

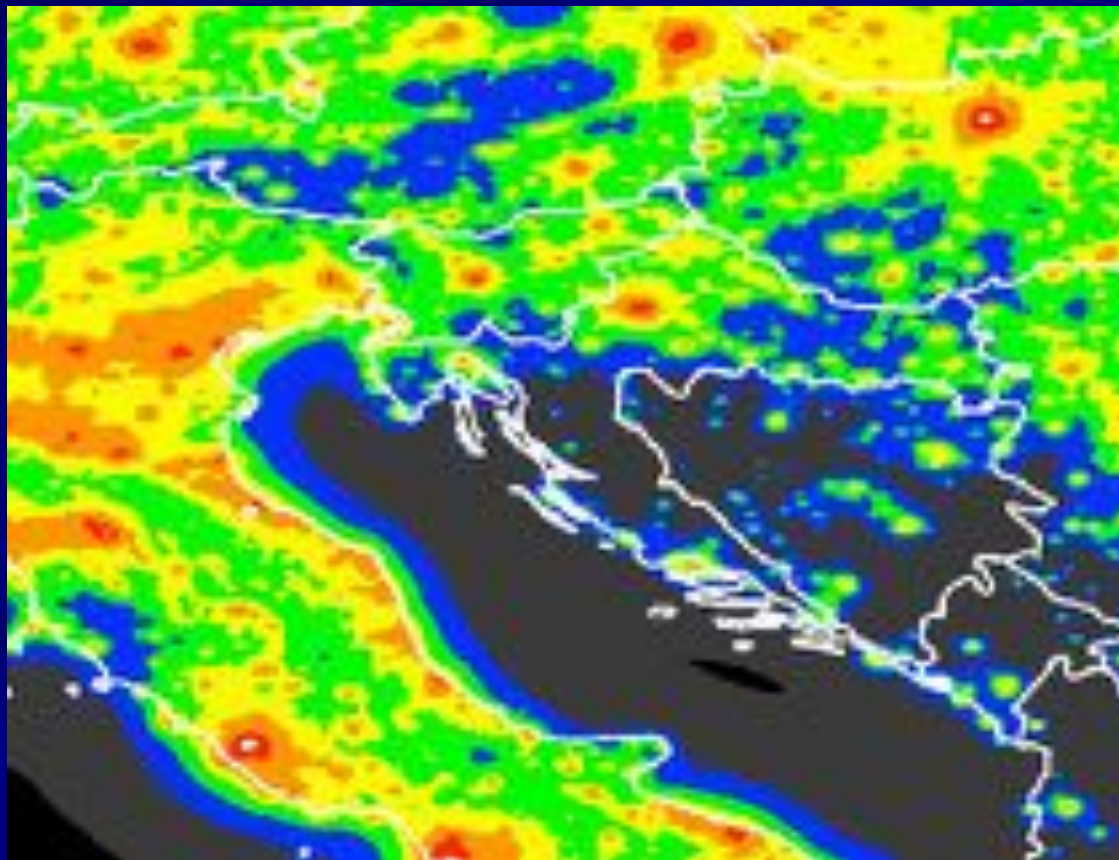
Light pollution at astronomical observatories in Italy (FVG), Croatia and Slovenia

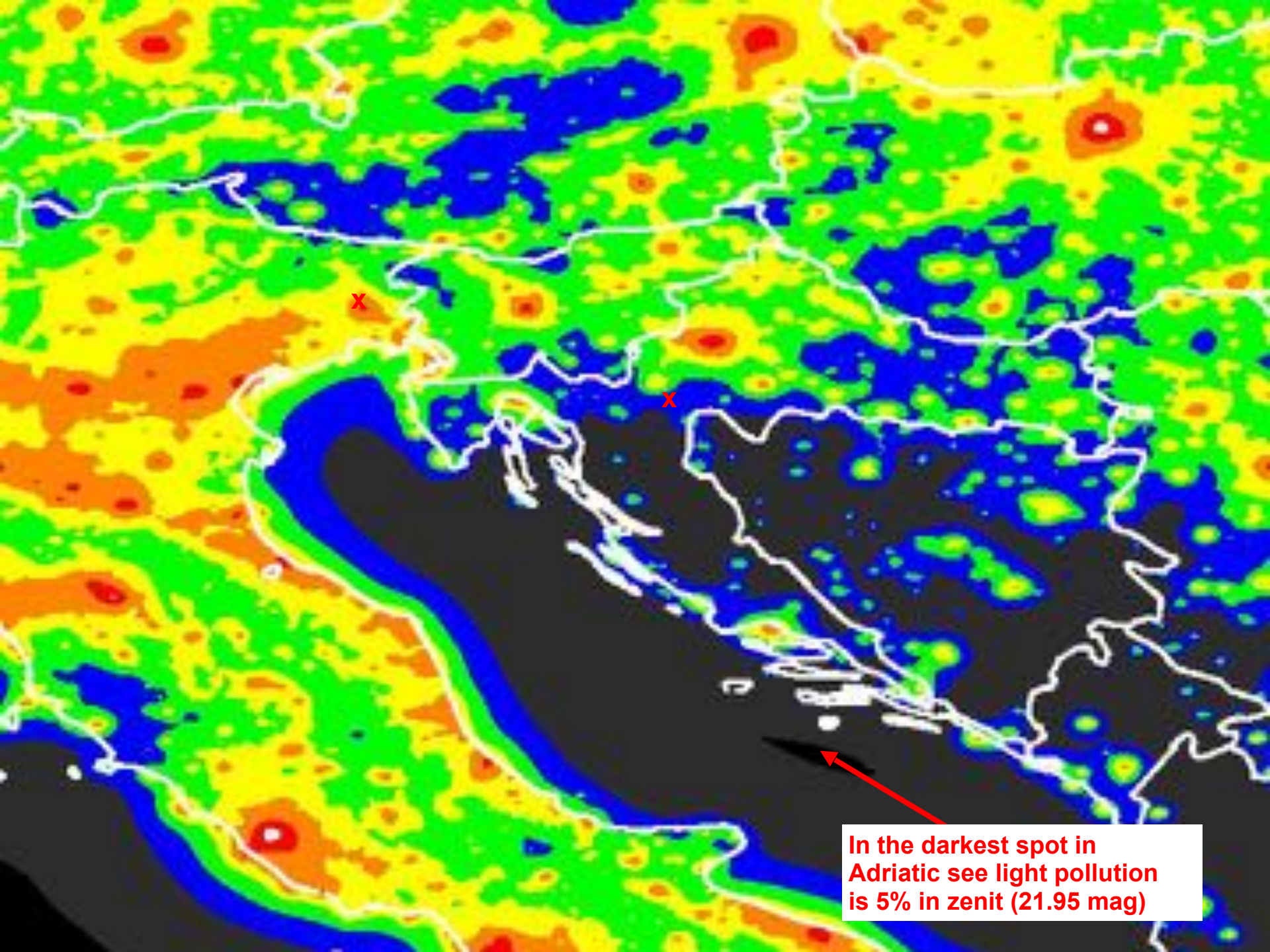
(Part 1)

Andrej Mohar

Dark-Sky Slovenia, UAD - Ustvarjalno Astronomsko Društvo, Ljubljana

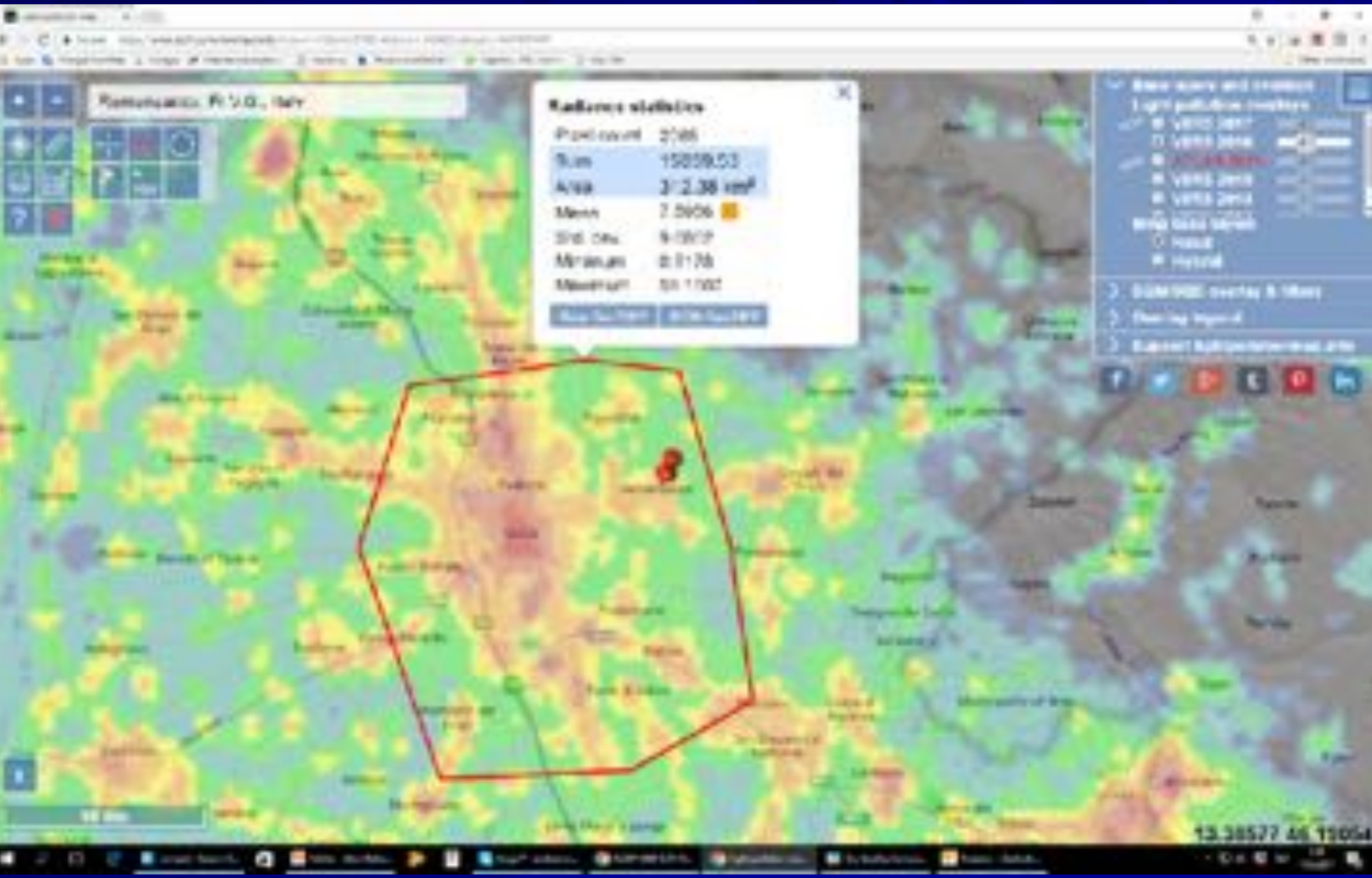
Alpe-Adria Meeting, Remanzacco, September 17, 2017





In the darkest spot in Adriatic see light pollution is 5% in zenith (21.95 mag)

How much light your town is sending into Universe?



Matajur, 1400 m, on border Slovenia / Italy

Slovenia:

Radiance per person:

44 units

Croatia:

Radiance per person:

92 units

Italy:

Radiance per person:

94 units



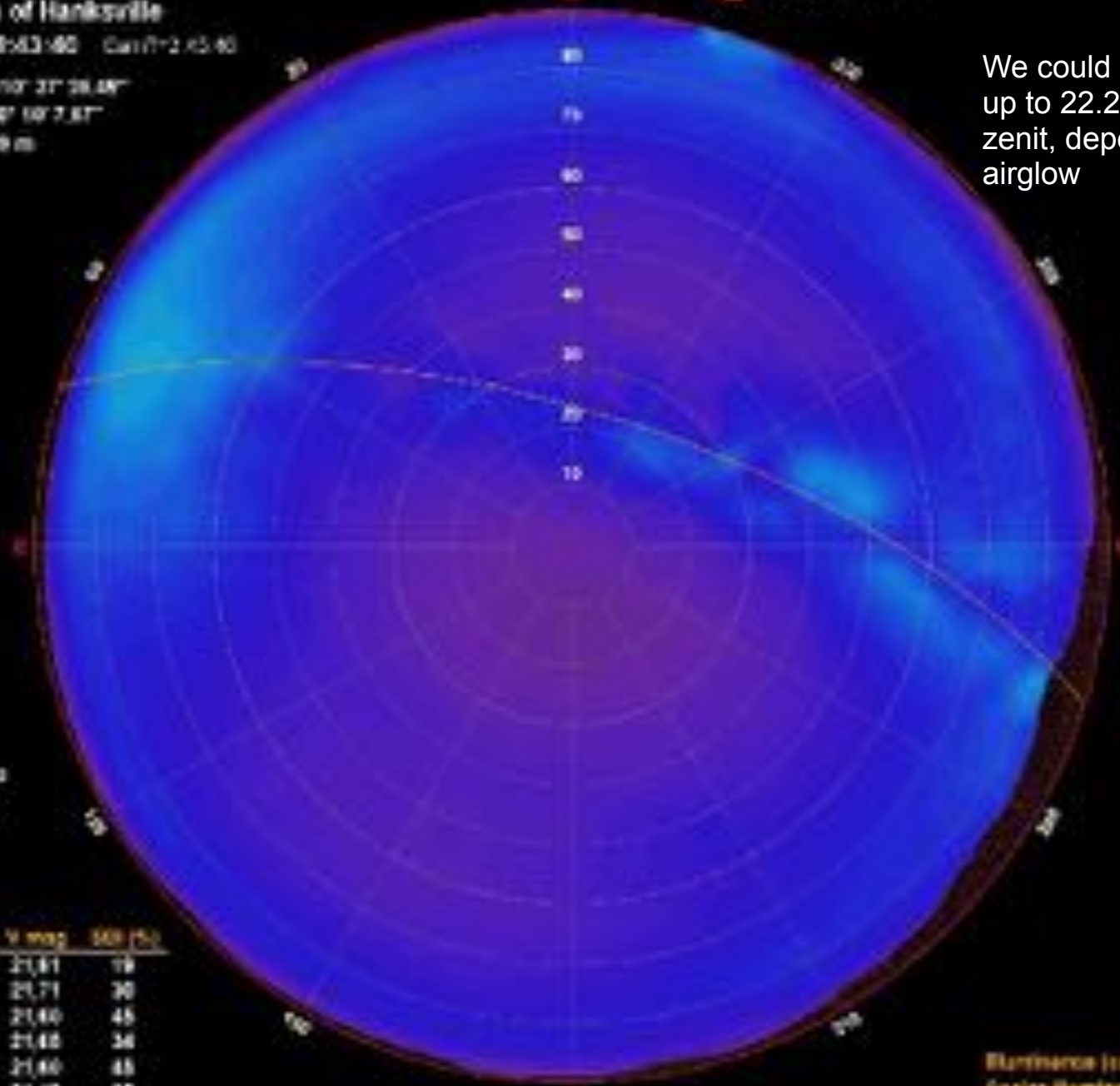
Udine (30 km)



Utah State Route 95
 25 km south of Hanksville
 25.8.2017 1:43:00 Cam 1/2 x5.60
 Longitude: W 110° 31' 28.48"
 Latitude: N 38° 10' 7.81"
 Elevation: 1489 m

Sky Quality Camera

Sky Brightness
 (V magnitude per arc²)



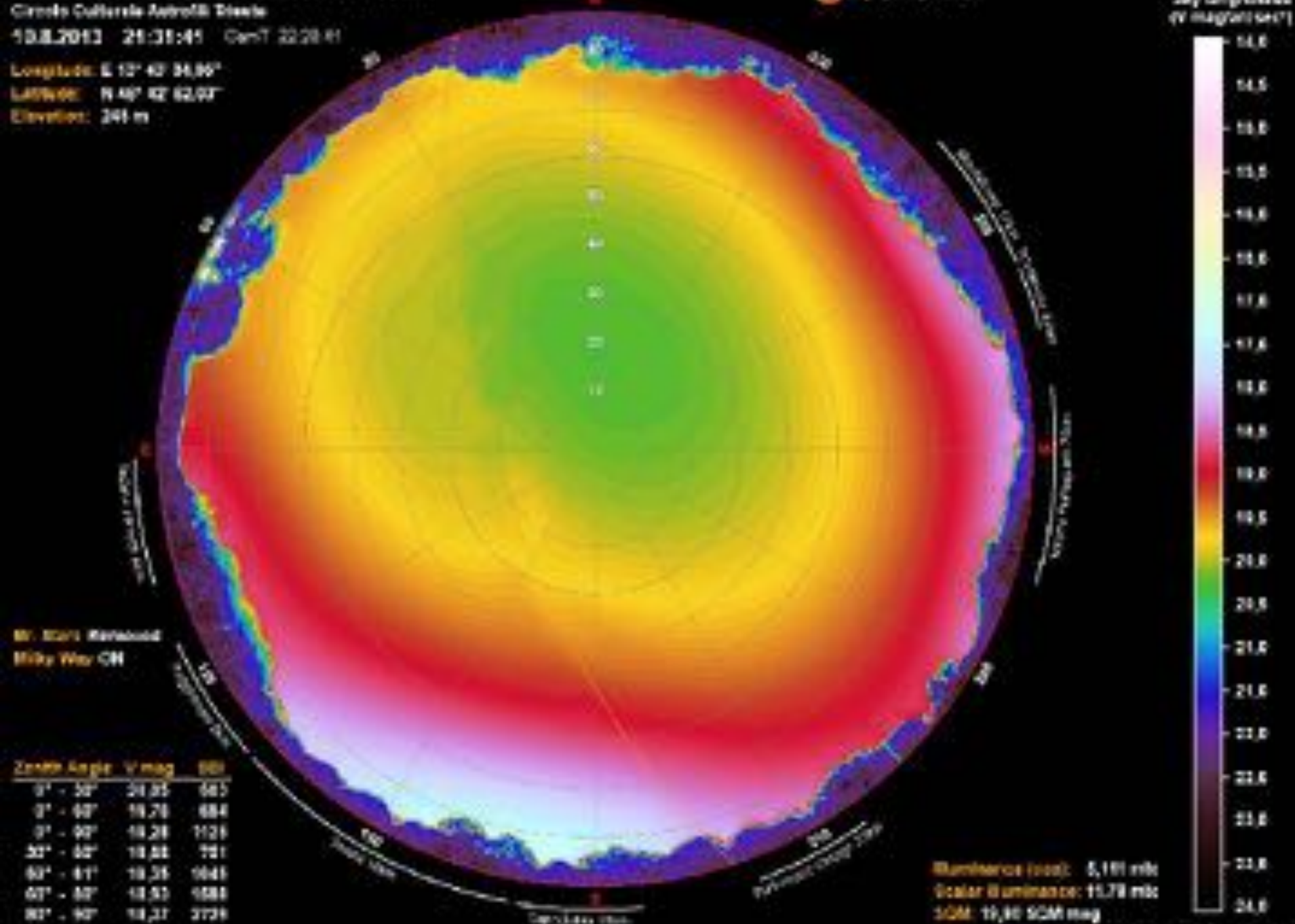
We could measure
 up to 22.2 mag
 in zenith, depending on
 airglow

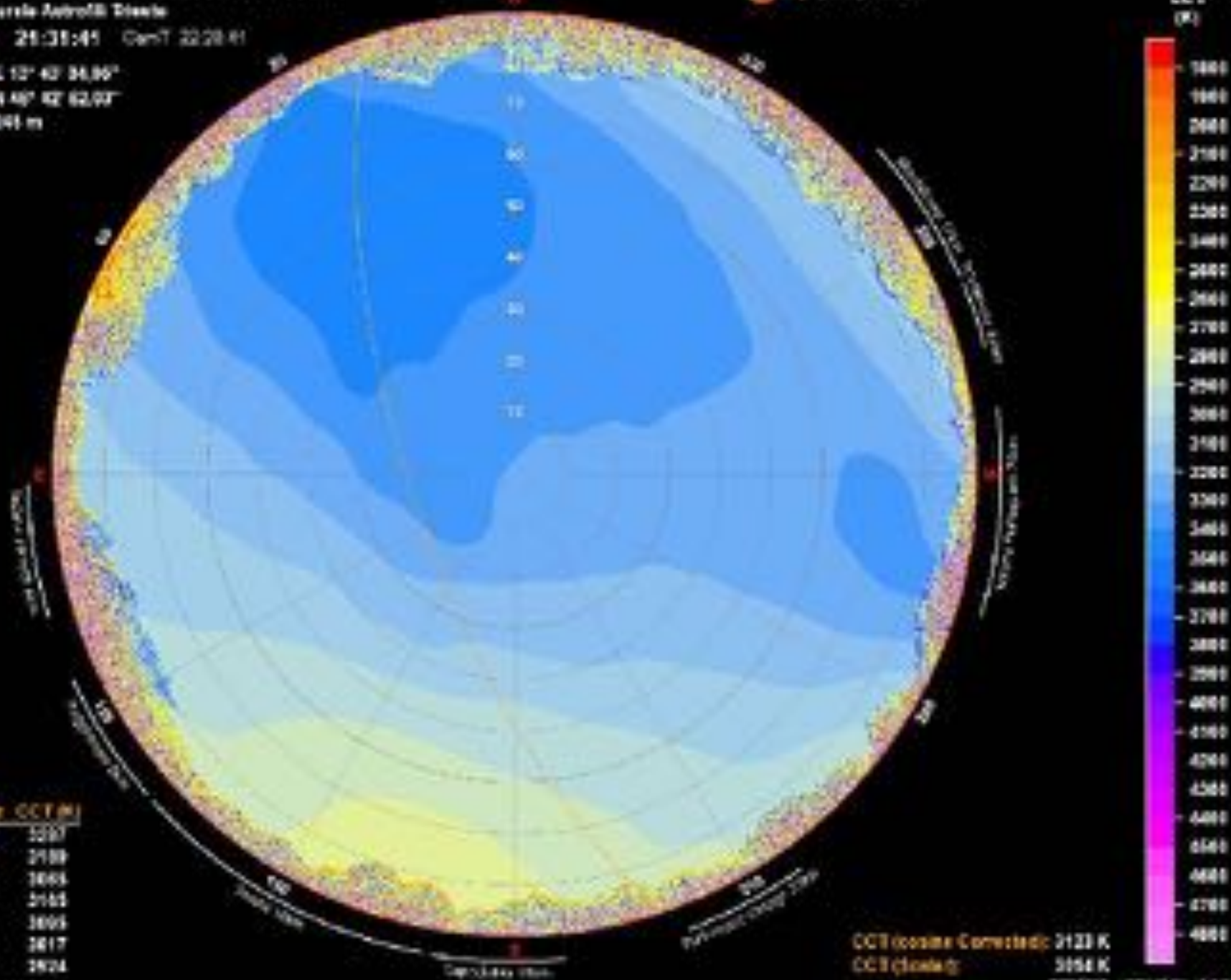


Stars Removed
 Milky Way ON

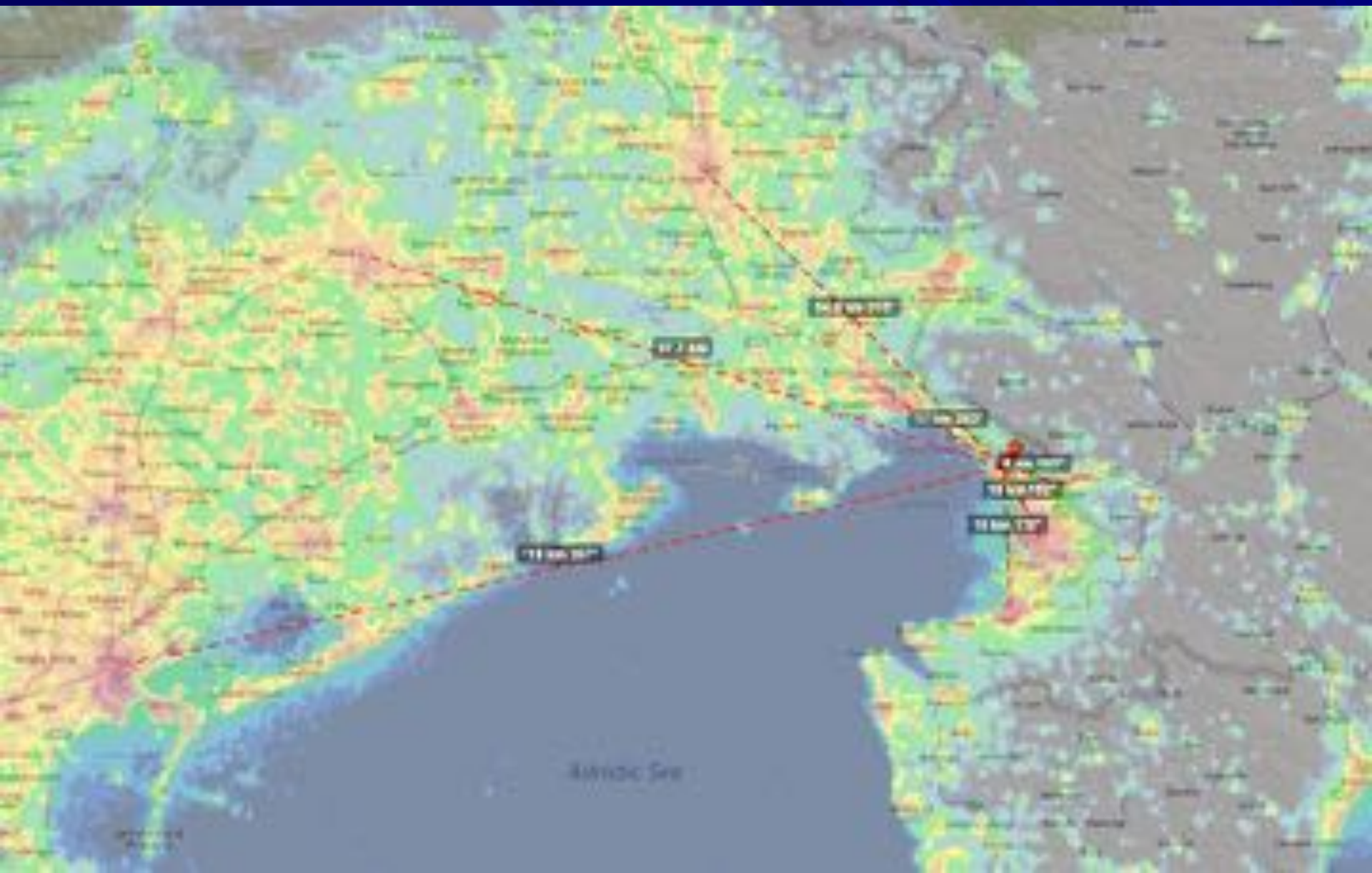
Zenith Angle	V mag	SB (%)
0° - 50°	21.81	19
0° - 60°	21.71	30
0° - 90°	21.46	45
50° - 60°	21.48	34
60° - 81°	21.46	43
60° - 80°	21.48	60
80° - 90°	21.81	67

Illuminance (foot): 0.731 mb
 Scalar Illuminance: 1.618 mb
 SQM: 21.78 SQM mag





Observatory „B-Zugna“ Prosecco (Prošek)



Observatory Talmassera

Circle Aurore III Talmassera

10.8.2013 23:20:29 Cam1 0:17:29

Longitude: E 10° 6' 48.64"

Latitude: N 46° 16' 9.66"

Elevation: 42 m

Sky Quality Camera

Sky Brightness
(V magnitude arc²)



Zenith Angle	V mag	SDR
0° - 30°	19.77	442
3° - 60°	19.90	584
0° - 90°	19.79	1228
30° - 60°	19.81	646
60° - 81°	19.68	921
60° - 90°	19.90	1486
80° - 90°	19.23	2122

Illuminance (foot): 4,868 mb
Scalar Illuminance: 13.99 mb
SQM 20,85 SQM mag

Observatory Talmassons

Circle Atmos II Telemessons

10.8.2013 23:20:29 Cam1 0:17:29

Longitude: E 10° 0' 48.64"

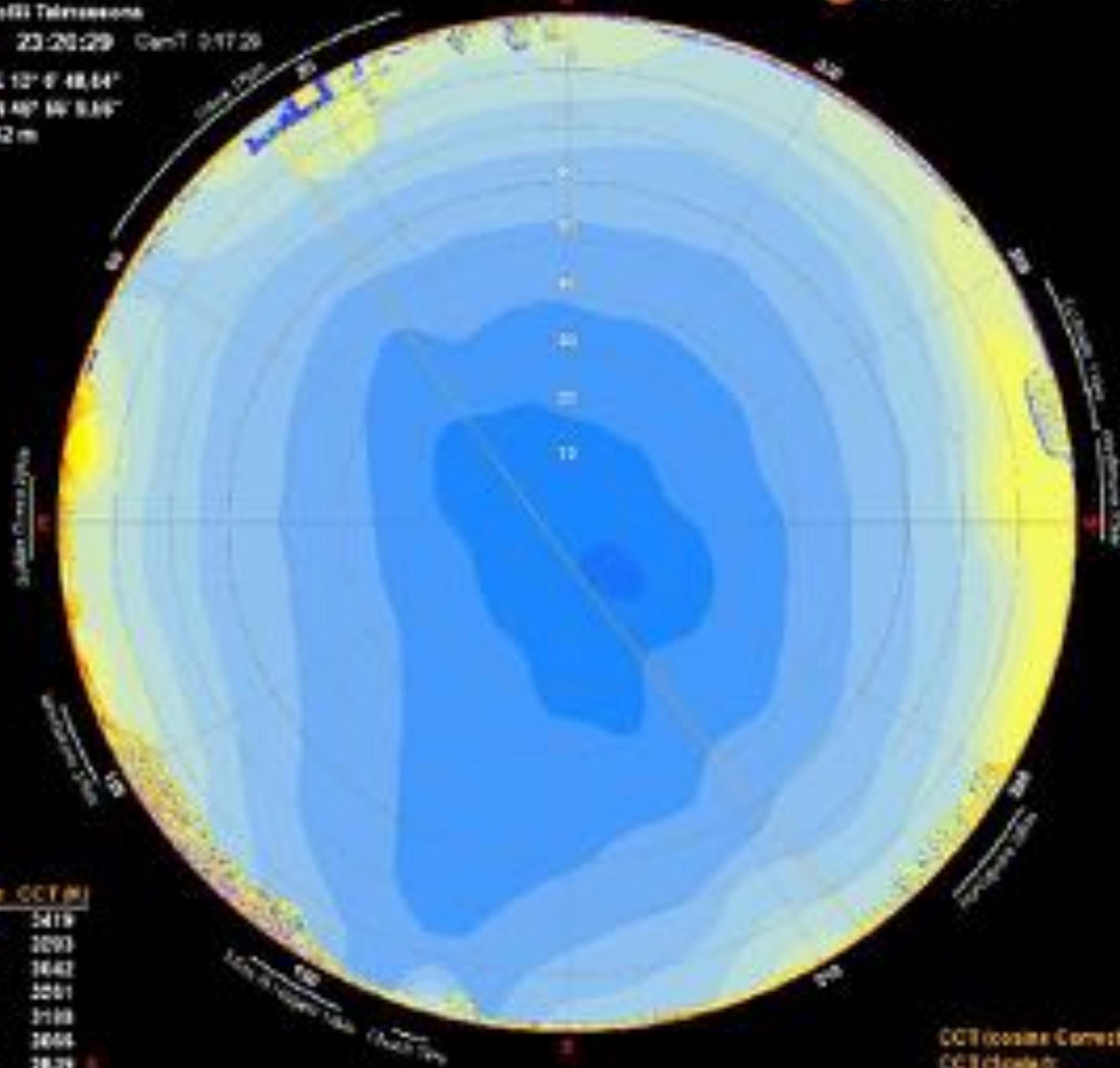
Latitude: N 48° 16' 9.66"

Elevation: 42 m

Sky Quality Camera

CCT
(K)

1800
1900
2000
2100
2200
2300
2400
2500
2600
2700
2800
2900
3000
3100
3200
3300
3400
3500
3600
3700
3800
3900
4000
4100
4200
4300
4400
4500
4600
4700
4800



Zenith Angle CCT (K)

0° - 30°	3419
3° - 60°	3293
0° - 90°	3642
30° - 60°	3051
60° - 81°	3138
60° - 90°	3666
80° - 90°	3839

CCT (cosine Corrected): 3178 K

CCT (cloud): 3021 K

© 2013 Sky Quality Camera

Observatory Talmassons



Observatory Montecalle Valcellina

Cloudy Sky in East and South

18.8.2013 2:12:10 GMT 20:10

Longitude: E 12° N 20.60°

Latitude: N 40° E 16.62°

Elevation: 679 m

Sky Quality Camera

Sky Brightness
(V magnitude)



Mr. Scott Kennedy
Milky Way CN

Zenith Angle	V mag	SD
0° - 30°	20.24	378
30° - 60°	20.41	321
60° - 90°	19.57	436
30° - 60°	20.22	371
60° - 90°	19.85	776
60° - 90°	19.18	1237
90° - 90°	18.08	2861

Luminance (rad): 3.244 mV
Scalar Luminance: 8.838 mV
SQM 20.58 SQM avg

Observatory Montecarlo Valcellina

Cloudy Sky in East and South

18.8.2013 2:12:10 CorT 2:07:10

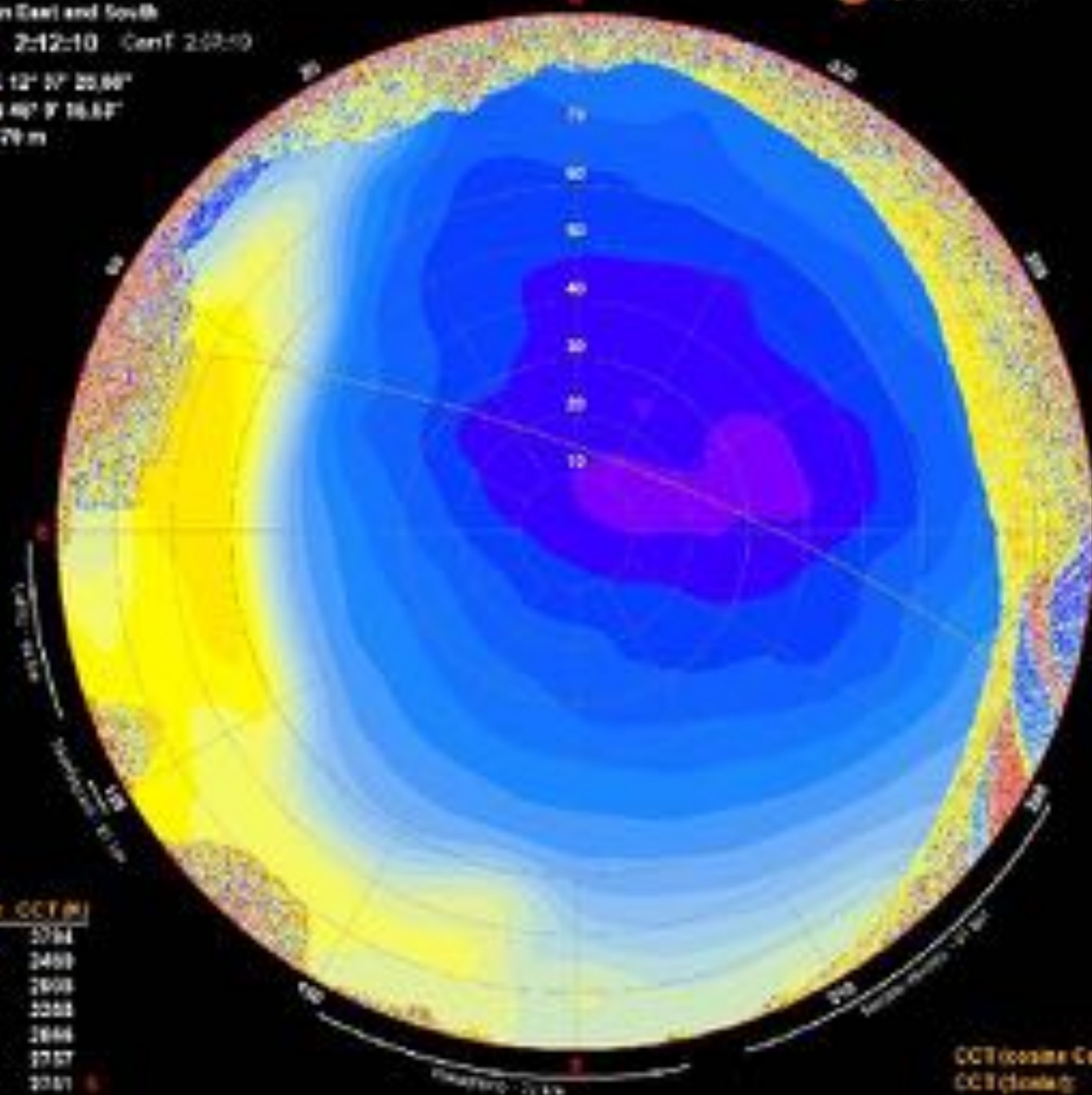
Longitude: E 12° N' 20.60"

Latitude: N 46° E' 16.62"

Elevation: 679 m

Sky Quality Camera

CCT
(K)



Zenith Angle CCT (K)

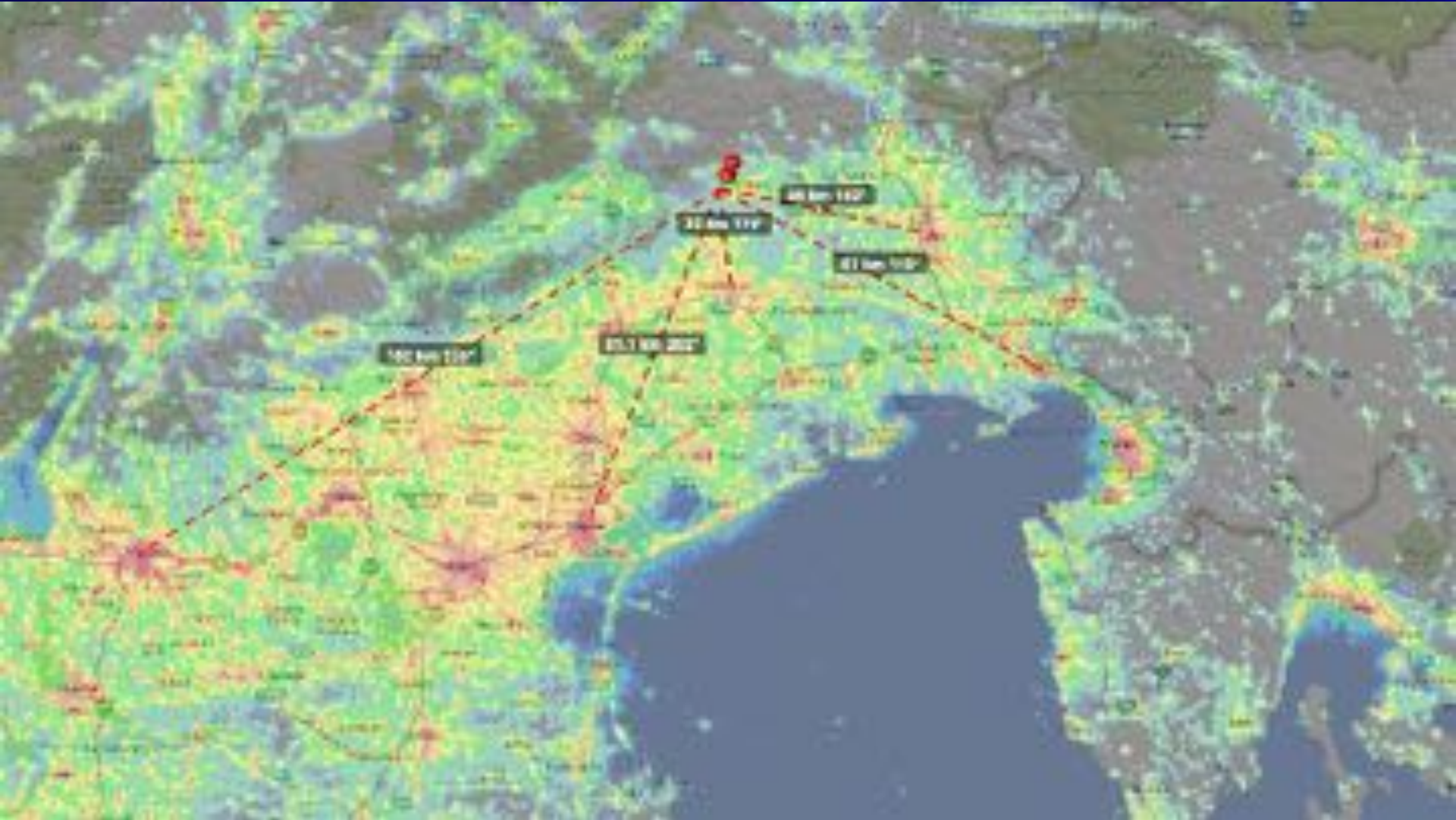
0° - 30°	3784
3° - 60°	3488
0° - 90°	2808
30° - 60°	3288
60° - 81°	2888
60° - 90°	3757
80° - 90°	3781

CCT (cosine Corrected): 3177 K

CCT (cloud): 2100 K

skyqualitycam.com

Observatory Remanzacco



Astronomical Observatory CCAF

Fama d'Enzo (CC)

3.8.2013 22:39:42 Com1 22:39:42

Longitude: E 10° 51' 32.81"

Latitude: N 48° 54' 59.57"

Elevation: 48 m

Sky Quality Camera

Sky Brightness
(V magnitude arc²)



Mr. Scott Renwood
Milky Way ON

Zenith Angle	V mag	DBI
0° - 30°	19.91	584
3° - 60°	19.82	799
0° - 90°	19.97	1633
30° - 60°	19.85	877
60° - 81°	19.30	1221
60° - 90°	18.80	1888
80° - 90°	17.93	2127

Illuminance (foot): 6,368 fc
Scalar Illuminance: 16.90 mc
SQM: 19.78 SQM mag

Astronomical Observatory CCAF

Farm & Tecnico (CC)

3.8.2013 22:39:42 Com1 22:39:42

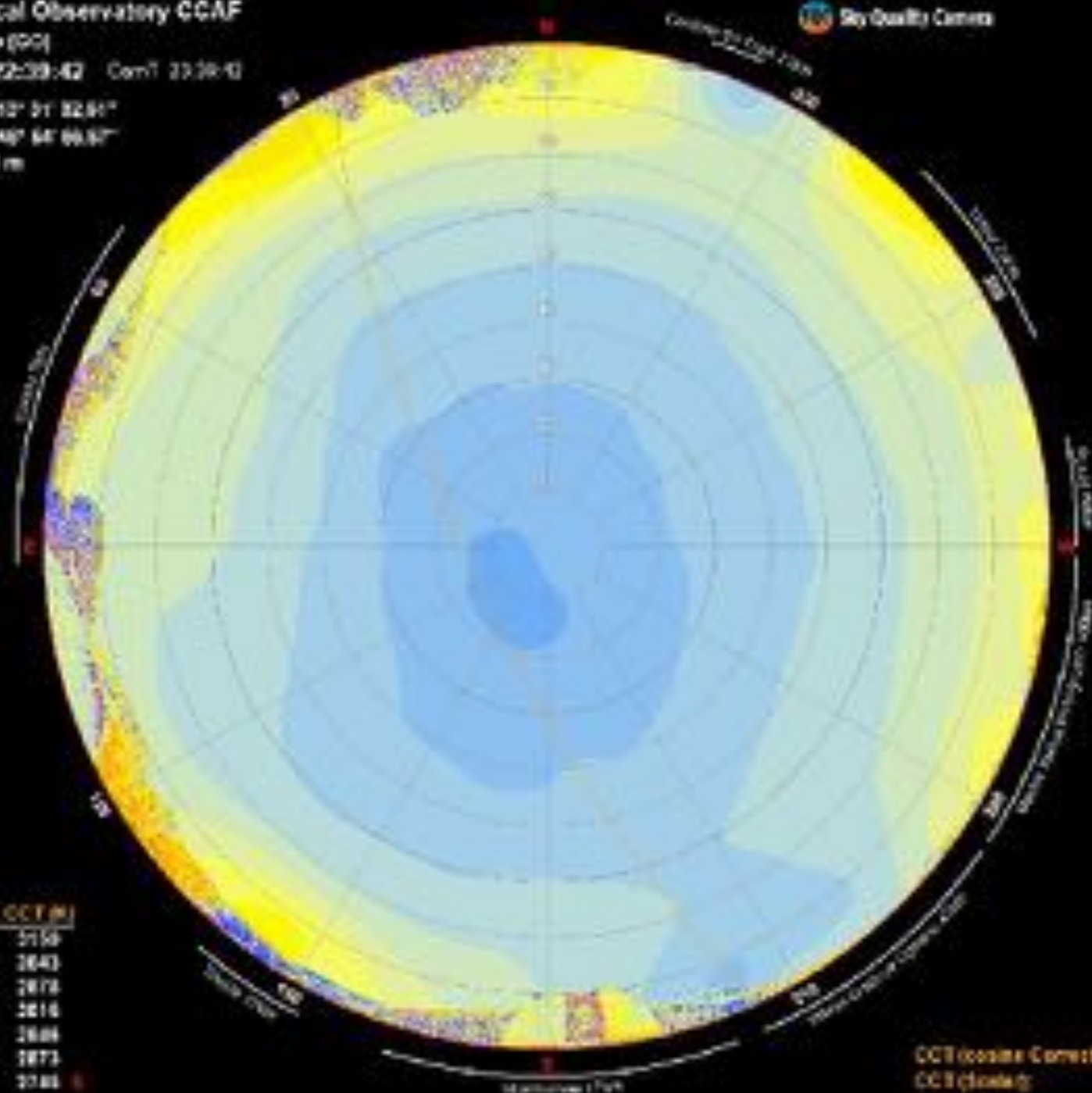
Longitude: E 10° 31' 32.81"

Latitude: N 48° 54' 59.57"

Elevation: 48 m

Sky Quality Camera

CC0
(K)



Zenith Angle	CCT (K)
0° - 30°	3159
3° - 60°	3643
0° - 90°	3878
30° - 60°	3816
60° - 81°	3889
60° - 90°	3873
80° - 90°	3788

CCT (cosine Corrected): 2958 K

CCT (cloud): 3100 K

Observatory Farra d' Isonzo



Observatory Remanzacco

Associazione Friulana di Astronomia e Meteorologia

4.8.2013 00:47:54 Const: 1/10/01

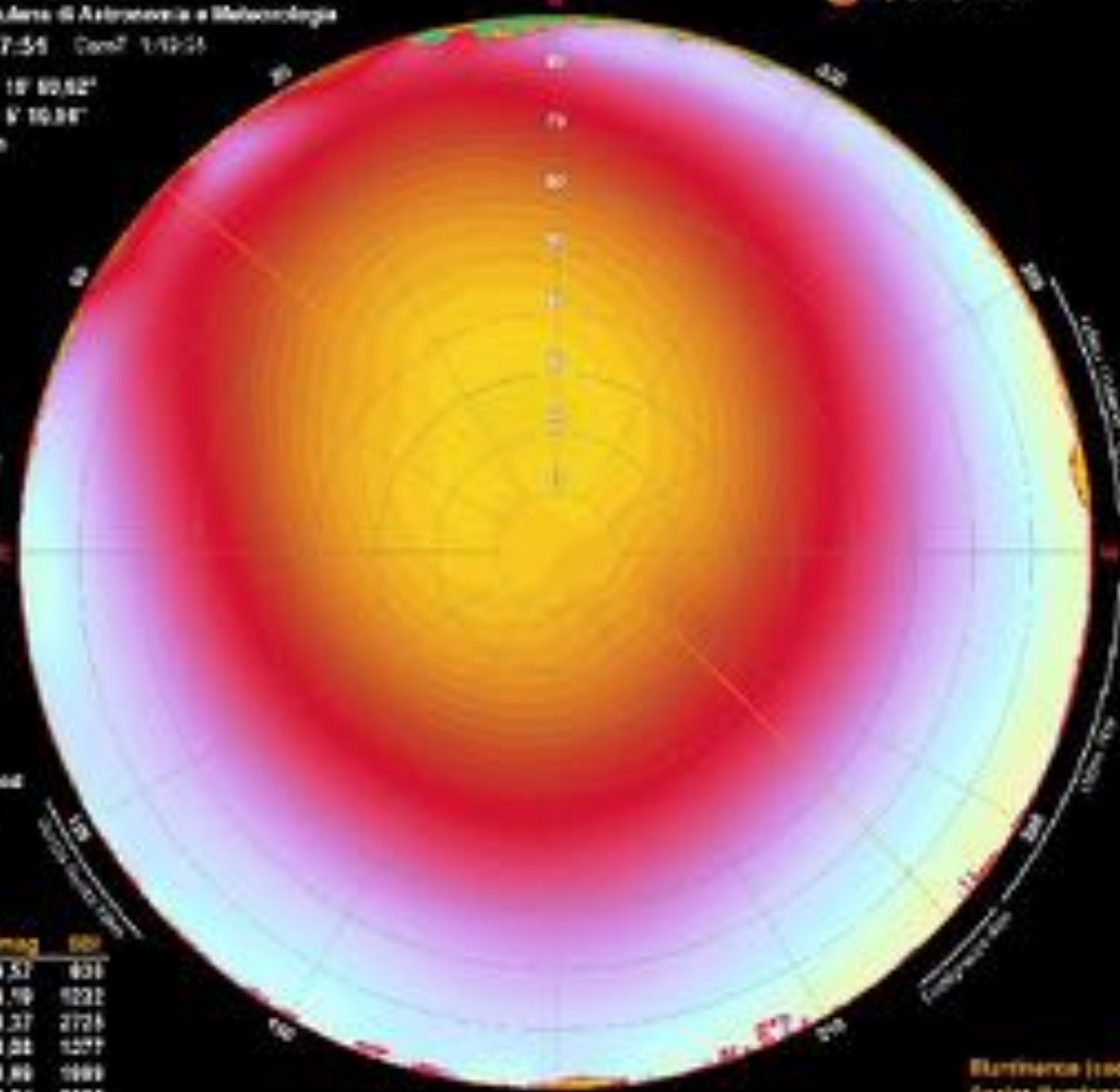
Longitude: E 12° 18' 50.82"

Latitude: N 46° 5' 10.88"

Elevation: 118 m

Sky Quality Camera

Sky Brightness
(V magnitude arc²)



Mr. Scott Remanzacco
Milky Way ON

Zenith Angle	V mag	SB
0° - 30°	18.57	638
0° - 60°	18.79	1221
0° - 90°	18.37	2726
30° - 60°	18.04	1277
60° - 81°	18.86	1889
60° - 90°	18.24	2682
81° - 90°	17.41	5789

Illuminance (foot): 8.641 mb
Scalar Illuminance: 30.48 mb
SQM: 19.37 SQM mag

Observatory Remanzacco

Associazione Friulana di Astronomia e Meteorologia

4.8.2013 00:47:54 Conn: 1/10/01

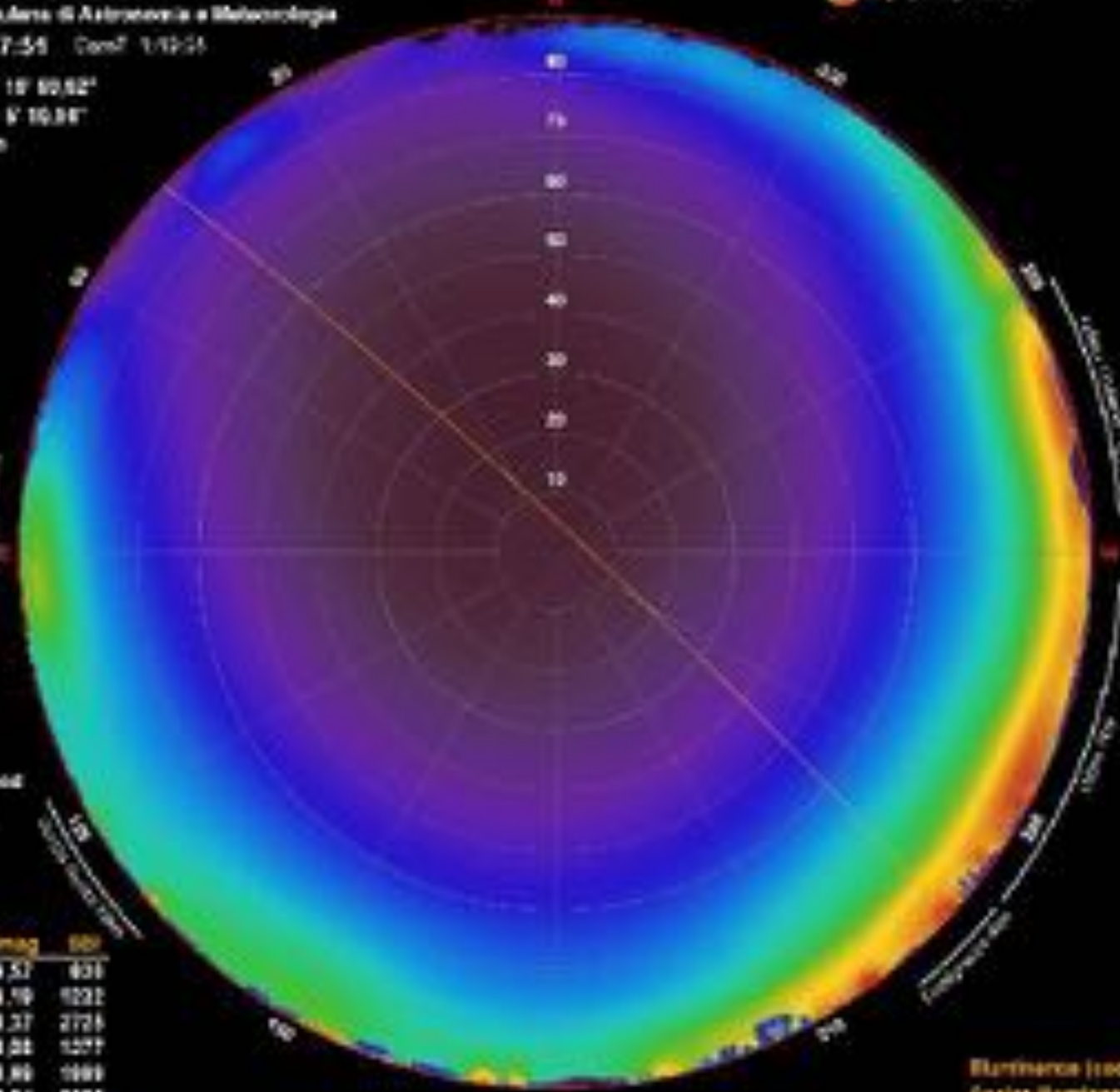
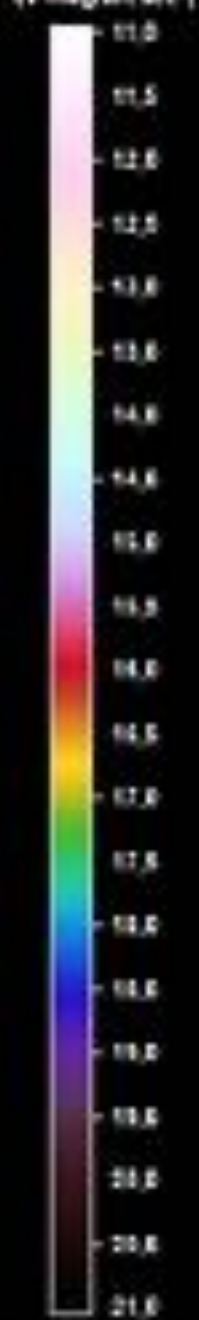
Longitude: E 12° 18' 50.82"

Latitude: N 46° 5' 10.88"

Elevation: 118 m

Sky Quality Camera

sky brightness
(v magniti sec²)



Mr. Scotti Remanzacco
Milky Way ON

Zenith Angle	V mag	SD
0° - 30°	18.57	638
3° - 60°	18.79	1232
0° - 90°	18.37	2726
30° - 60°	18.08	1207
60° - 81°	18.86	1889
60° - 90°	18.24	2682
81° - 90°	17.41	5789

Illuminance (foot): 8.641 mb
Scalar Illuminance: 30.48 mb
SQM: 19.37 SQM mag

Observatory Remanzacco

Associazione Friulana di Astronomia e Meteorologia

4.8.2013 0:47:54 Com7 1/10/01

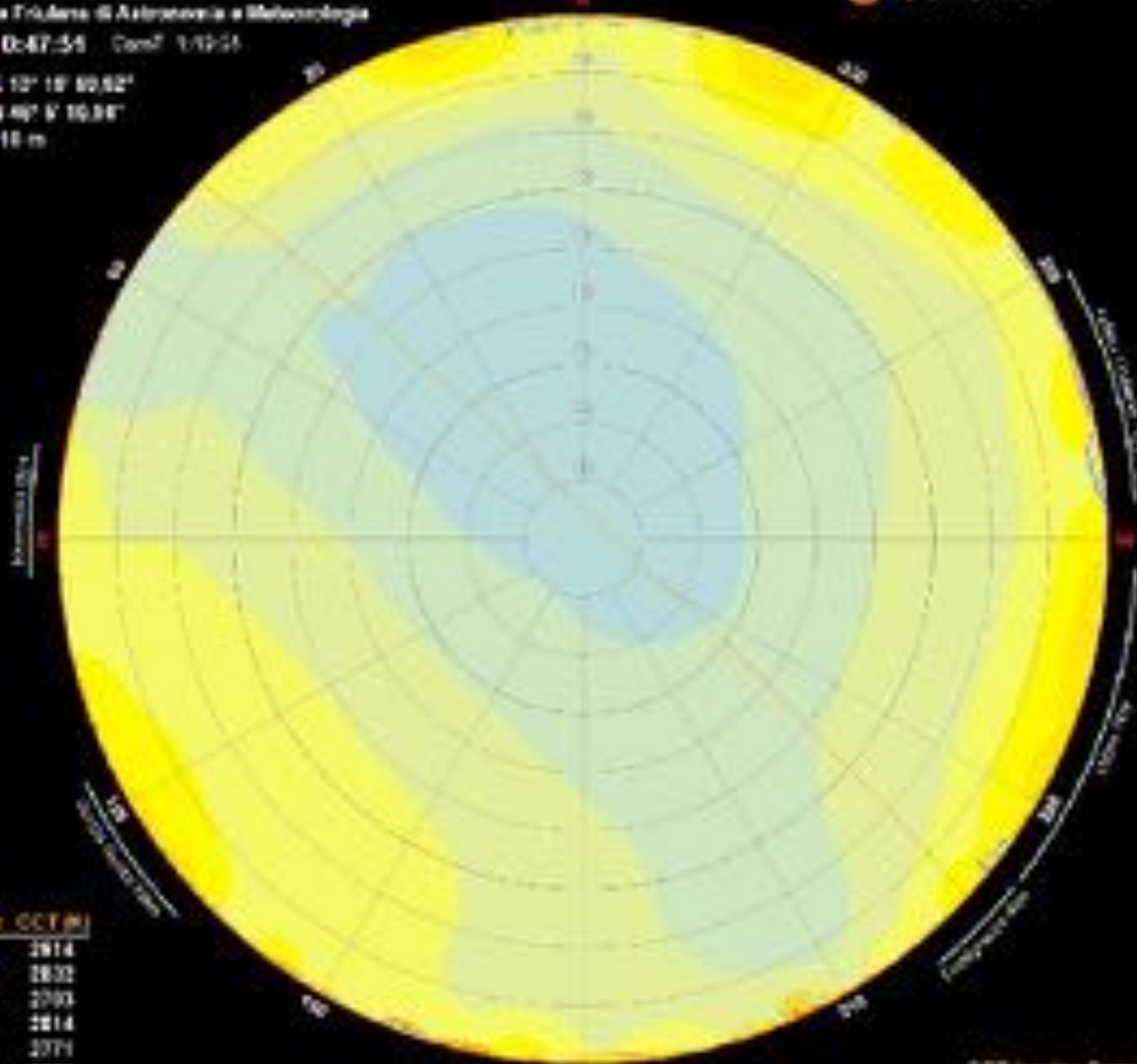
Longitude: E 12° 18' 50.82"

Latitude: N 46° 5' 10.86"

Elevation: 118 m

Sky Quality Camera

CCT
(K)



Zenith Angle CCT (K)

0° - 30°	2814
0° - 45°	2832
0° - 60°	2793
30° - 45°	2814
45° - 60°	2771
60° - 75°	2729
75° - 90°	2607

CCT (cosine corrected): 2778 K

CCT (cloud): 2800 K

Remanzacco - 4.8.2013 0:47:54

Milky way from Grand
Canyon, USA, August 2017

Lights of Phoenix - 285 km

Please protect skies
above your observatories
Thank you!