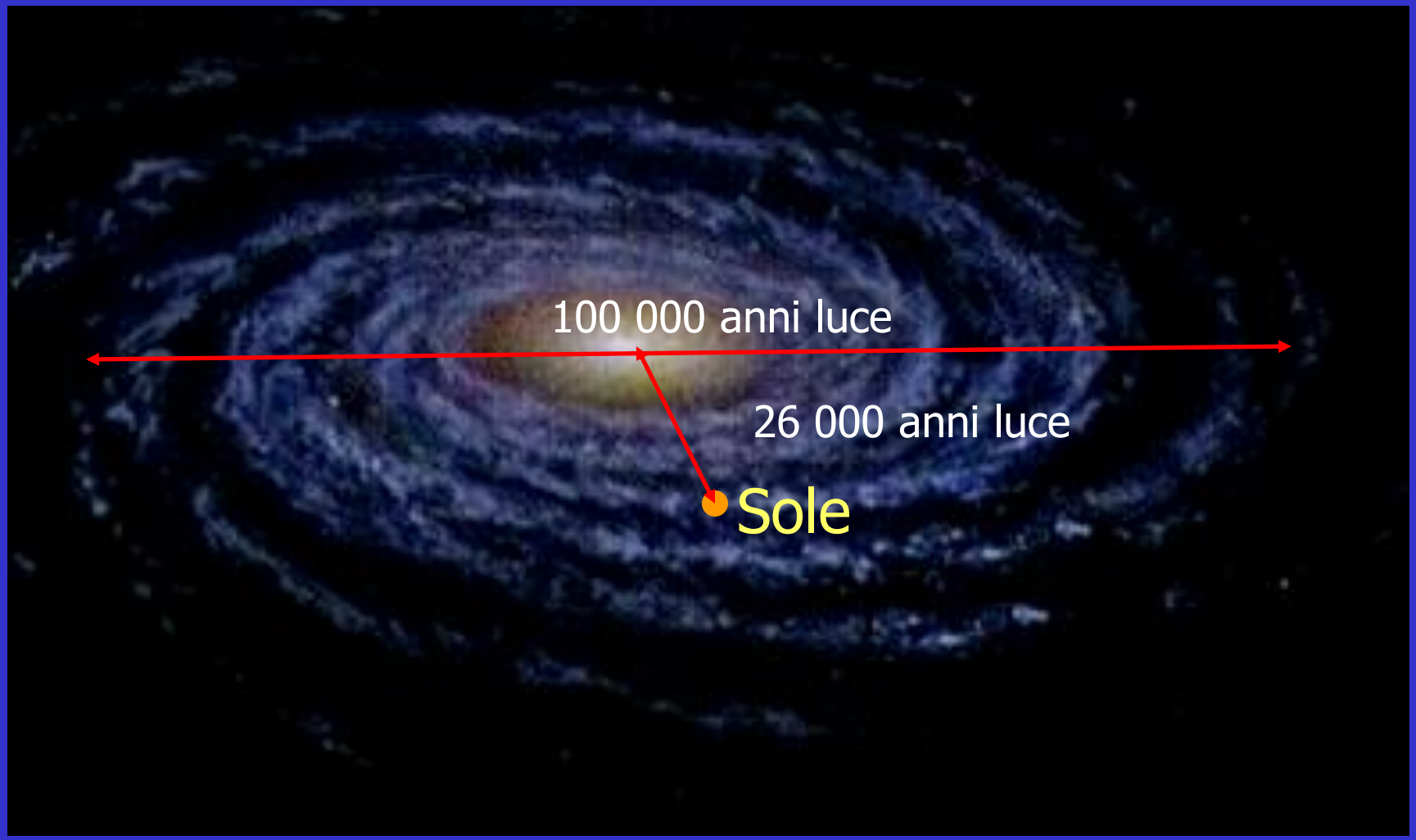
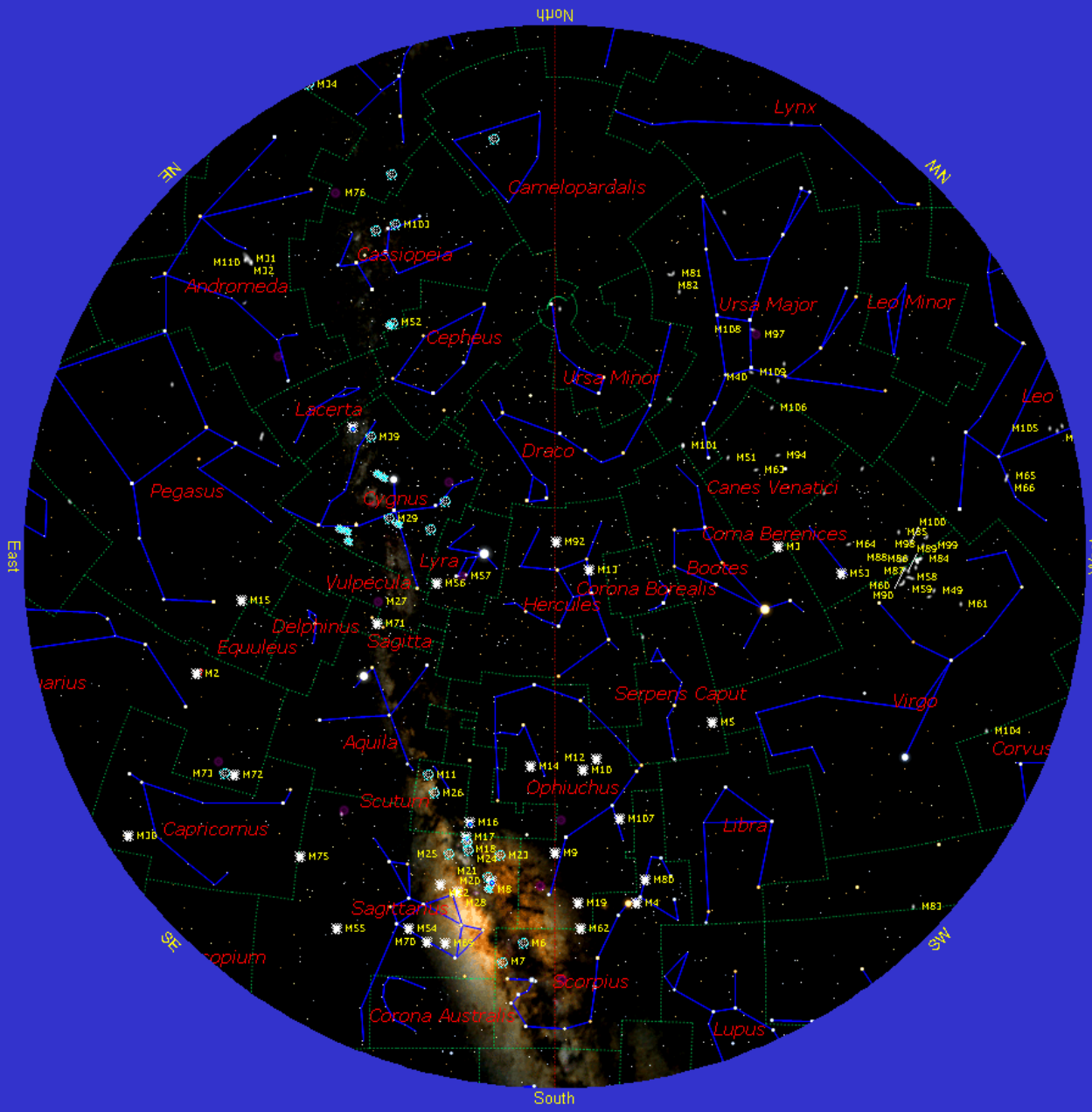
La nostra Galassia



Un'orbita solare attorno al centro della Galassia in 250 milioni di anni

a 220 km/s~800 000 km/h ~1000 volte la velocità di un aereo di linea

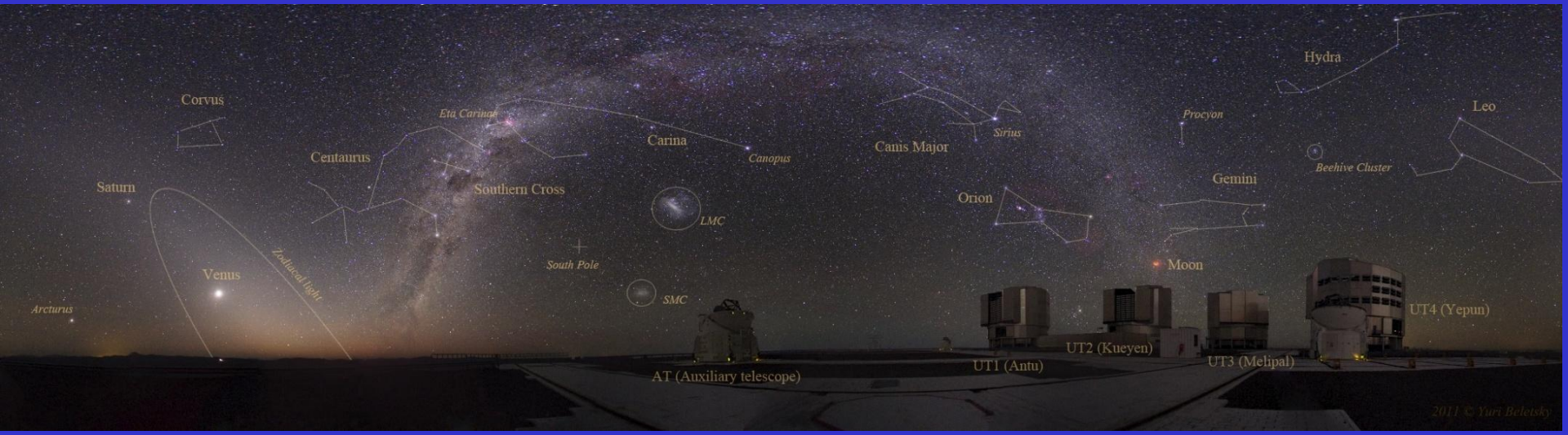
La Via Lattea come la vediamo



La Via Lattea dal Paranal

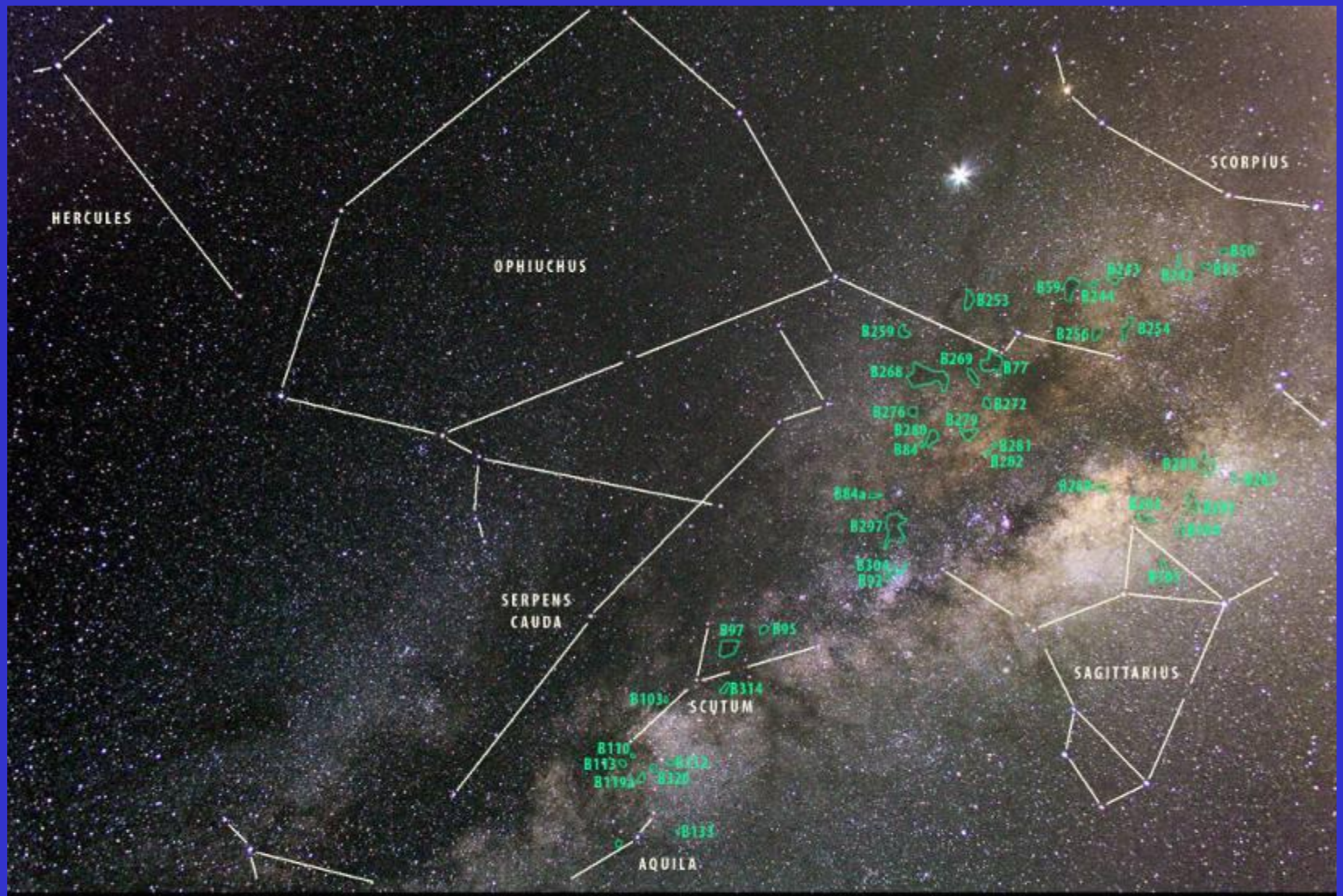
Via Lattea vista dalle Canarie

Cielo –costellazioni e luce zodiacale- nell'emisfero Australe



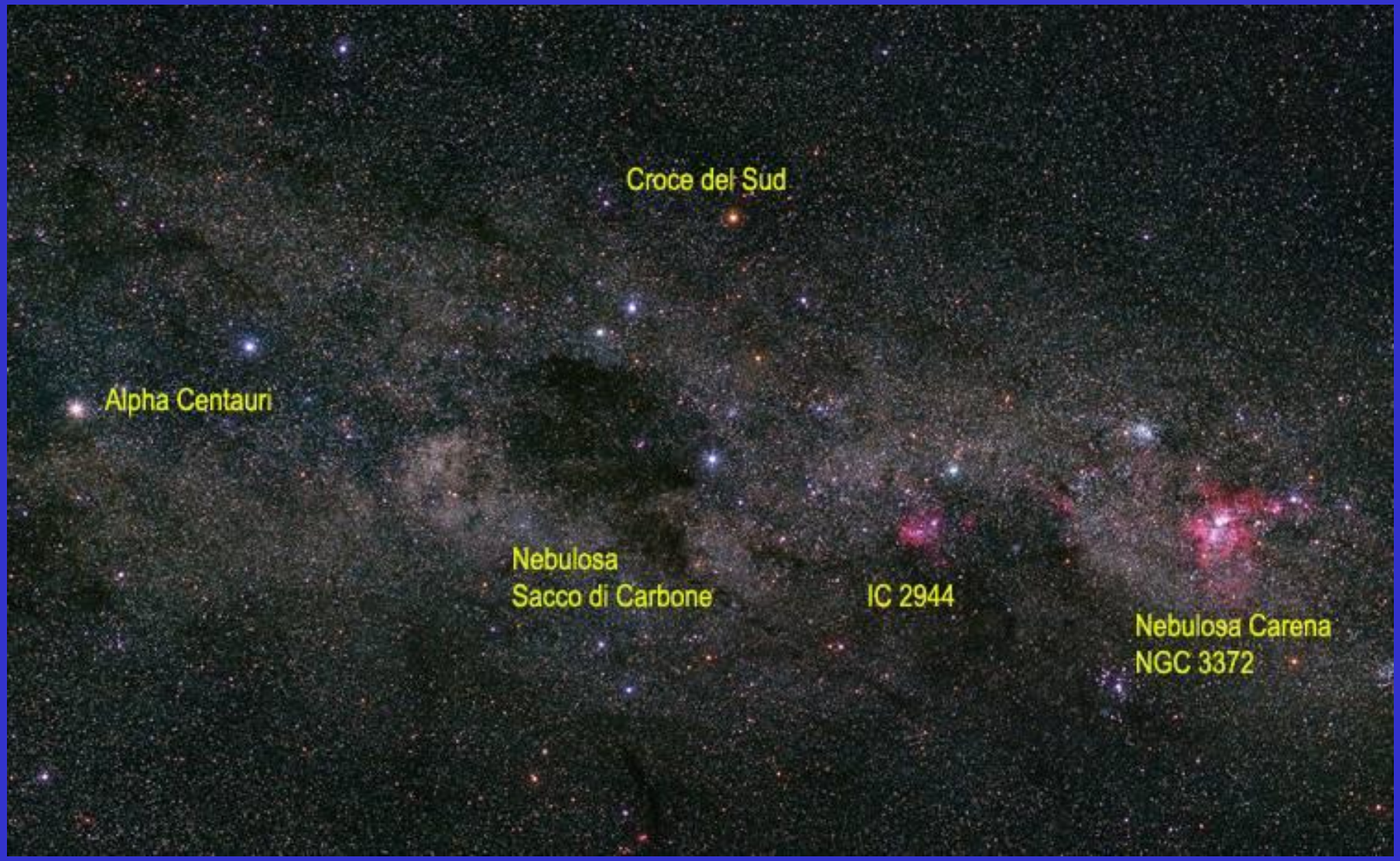
Il cielo notturno

La Via Lattea come la vediamo



Scutum - Sagittarius Milky Way
June 17, 2007 - 01:30 AM MST
Canon EOS Digital Rebel (300D)
18 - 55 mm Kit Lens @ 18 mm • f/7.1 • ISO 800 • 3 x 10 minutes
Photo by Jeremy Perez © 2007

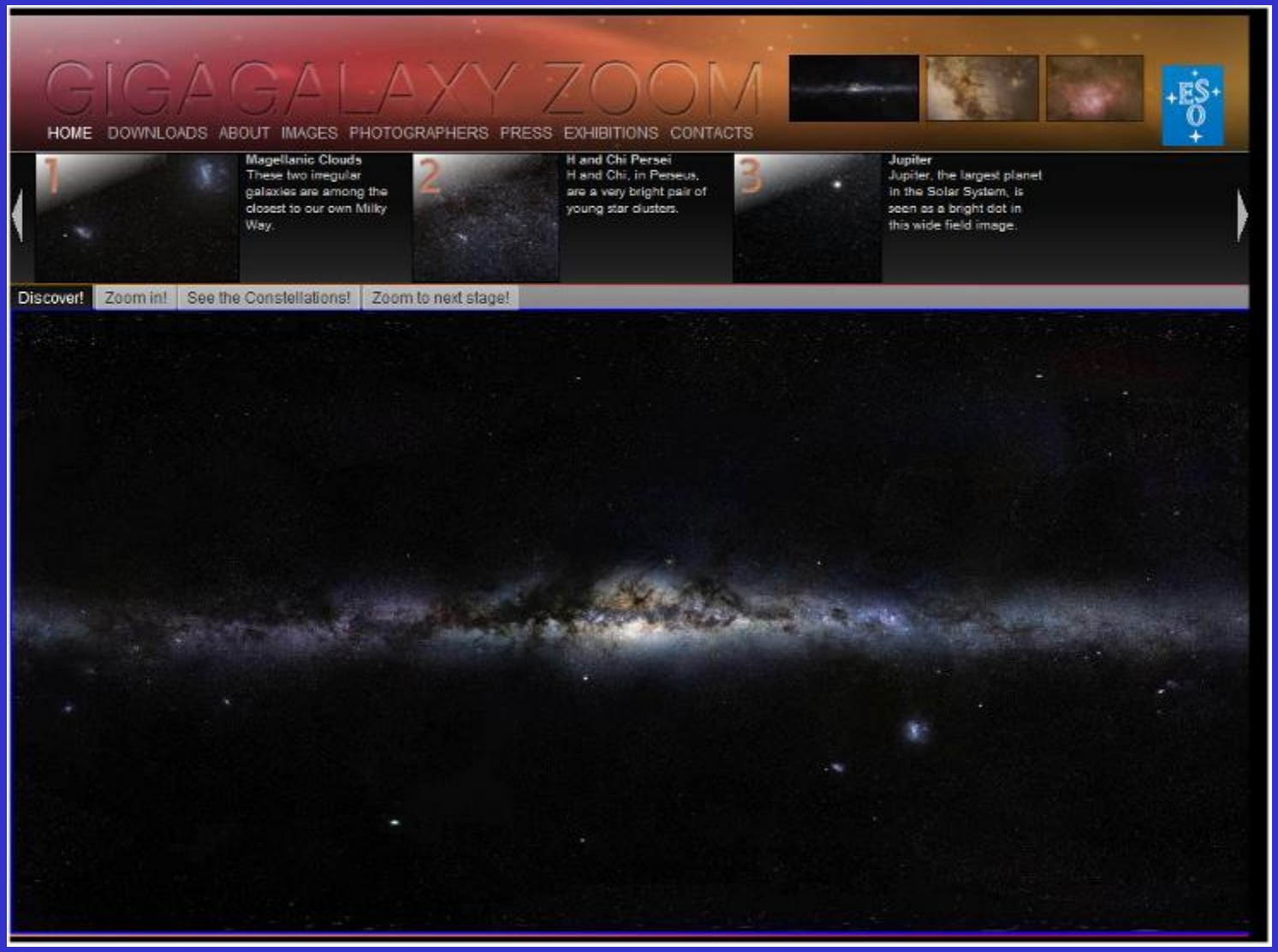
La Via Lattea-un dettaglio



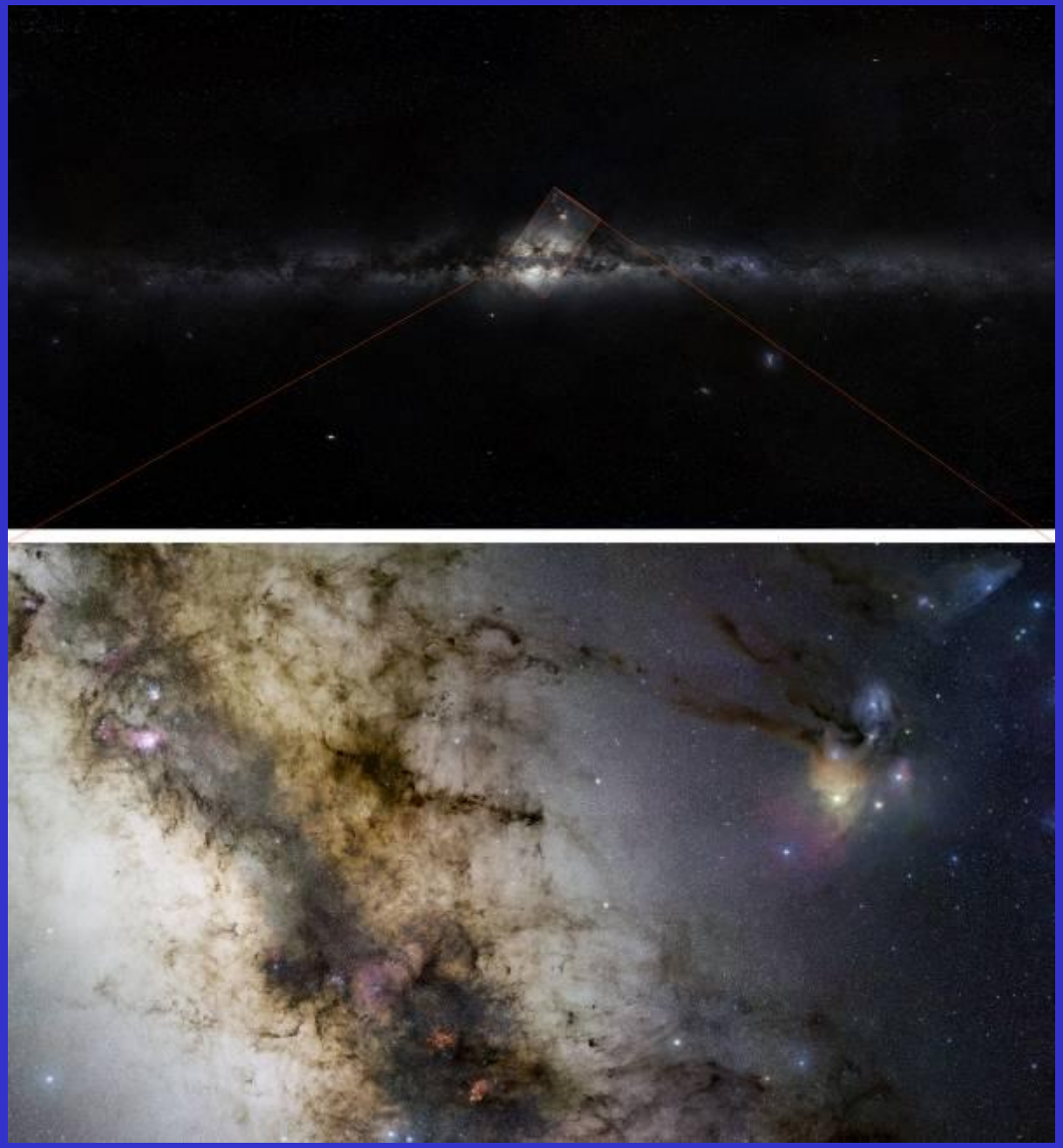
Verso il centro galattico

La Via Lattea: Giga-Galaxy Zoom

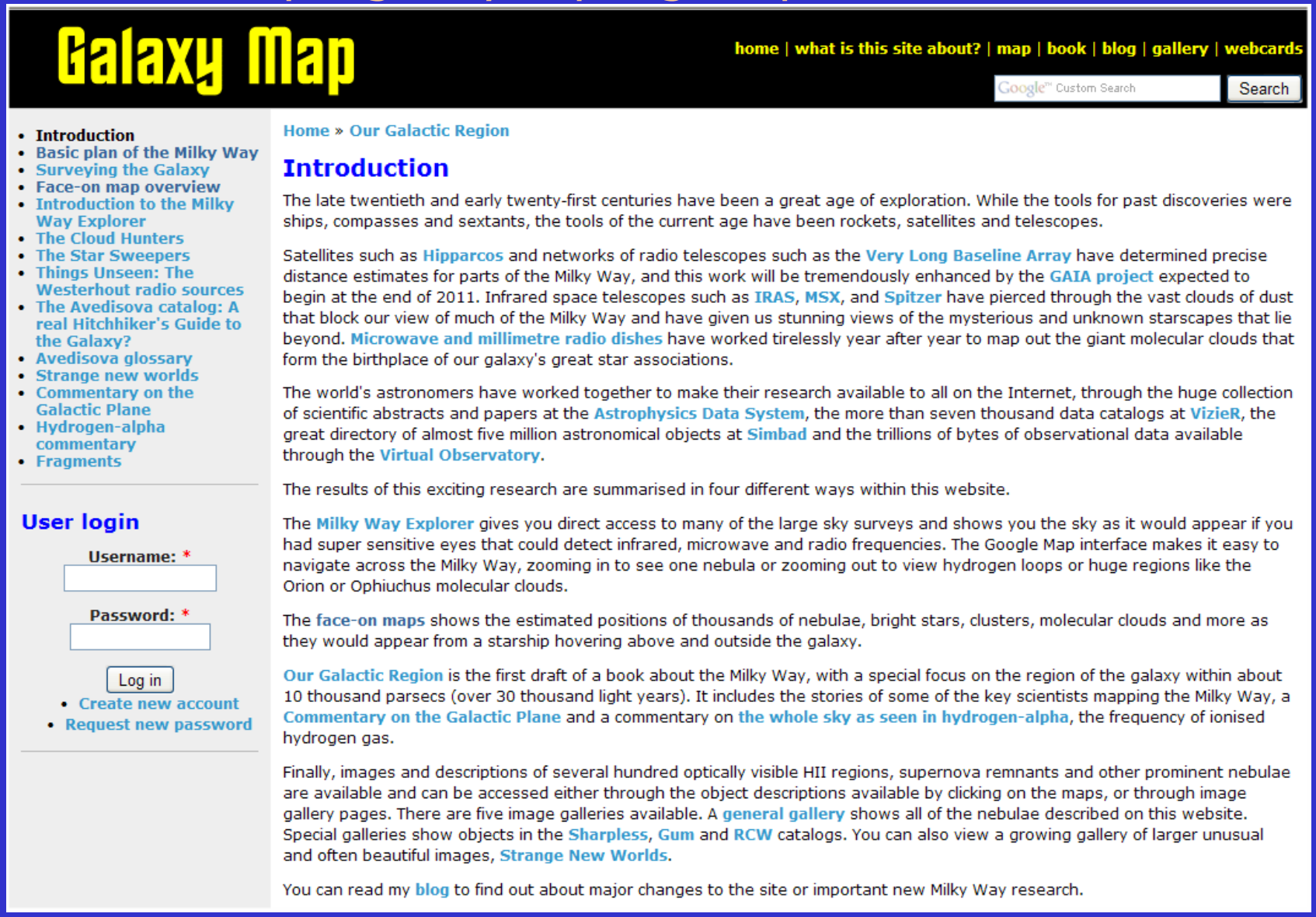
http://www.gigagalaxyzoom.org/B.html



La Via Lattea: Giga-Galaxy Zoom



La Via Lattea: Galaxy Map
http://galaxymap.org/drupal/node/171



Galaxy Map

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- **Introduction**
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- Surveying the Galaxy
- Face-on map overview
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- The Cloud Hunters
- The Star Sweepers
- Things Unseen: The Westerhout radio sources
- The Avedisova catalog: A real Hitchhiker's Guide to the Galaxy?
- Avedisova glossary
- Strange new worlds
- Commentary on the Galactic Plane
- Hydrogen-alpha commentary
- Fragments

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Introduction

The late twentieth and early twenty-first centuries have been a great age of exploration. While the tools for past discoveries were ships, compasses and sextants, the tools of the current age have been rockets, satellites and telescopes.

Satellites such as Hipparcos and networks of radio telescopes such as the Very Long Baseline Array have determined precise distance estimates for parts of the Milky Way, and this work will be tremendously enhanced by the GAIA project expected to begin at the end of 2011. Infrared space telescopes such as IRAS, MSX, and Spitzer have pierced through the vast clouds of dust that block our view of much of the Milky Way and have given us stunning views of the mysterious and unknown starscapes that lie beyond. Microwave and millimetre radio dishes have worked tirelessly year after year to map out the giant molecular clouds that form the birthplace of our galaxy's great star associations.

The world's astronomers have worked together to make their research available to all on the Internet, through the huge collection of scientific abstracts and papers at the Astrophysics Data System, the more than seven thousand data catalogs at VizieR, the great directory of almost five million astronomical objects at Simbad and the trillions of bytes of observational data available through the Virtual Observatory.

The results of this exciting research are summarised in four different ways within this website.

The Milky Way Explorer gives you direct access to many of the large sky surveys and shows you the sky as it would appear if you had super sensitive eyes that could detect infrared, microwave and radio frequencies. The Google Map interface makes it easy to navigate across the Milky Way, zooming in to see one nebula or zooming out to view hydrogen loops or huge regions like the Orion or Ophiuchus molecular clouds.

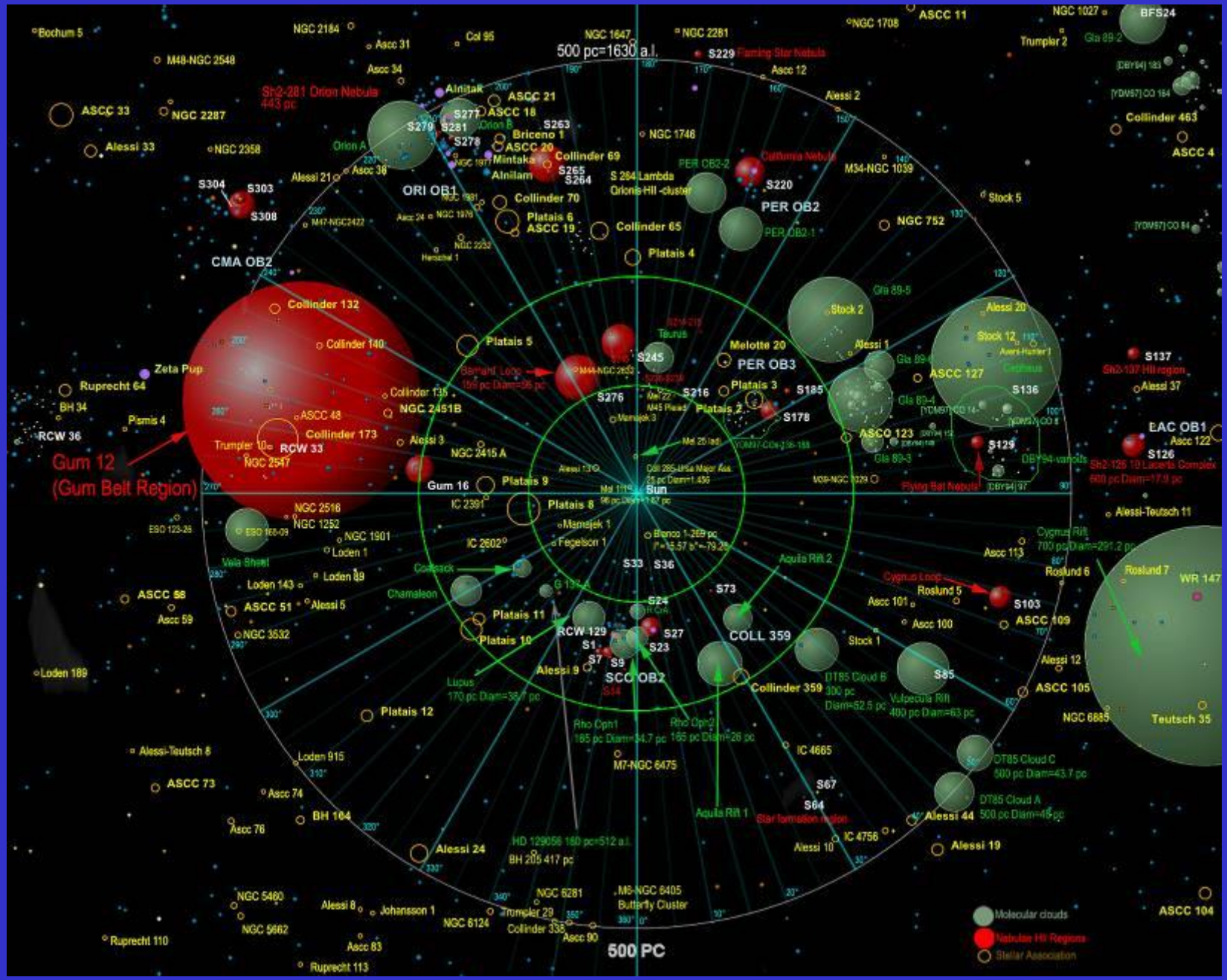
The face-on maps shows the estimated positions of thousands of nebulae, bright stars, clusters, molecular clouds and more as they would appear from a starship hovering above and outside the galaxy.

Our Galactic Region is the first draft of a book about the Milky Way, with a special focus on the region of the galaxy within about 10 thousand parsecs (over 30 thousand light years). It includes the stories of some of the key scientists mapping the Milky Way, a Commentary on the Galactic Plane and a commentary on the whole sky as seen in hydrogen-alpha, the frequency of ionised hydrogen gas.

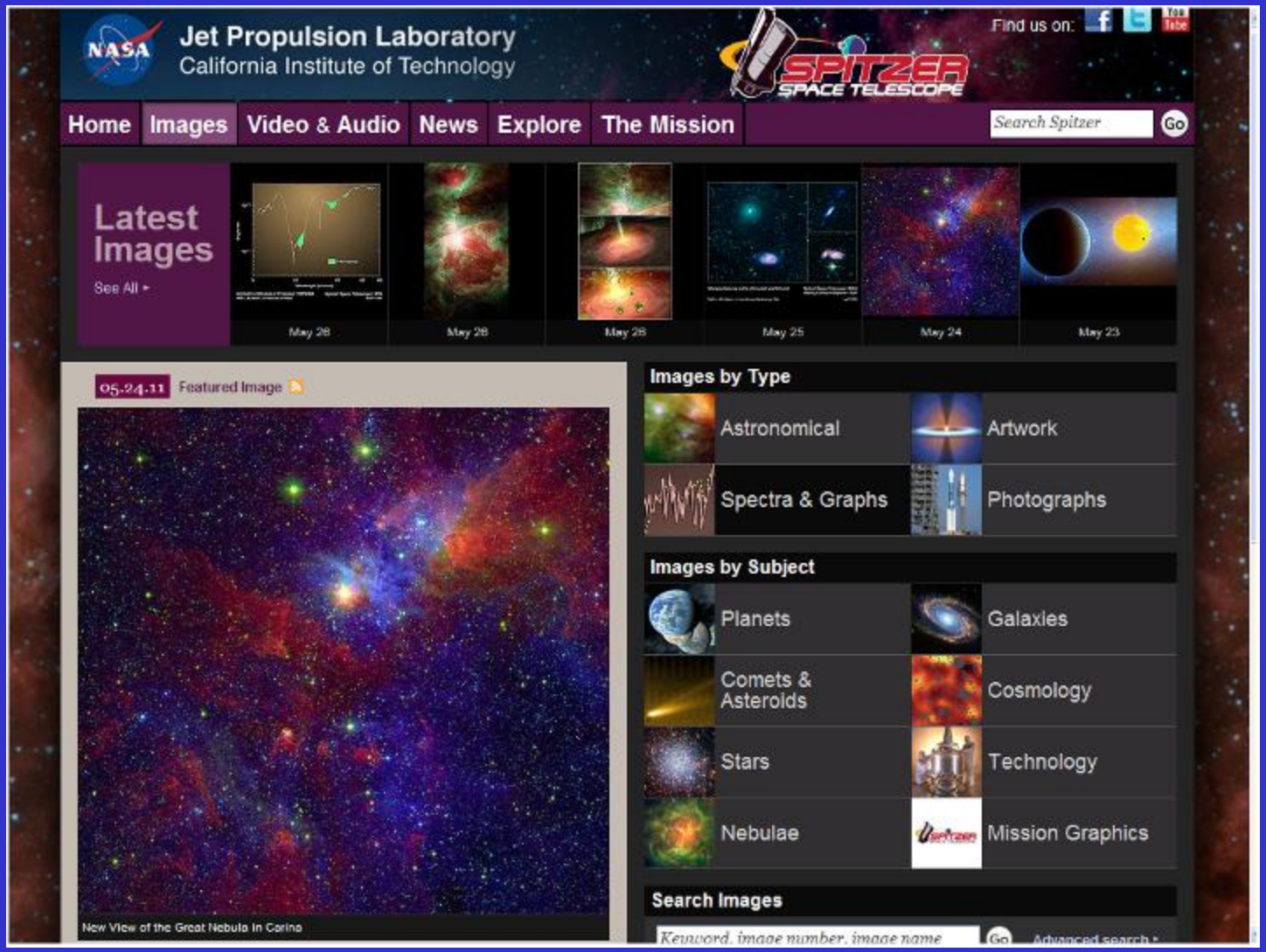
Finally, images and descriptions of several hundred optically visible HII regions, supernova remnants and other prominent nebulae are available and can be accessed either through the object descriptions available by clicking on the maps, or through image gallery pages. There are five image galleries available. A general gallery shows all of the nebulae described on this website. Special galleries show objects in the Sharpless, Gum and RCW catalogs. You can also view a growing gallery of larger unusual and often beautiful images, Strange New Worlds.

You can read my blog to find out about major changes to the site or important new Milky Way research.

La Fascia di Gould-Galaxy Map



La Via Lattea: Hurt's Map
http://www.spitzer.caltech.edu/images



La Via Lattea: Hurt's Map

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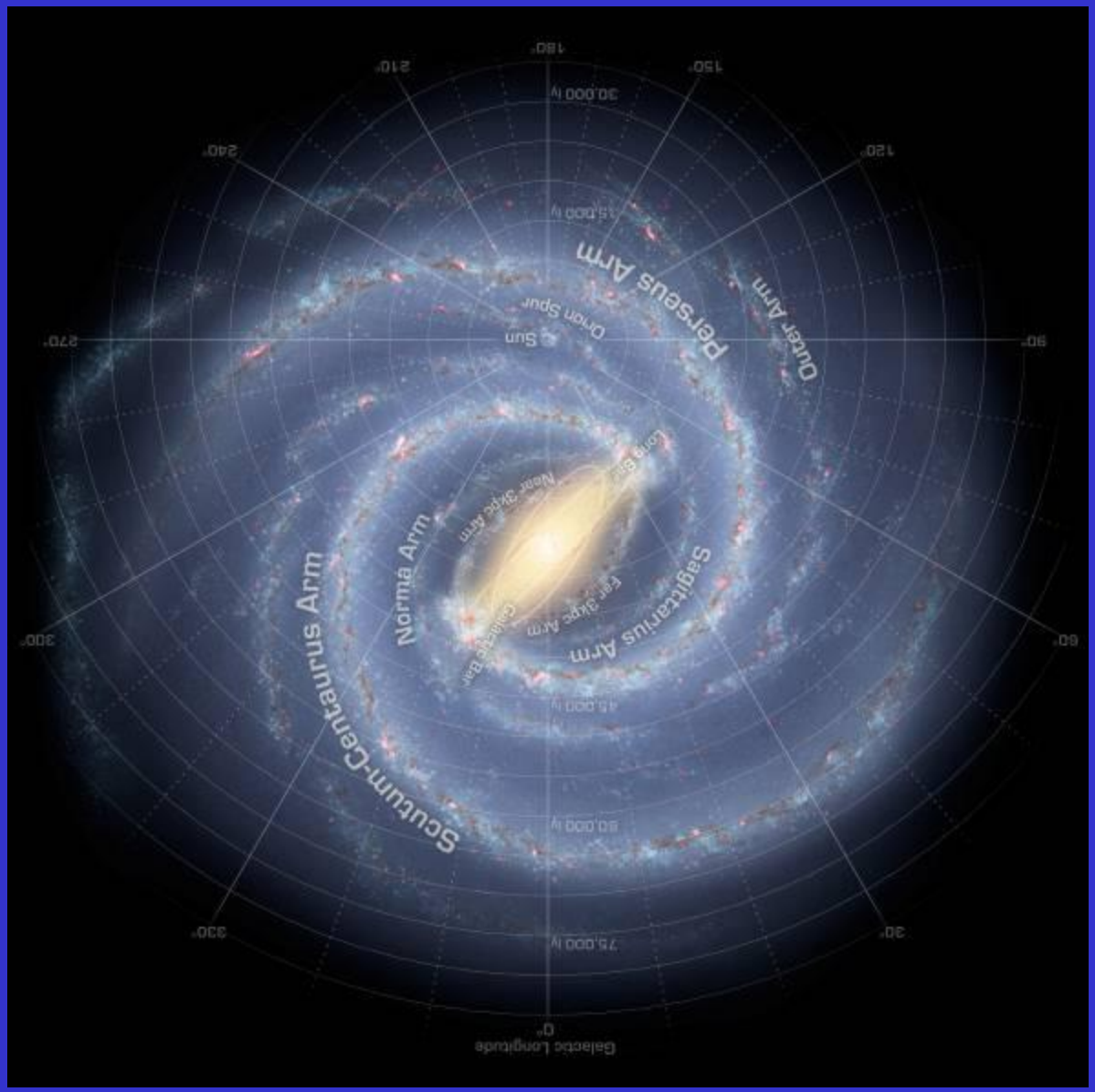
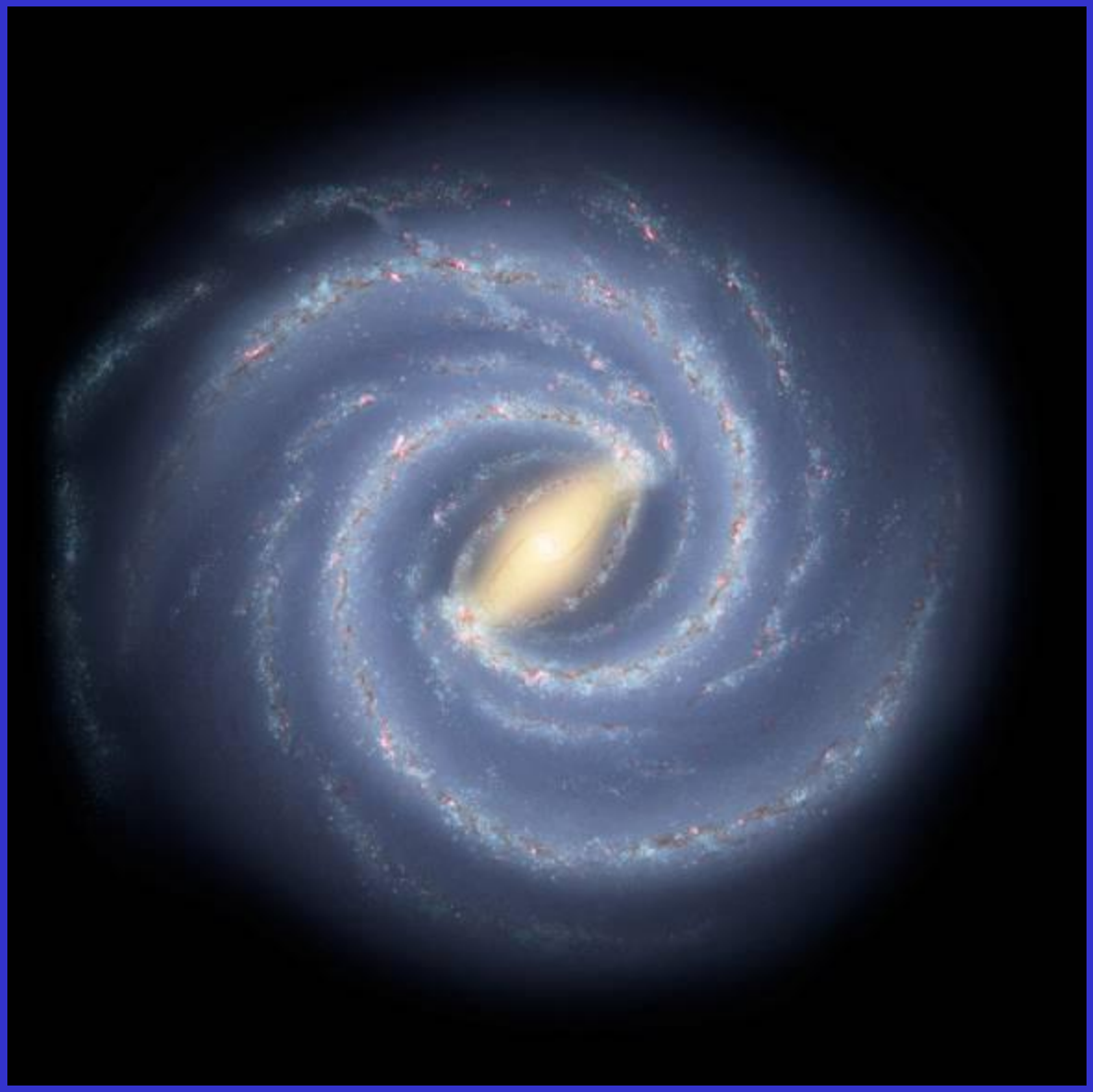
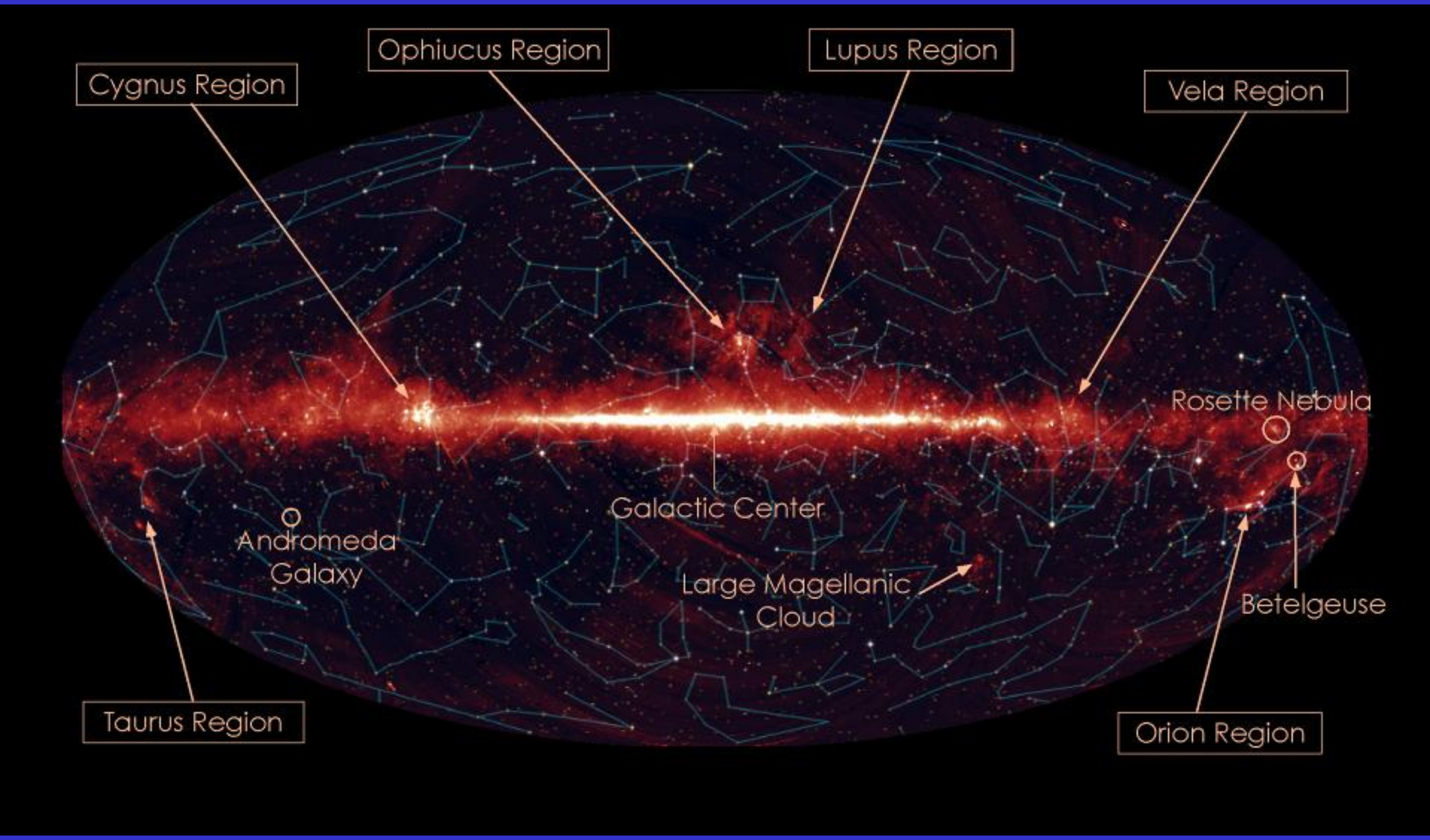


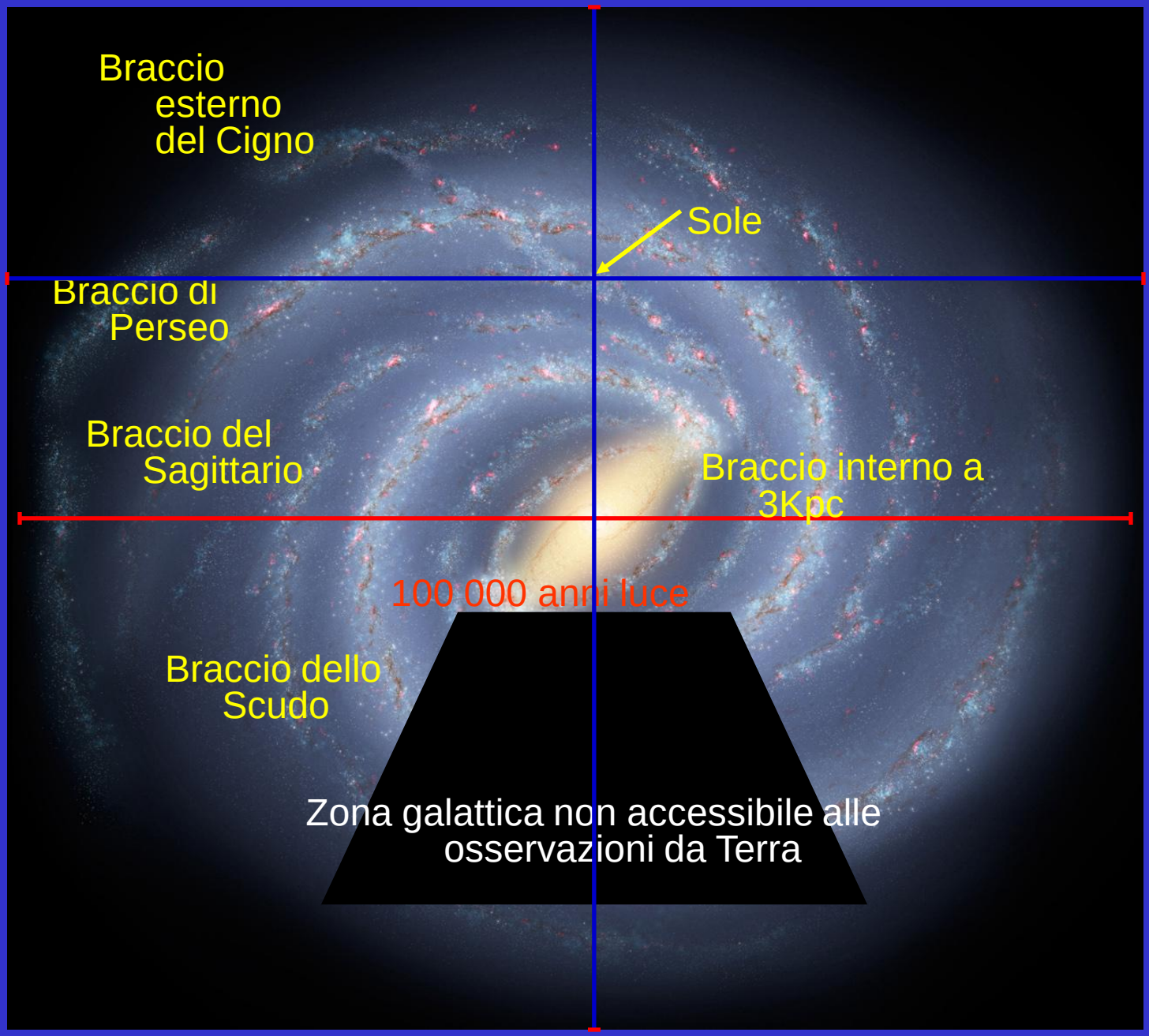
La Via Lattea: Hurt's Map
rielaborata da R. Mura di Wikipedia



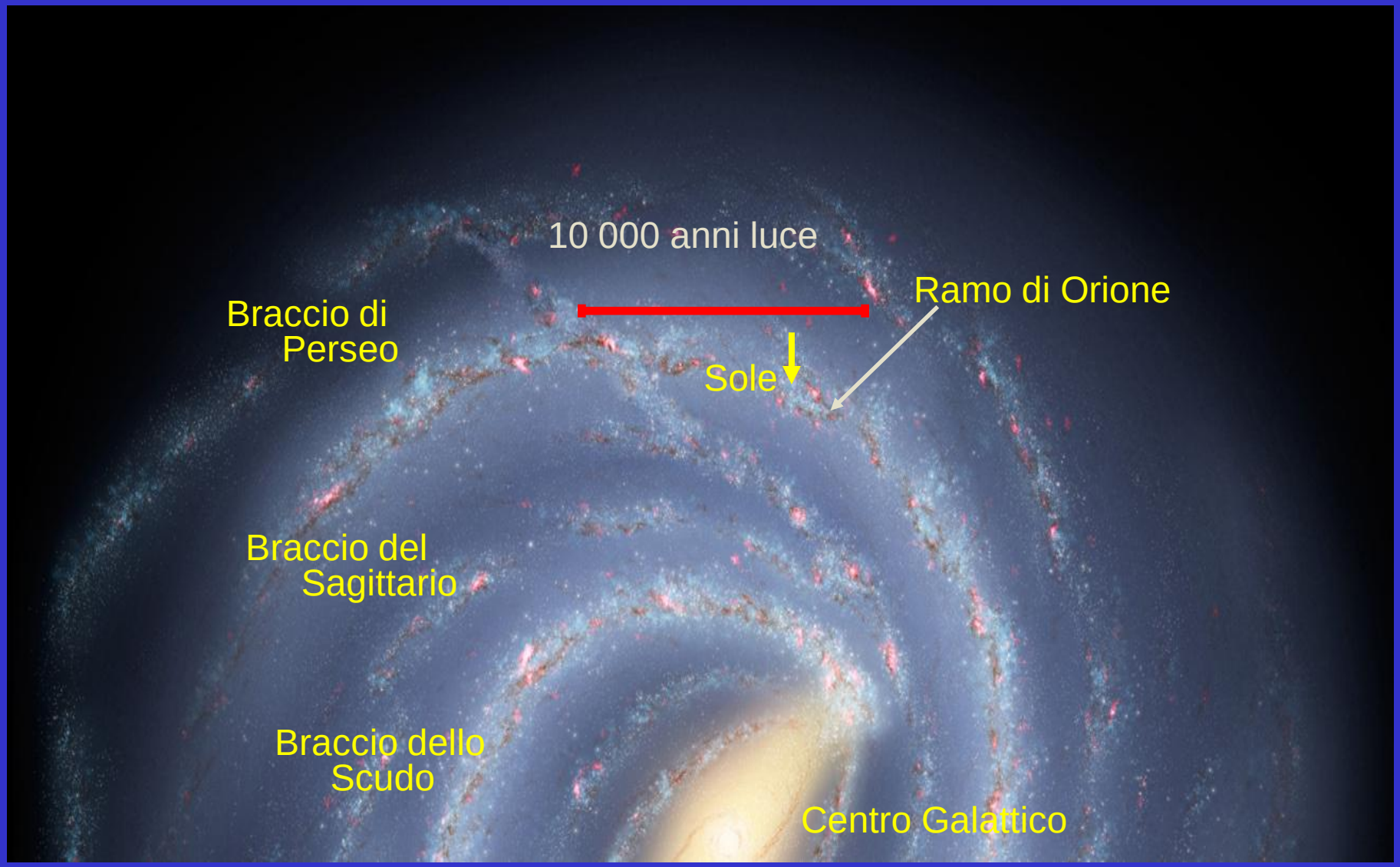
La Via Lattea una ricostruzione nell'IR



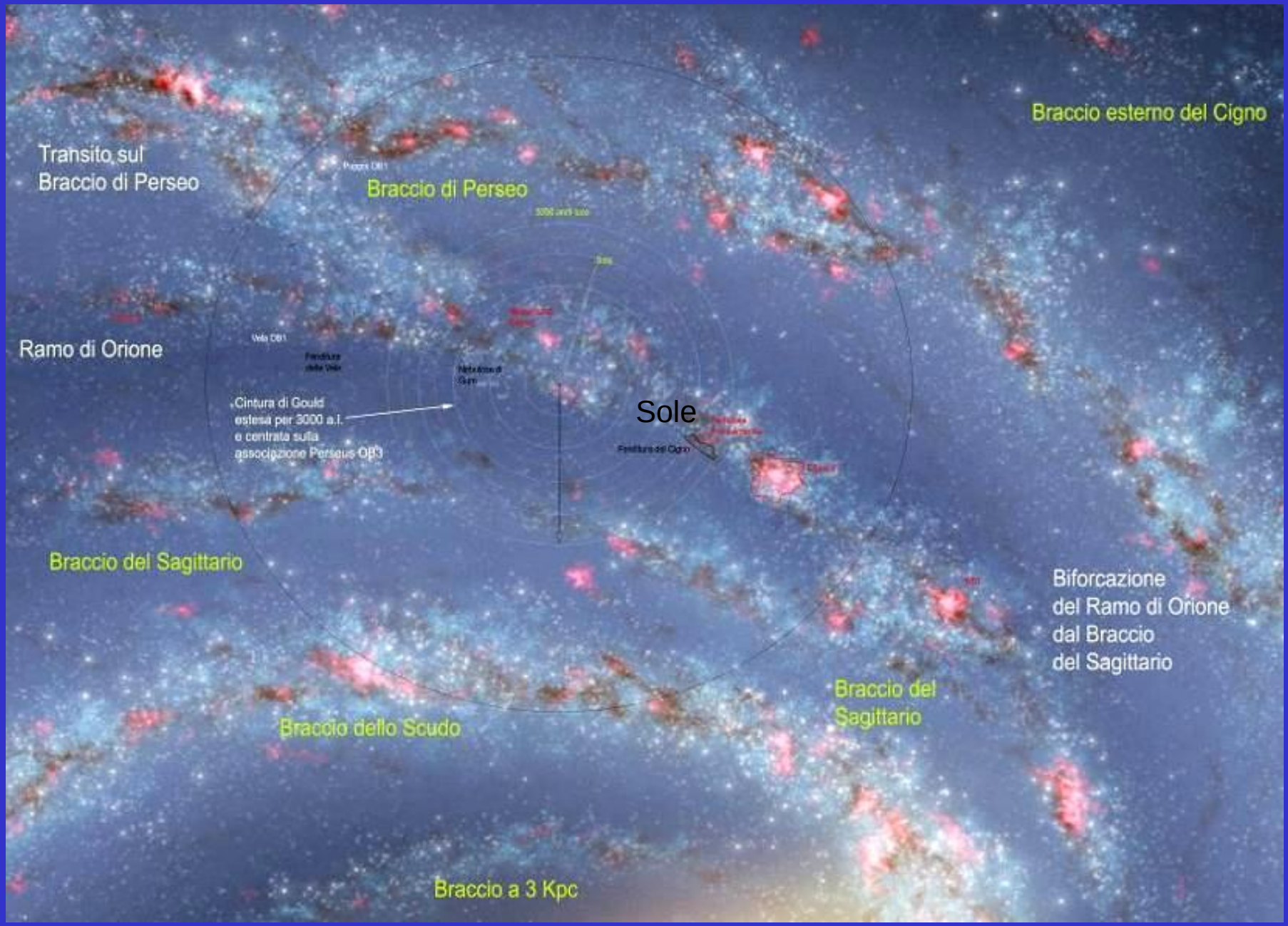
La Via Lattea



La Via Lattea



Il Ramo di Orione-5000 a.l.

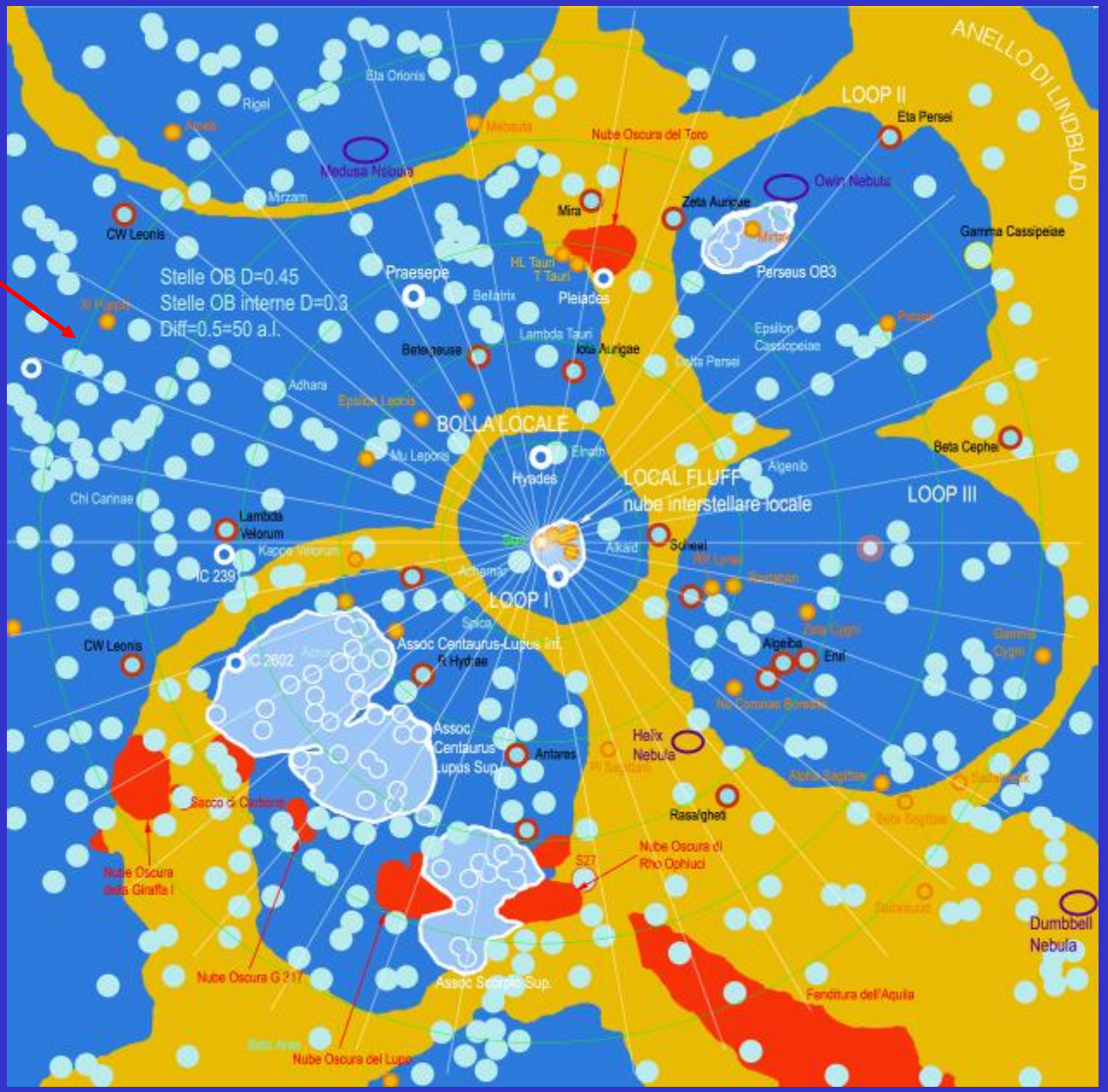


Il Local Bubble

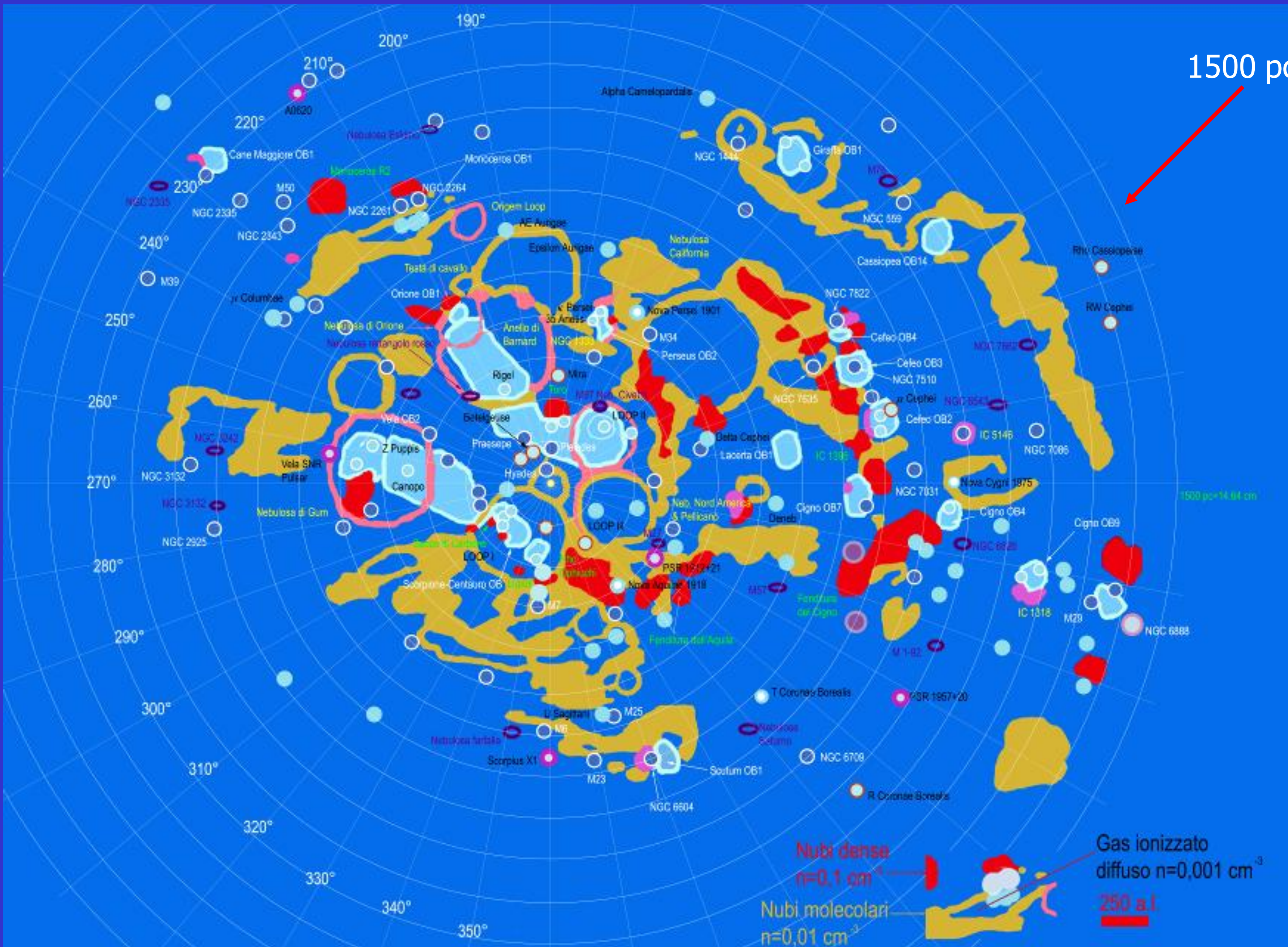
Loop I-II e III

250 pc

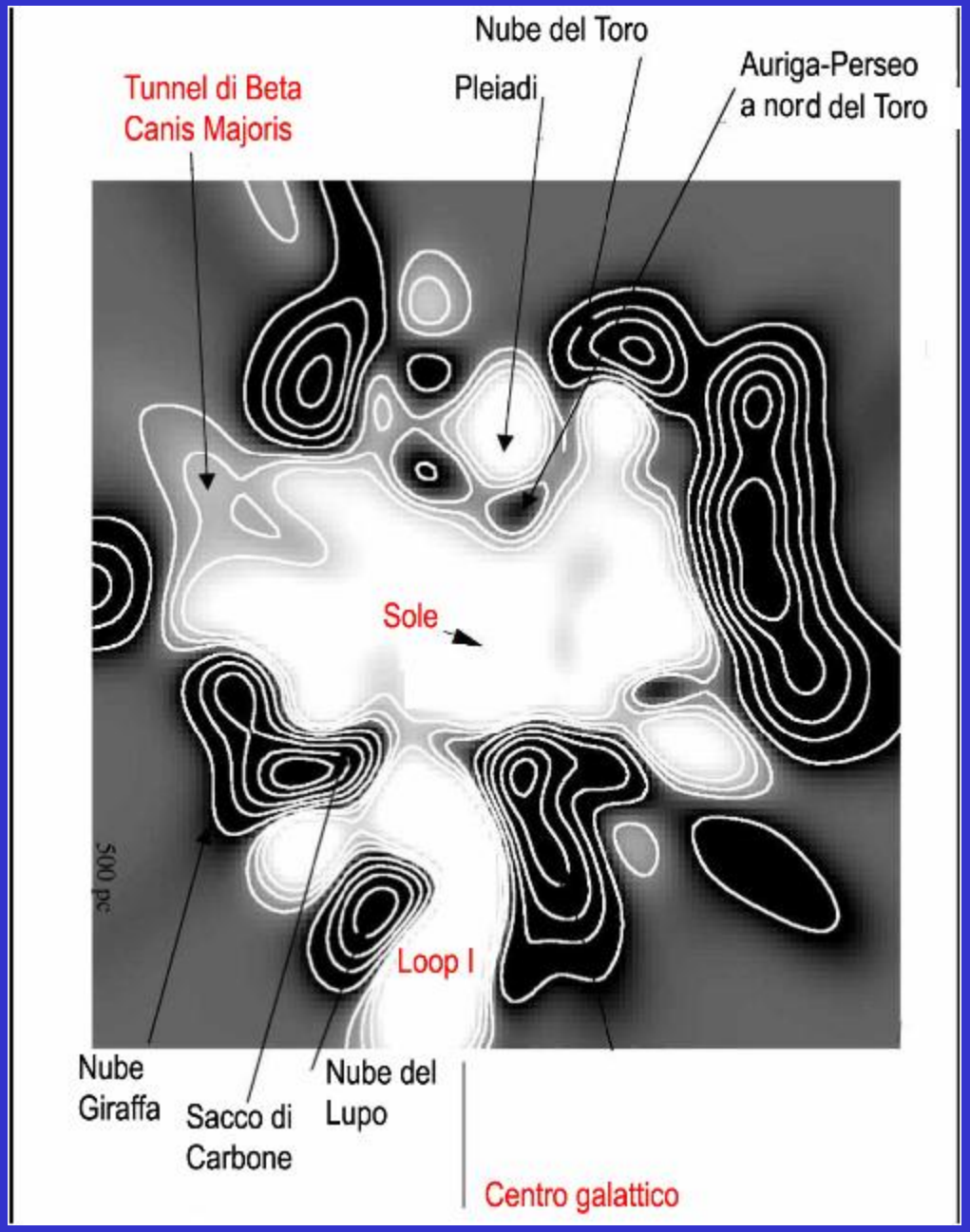
~800 a.l.



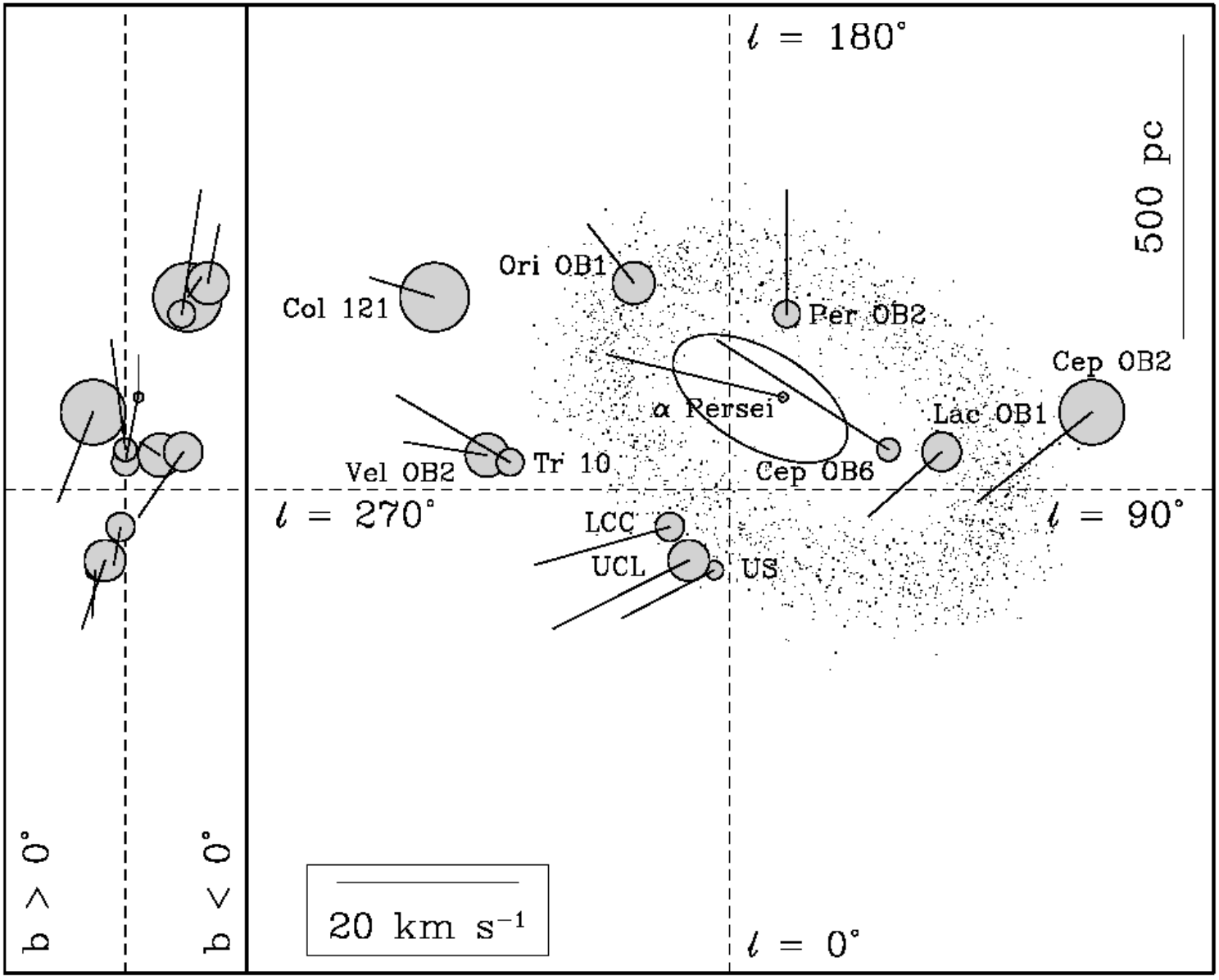
Gould Belt


1500 pc
190°
200°
210°
220°
230°
240°
250°
260°
270°
280°
290°
300°
310°
320°
330°
340°
350°
Alpha Camelopardalis
Cane Maggiore OB1
Monoceros OB1
NGC 2264
NGC 2261
NGC 2335
NGC 2343
M50
M39
Origem Loop
AE Aurigae
Epsilon Aurigae
Nebulosa California
Testa di cavallo
Orione OB1
Nebulosa di Orione
Anello di Barnard
Rigel
Betelgeuse
Presepe
Pleiadi
Hyades
Mira
Nova Persei 1901
M34
Perseus OB2
LOOP II
LOOP III
LOOP I
Vela OB2
Z Puppis
Vela SNR Pulsar
Canopo
NGC 3132
NGC 2925
Nebulosa di Gum
Scorpione-Centauro OB
M7
Nova Aquilae 1918
PSR 1919+21
Neb. Nord America & Pellicano
Deneb
Cigno OB7
Delta Cephei
Lacerta OB1
NGC 1444
Giraffa OB1
NGC 559
Cassiopea OB14
NGC 7822
Cefeo OB4
Cefeo OB3
NGC 7510
Cefeo OB2
NGC 7535
Rho Cassiopeiae
RW Cephei
IC 5146
NGC 7086
NGC 7031
Nova Cygni 1875
Cigno OB4
Cigno OB9
IC 1318
M29
NGC 6888
M 1-92
T Coronae Borealis
PSR 1957+20
NGC 6709
R Coronae Borealis
Scutum OB1
NGC 6604
M23
M25
M6
Scorpius X1
Nebulosa farfalla
Fenditura dell'Aquila
Fenditura del Cigno
Nubi dense
n=0,1 cm⁻³
Nubi molecolari
n=0,01 cm⁻³
Gas ionizzato
diffuso n=0,001 cm⁻³
250 a.l.

Il Local Bubble-un modello



La Gould Belt – ricostruzione Dezeeuw et al.



La Gould Belt – ricostruzione Perrot & Grenier

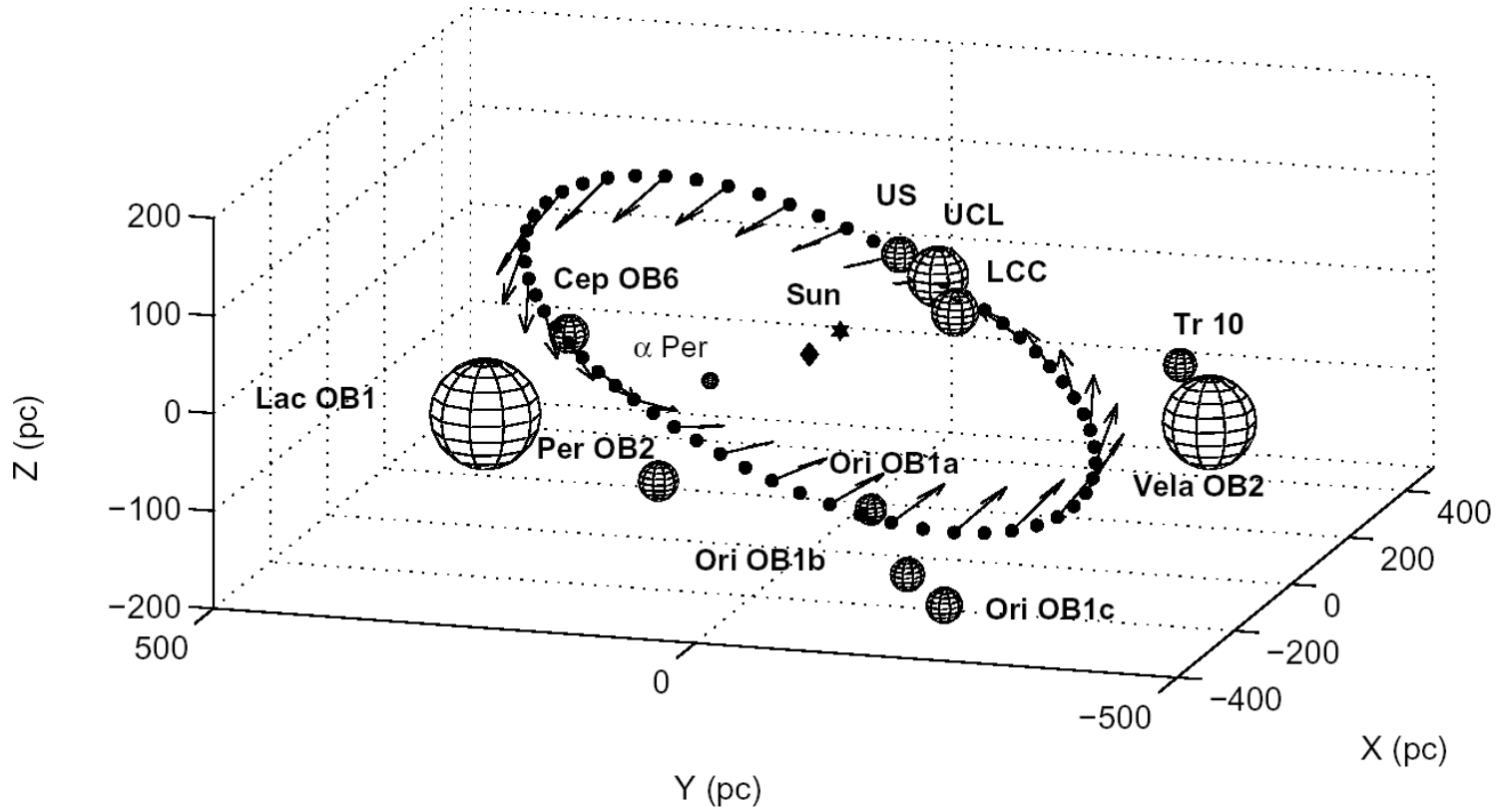


Fig. 6. 3D view of the present Belt wave and its velocity field (with respect to the LSR) amid the local OB associations that are marked as spheres with a radius equal to their size (de Zeeuw et al. 1999). The diamond and star note the Belt centre and the Sun, respectively.

NB l'orientamento della mappa NON è quello assunto in questa presentazione

GMC- Giant Molecular Clouds: SRBY catalog

TABLE 1

FLUX LUMINOSITY, AND MASS BUDGET OF THE MASSACHUSETTS–STONY BROOK CO SURVEY

Component	Flux (K km s^{-1} $arcmin^2$)	Luminosity (K km s^{-1} pc^2)	Virial Mass ($M_\odot$)
273 Clouds[a]	7.8×10^6	3.3×10^7	1.3×10^8
167 Clouds[b]	0.3×10^6	0.1×10^7	0.4×10^7
Total (440) clouds	8.1×10^8	3.4×10^7	1.3×10^8
Total boundary-corrected clouds	11.3×10^6	4.7×10^7	1.8×10^8
Total Malmquist and boundary-corrected clouds	...	5.7×10^7	2.7×10^8
Total survey region ($8° < l < 90°$, $-1° < b < 1°$)	19.4×10^6	...	...
Equal near–far emission model[c] ($2 < R < 10$ kpc, $8° < l < 90°$)	20.0×10^6	1.5×10^8	7.2×10^8 [d]
Equal near-far emission model[c] ($2 < R < 10$ kpc, $0° < l < 360°$)	...	3.7×10^8	1.8×10^9 [d]

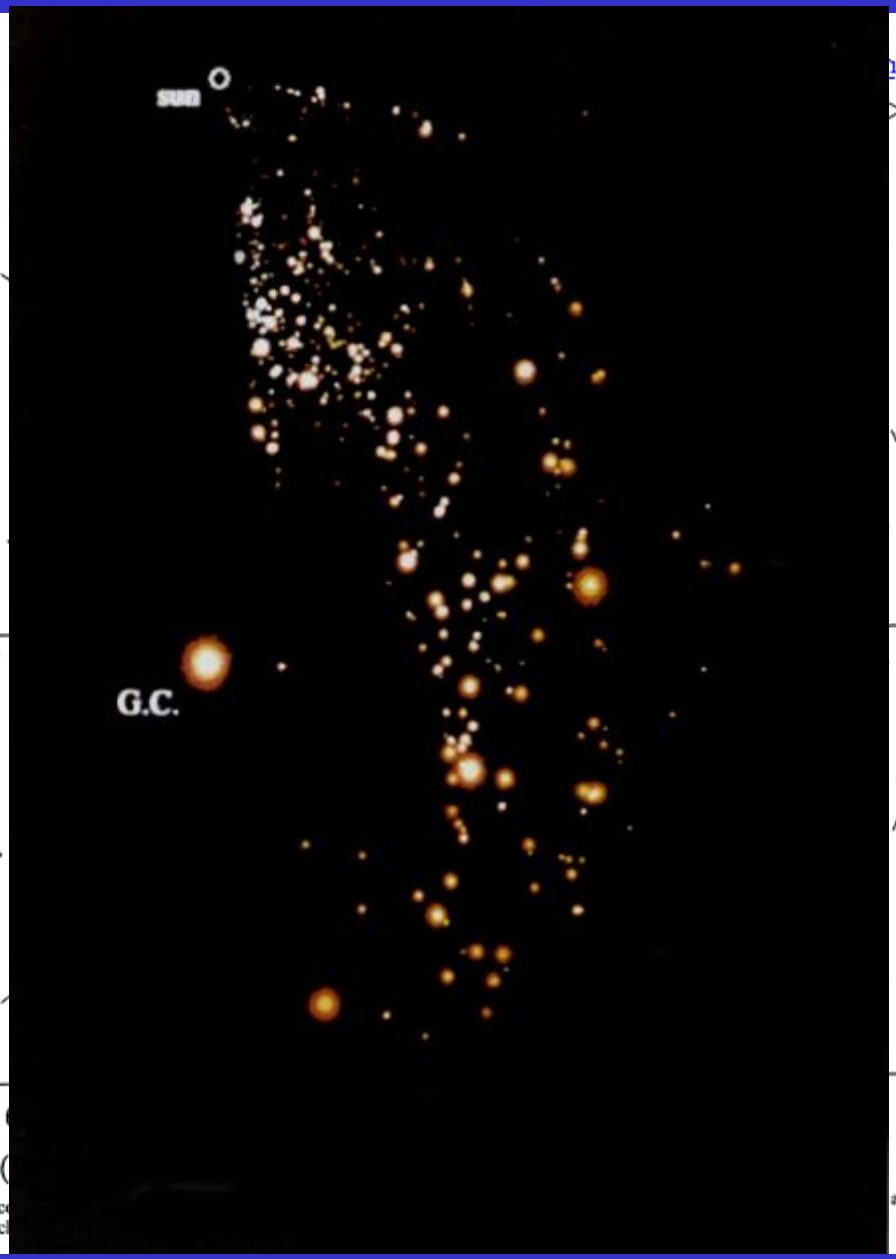
[a] Clouds with T_R^*(peak) > 5 K from SRBY.

[b] Uncataloged clouds from University of Massachusetts–Story Brook survey which failed the criteria for inclusion in SRBY.

[c] Fit to observed CO emission (Solomon and Barrett 1988).

[d] Using $\langle M_{VT}/L_{CO} \rangle = 4.8$ (appropriate to warm clouds).

GMC- Giant Molecular Clouds: SRBY catalog



GMC- Giant Molecular Clouds + B Plume: Vasquez (2005)

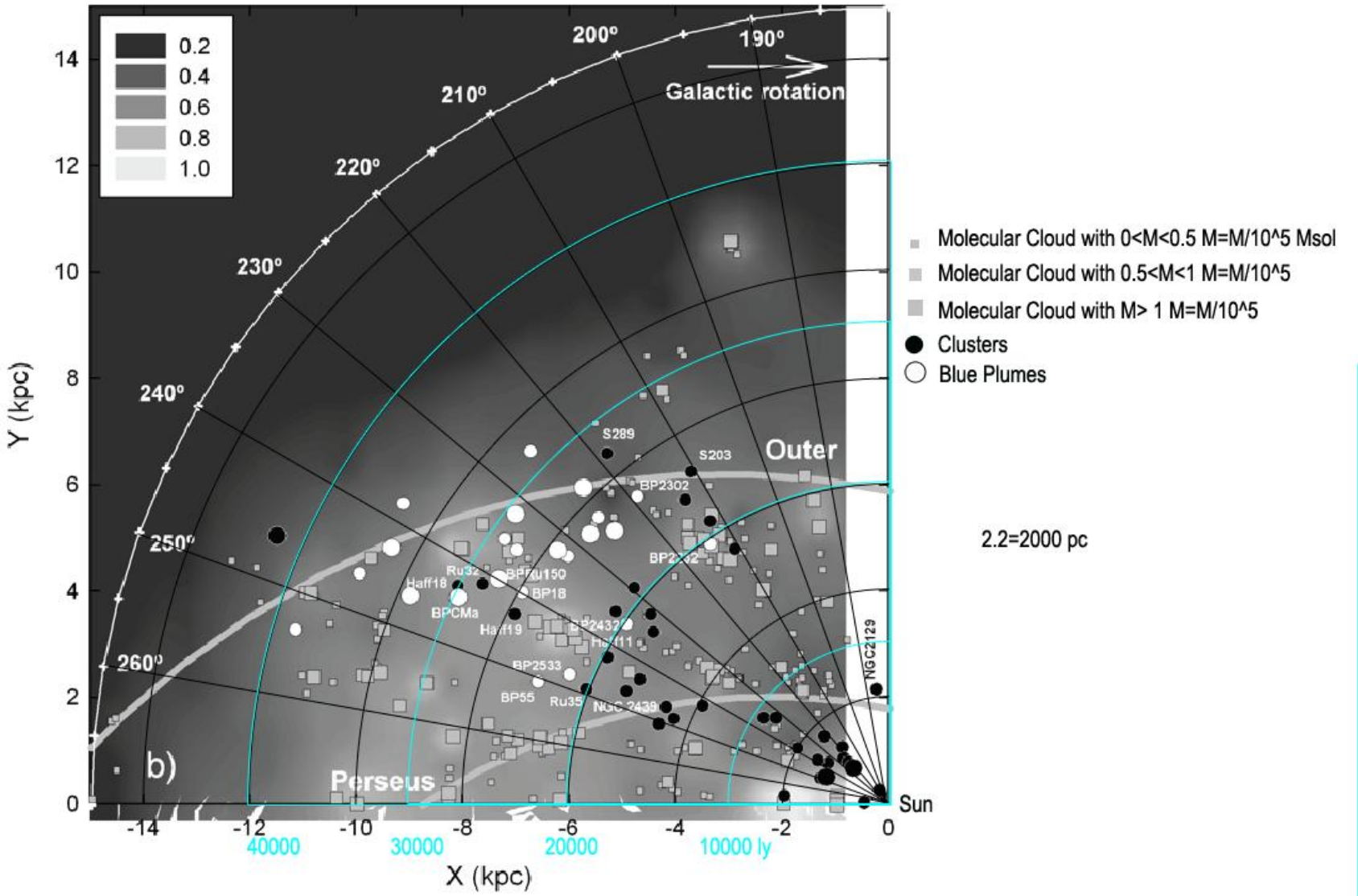


FIG. 4.—Same as Fig. 3, but including the Vallée (2005) arms.

Ammassi Aperti

NGC 188

D=5050 a.l.

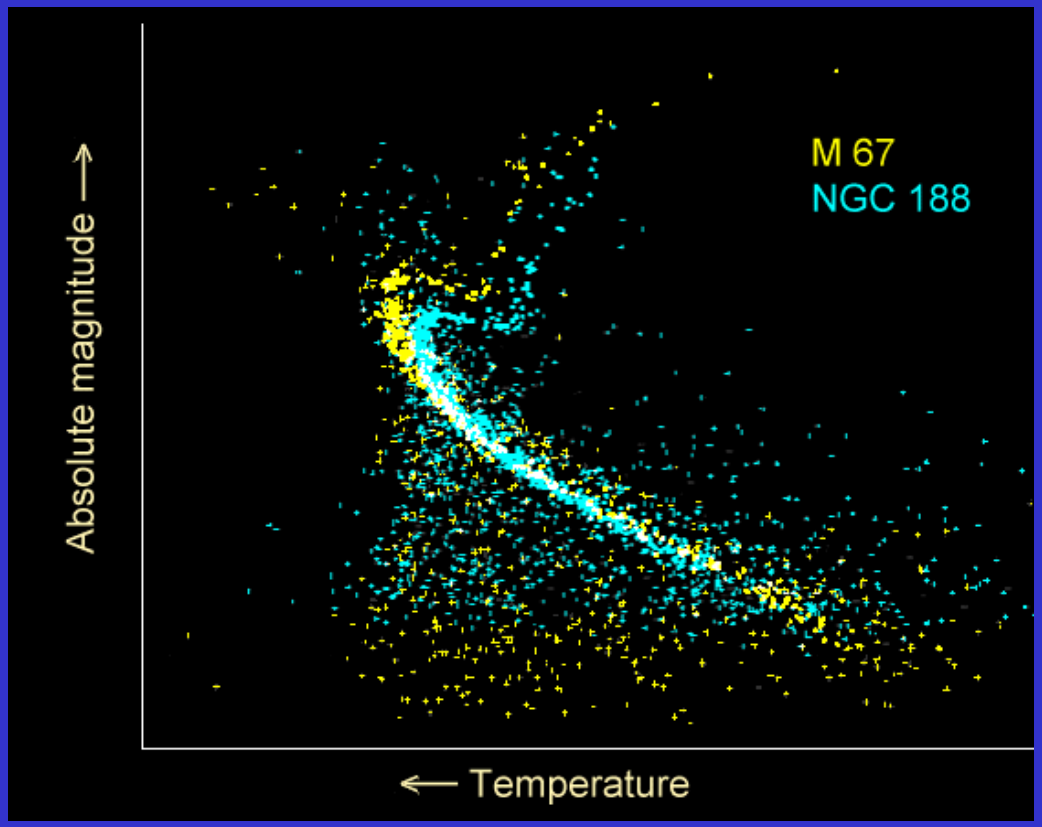
M_V=8,1

Dimensione apparente 13’

Classe I2r

Età stimata

5 miliardi di anni



M67

D=2700 a.l.

M_V=6,1

Dimensione apparente 30’

(10 a.l.)

Classe I2r

Età stimata

3,2 miliardi di anni

Un ammasso aperto è un gruppo di stelle nate insieme da una nube molecolare gigante, e ancora unite dalla reciproca attrazione gravitazionale

Le stelle in un ammasso hanno circa

1. la stessa distanza
2. la stessa età
3. la stessa composizione chimica
4. masse diverse da 0,08 $M_\odot$ a 80-100 $M_\odot$

Ammassi Aperti-Età

Nome	Costellazione	Distanza pc (a.l.)	Età (Myr)
Iadi	Toro	46 (150 a.l.)	625
Coma	Coma Berenice	90 (293 a.l.)	400-500
Pleiadi	Toro	135 (440 a.l.)	100
IC 2602	Carena	147 (480 a.l.)	30
IC 2391	Vela	148 (482 a.l.)	30
Beehive	Cancro	160 (521 a.l.)	830
NGC 24151 A	Puppis	189 (616 a.l.)	50
α Persei	Perseo	200 (652 a.l.)	50
Blanco 1	Scultore	253 (825 a.l.)	100
M7	Scorpione	280 (913 a.l.)	224
M 39	Cigno	311 (1014 a.l.)	280
NGC 2232	Monoceros	325 (1060 a.l.)	53
IC 4756	Serpente	330 (1076 a.l.)	500
NGC 2516	Carena	346 (1128 a.l.)	141
IC 4665	Ofiuco	352 (1147 a.l.)	35

Associazione stellari

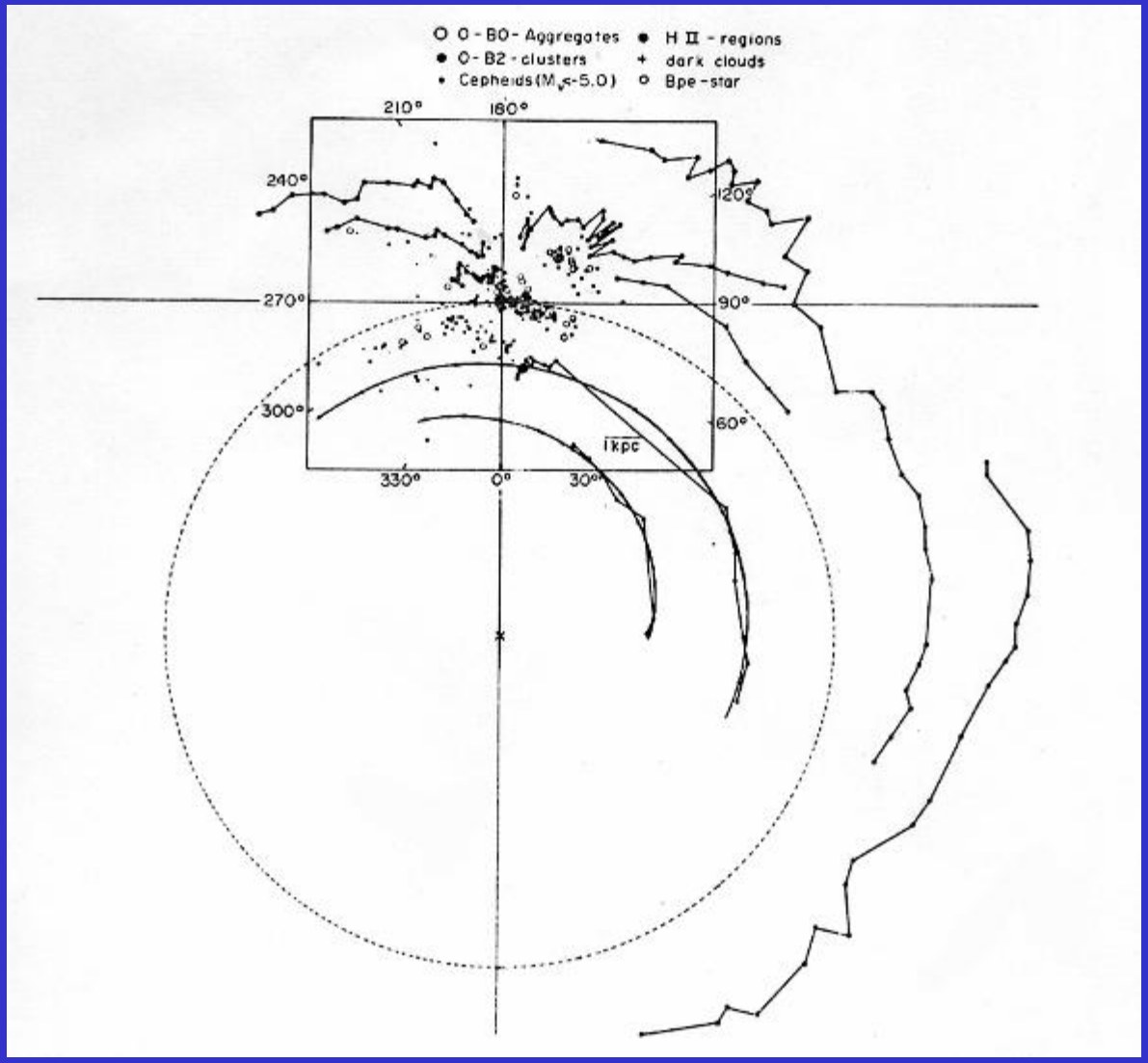
Alcune tra le principali associazioni OB

Nome	Ascensione retta	Declinazione	Coordinate galattiche	Distanza dal Sole - pc (al)	Braccio di appartenenza	Oggetti notevoli associati
Sagittarius OB5	$17^h\ 55^m$:	-28° :	l=0°; b=-1,0°	3000 (9800)	Braccio del Sagittario	-
Sagittarius OB1	$18^h\ 10^m$:	-22° :	l=9,0°; b=0°	1500 (4900)	Braccio del Sagittario	M8; Sh2-34
Sagittarius OB7	$18^h\ 15^m$:	-20° :	l=10,5°; b=-1,5°	1750 (5700)	Braccio del Sagittario	RCW 151
Sagittarius OB4	$18^h\ 17^m$:	-19° :	l=12,0°; b=-1,0°	2400 (7800)	Braccio del Sagittario	M24
Sagittarius OB6	$18^h\ 13^m$:	-16° :	l=14,0°; b=+1,0°	-	Braccio del Sagittario	-
Serpens OB1	$18^h\ 21^m$:	-15° :	l=17,0°; b=0°	1700 (5540)	Braccio del Sagittario	M16; M17; NGC 6611
Scutum OB3	$18^h\ 26^m$:	-14° :	l=17,5°; b=-1,0°	1700 (5540)	Braccio del Sagittario	Sh2-50
Serpens OB2	$18^h\ 21^m$:	-12° :	l=18,5°; b=+1,5°	1700 (5540)	Braccio del Sagittario	M16; NGC 6604
Scutum OB2	$18^h\ 35^m$:	-09° :	l=23,0°; b=-0,5°	-	Braccio del Sagittario	-

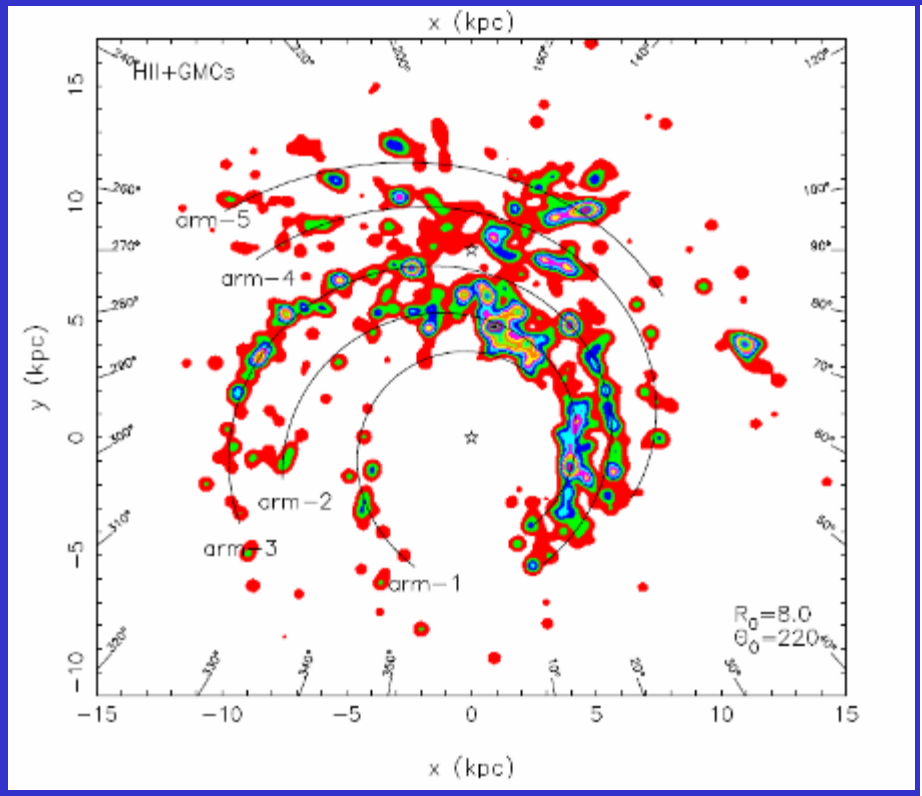
Associazione stellari OB

L'ammasso h and chi Persei, o NGC 869 e NGC 884, separati da un centinaio di parsec ad una distanza di circa 7000 a.l. nella costellazione di Perseo.

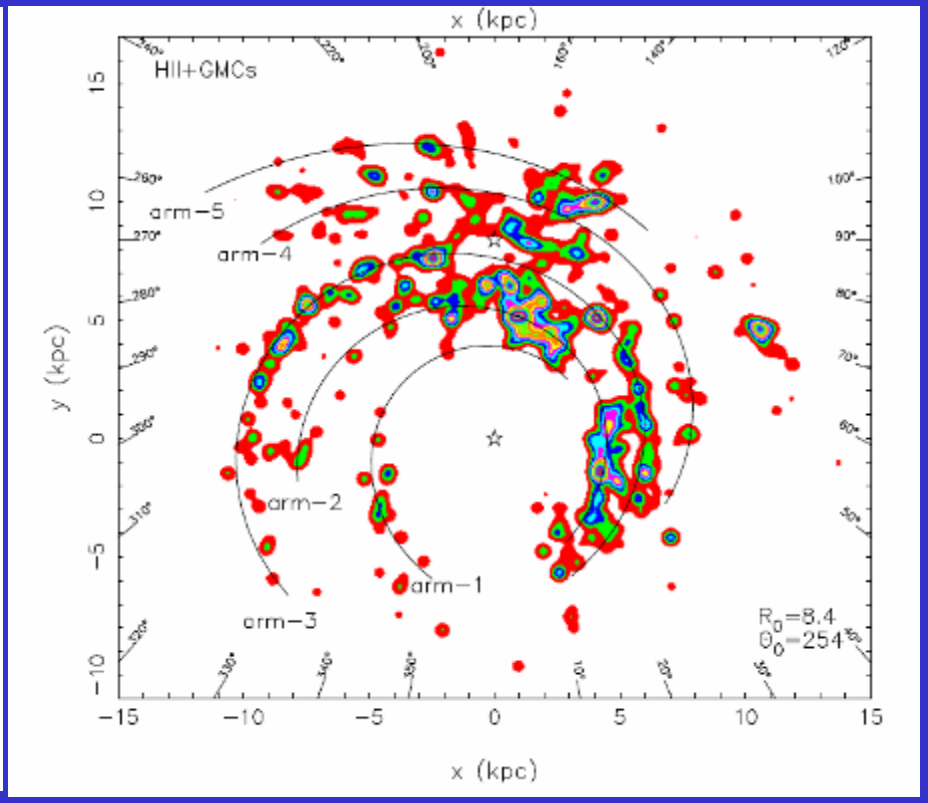
Ricostruzione della Via Lattea 1975



Ricostruzione della Via Lattea 2009



Curva di rotazione con R_0=8.0 kpc e Θ_0=220 km/s



Curva di rotazione con R_0=8.4 kpc e Θ_0=254 km/s

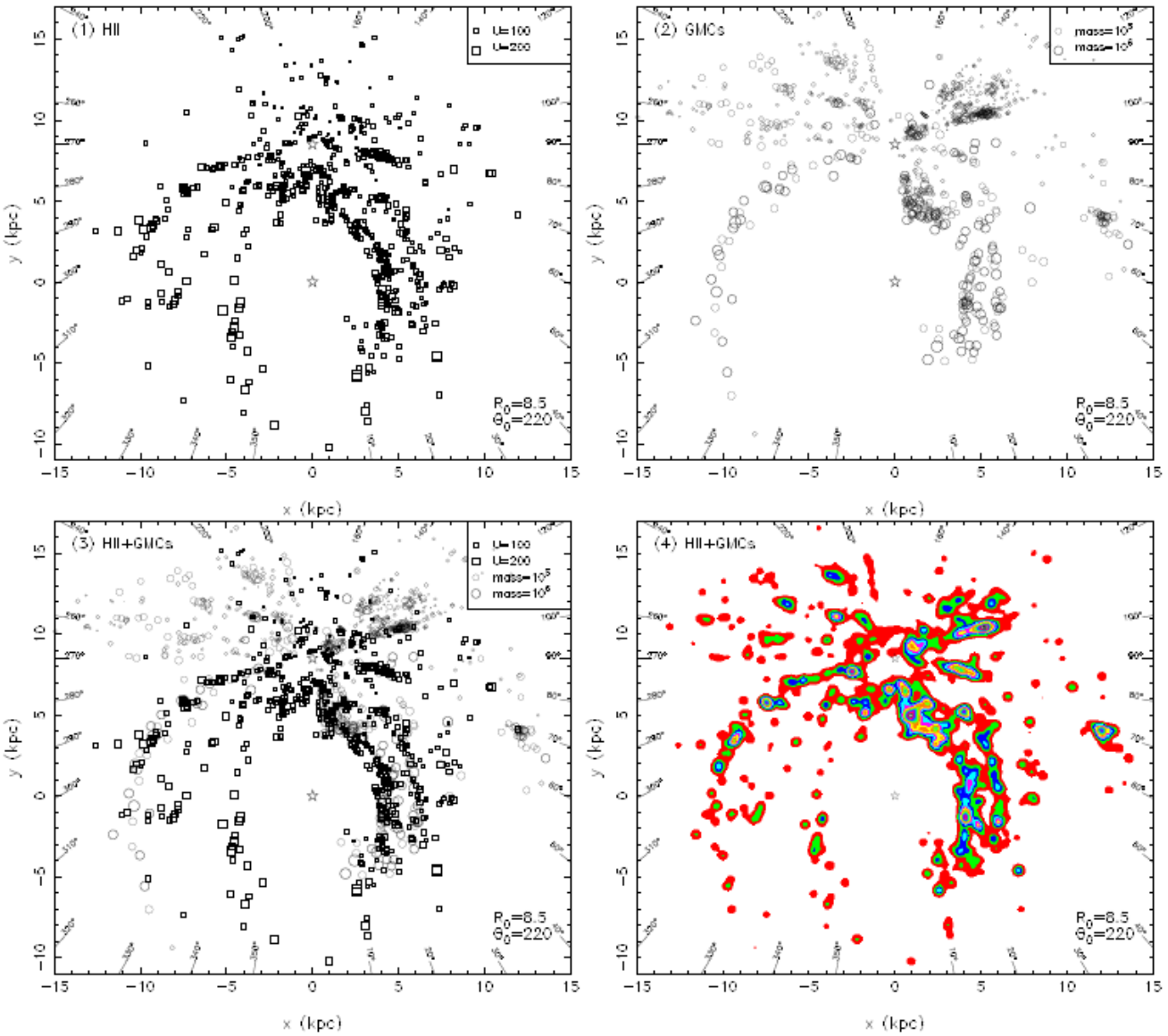


Fig. 3. *Panel (1)* is the distribution of HII regions, *Panel (2)* is the distribution of GMCs, and *Panel (3)* is the distribution of HII regions and GMCs together for illustration of the Galactic spiral structure. The solar parameters R_0=8.5 kpc and Θ_0=220 km s^{-1} were adopted. The coordinates originate from the Galactic center, and the Sun is located at (x = 0.0 kpc, y = 8.5 kpc). The open squares indicate the HII regions with the symbol area proportional to exciting parameters. The open circles indicate GMCs with the symbol size proportional to $log(M_{GMCs})$ (see Sect. 2.3). *Panel (4)* is the color distribution of both kinds of tracers, each brightened as a Gaussian with the amplitude of the weighting parameter, B, so that the spiral arms are clearly demonstrated.

Ricostruzione della Via Lattea 2009

l°	b°	Vlsr Km/s	S Jy	Freq GHz	d kpc	d err kpc	D8.5 Kpc	R8.5 kpc	U8.5 Pc cm $^{-2}$	D8.0 Kpc	R8.0 Kpc	U8.0 Pc cm $^{-2}$	D8.4 Kpc	R8.4 kpc	U8.4 Pc cm $^{-2}$
2.40	1.40	3.0	3.00	2.70	4.7	1.4			54.7			54.7			54.7
2.90	-0.00	-1.7	3.40	2.70			18.7	10.3	143.3	17.4	9.4	136.6	18.2	9.7	140.7
4.30	0.60	6.6			1.3	0.4			28.0			28.0			28.0
6.00	-1.30	2.8	44.9	2.70	1.6	0.25			65.8			65.8			65.8
6.00	-1.20	3.6	113	2.70	1.6	0.25			89.5			89.5			89.5
6.20	-1.20	3.0	2.10	2.70	1.6	0.25			23.7			23.7			23.7
6.40	-0.50	19.0	4.00	2.70			3.8	4.8	52.3	3.5	4.5	49.5	3.6	5.0	50.4
6.50	0.10	14.1	0.50	2.70			3.1	5.4	22.8	2.9	5.1	21.8	2.9	5.6	21.8
6.60	-0.30	16.1	54.0	2.70			3.4	5.2	115.6	3.1	4.9	108.7	3.2	5.4	111.0
6.60	-0.10	13.4	11.1	2.70			3.0	5.5	62.7	2.8	5.2	59.9	2.8	5.7	59.9
6.70	-0.20	19.4	7.60	2.70			3.7	4.8	63.6	3.5	4.6	61.3	3.5	5.0	61.3

Catalogo Sharpless

Nebulosa California
Sh2-220

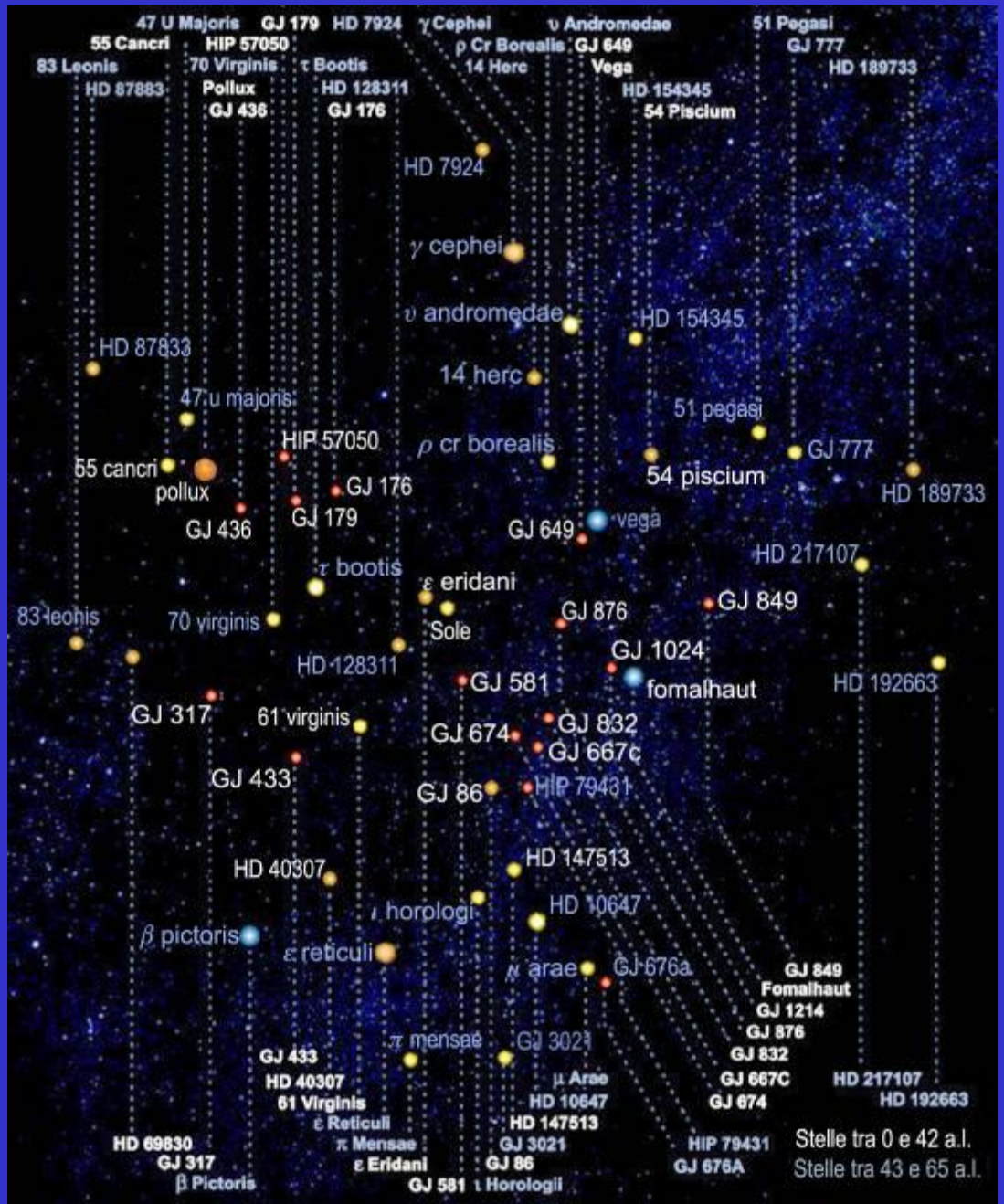
Il Catalogo Sharpless conta 313 regioni H II (nebulose ad emissione)

Catalogo completo di tutte le nebulose della Via Lattea poste a nord di 27° di declinazione sud.

Per le nebulose dell'emisfero sud esiste il Catalogo di Gum .

La versione finale del Catalogo Sharpless fu pubblicata dall'astronomo americano Stewart Sharpless, nel 1959.

Pianeti extrasolari vicini



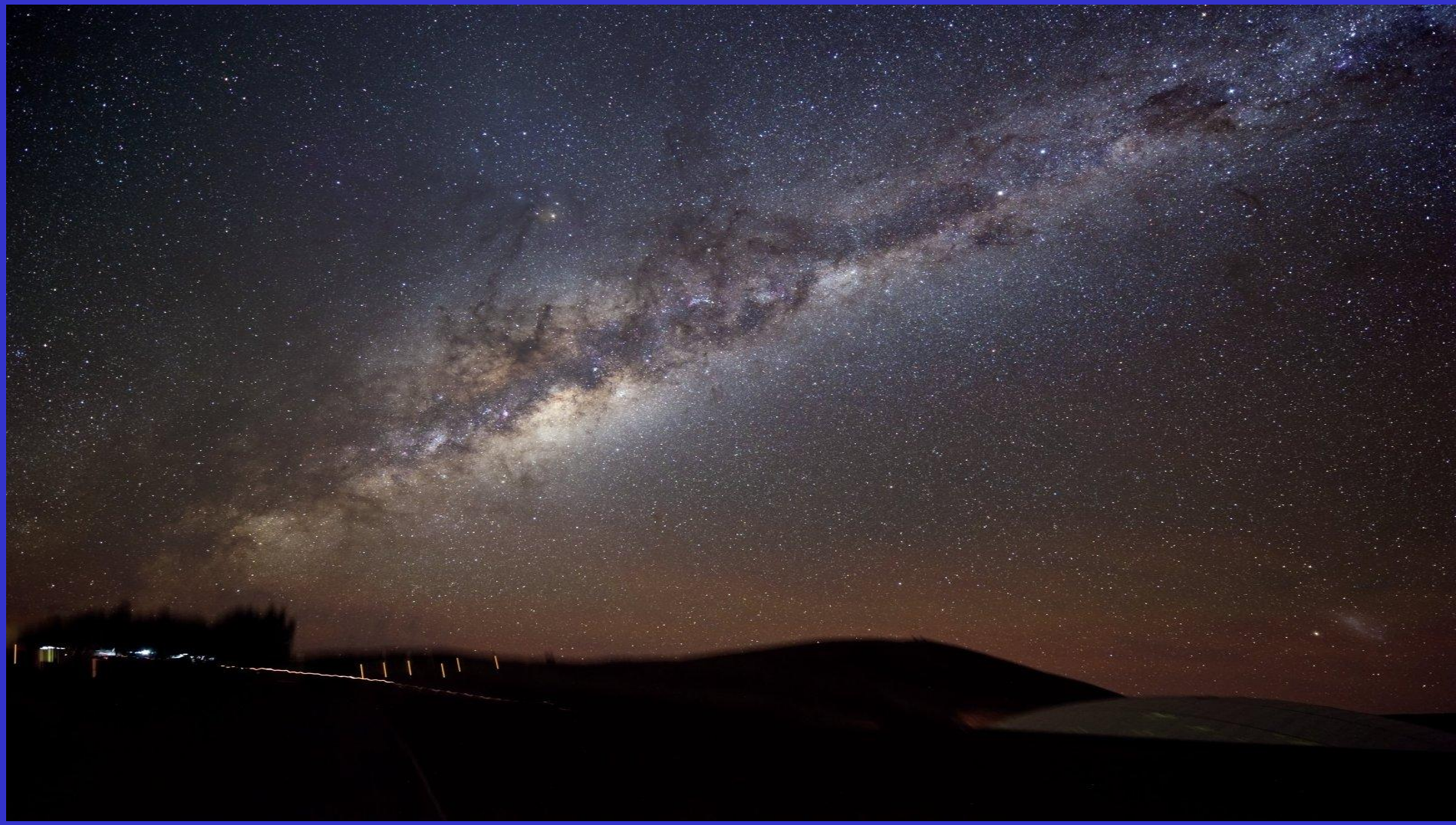
La presentazione è terminata

Grazie

Nelle notti estive si vede una nebulosità che gli antichi chiamavano “Via Lattea”

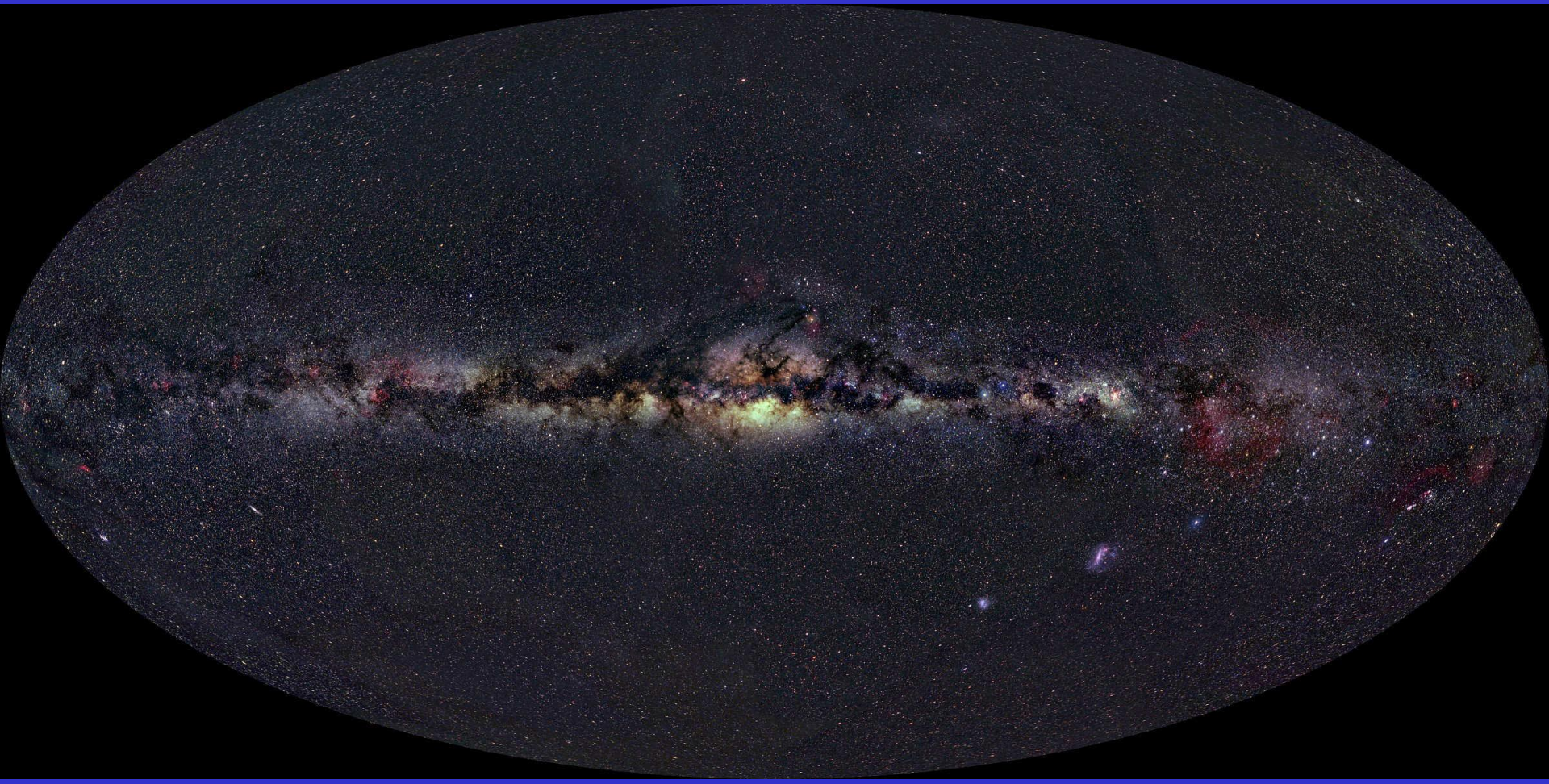
"..si scorgerà poi con il cannocchiale un così numeroso gregge di altre stelle che appena è credibile"

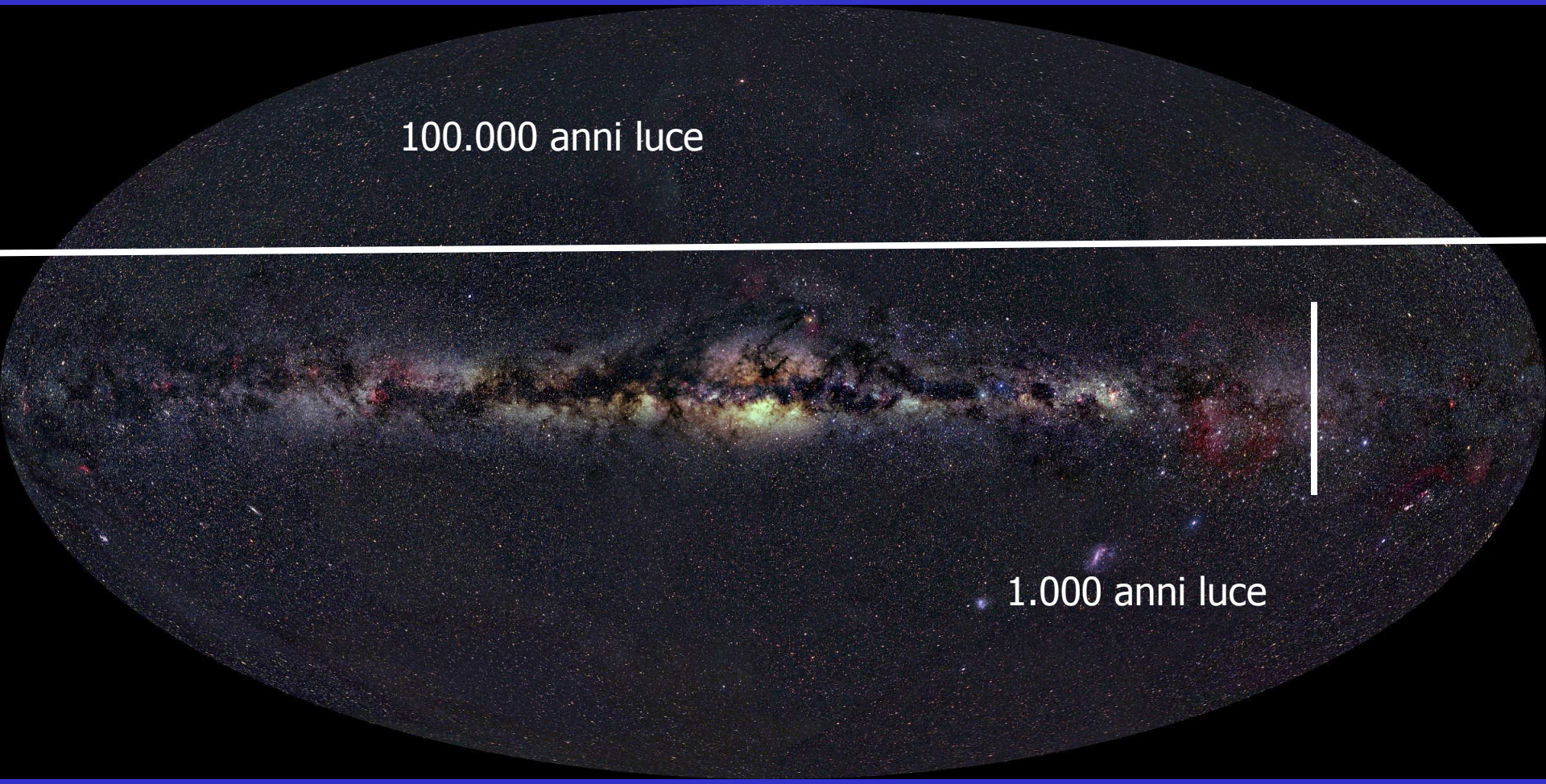
Galileo Galilei scoprì che la nebulosità era formata da tantissime piccole stelle



Galileo Galilei scoprì che la nebulosità era formata da tantissime piccole stelle

La Via Lattea: la nostra Galassia





Un raggio di luce impiega 100.000

anni a percorrerla tutta

Posizione

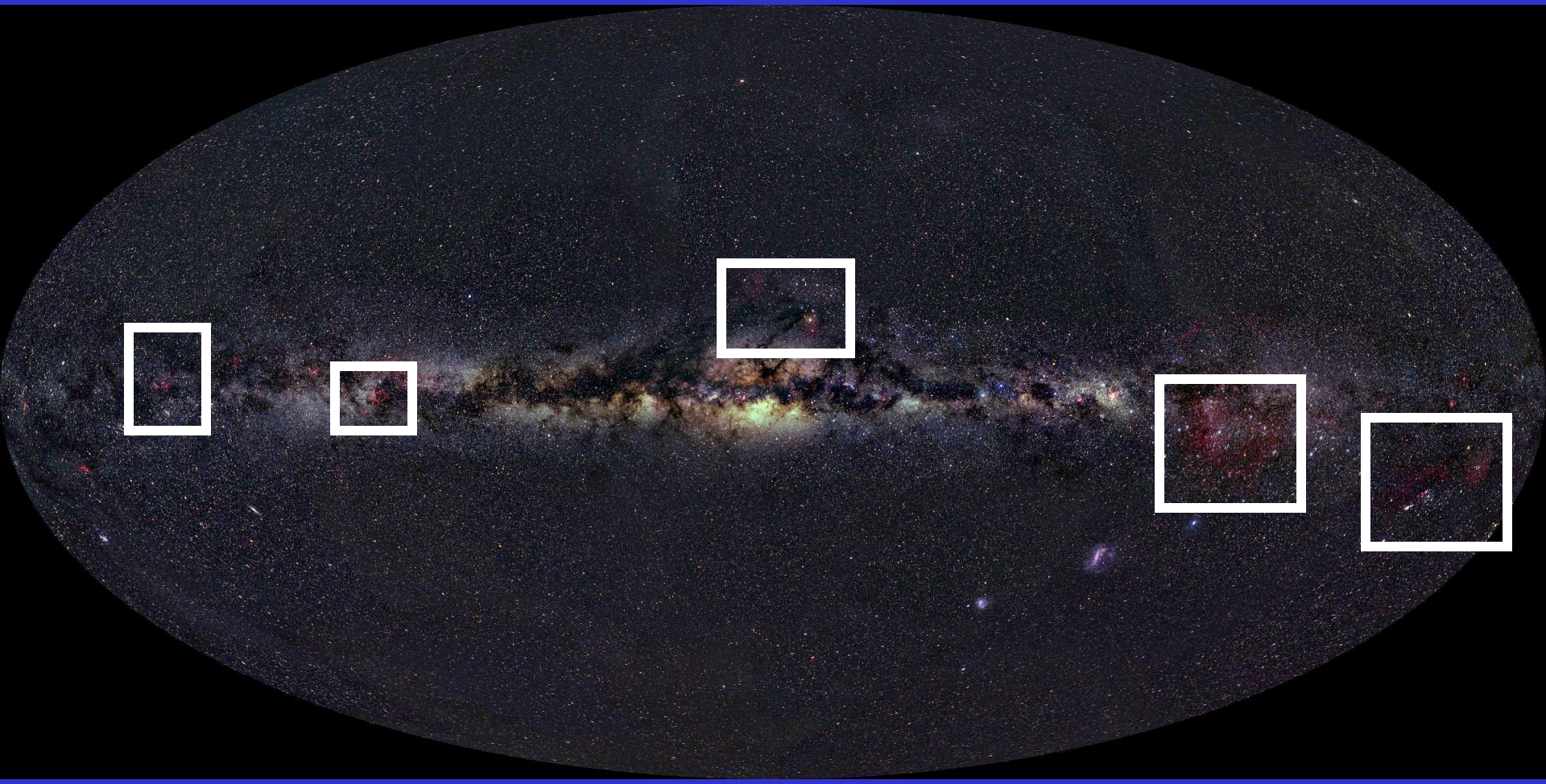
del Sole

Vista dal di fuori è una normale

galassia a spirale

Essa contiene più di cento miliardi

di stelle, che nascono e muoiono



Zone dove nascono le stelle dal gas interstellare

Nella Nebulosa di Orione si stanno formando 700 stelle in una regione di 12 anni luce di raggio

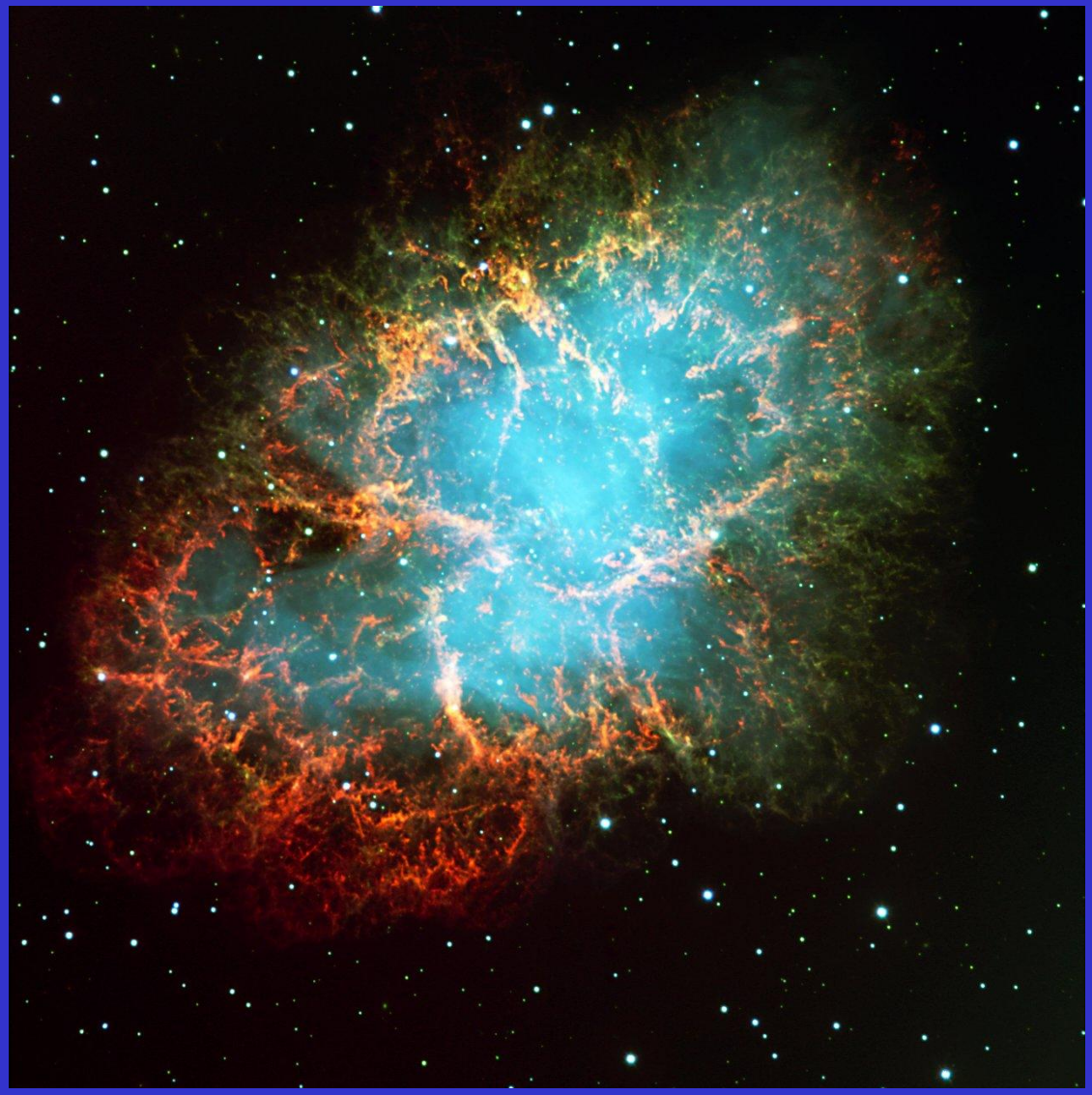
Poi le stelle si liberano del gas

e vivono la loro vita

Possono morire rilasciando il loro

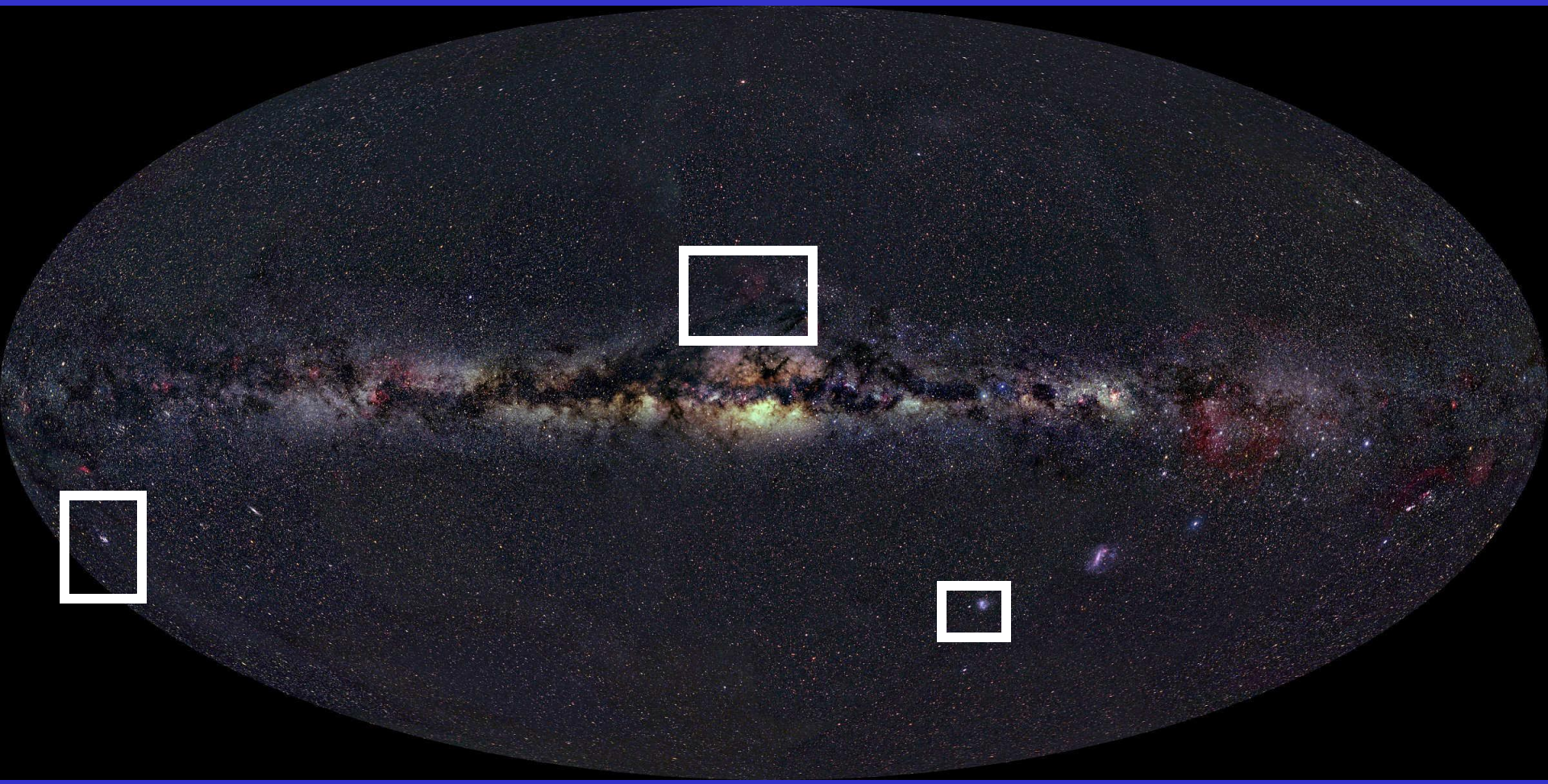
gas alla galassia in modo quieto

come il Sole

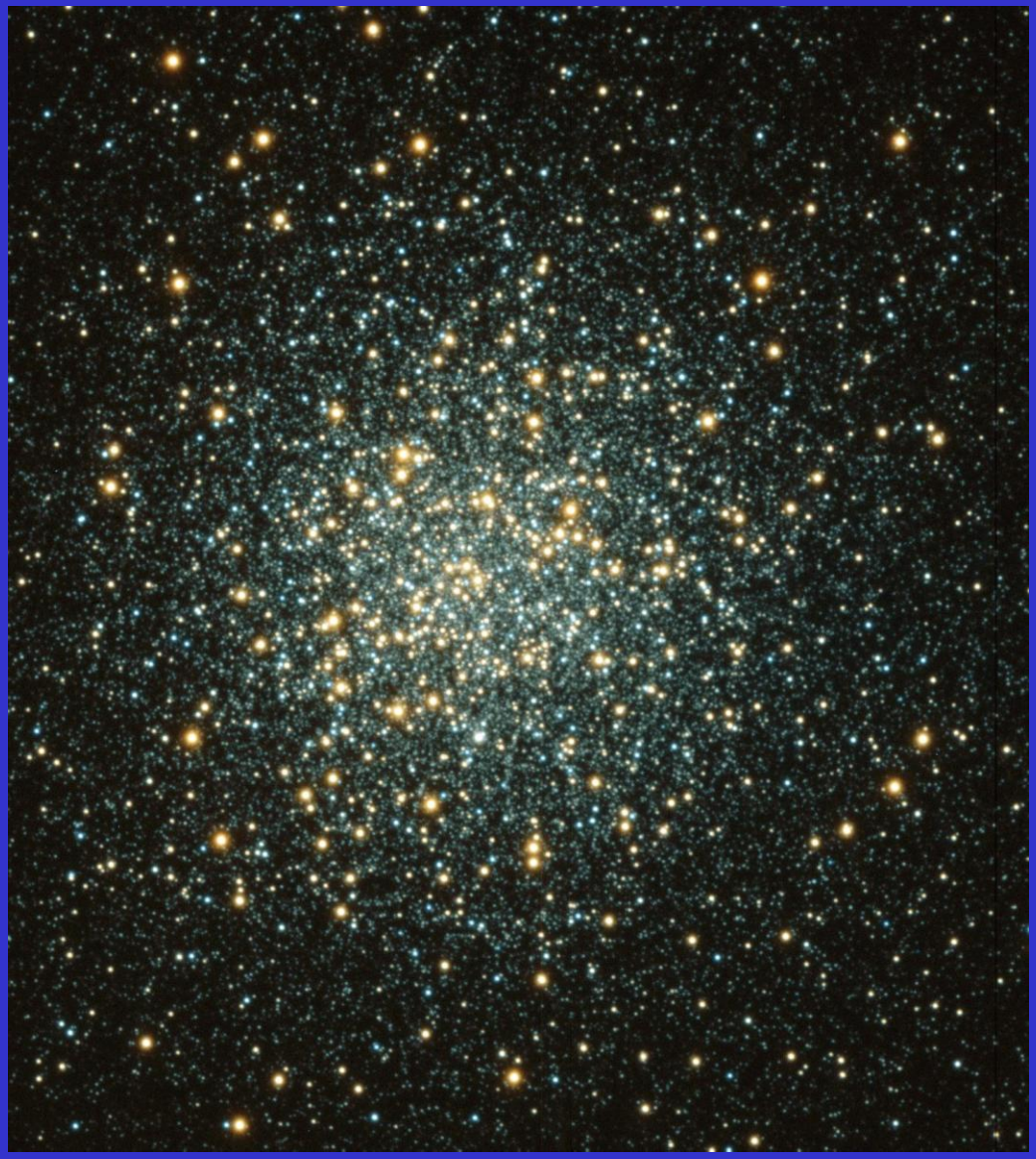


Oppure esplodendo come la Nebulosa del Granchio

Gli ammassi globulari

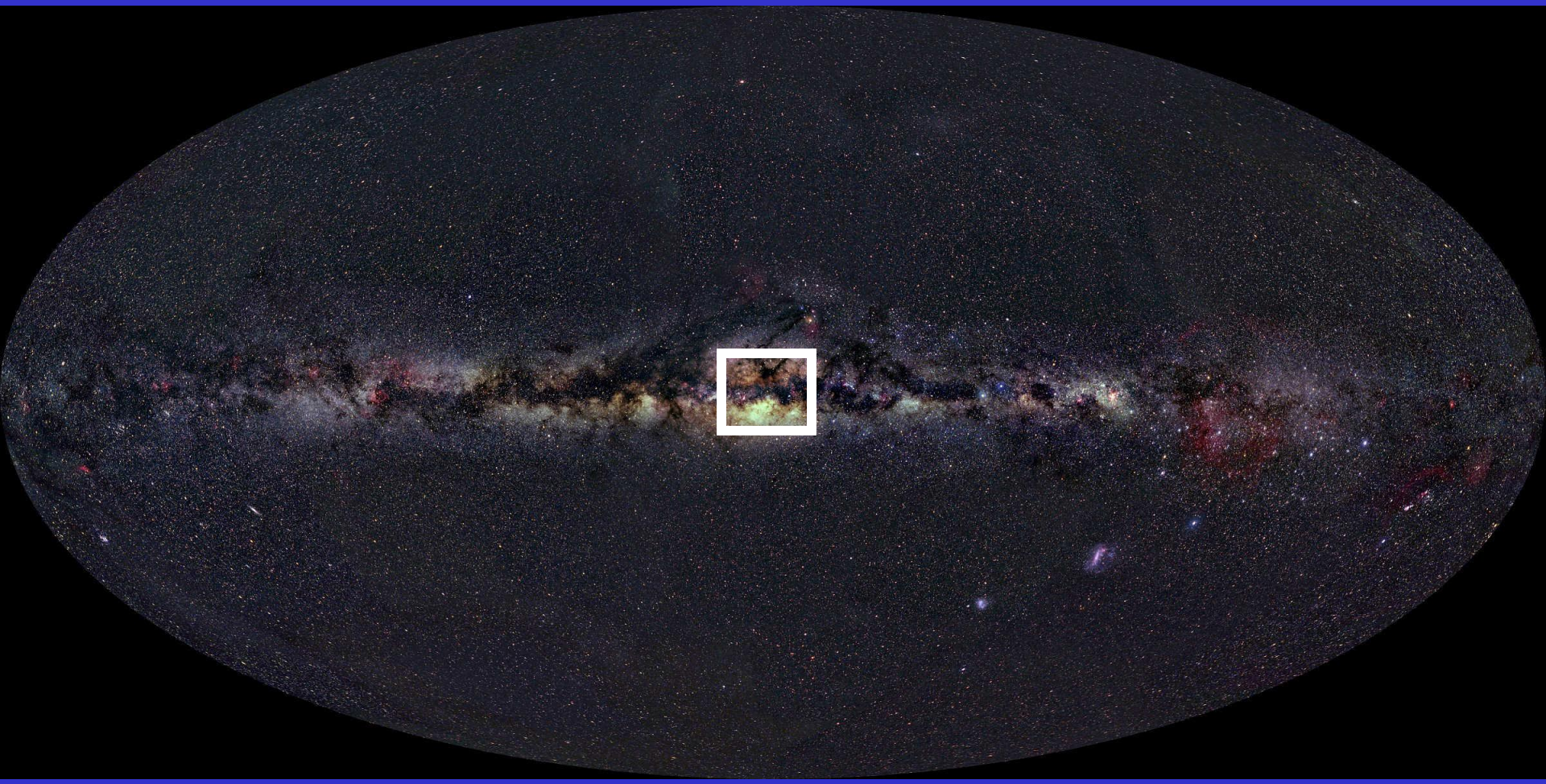


Attorno alla Via Lattea, ma ancora parte di essa, ci sono gli ammassi globulari

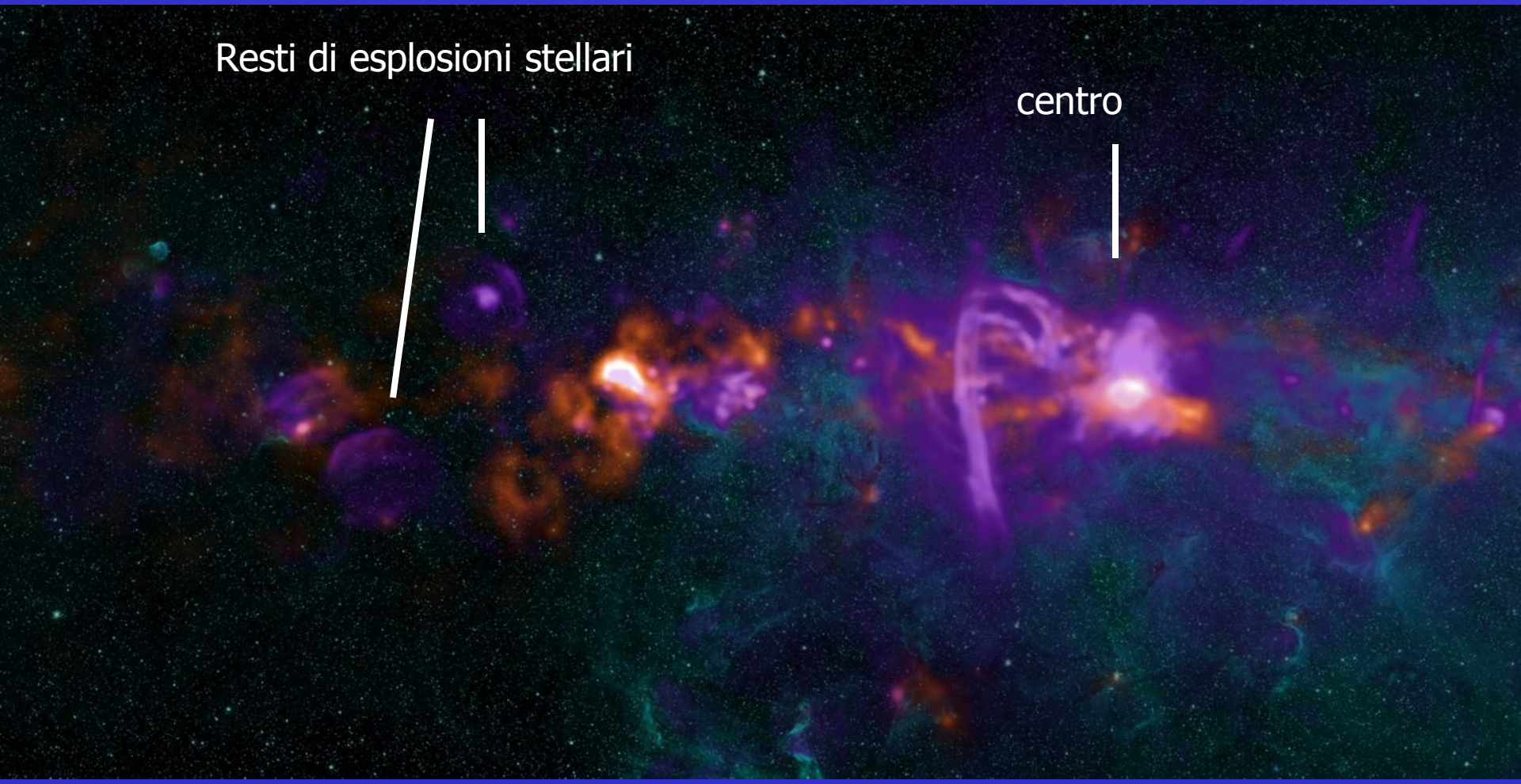


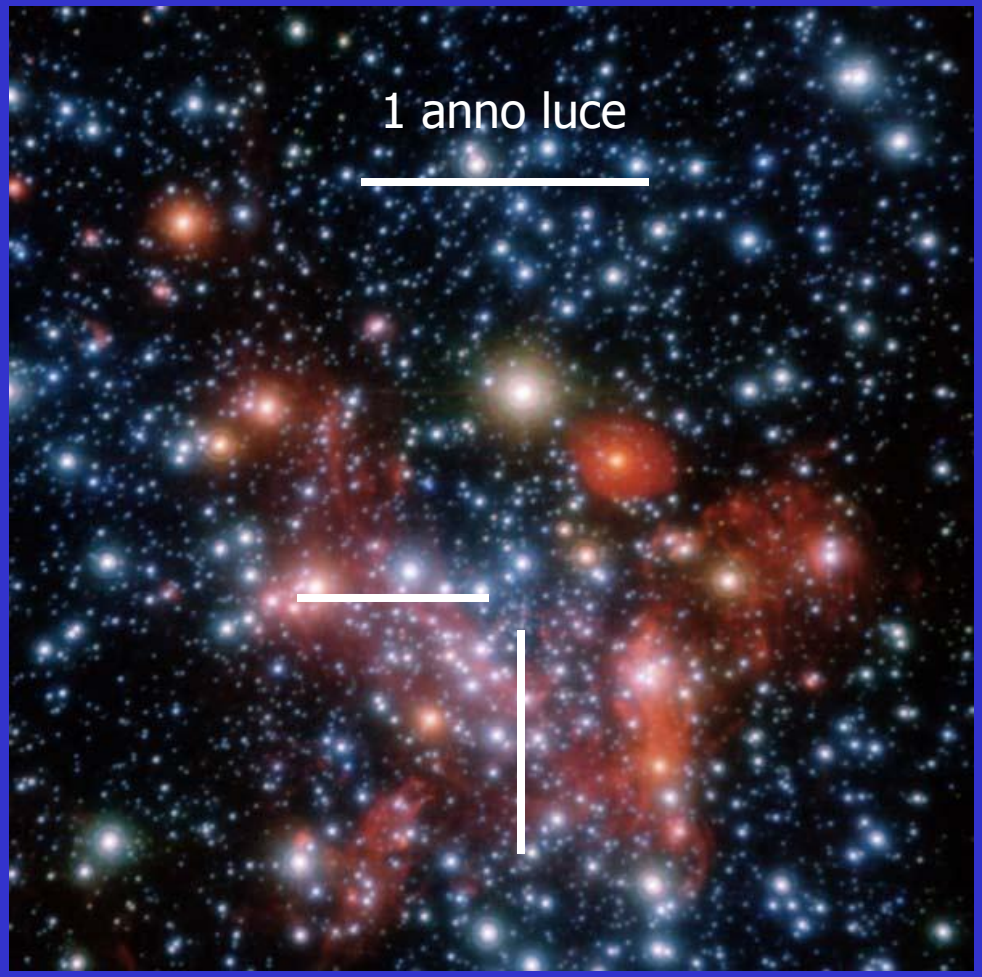
Sono insiemi di 100 000 stelle, le più vecchie della galassia

Il centro della nostra Galassia è schermato dalle polveri



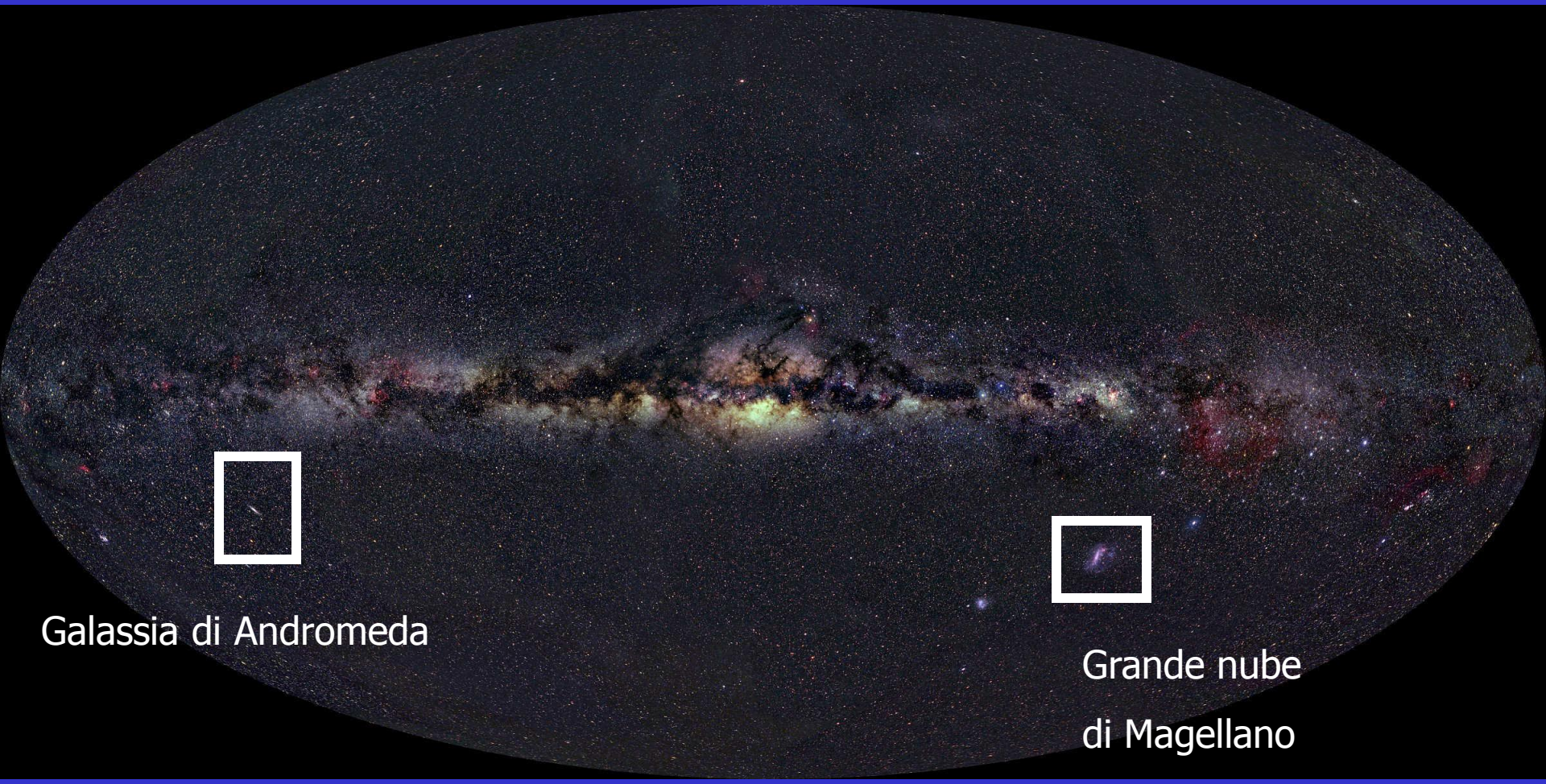
Le onde radio ci mostrano fenomeni molto violenti

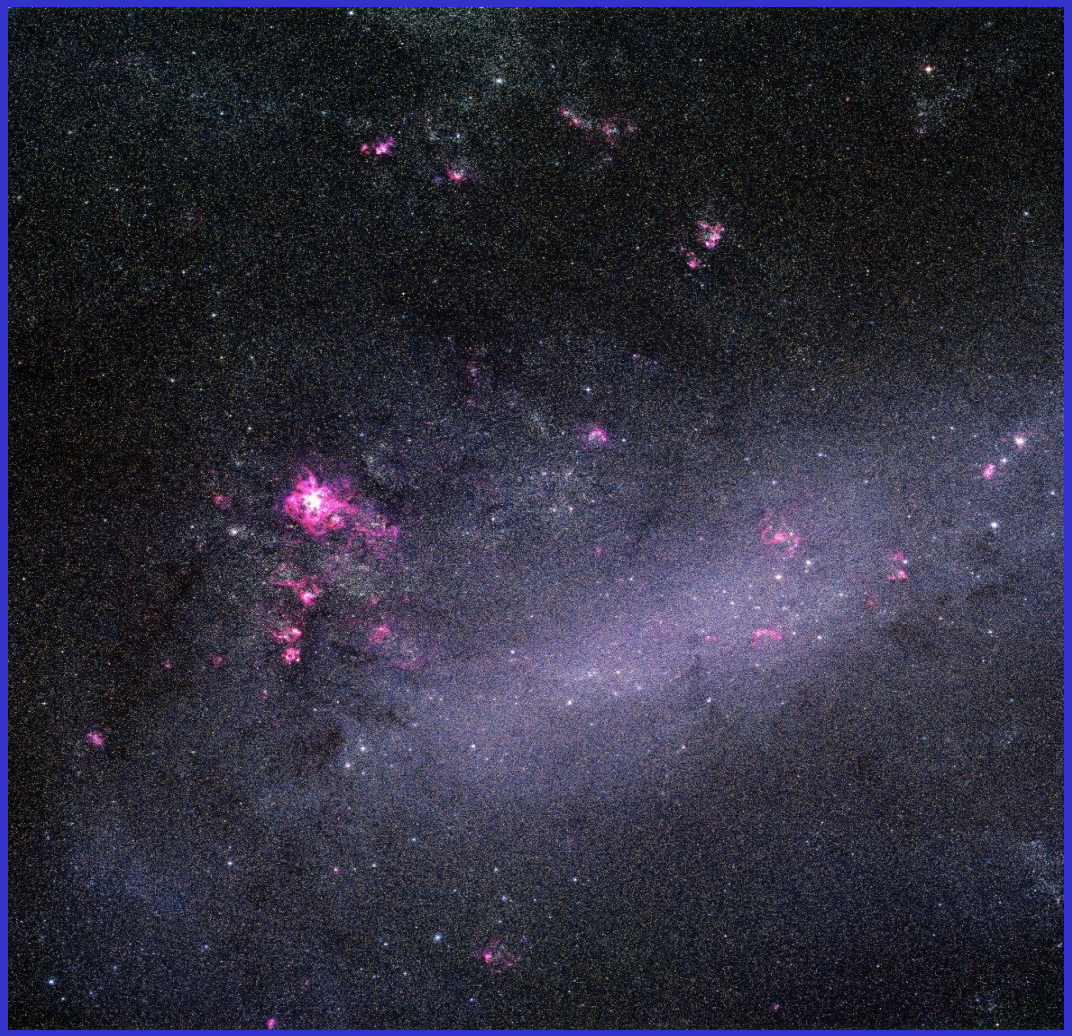




Lo studio delle orbite stellari indica l'esistenza di un buco nero (invisibile) 4 milioni di volte più pesante del Sole

Le galassie esterne





La grande nube di Magellano dista 160.000 anni luce ed è 10 volte meno massiccia della Via Lattea

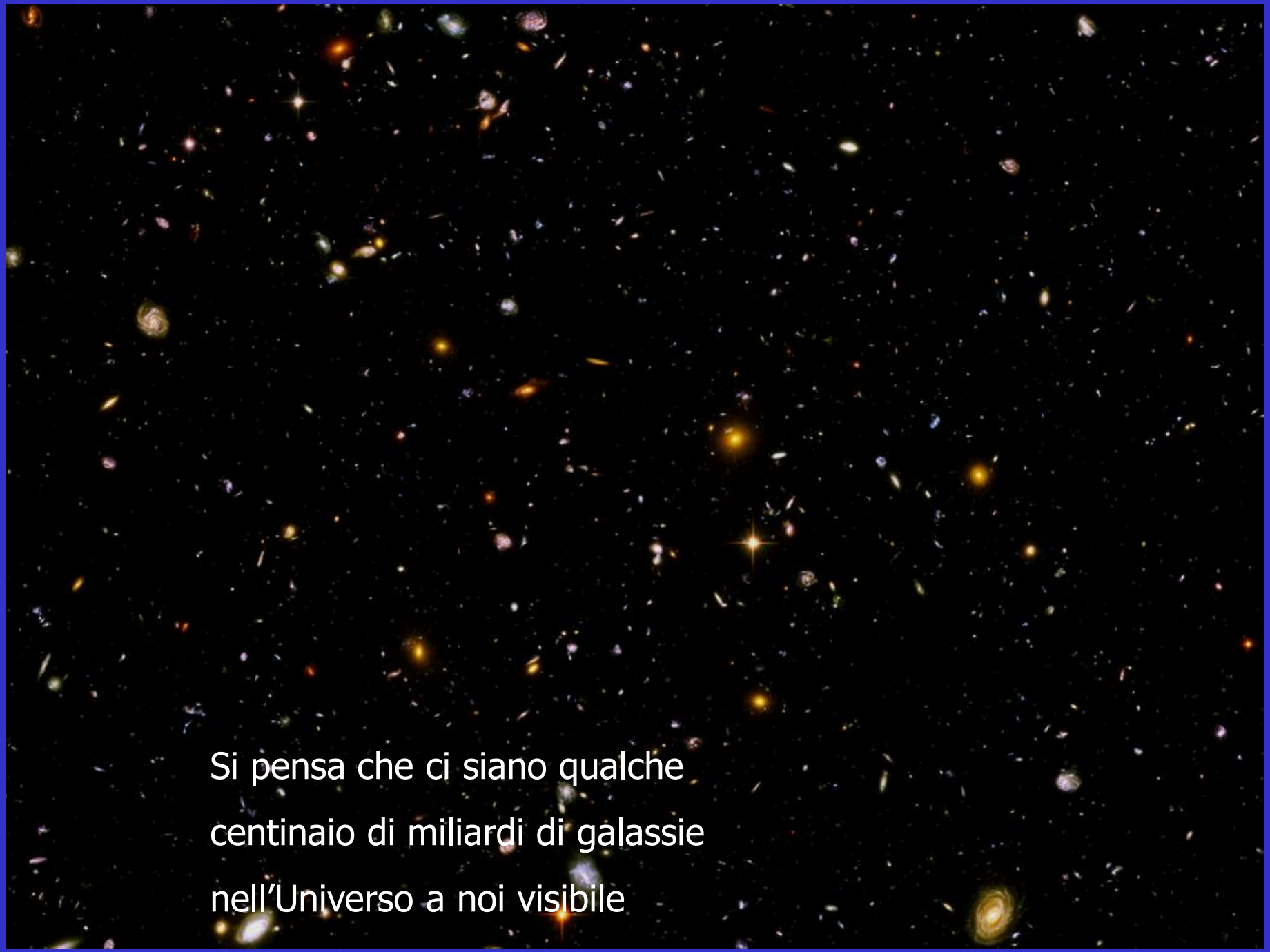
La galassia di

Andromeda è simile alla

nostra e dista

2 milioni di

anni luce



Si pensa che ci siano qualche centinaio di miliardi di galassie nell'Universo a noi visibile