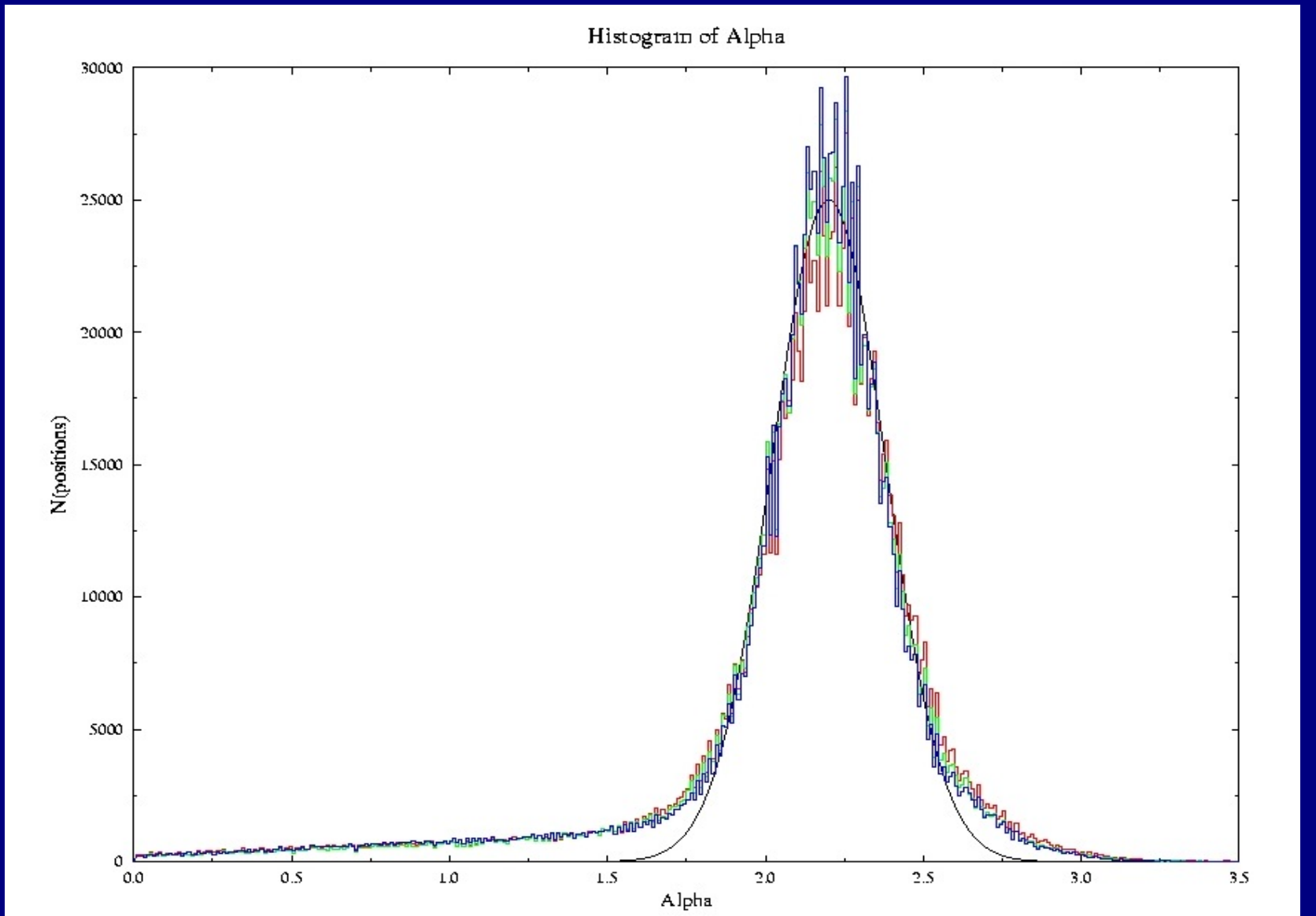
$$A_\lambda \propto \lambda^{-\alpha}$$

$$A_{\lambda_1} = \frac{\langle E(\lambda_1 - \lambda_2) \rangle}{1 - \left(\frac{\lambda_1}{\lambda_2}\right)^\alpha}$$

$$A_{\lambda_2} = \frac{\langle E(\lambda_1 - \lambda_2) \rangle}{\left(\frac{\lambda_2}{\lambda_1}\right)^\alpha - 1}$$

$$\frac{\langle E(\lambda_1 - \lambda_2) \rangle}{\langle E(\lambda_2 - \lambda_3) \rangle} = \frac{\left(\frac{\lambda_2}{\lambda_1}\right)^\alpha - 1}{1 - \left(\frac{\lambda_2}{\lambda_3}\right)^\alpha}$$

2,125,000 positions
Average of 50 stars per position

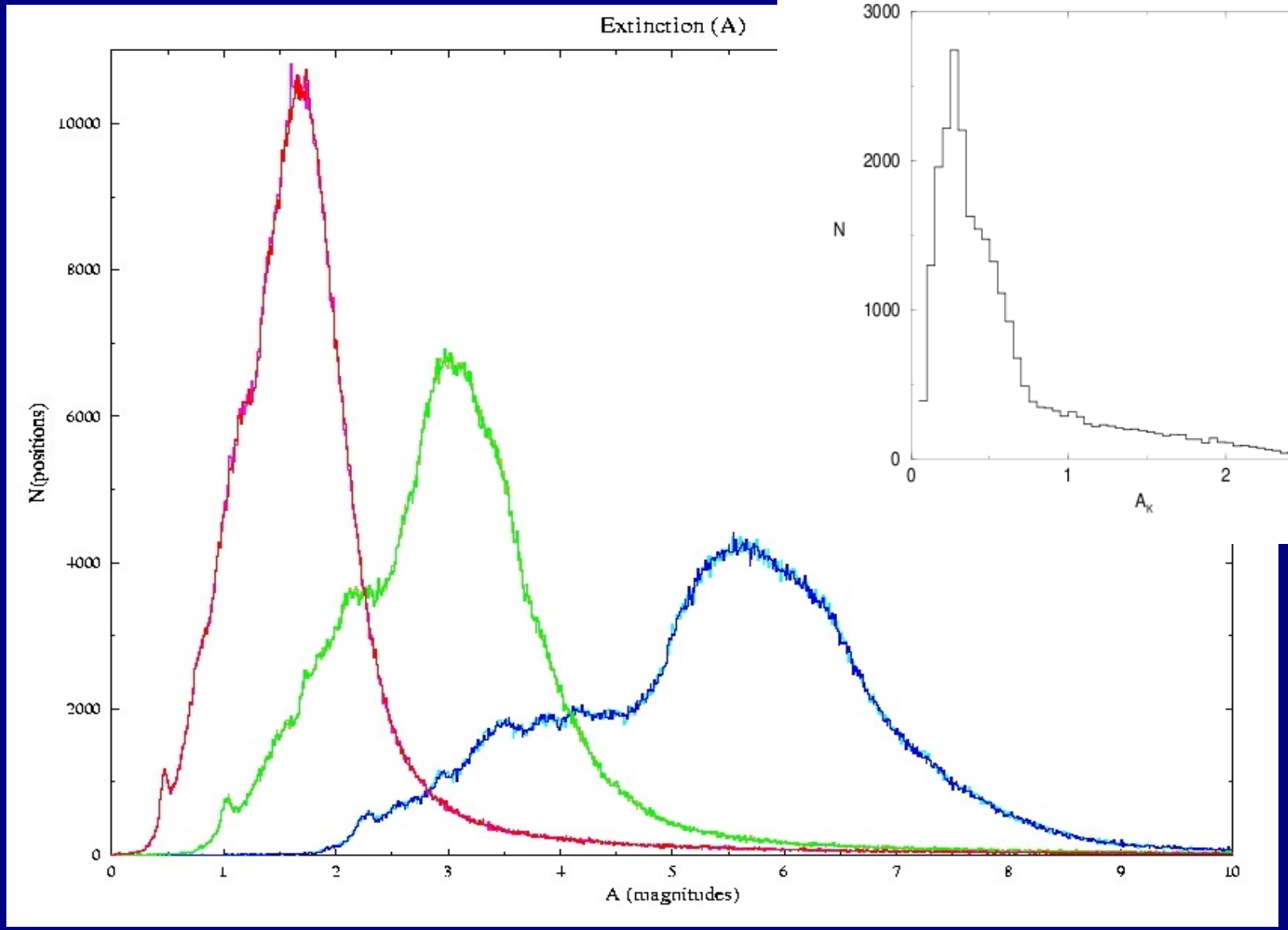

Histogram of Alpha
N(positions)
Alpha
0
5000
10000
15000
20000
25000
30000
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5

- Extinction theory assumes infinitely narrow filters
- Reality is broad wavelength coverage coupled with spectral type affects the measured value of α.

$$-0.15 \leq \alpha \leq 0.1$$

  - Additionally, extinction measured is dependent on the fiterset used

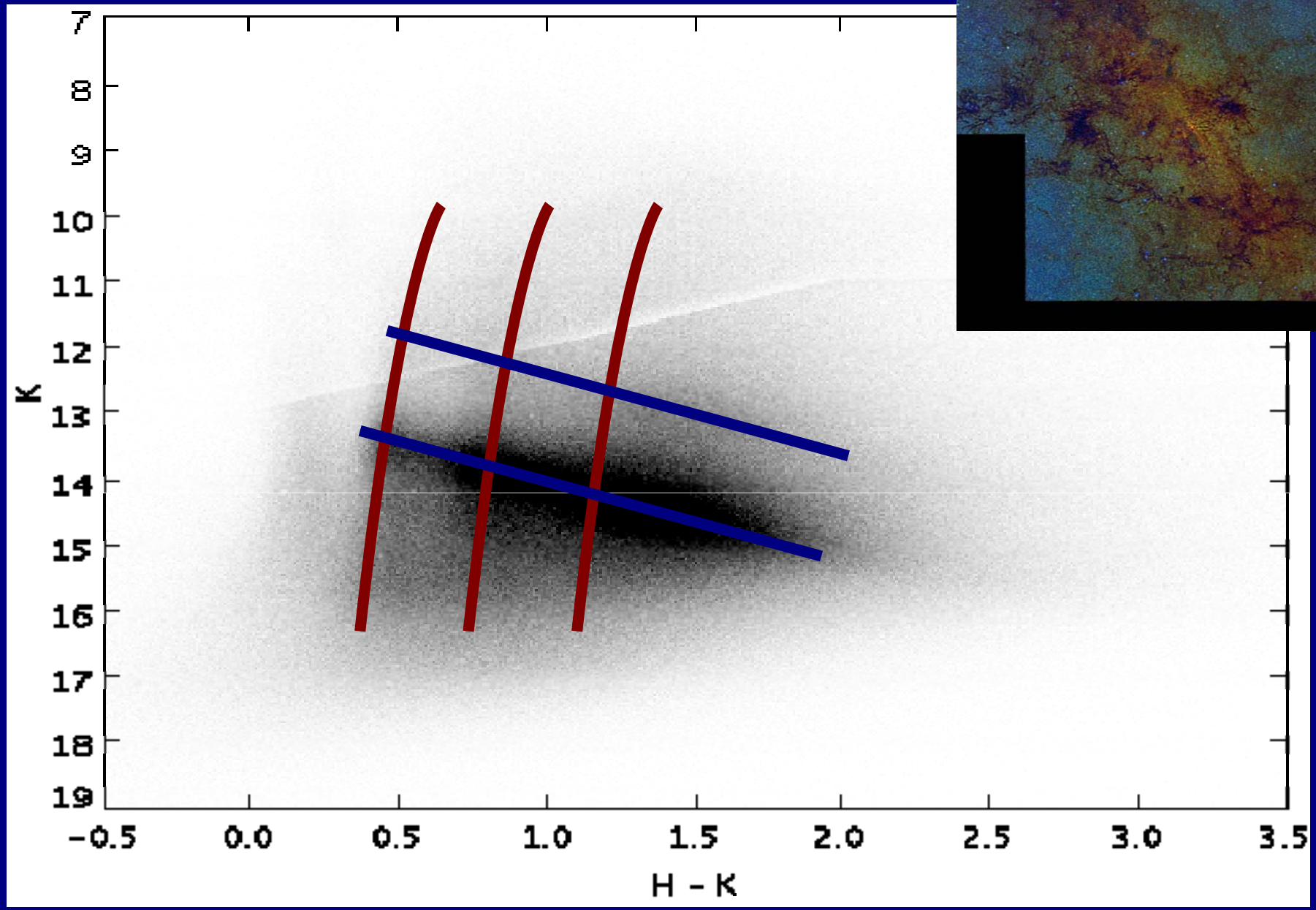
- Extinction calculations must be specific to the instrumental and spectral system setup

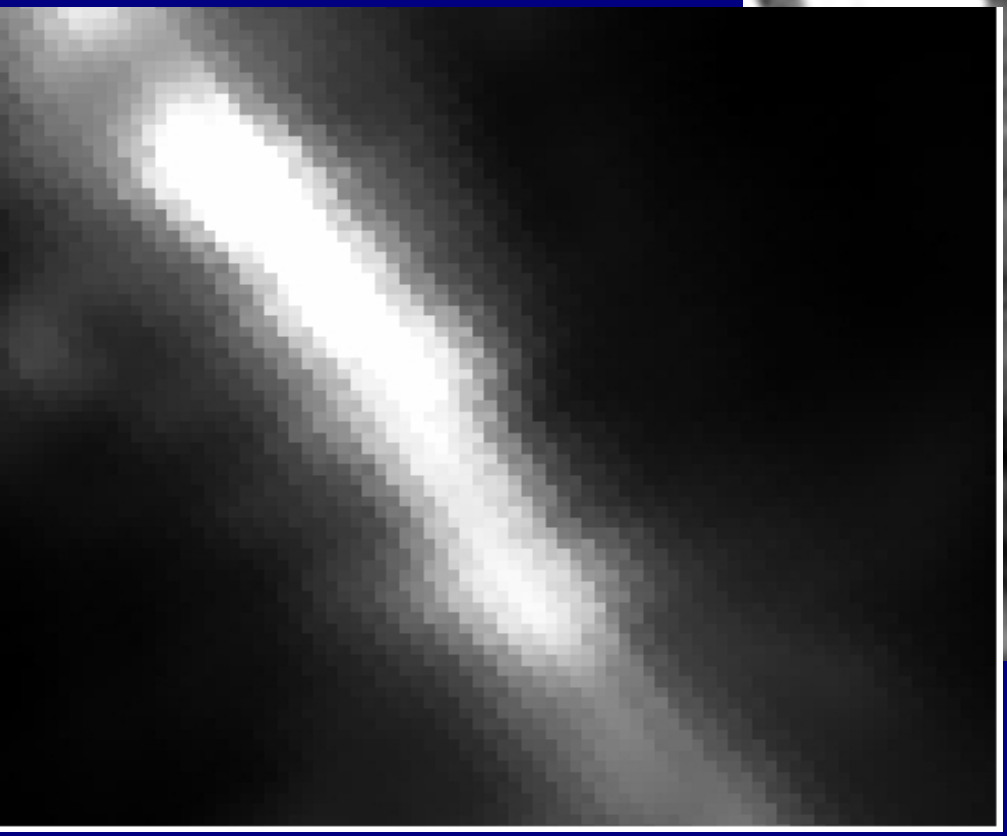


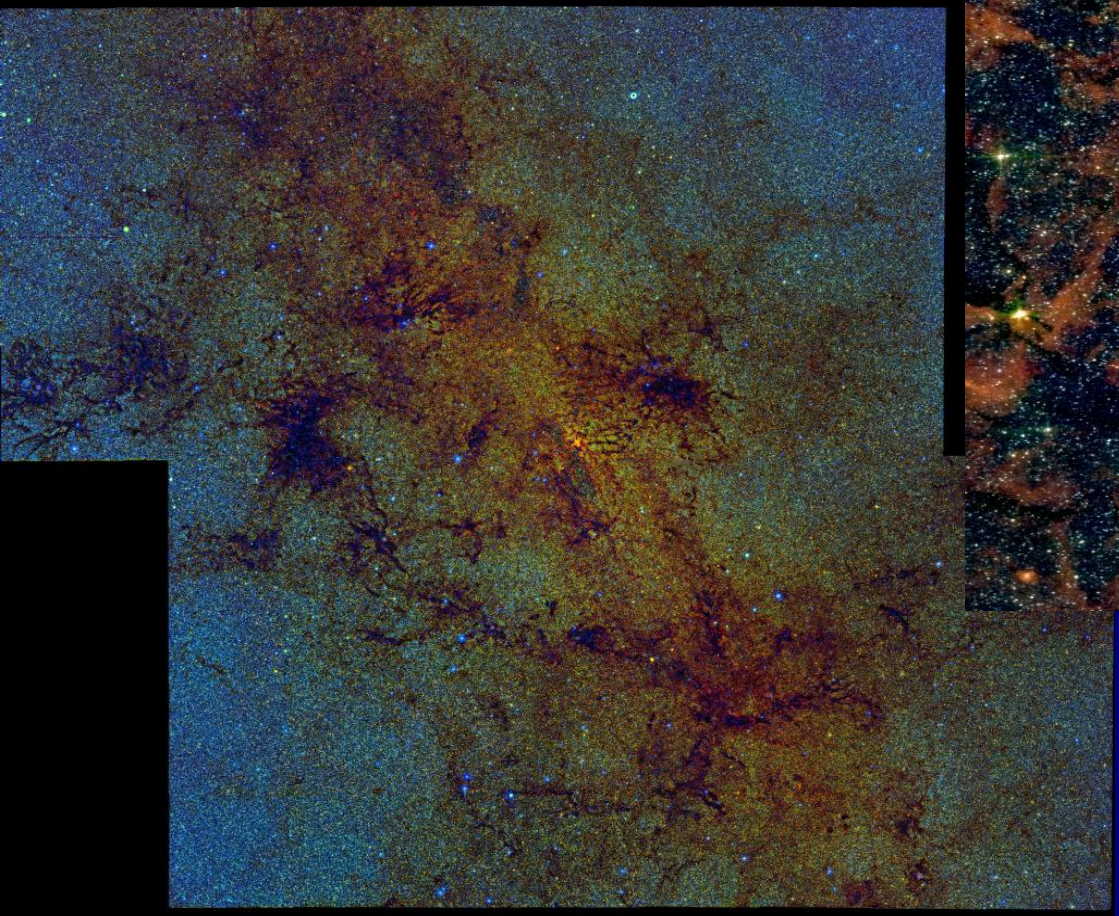
$A_K = 1.6$
$0.3 < A_K < 5.0$

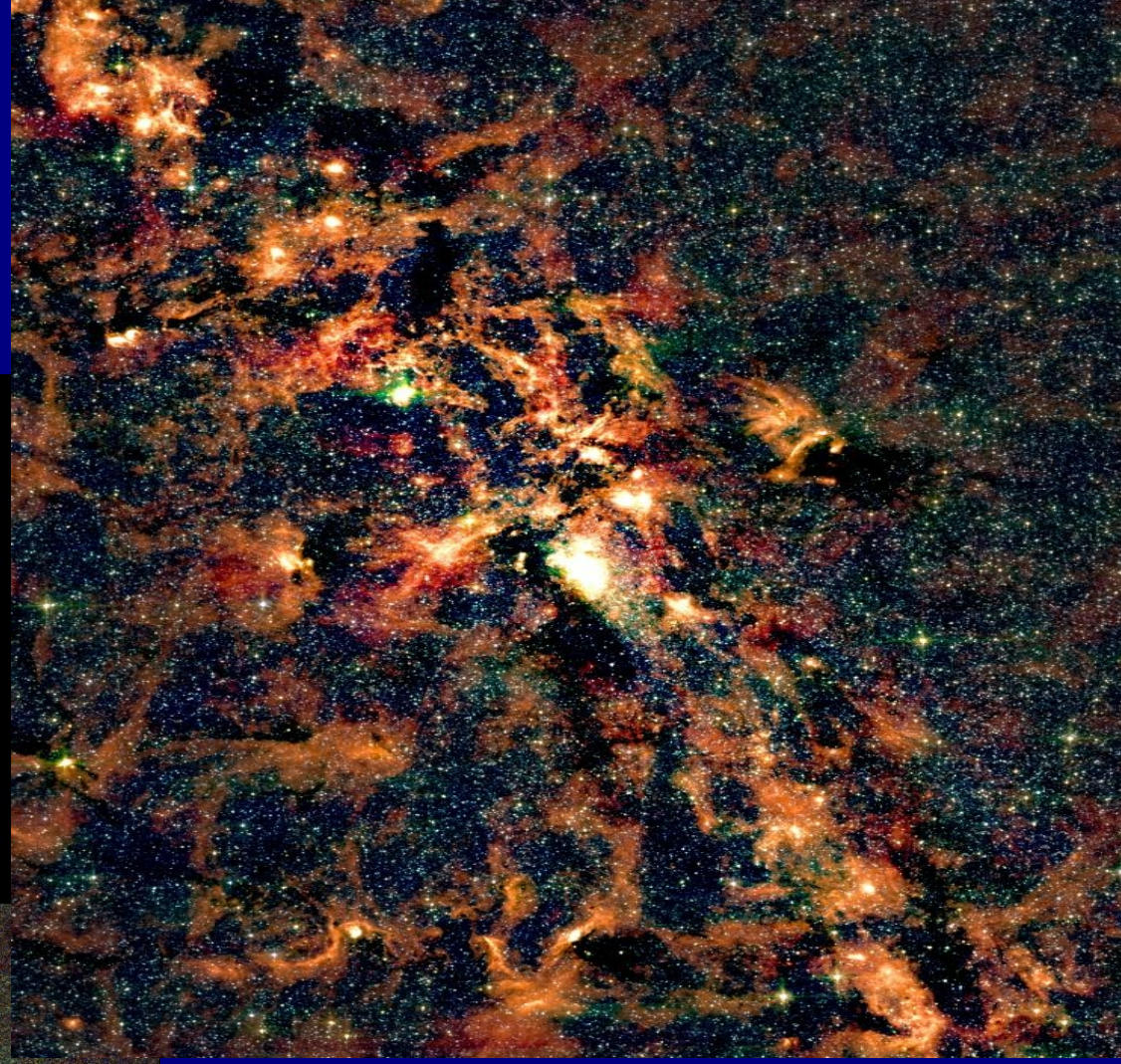
$A_H = 1.6$
$0.8 < A_H < 7.0$

$A_J = 1.6$
$1.9 < A_J < 10.0$


7
8
9
10
11
12
13
14
15
16
17
18
19
K
-0.5
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
H - K








Thanks