

# Topic A

## Part 2. What's Up?

(Web Version: 08-15-01)

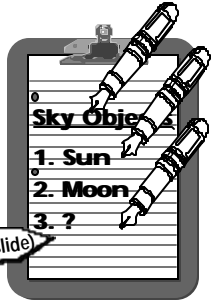
1

## Census of the Night Sky

An inventory of sky objects  
by *apparent brightness*

(By how bright things *look*)

Here are possible objects (on next slide)



2

## Question


Question What is the brightest appearing night-time celestial object *not counting* the Moon?

- (1) Alpha Centauri
- (2) Jupiter
- (3) North Star
- (4) Sirius
- (5) Venus

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## Brilliant Venus

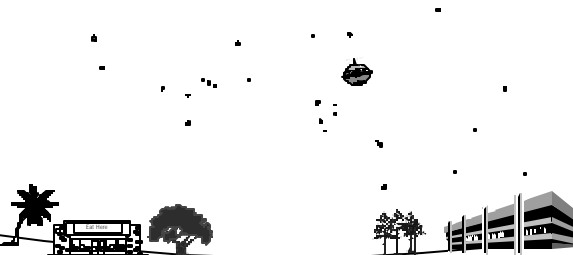
*Often visible just after sunset or before sunrise  
(and sometimes during daytime)*



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## Brilliant Venus

*Sometimes mistaken for airplane lights... or a UFO !*



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## Sky Objects

Object

Sun

Moon (Full)

VENUS

?

?

Can you fill in next two objects?  
(see next slide)

6

### What Have We Here?

1998 April 23  
6:15 a.m. EDT  
(40 min. before sunrise)

**Crescent Moon**  
(3 days before *New*)

Lake Alice (UF Campus)

Entire lunar outline visible  
("New moon in old moon's arms")

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### Sky Objects

Object

Sun

Moon (Full)

VENUS

JUPITER

Next ?

Another *planet*

?

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### Sky Objects

Object

Sun

Moon (Full)

VENUS

JUPITER

MARS

Object

*Brightest nighttime star*

*Sirius*

Still another *planet!*

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### Sirius

*Sirius, a brilliant whitish star, not the North Star is brightest nighttime star*

But Venus is about 15 times brighter!

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### Know the Planets & Sirius

Table 1 in Study Guide (also on web)

<u>Object</u>	<u>Mag.</u>	<u>Object</u>	<u>Mag.</u>
Sun	-27	<i>Sirius**</i>	-1½
Moon (Full)	-13	<i>Canopus</i>	-¾
VENUS*	-4½ to -3	MERCURY*	-½ to +1
JUPITER*	-2½ to -1	Several Stars	0
MARS*	-3 to +2	SATURN*	-½ to +1

\*The naked eye planets      \*\*Brightest nighttime star

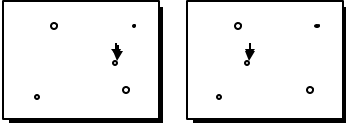
11

### What is a Planet?

- Ancient literature often cites seven planets (*not* five)
  - What are the other two?
  - Why included?
- To answer must understand "*classical meaning*" of a planet

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### Wandering “Stars”



Last Week      Today

One “star” has “moved”

Ancient peoples observed wandering stars

- The four corner stars are “fixed”
- The middle “star” has moved or “wandered”

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### Planets & Stars

- The *Ancients* knew seven “wanderers”
- What are their names?
- Answer  
The five “naked eye” planets + ? + ?
- “*Planet*” is from ancient Greek meaning . . .  
“a wanderer”

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### Sky List Incomplete


Examples suggest “flavor of what’s up”


Object	Mag.	Object	Mag.
Bright Stars*	½ to +1½	Rural Limit	+6½
Another “50”	+1½ to +2	Bright Asteroids	+6
<i>Polaris</i> (N. Star)	+2	NEPTUNE**	+9
URANUS**	+5½	Binoculars	+10
Galilean Satell.	+5½	PLUTO**	+13 to +15

\*About 15      \*\*Non-naked eye planets

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### List Shows Magnitudes





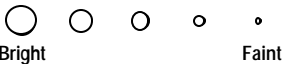
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### Magnitudes

- To appreciate table need knowledge of *magnitudes*  
*Magnitude = brightness* (not size)
- ◆ Even simple star charts use them . . .



Bright      Faint

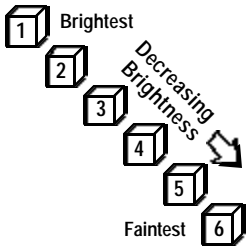


(Different size dots simulate different brightness or magnitudes)

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### Classical Magnitude System

- An early Greek system (Hipparchus, c. 120 B.C.)
- Naked eye stars put in six *magnitude classes*
  - Brightest = magnitude +1
  - Faintest = magnitude +6



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### Numbers of Stars

Brightest stars most common →

1st mag. — Approx. 20

6th mag. — Thousands → Faintest

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### Magnitudes Now

- Based on original system
- Magnitude classes now a *continuous scale*
- Scale goes from  
Negative (very bright)  
to  
Positive (very faint)

⋮
- 5.00
- 4.00
- 3.00
- 2.00
- 1.00
0.00
+ 1.00
+ 2.00
+ 3.00
+ 4.00
+ 5.00
+ 6.00
+ 7.00
+ 8.00
+ 9.00
+10.00
⋮

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### See Study Guide

Very bright objects have *negative* magnitudes

- Sun -27
- Full Moon -13
- Venus -4½
- Jupiter -2½
- *Sirius* -1½
- etc.

Approx. Naked Eye

See Table 1	
⋮	Venus
- 5.00	
- 4.00	
- 3.00	Jupiter
- 2.00	
- 1.00	<i>Sirius</i>
0.00	
+ 1.00	
+ 2.00	<i>Polaris</i>
+ 3.00	
+ 4.00	
+ 5.00	
+ 6.00	Limit
+ 7.00	
+ 8.00	
+ 9.00	Neptune
+10.00	
⋮	

Very Faint

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### Don't Memorize Magnitudes!

Object	Mag.	Object	Mag.
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\*The naked eye planets      \*\*Brightest nighttime star

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### How Many Stars?

With Naked Eye (mag. limit +6½)

1) At any one time?  
?

2) Over entire sky?  
?

(See Study Guide Table 1, Notes 6 & 7)

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