Protostellar Explosions IR-Transients and Runaway Young Stars:

A 10^{48} erg Cataclysm 0.1 pc Behind the Orion Nebula ~500 years ago (actually ... in CE 125)

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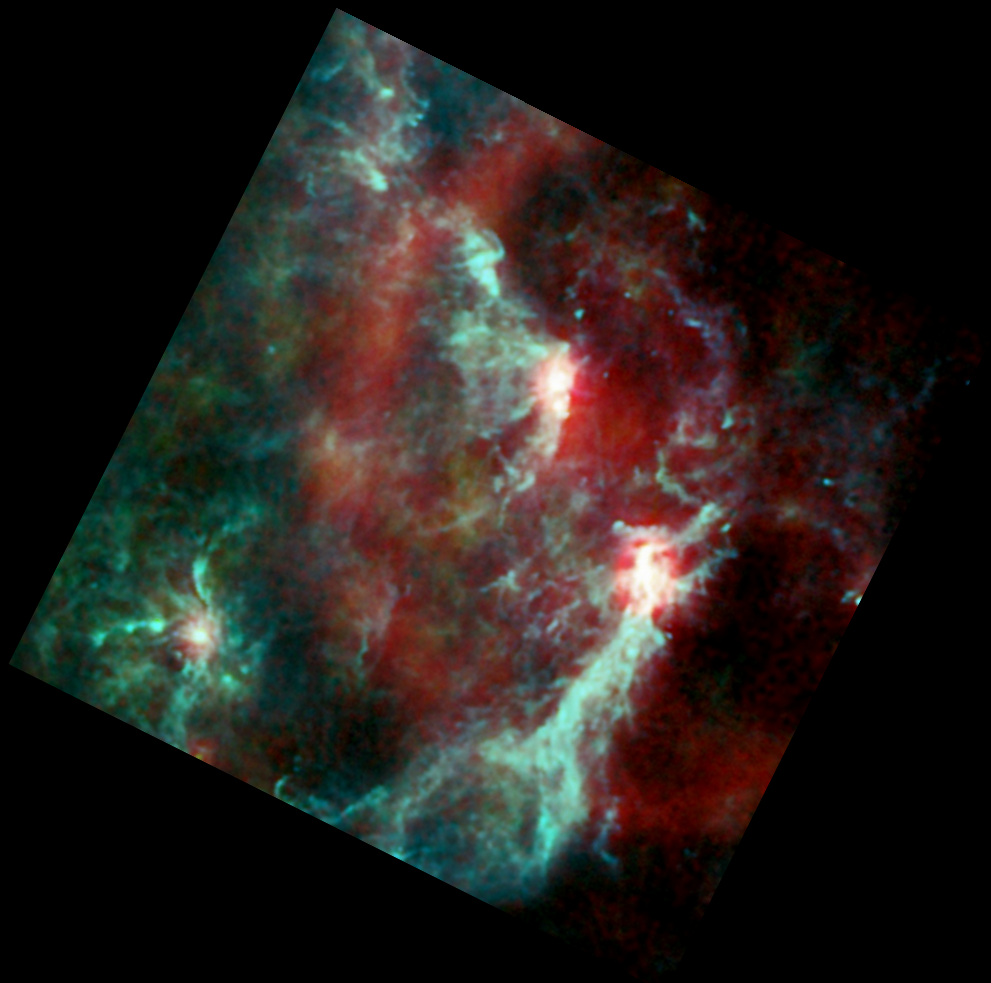
Orion
(Visual)



Orion

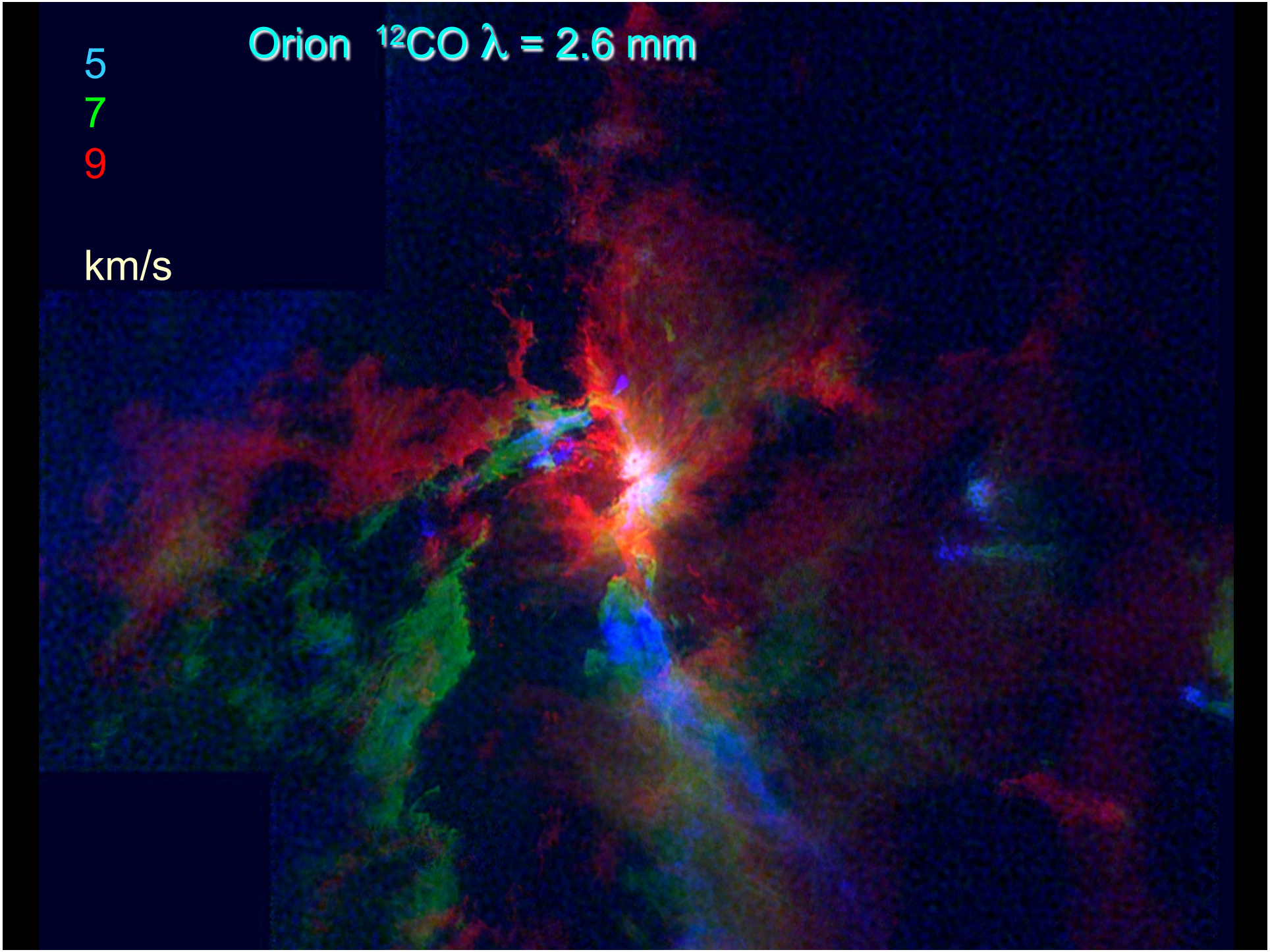
(Planck Satellite)

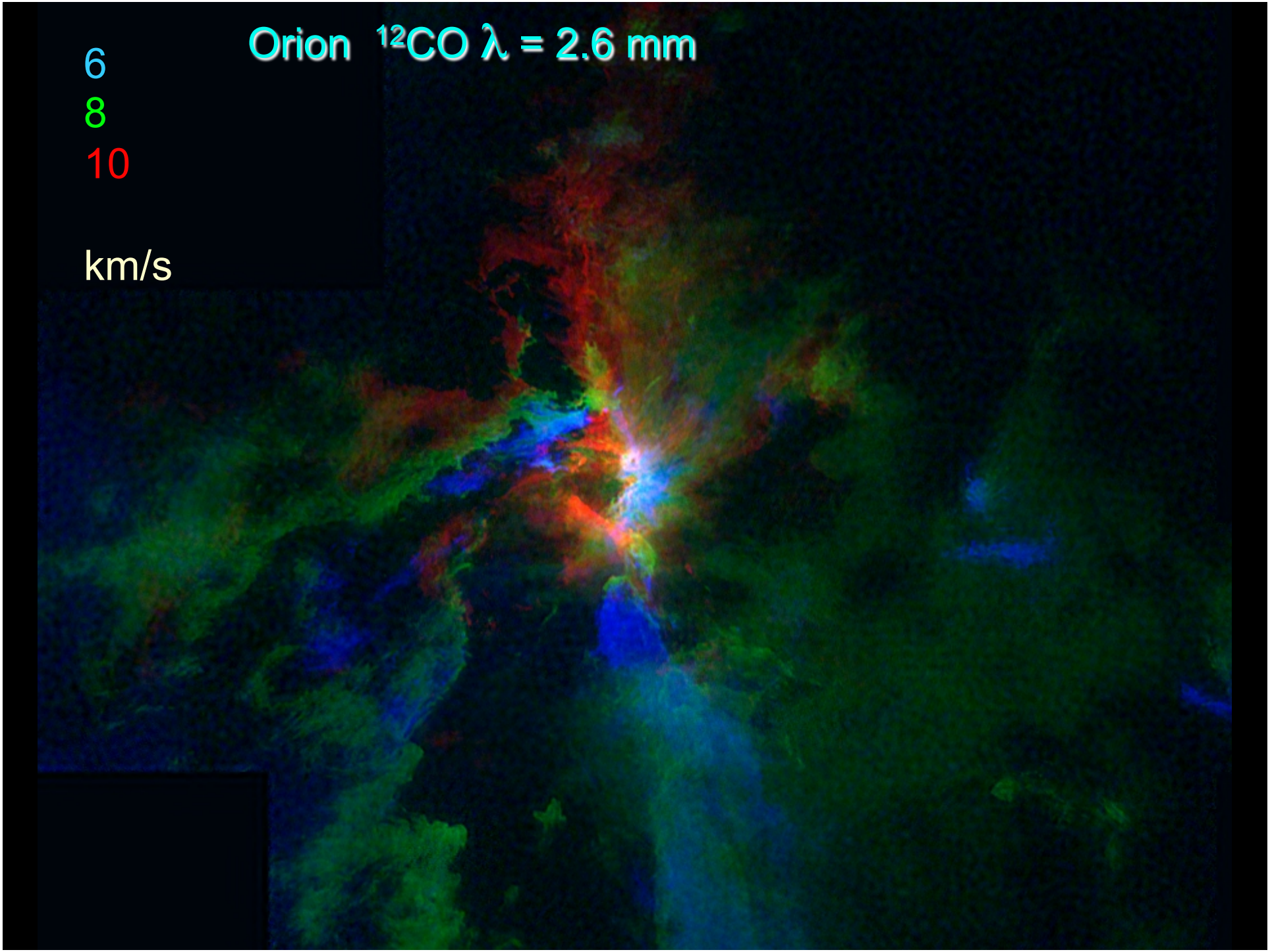
Dust 545 GHz

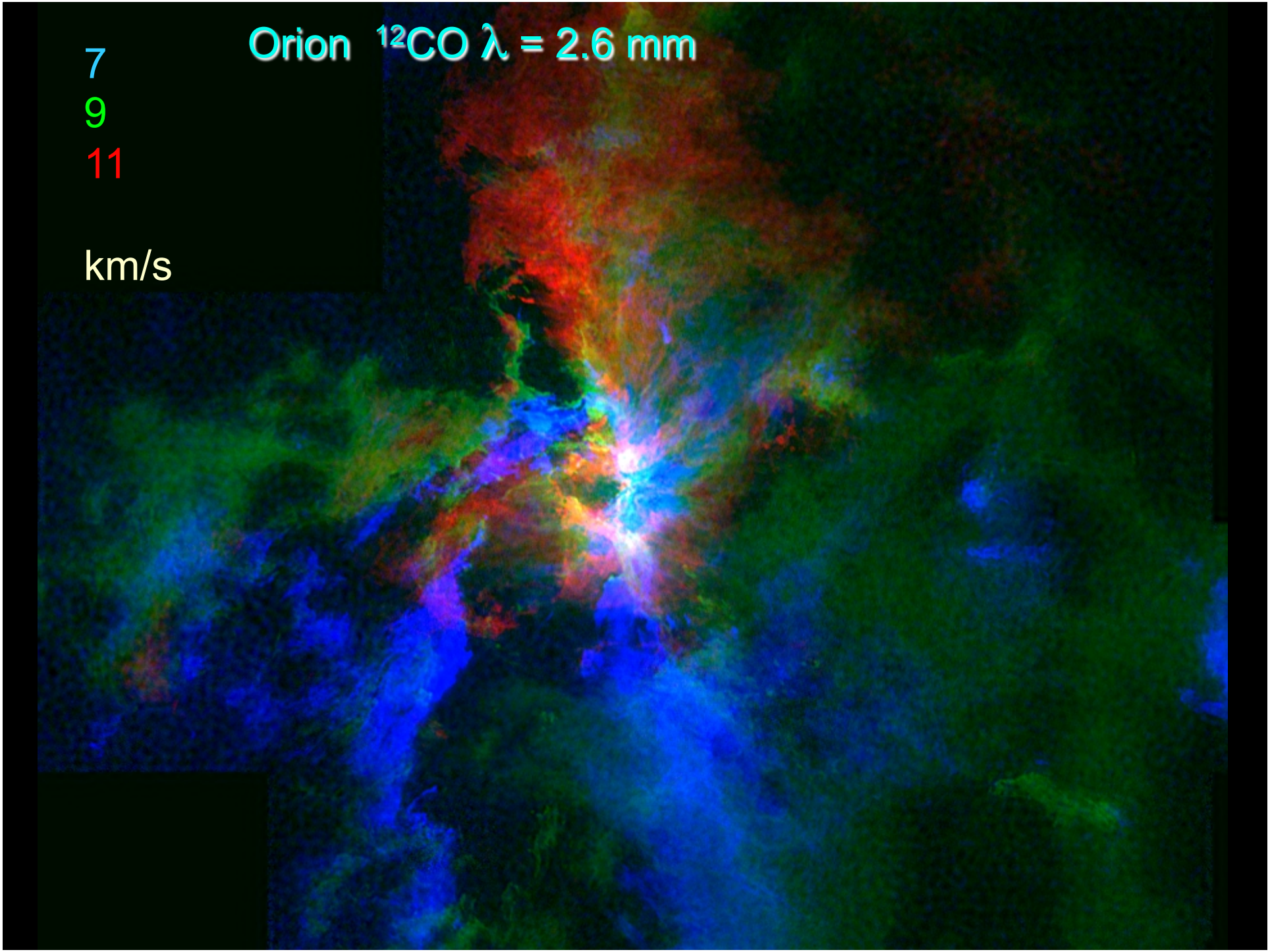
Plasma 30 GHz

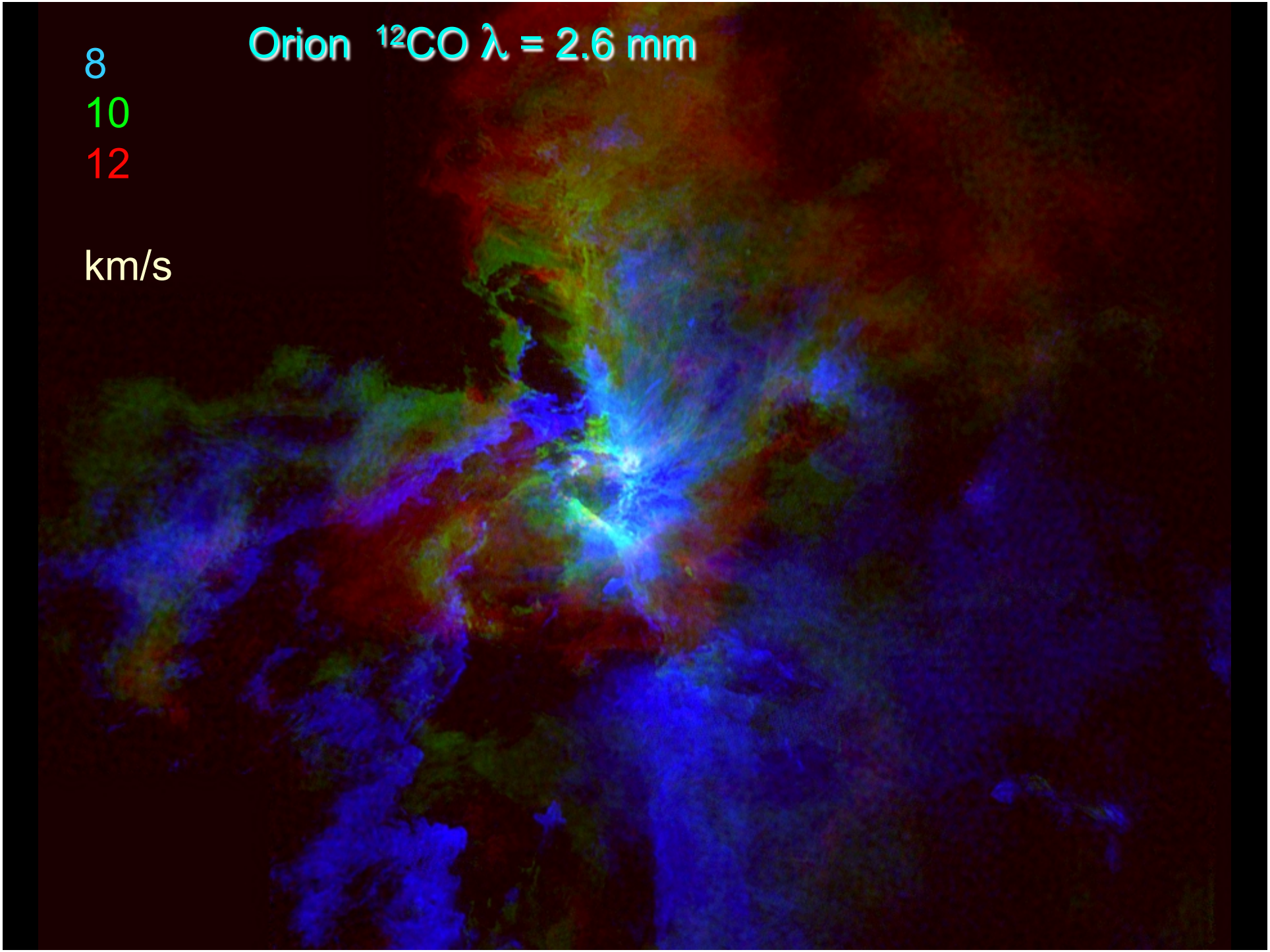
Orion Nebula
Visual
~0.5 um

Orion Nebula
(ESO VISTA near-IR)
1.2, 1.6, 2.2 um

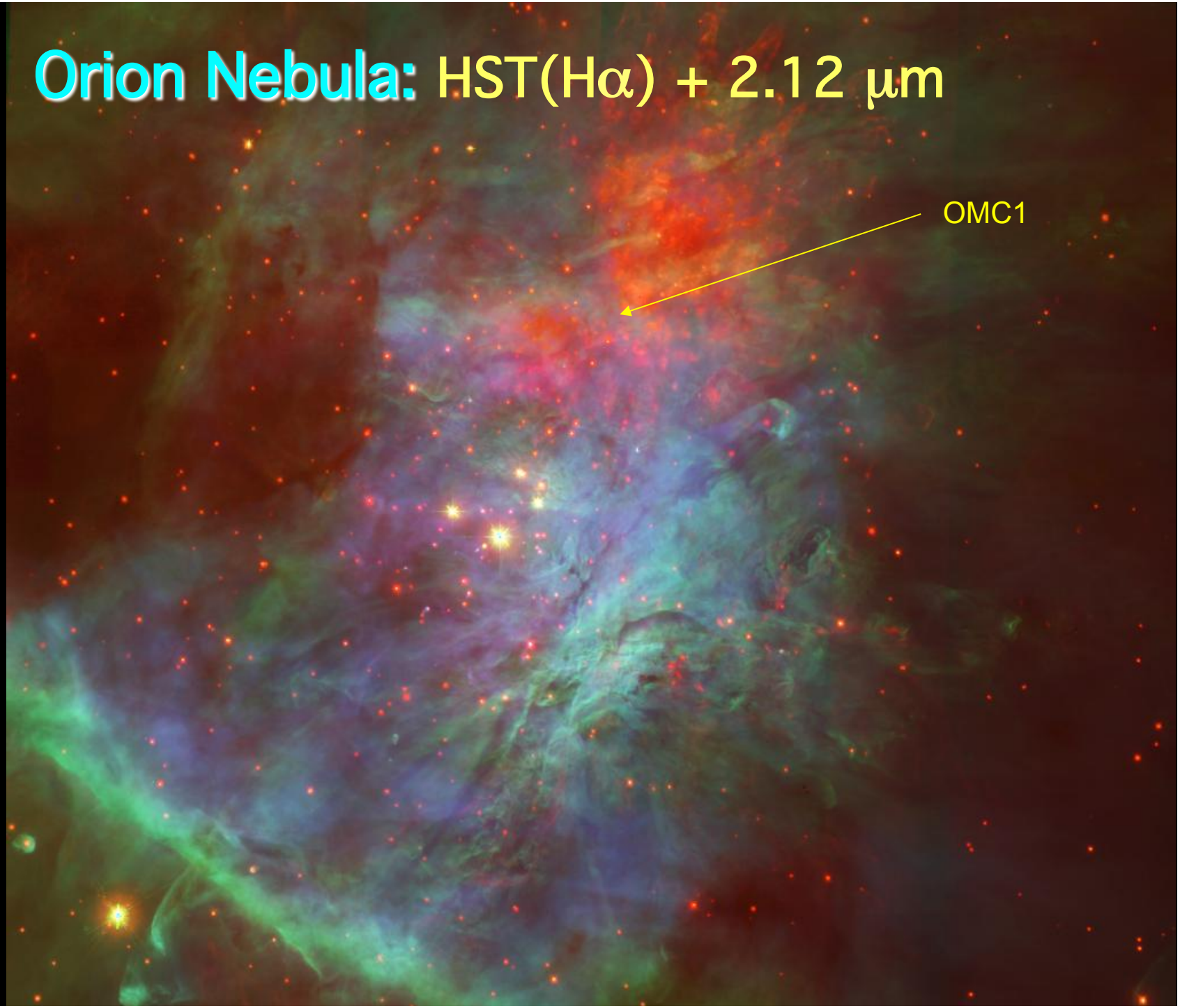

Orion ^{12}CO λ = 2.6 mm
5
7
9
km/s

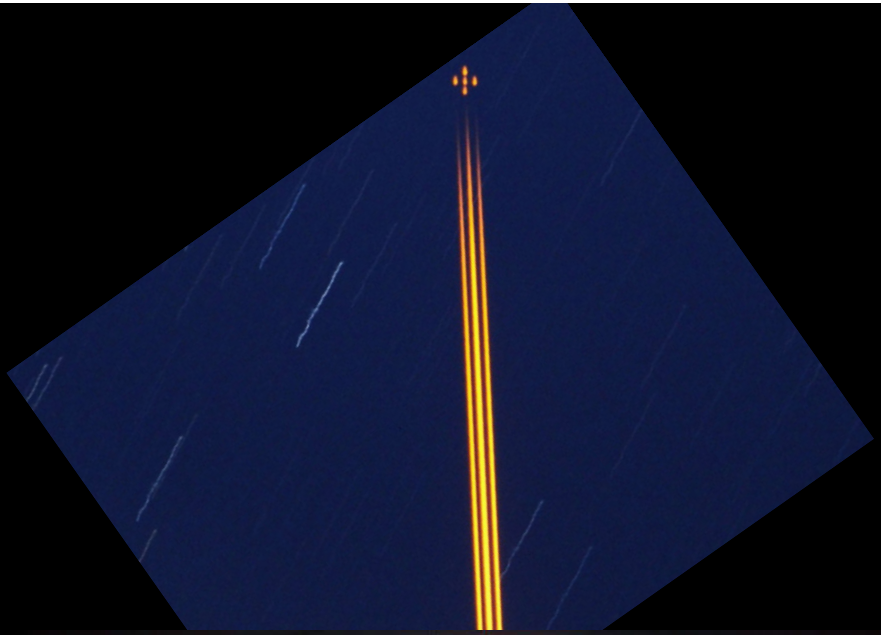

Orion ^{12}CO λ = 2.6 mm
6
8
10
km/s


Orion ^{12}CO λ = 2.6 mm
7
9
11
km/s

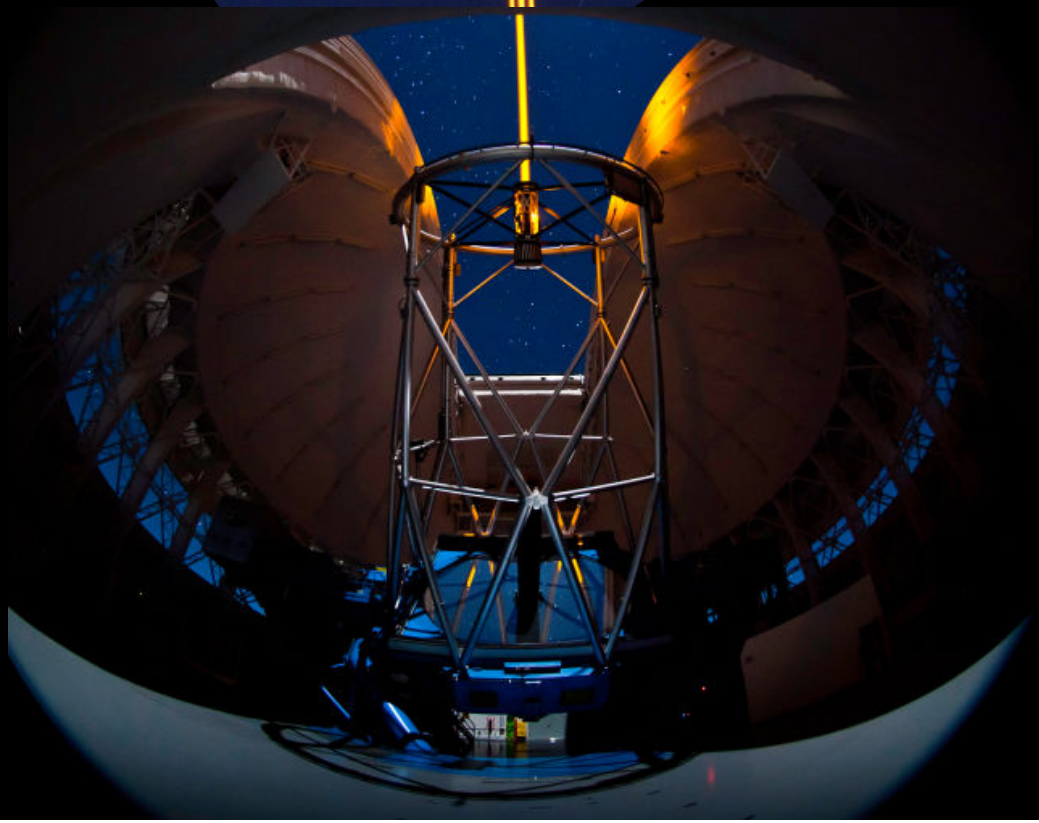

Orion ^{12}CO λ = 2.6 mm
8
10
12
km/s

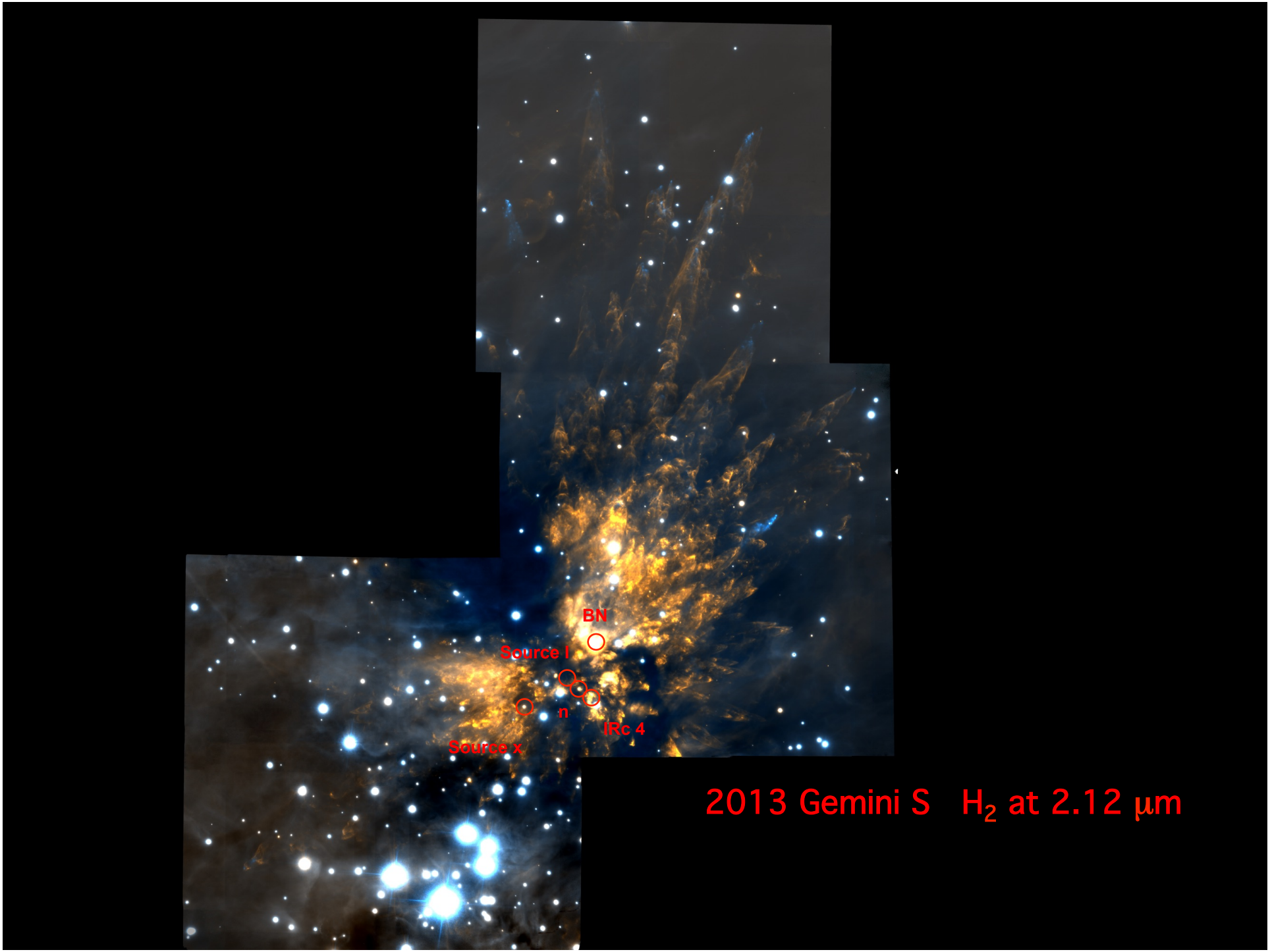
Orion Nebula: HST(Hα) + 2.12 μm

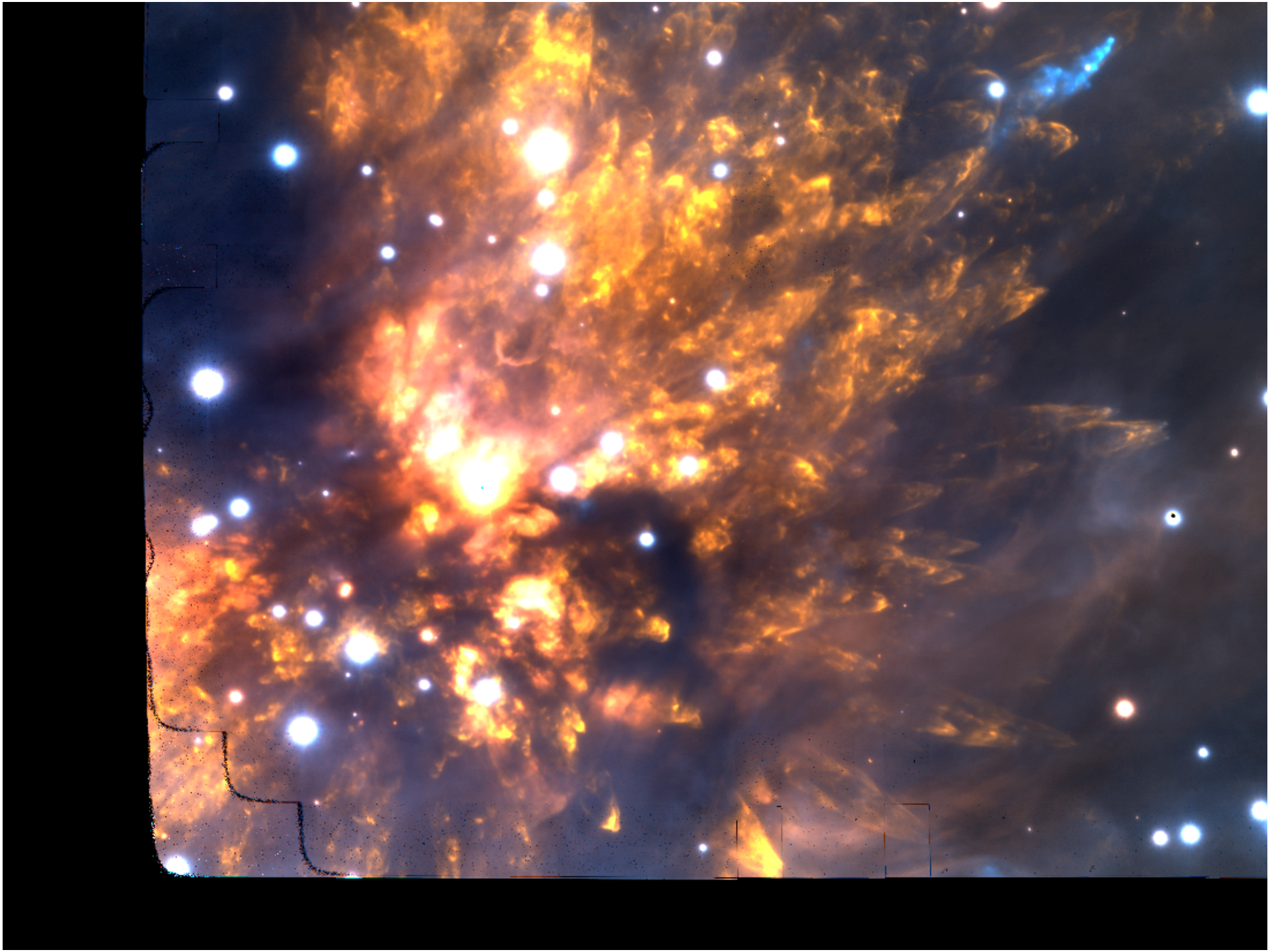


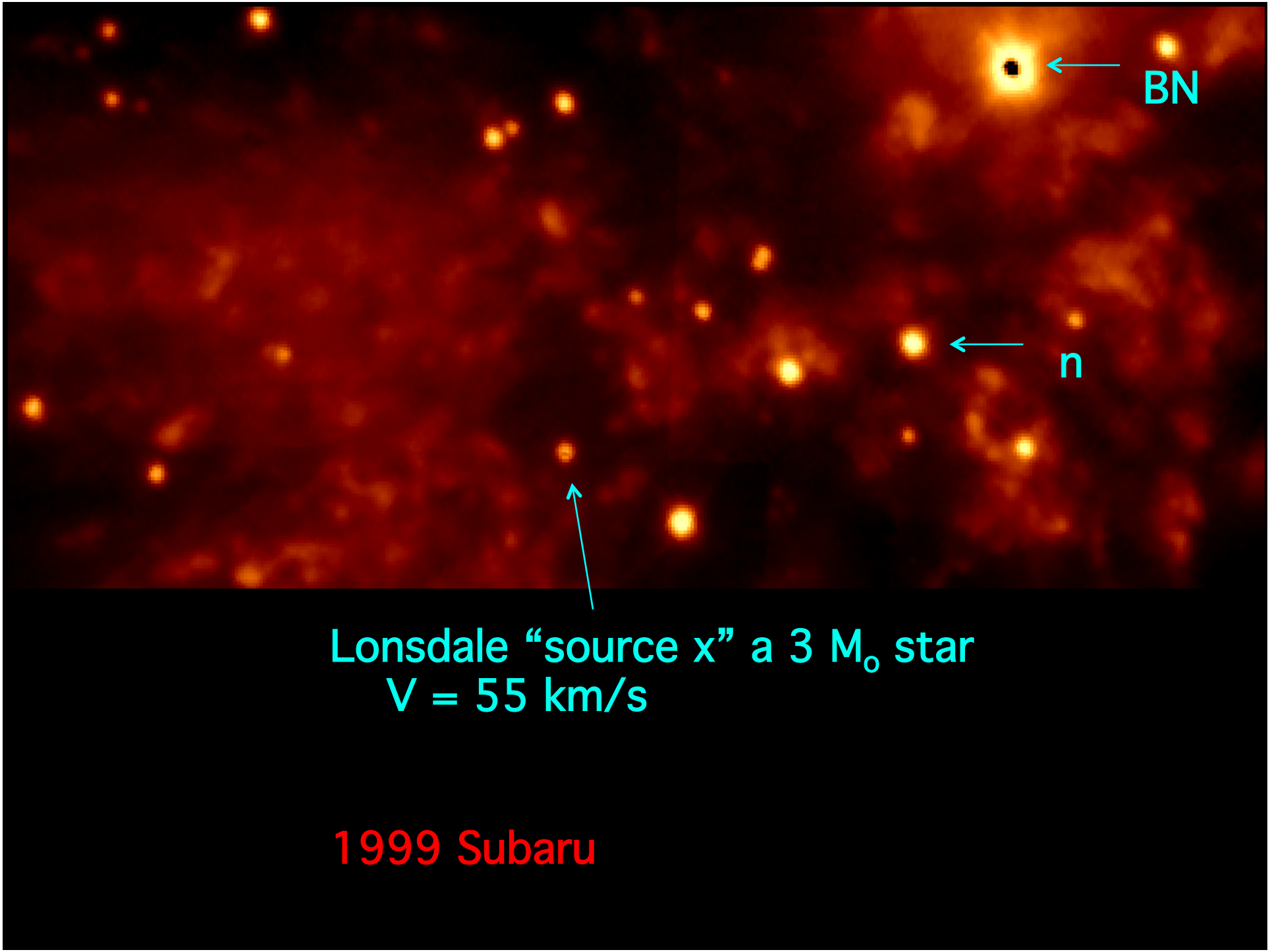


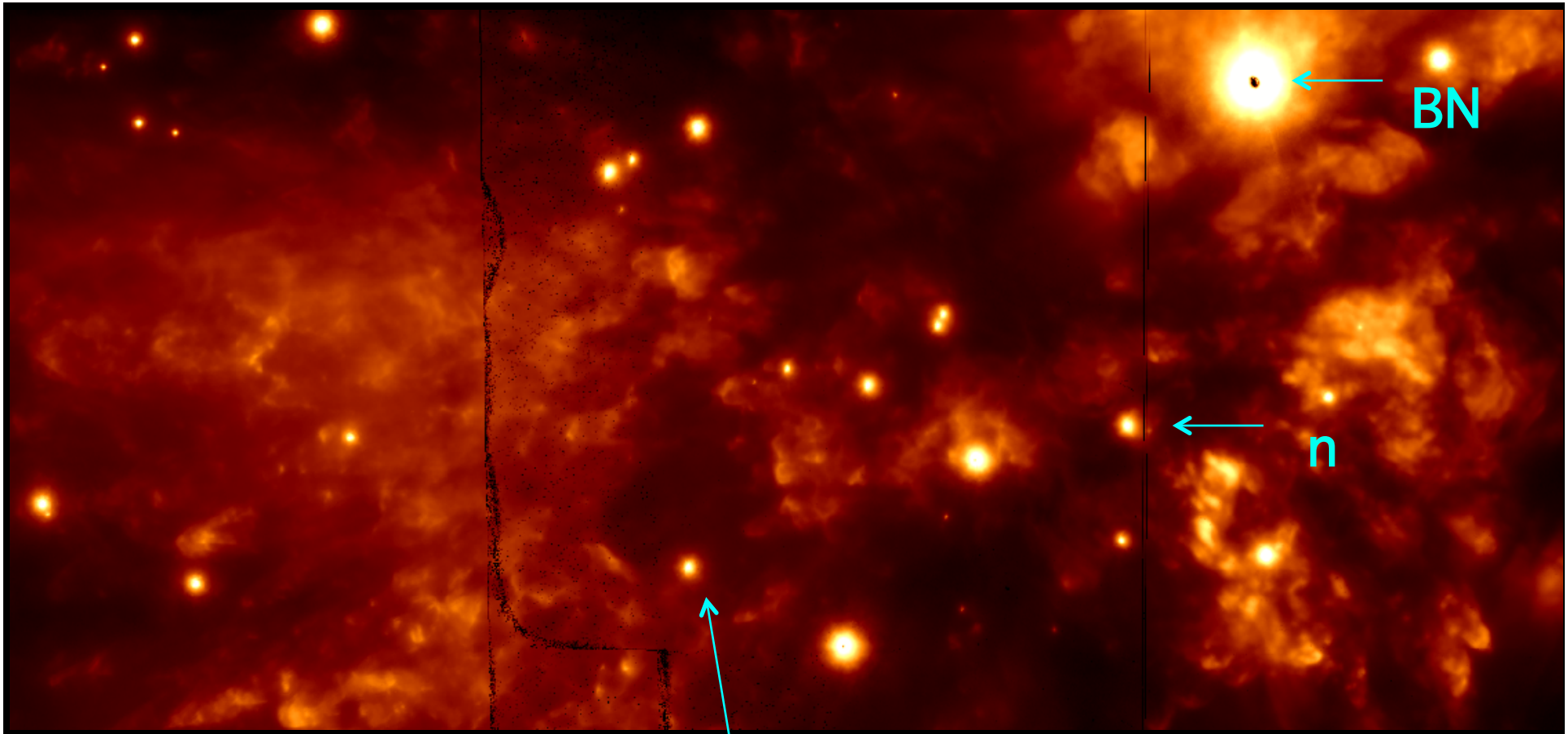
Gemini
South
Adaptive
Optics
Imager




BN
Source I
n
IRc 4
Source x
2013 Gemini S H2 at 2.12 μm

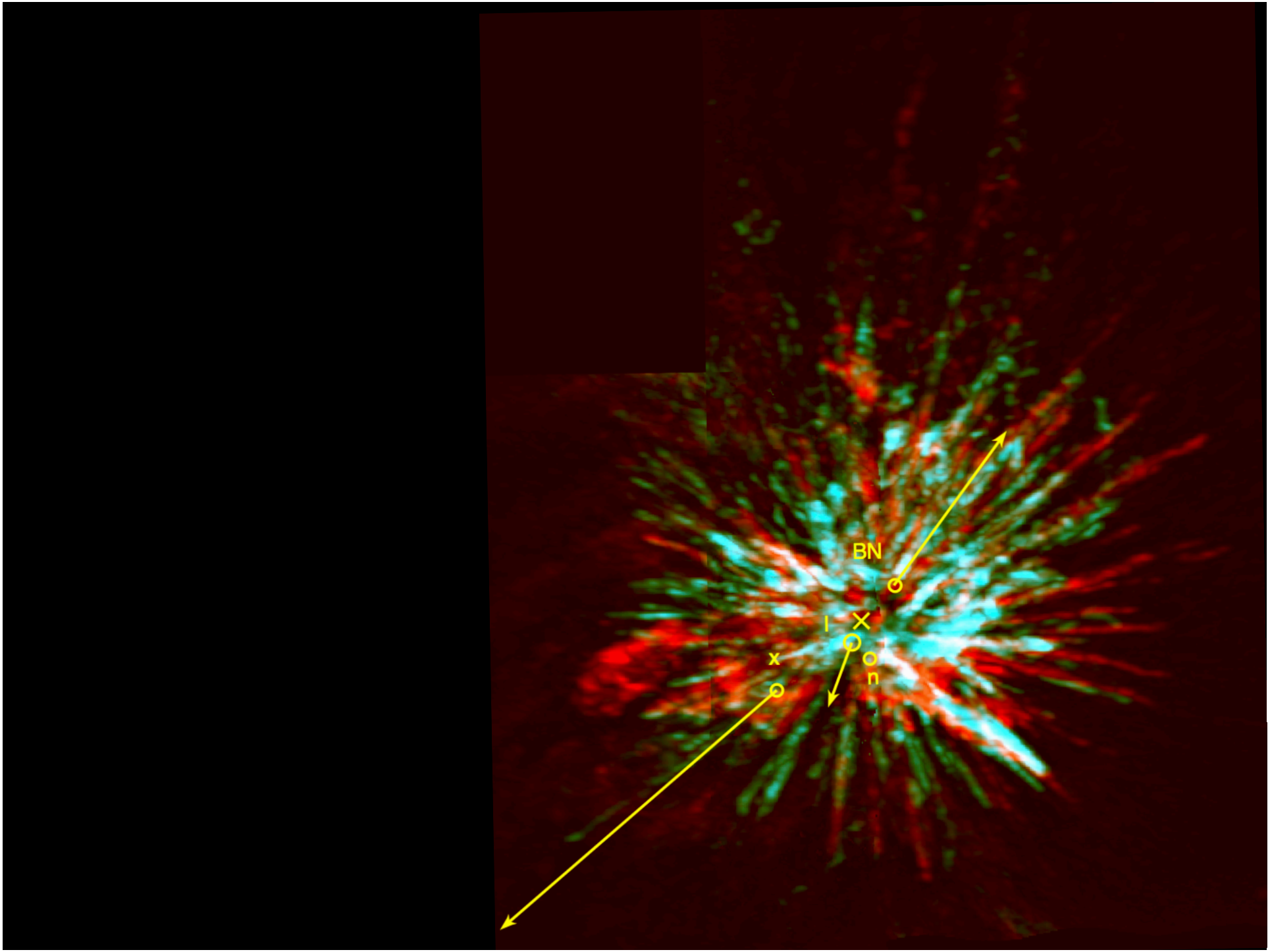


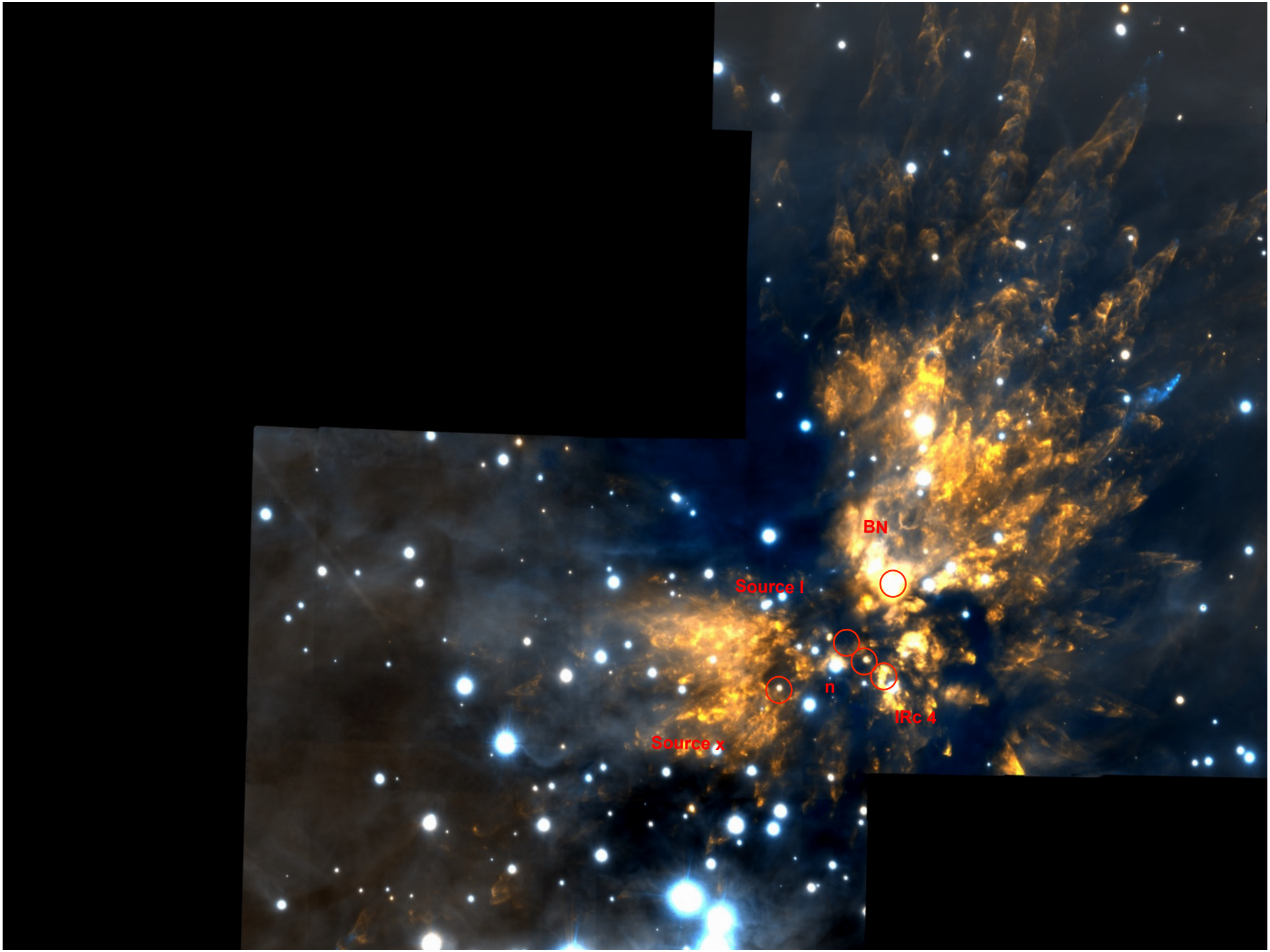

BN
n
Lonsdale “source x” a 3 M_o star
V = 55 km/s
1999 Subaru



Lonsdale “source x” a 3 M_o star
V = 55 km/s

2013 Gemini South


BN
I
X
x
n

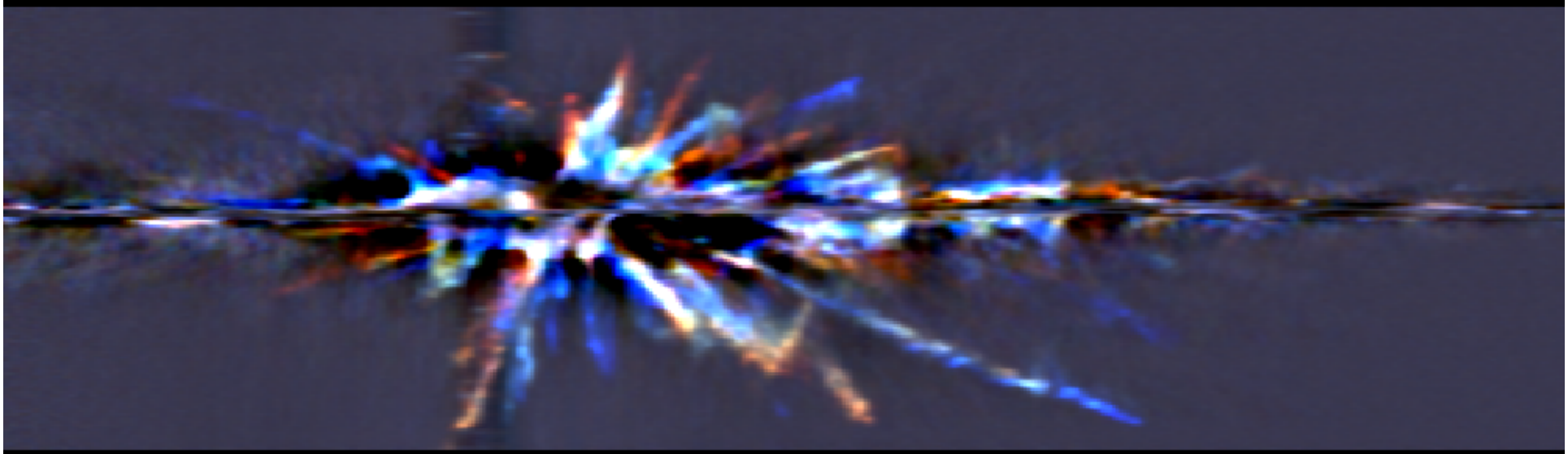

BN
Source I
n
IRc 4
Source x

North-South Cut

South
North

120”

V =+120 km / s



V = -120 km/s

Constant dV/dr ! => No deceleration !

n ~ 100 linear ejecta streams with $V = C_n R$

$\rho >> \rho_{ambient}$ $\rho > 10^8$ cm^{-3}

$N \sim 10^3$ clumps with $M_{clump} \sim 10^{28} - 10^{30}$ grams ?