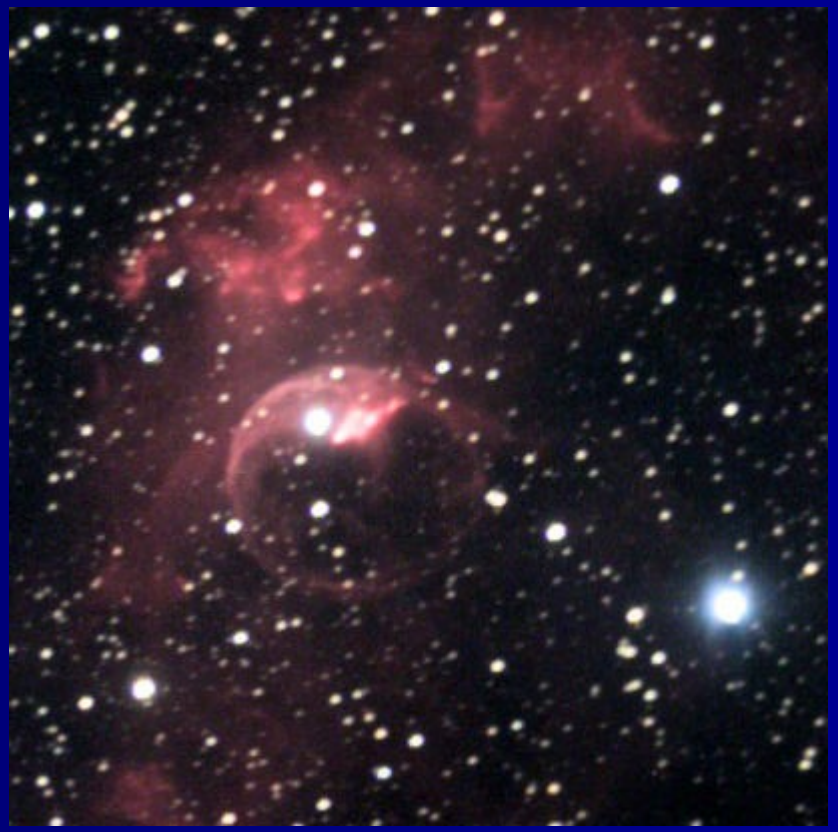
Learning the Night Sky



Mark Huss

Introduction

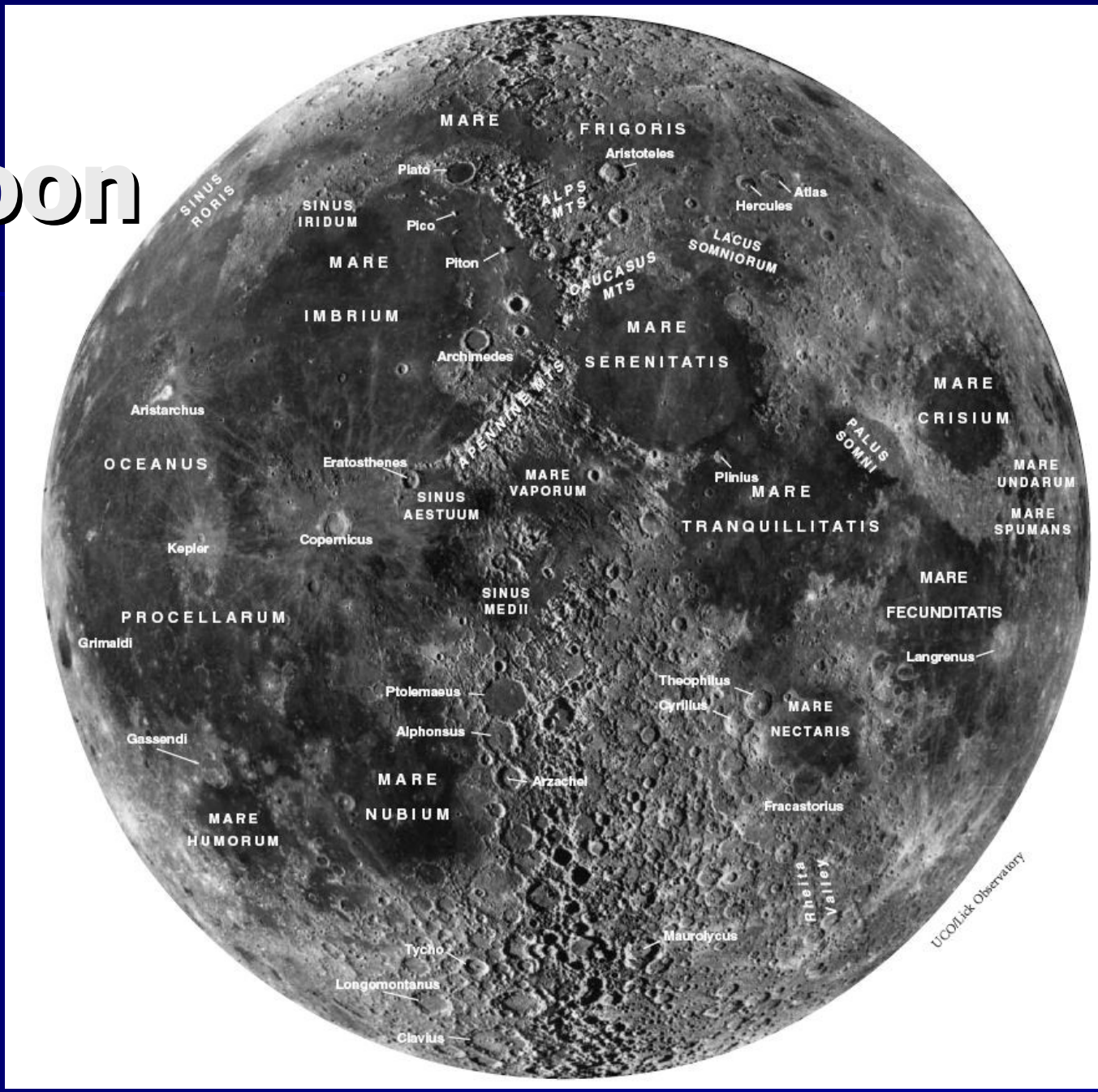
- What's up there?
  - The Moon, Planets, Stars and Beyond
  - Deep Sky vs. Shallow Sky
- What are the challenges?
- What resources are available?
- Do I need expensive equipment?

Cycles

- Day and Night (and twilight)
- Lunar Month
- Annual circle of the heavens

March, 2007 at latitude 40.17, longitude -75.80, tz UTC-5									
Day	Darkest Hours	Event	Moon Rises	Moon Sets	Sunset	AstTwi Ends	Next Day	AstTwi Starts	Sunrise
1	-- none --		15:45	05:40	17:55	19:25	2	05:06	06:36
2	-- none --		16:50	06:06	17:56	19:26	3	05:04	06:34
3	-- none --	FM 18:17	17:52	06:28	17:57	19:27	Su	05:03	06:33
Su	-- none --		18:52	06:48	17:58	19:28	5	05:01	06:31
5	19:29 - 19:52		19:52	07:08	17:59	19:29	6	05:00	06:30
6	19:30 - 20:51		20:51	07:27	18:00	19:30	7	04:58	06:28
7	19:31 - 21:52		21:52	07:47	18:01	19:31	8	04:56	06:26
8	19:33 - 22:55		22:55	08:10	18:02	19:33	9	04:55	06:25
9	19:34 - 23:58		23:58	08:38	18:03	19:34	10	04:53	06:23
10	19:35 - 02:01		--:--	09:11	18:04	19:35	Su	05:52	07:22
Su	20:36 - 03:02	3Q 23:55 DST	02:01	10:51	19:06	20:36	12	05:50	07:20
12	20:37 - 03:57		03:02	11:42	19:07	20:37	13	05:48	07:18
13	20:38 - 04:44		03:57	12:43	19:08	20:38	14	05:47	07:17
14	20:39 - 05:24		04:44	13:52	19:09	20:39	15	05:45	07:15
15	20:40 - 05:43		05:24	15:06	19:10	20:40	16	05:43	07:14
16	20:41 - 05:41		05:57	16:23	19:11	20:41	17	05:41	07:12
17	20:43 - 05:40		06:26	17:41	19:12	20:43	Su	05:40	07:10
Su	20:44 - 05:38	NM 22:44	06:52	18:58	19:13	20:44	19	05:38	07:09
19	20:45 - 05:36		07:18	20:16	19:14	20:45	20	05:36	07:07
20	21:36 - 05:35	VEq	07:44	21:36	19:15	20:46	21	05:35	07:06
21	22:56 - 05:33		08:14	22:56	19:16	20:47	22	05:33	07:04
22	00:15 - 05:31		08:48	--:--	19:17	20:48	23	05:31	07:02
23	01:29 - 05:29		09:30	00:15	19:18	20:50	24	05:29	07:01
24	02:33 - 05:27		10:20	01:29	19:19	20:51	Su	05:27	06:59
Su	03:27 - 05:26	1Q 14:17	11:19	02:33	19:20	20:52	26	05:26	06:57
26	04:10 - 05:24		12:24	03:27	19:21	20:53	27	05:24	06:56
27	04:43 - 05:22		13:31	04:10	19:22	20:54	28	05:22	06:54
28	05:11 - 05:20		14:38	04:43	19:23	20:56	29	05:20	06:53
29	-- none --		15:42	05:11	19:24	20:57	30	05:18	06:51
30	-- none --		16:44	05:34	19:25	20:58	31	05:17	06:49
31	-- none --		17:44	05:54	19:26	20:59	Su	05:15	06:48

The Moon

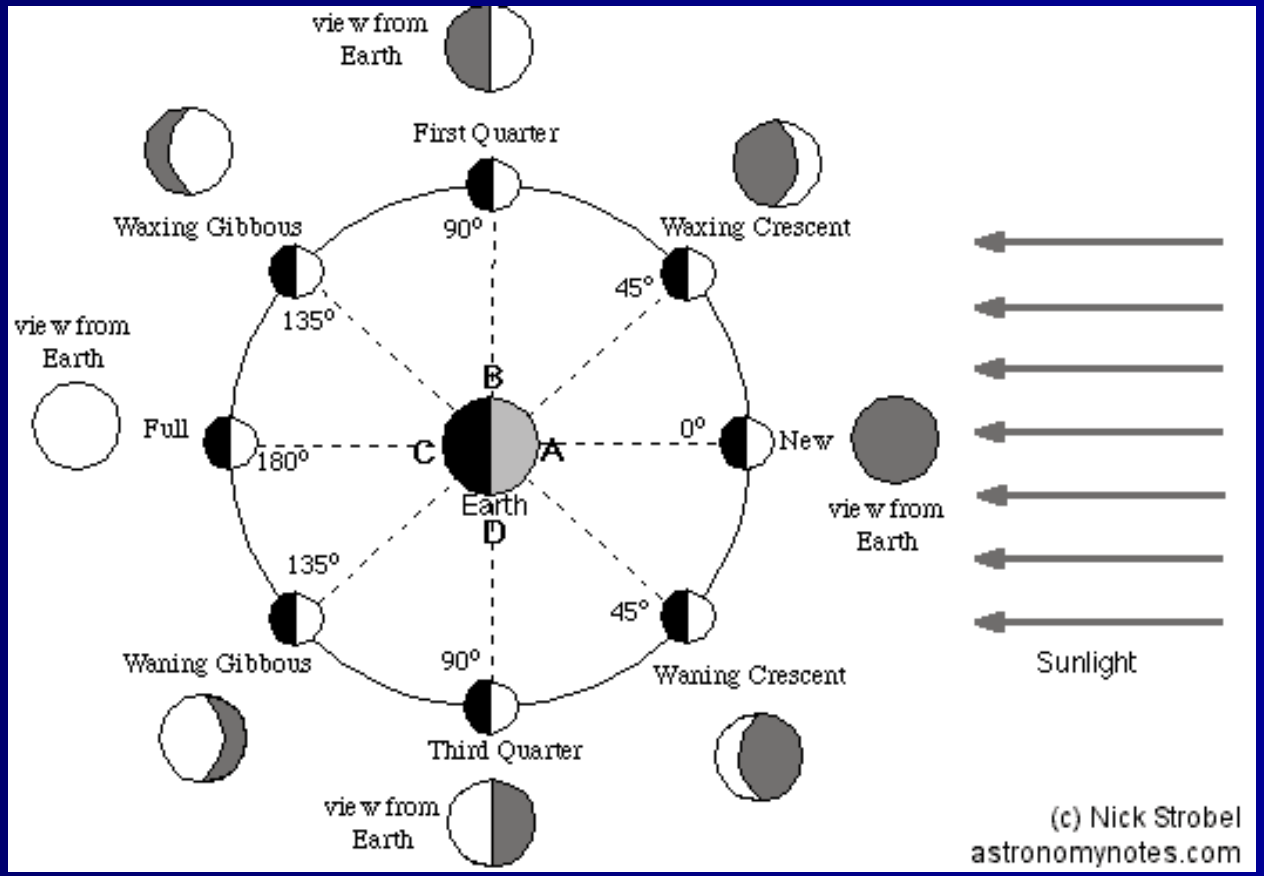

MARE
FRIGORIS
Aristoteles
Plato
SINUS
RORIS
SINUS
IRIDUM
ALPS
MTS
Atlas
Hercules
Pico
LACUS
SOMNIORUM
MARE
Piton
CAUCASUS
MTS
IMBRIUM
MARE
Archimedes
SERENITATIS
APENNINE MTS
MARE
CRISIUM
Aristarchus
PALUS
SOMNI
OCEANUS
Eratosthenes
MARE
VAPORUM
Plinius
MARE
UNDARUM
SINUS
AESTUUM
MARE
TRANQUILLITATIS
MARE
SPUMANS
Kepler
Copernicus
MARE
FECUNDITATIS
SINUS
MEDII
PROCELLARUM
Grimaldi
Langrenus
Theophilus
Ptolemaeus
Cyrillus
MARE
NECTARIS
Alphonsus
Gassendi
MARE
NUBIUM
Arzachel
Fracastorius
MARE
HUMORUM
Rheita
Valley
Maurolycus
Tycho
Longomontanus
Clavius
UCO/Lick Observatory

The Moon

- Maria - dark “seas”
- Craters
- The terminator
- 29.5 day cycle
- Libration

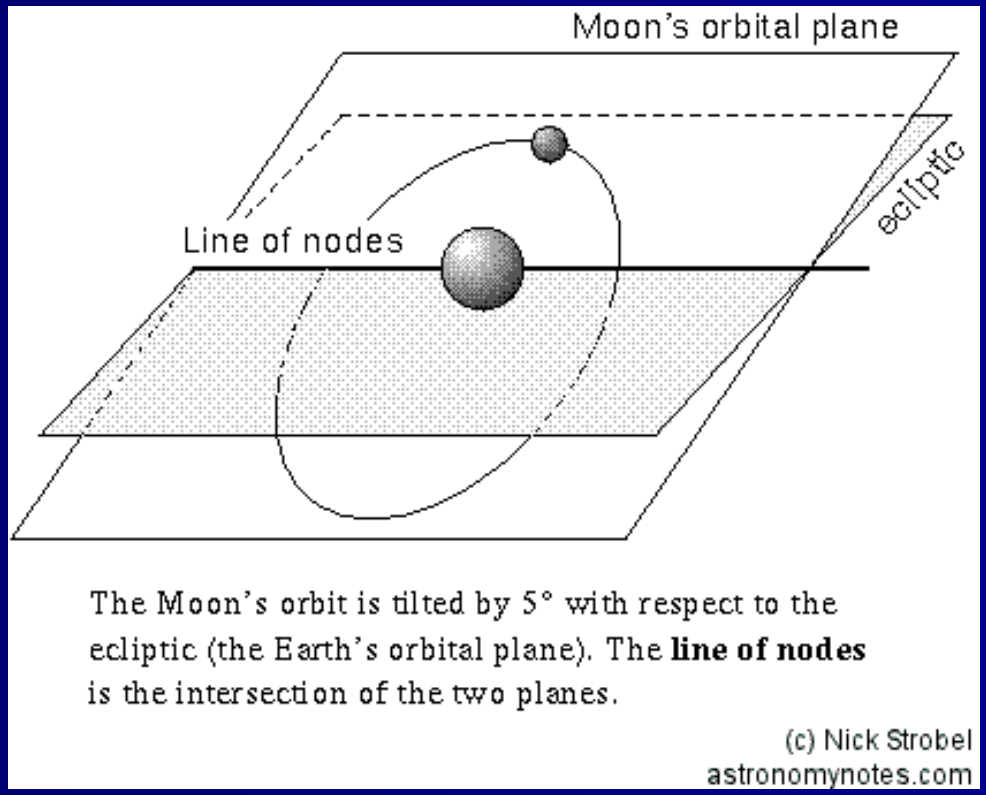
The Moon

- Phases of the Moon



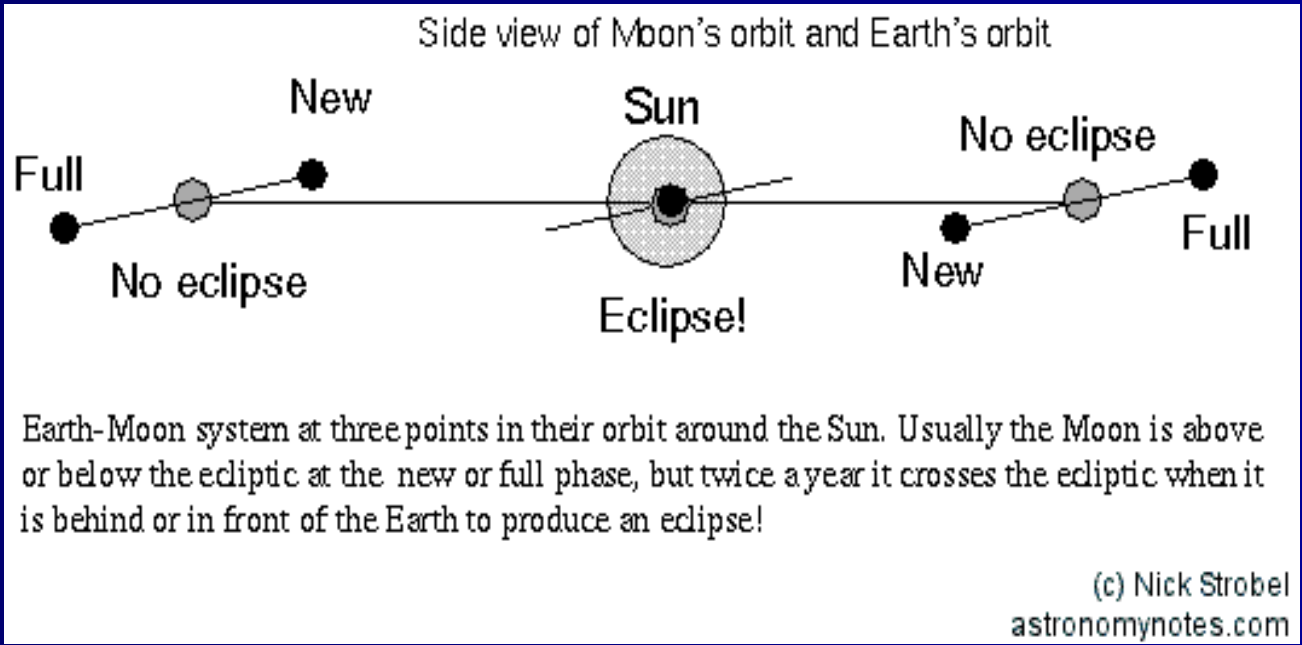
The Moon

- Moon's Orbit is Slightly Tilted



The Moon

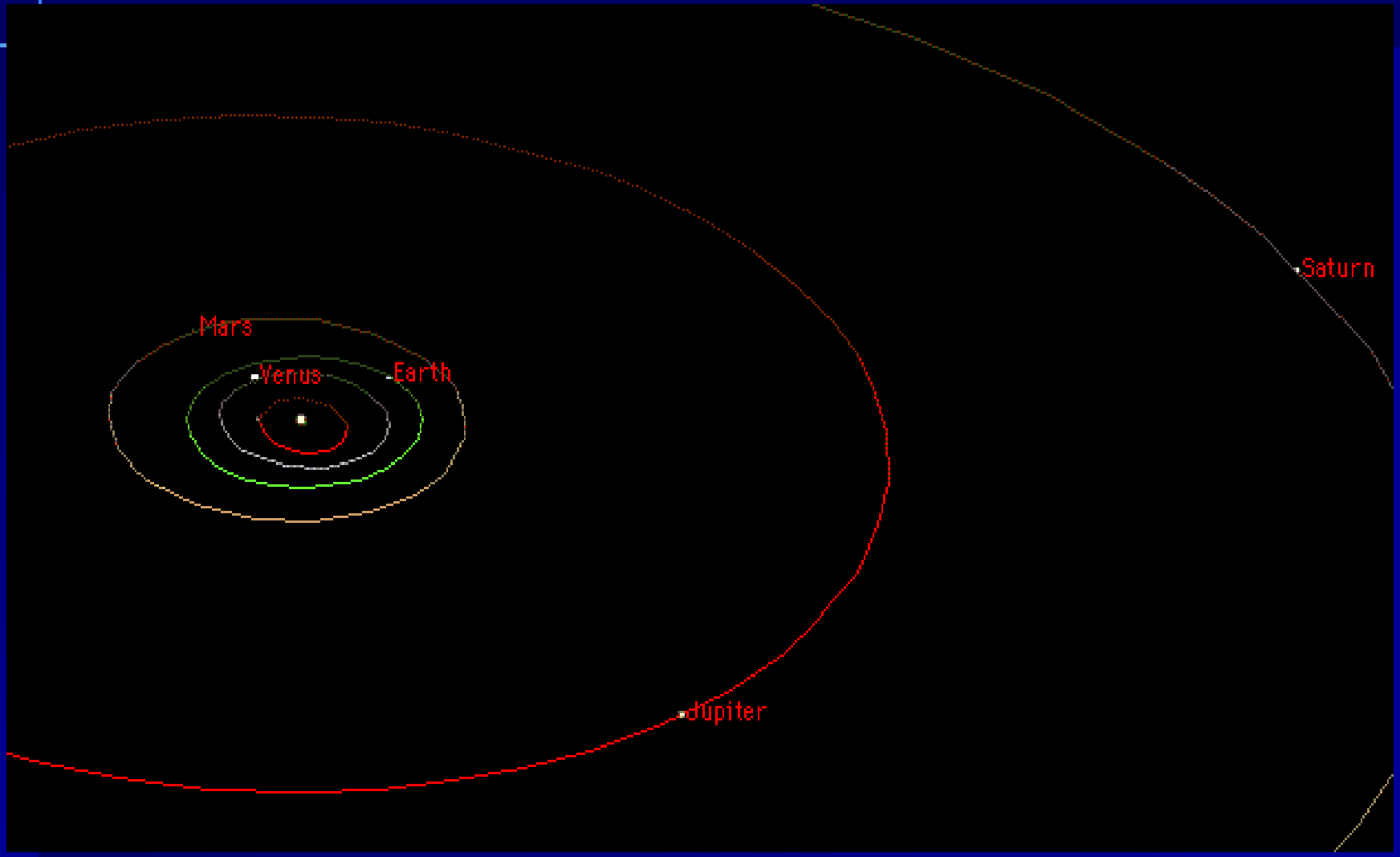
- Eclipses



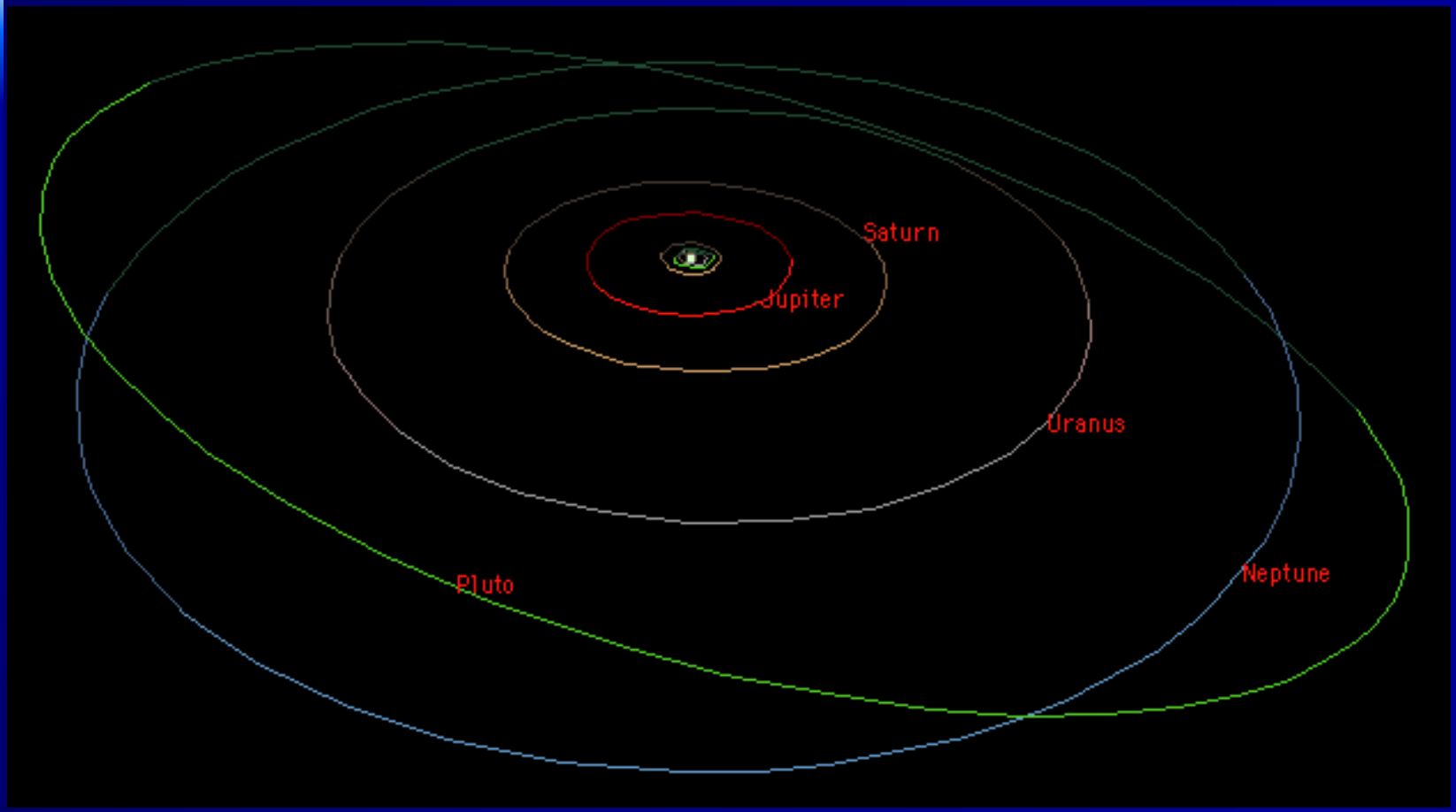
The Planets

- Inside – Mercury and Venus
- Earth
- Outside – Mars, Jupiter, Saturn
- Way Out – Uranus & Neptune
- “Dwarf Planets” – Pluto

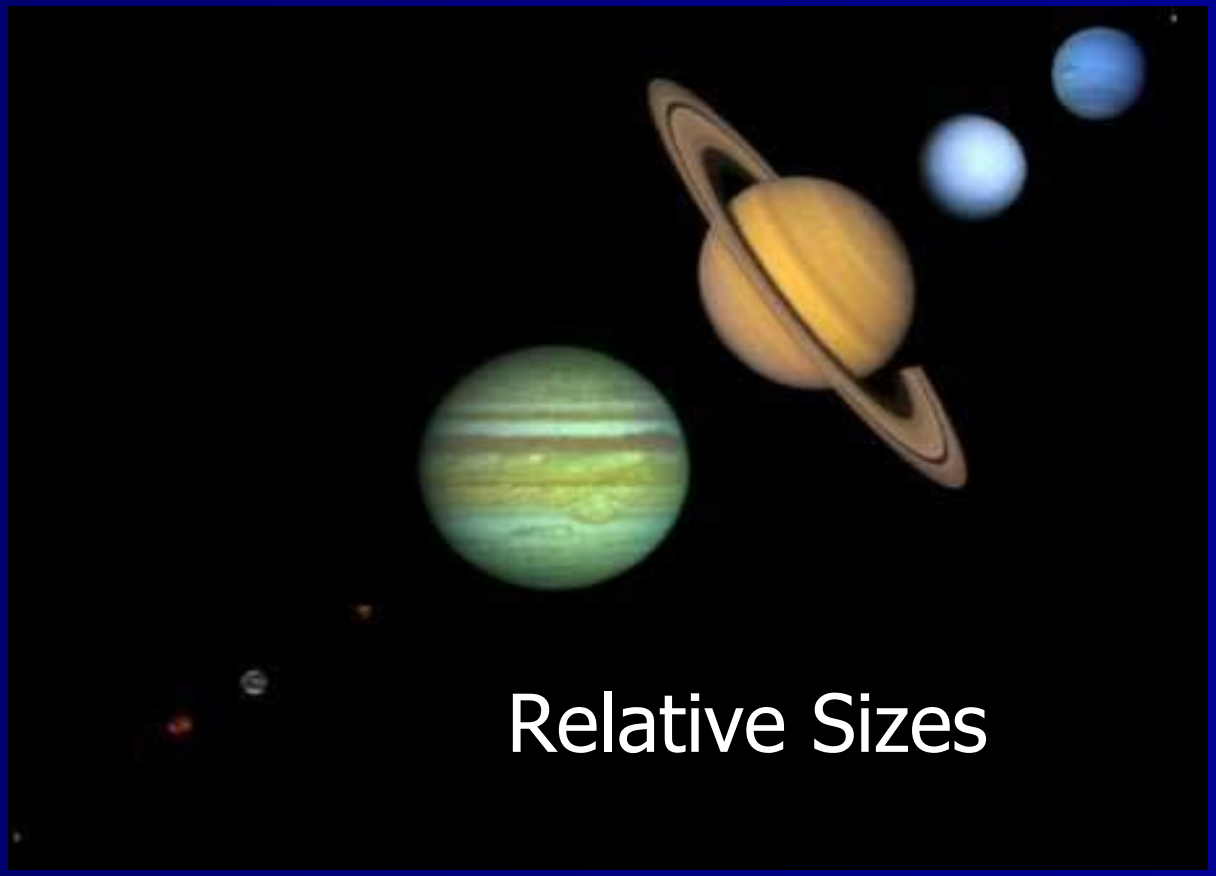
The Planets



The Planets



The Planets



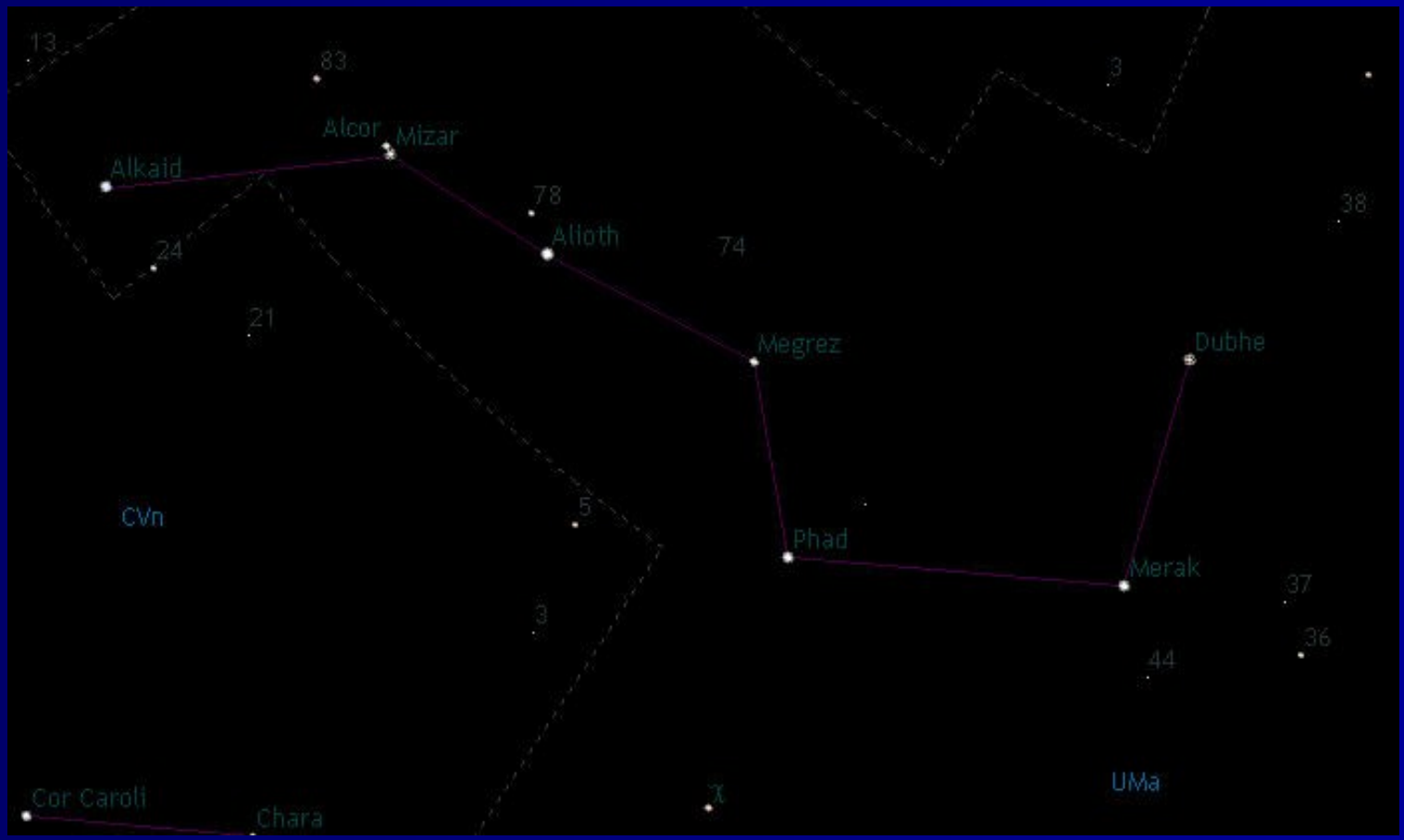
Deep Sky

- Stars and Constellations
- Star Clusters (open and globular)
- Nebulae (bright, dark, planetary)
- Galaxies
- Catalogs (NGC, Messier, …)

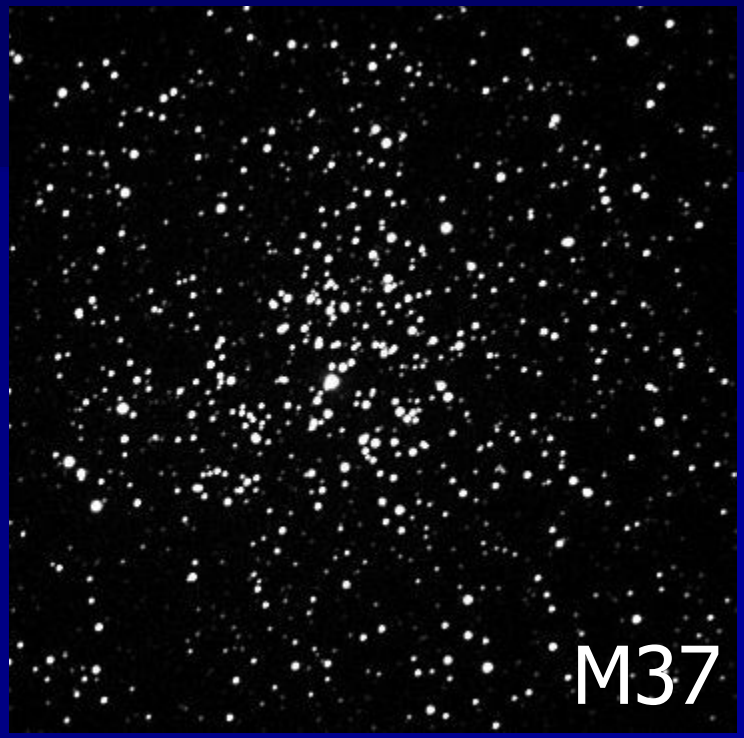
Deep Sky

- Star Brightness is called Magnitude
  - "Mag 1" is brightest
- Star Colors - subtle
- Star Groupings - asterisms, clusters
- Sky "real estate" = constellations
  - Example: Ursa Major aka The Big Dipper

Deep Sky


13
83
3
Alcor
Mizar
Alkaid
78
38
Alioth
74
24
21
Megrez
Dubhe
CVn
5
Phad
Merak
37
3
36
44
Cor Caroli
Chara
UMa

Deep Sky



Deep Sky

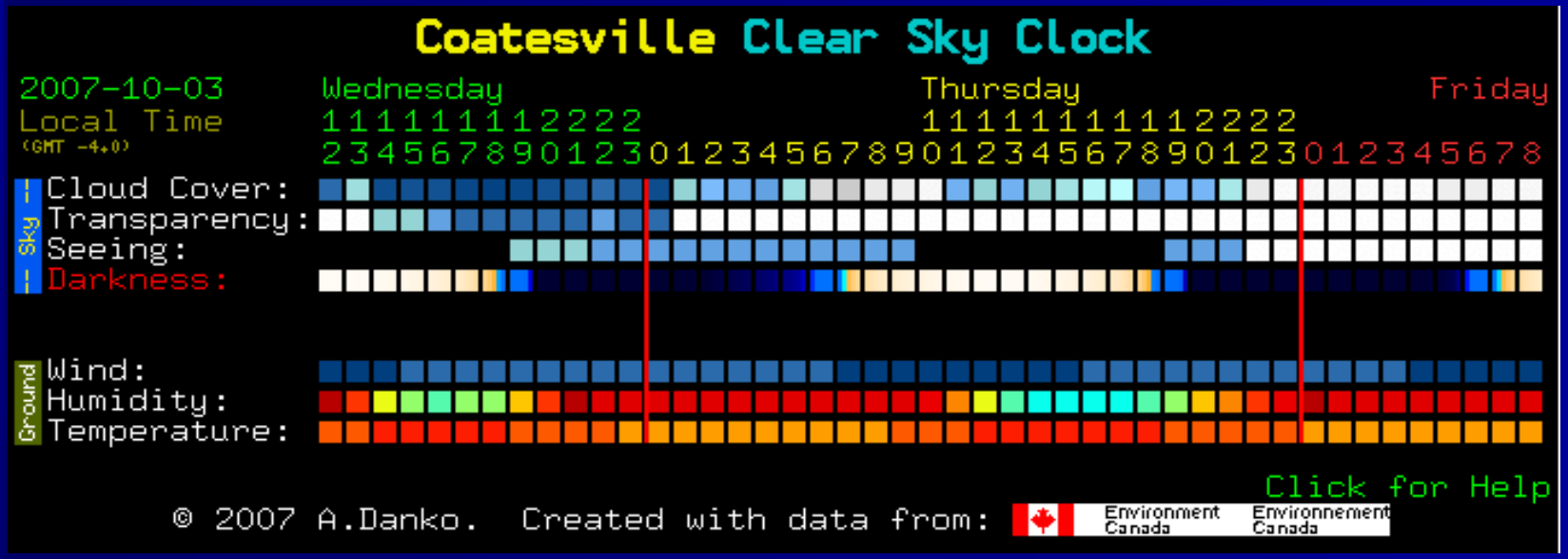
Deep Sky

Challenges

- Weather in this part of the country
- Light Pollution
- Lunar Cycle (for Deep Sky)
- Life!

Clear Sky Chart

- Summary View - “Is tonight good?”
- http://www.cleardarksky.com/csk/



Resources

- The Internet!
- Local Astronomy Clubs
  - Delaware Valley Amateur Astronomers (dvaa.org)
  - Chester County Astronomical Society (www.ccas.us)
  - Chesmont Astronomical Society (www.chesmontastro.org)
- The Library

Equipment

- Your Eyes
  - Dark Adaptation
  - Red Lights
- Binoculars
- Telescope
- Accessories & Gadgets