

DARK SKIES for December 2021:

| | | | | |
|-----------------|-------------|------------------|---|------------------|
| W/T Dec. | 1/2 | 6:08 p.m. | - | 5:00 a.m. |
| T/F Dec. | 2/3 | 6:08 p.m. | - | 5:32 a.m. |
| F/S Dec. | 3/4 | 6:08 p.m. | - | 5:33 a.m. |
| S/S Dec. | 4/5 | 6:07 p.m. | - | 5:34 a.m. |
| S/M Dec. | 5/6 | 6:07 p.m. | - | 5:35 a.m. |
| M/T Dec. | 6/7 | 6:53 p.m. | - | 5:35 a.m. |
| T/W Dec. | 7/8 | 8:08 p.m. | - | 5:36 a.m. |
| W/T Dec. | 8/9 | 9:24 p.m. | - | 5:37 a.m. |
| T/F Dec. | 9/10 | 10:37 p.m. | - | 5:38 a.m. |
| F/S Dec. | 10/11 | 11:46 p.m. | - | 5:39 a.m. |
| S/S Dec. | 11/12 | 12:52 a.m. | - | 5:39 a.m. |
| S/M Dec. | 12/13 | 1:56 a.m. | - | 5:40 a.m. |
| M/T Dec. | 13/14 | 2:59 a.m. | - | 5:41 a.m. ! |
| T/W Dec. | 14/15 | 4:01 a.m. | - | 5:42 a.m. |
| W/T Dec. | 15/16 | 5:04 a.m. | - | 5:42 a.m. |
| T/F Dec. | 16/17 | none | | |
| F/S Dec. | 17/18 | none | | |
| S/S Dec. | 18/19 | none | | |
| S/M Dec. | 19/20 | none | | |
| M/T Dec. | 20/21 | none | | |
| T/W Dec. | 21/22 | 6:11 p.m. | - | 6:37 p.m. |
| W/T Dec. | 22/23 | 6:12 p.m. | - | 7:40 p.m. |
| T/F Dec. | 23/24 | 6:12 p.m. | - | 8:46 p.m. |
| F/S Dec. | 24/25 | 6:13 p.m. | - | 9:52 p.m. |
| S/S Dec. | 25/26 | 6:13 p.m. | - | 11:00 p.m. |
| S/M Dec. | 26/27 | 6:14 p.m. | - | 12:08 a.m. |
| M/T Dec. | 27/28 | 6:15 p.m. | - | 1:20 a.m. |
| T/W Dec. | 28/29 | 6:15 p.m. | - | 2:34 a.m. |
| W/T Dec. | 29/30 | 6:16 p.m. | - | 3:52 a.m. |
| T/F Dec. | 30/31 | 6:17 p.m. | - | 5:13 a.m. |
| F/S Dec. | 31/1 | 6:18 p.m. | - | 5:49 a.m. |

Times listed are for Dodgeville, Wisconsin when

(1) Moon is below the horizon

(2) Sun is > 18° below the horizon
(astronomical twilight)

Please minimize your use of outdoor lighting during these times to give everyone the best possible view of the night sky.

Time Travel

conducted by David Oesper

THE DISAPPEARANCE OF DARKNESS

NORMAN SPERLING

Chabot Observatory
Oakland, CA U.S.A.

Continued from last month...

I am greatly distressed to notice that many countries, in their rush to build American-style industry and infrastructure, seem determined to repeat, as well, every mistake we have made in our own development. Those countries should notice the fabulous price that America now pays to restore its environment, mostly to undo our

previous mistakes. Among these mistakes are many which contribute to air and light pollution. I fervently urge other countries to learn from our mistakes and deliberately avoid them, on their ways to development. "Those who do not learn from history are condemned to repeat it."

A RECIPE TO CHANGE THE FUTURE

Though this history of light pollution offers some inspiration, it also teaches that we are still losing, and losing badly. Present tactics win only limited, local victories, while light pollution increases, even where restricted by ordinances. Therefore, this history suggests that we must take other approaches.

Eliminating waste lighting will help all astronomers, and also the consumers who pay for lighting, while conserving resources used to generate the waste. Sometime, there will be another energy crunch, or economic setback, or major reverse in public approval of utilities. To be ready when that happens, our coalition should design a new type of luminaire to satisfy our own criteria along with the public's. I think these include:

- no light above 15° below horizontal
- smooth spread of light over target area on ground
- target area easily tailorable, perhaps by adjustable side shields
- 2 or 3 narrow emission lines (perhaps from separate tubes, phosphorescence, or other means) that the human eye will accept for decent color rendition, but at wavelengths not critical to spectroscopy, dim to color-film emulsions, and easy and cheap to filter
- easy and cheap to manufacture
- rights easy to license to everyone who will make them
- economical to operate (easy installation and replacement, low power consumption, long life)

We should develop this luminaire. When we have it ready, we should promote it with all manufacturers, utilities, government authorities, and the public. When we offer a luminaire demonstrably superior for the public's purposes, it should win widespread acceptance, especially in an energy crunch. Since we also tailor it to suit our own purposes, that is how we can achieve our eventual victory.

Light Pollution, Radio Interference, and Space Debris, ASP Conference Series, Vol. 17, IAU Colloquium 112, 1991, D.L. Crawford, Ed., p. 101.

"In the end, we will be judged not for what we build, but for what we choose not to destroy." - Anonymous

"Our fantastic civilization has fallen out of touch with many aspects of nature, and with none more completely than with night." - Henry Beston (1888-1968)

"Many walk by day; few walk by night. It is a very different season." - Henry David Thoreau (1817-1862)