



Presidents Message – April 2014

The following is from an article about the ethics of long space voyages, written by Miriam Kramer:

"NASA should set up a clear set of ethical rules regarding the health of astronauts on long-duration spaceflights, such as a trip to Mars. As it stands now, astronauts on a round trip to Mars would experience a level of radiation exposure that violate at least one of NASA's existing health limits, according to previous Mars mission studies. Such a trip to the Red Planet would expose astronauts to enough radiation to increase their lifetime risk of developing fatal cancer by more than 3 percent, a health limitation imposed by NASA.

While NASA should not relax its current health standards for long-duration space travel, the agency should consider developing ethics guidelines on when exceptions to those standards should be made for deep-space voyages. Those exceptions could be vital for missions that send humans to Mars, an ultimate goal for NASA, or to send astronauts on ultra-long missions to the International Space Station. Currently, astronauts spend about six months on the space station. A NASA astronaut and Russian cosmonaut are due to fly a one-year trip to the station in 2015.

From its inception, space exploration has pushed the boundaries of human endurance, and risked the lives and health of astronauts. Determining where those boundaries lie and when to push the limits is complex. NASA will continue to face decisions as technologies improve, and longer and farther spaceflights become feasible. Ethics principles should be an integral part of discussions and decisions regarding health standards for long-duration and exploration spaceflight.

Some of the risks astronauts face during long term spaceflights include vision impairment, heightened cancer risk due to radiation exposure and bone loss from the micro-gravity environment. There may also be risks that are "unforeseeable" before the mission begins. The first step in this ethical framework should be deciding if a long-term space mission's value is worth the potential risk to the astronauts performing it. If a mission is considered "ethically acceptable," then NASA officials should develop a system for granting the exception.

For example, a 180-day flight to the Red Planet followed by a 600-day stay on Mars and a 180-day flight back to Earth would expose astronauts to about 1.01 Sieverts (radiation units). Some researchers consider that level of radiation manageable, however, it would violate NASA's current standard that caps the excess cancer risk for a given astronaut at 3 percent.

These ethical principles should help guide mission decisions:

Avoid harm by preventing harm, exercising caution, and removing or mitigating harms that occur.

Provide benefits to society. Seek a favorable and acceptable balance of risk of harm and potential for benefit.

Allowing individual astronauts to make voluntary decisions regarding participation in proposed mission; ensure fair processes and provide equality of opportunity for mission participation and crew selection.

Recognize the individual sacrifices made for the benefit of society, as well as honor societal obligations in return, by offering health care and protection for astronauts during missions and over the course of their lifetimes. "It is clear that space exploration will open up a broad range of humanistic questions."

Mike Thomas.

March 2014 Meeting Minutes:

- It was determined that we would host a "Mini-Messier Marathon" on March 22nd.
- Annual scholarships we give to WNC students were increased to \$1,500, by vote.
- Jim Bean's students gave a presentation on their project at the Observatory.

WNAS Officers

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Monthly Membership Meeting Tuesday, April 15th, 7:00 PM

"The Space Shuttle"

A slide-show lecture by Mike Thomas

The story of NASA's "Space Transportation System", the Space Shuttle, is a tale of triumph and tragedy. The shuttles flew 135 missions over their 30 years of operations. This presentation is filled with many stunning NASA photographs, and highlights numerous program accomplishments. Members are welcome to bring guests.

~ April 2014 ~

| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|-----|--|--|----------------------------|--|-----|------------------|
| | | 1 | 2 | 3 | 4 | 5 Star Party |
| 6 | 7 Moon 1 st Qtr  | 8 Mars at Opposition The red planet will be at its closest approach to Earth | 9 | 10 | 11 | 12 Star Party |
| 13 | 14 Lunar Eclipse See times below | 15 WNAS Meeting @JCDO 7pm Full Moon  | 16 | 17 | 18 | 19 Star Party |
| 20 | 21 | 22 Moon Last Qtr  Lyrid meteors | 23 Lyrid meteors | 24 | 25 | 26 Star Party |
| 27 | 28 | 29 New Moon  | 30 | April 15 UT Penumbral Eclipse Begins: 04:53:37 UT /21:57:37 PDT Partial Eclipse Begins: 05:58:19 UT/22:58:19 PDT Total Eclipse Begins: 07:06:47 UT/00:06:47 PDT Greatest Eclipse: 07:45:40 UT/00:45:40 PDT Total Eclipse Ends: 08:24:35 UT/01:24:35 PDT Partial Eclipse Ends: 09:33:04 UT/02:33:04 PDT Penumbral Eclipse Ends: 10:37:37 UT/03:37:37 PDT | | |

~ May 2014 ~

| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|-----|----------------------------------|----------------------------------|--|-----|-----|---|
| | | | | 1 | 2 | 3 Dark Skies Star Party |
| 4 | 5 Eta Aquarids Meteor Showers | 6 Eta Aquarids Meteor Showers | 7 Moon 1 st Qtr  | 8 | 9 | 10 Star Party Saturn at Opposition, closest approach to Earth |
| 11 | 12 | 13 | 14 Full Moon  | 15 | 16 | 17 Star Party |
| 18 | 19 | 20 WNAS Meeting @JCDO 7pm | 21 Moon Last Qtr  | 22 | 23 | 24 Star Party Possible meteor storm from comet P/209 Linear |
| 25 | 26 | 27 | 28 New Moon  | 29 | 30 | 31 Dark Skies Star Party |

