Comet ISON from the Ground

Kelly Fast (if released from jury duty early)

OR

Lindley Johnson (if triumphant over flu in time)

OR

???????

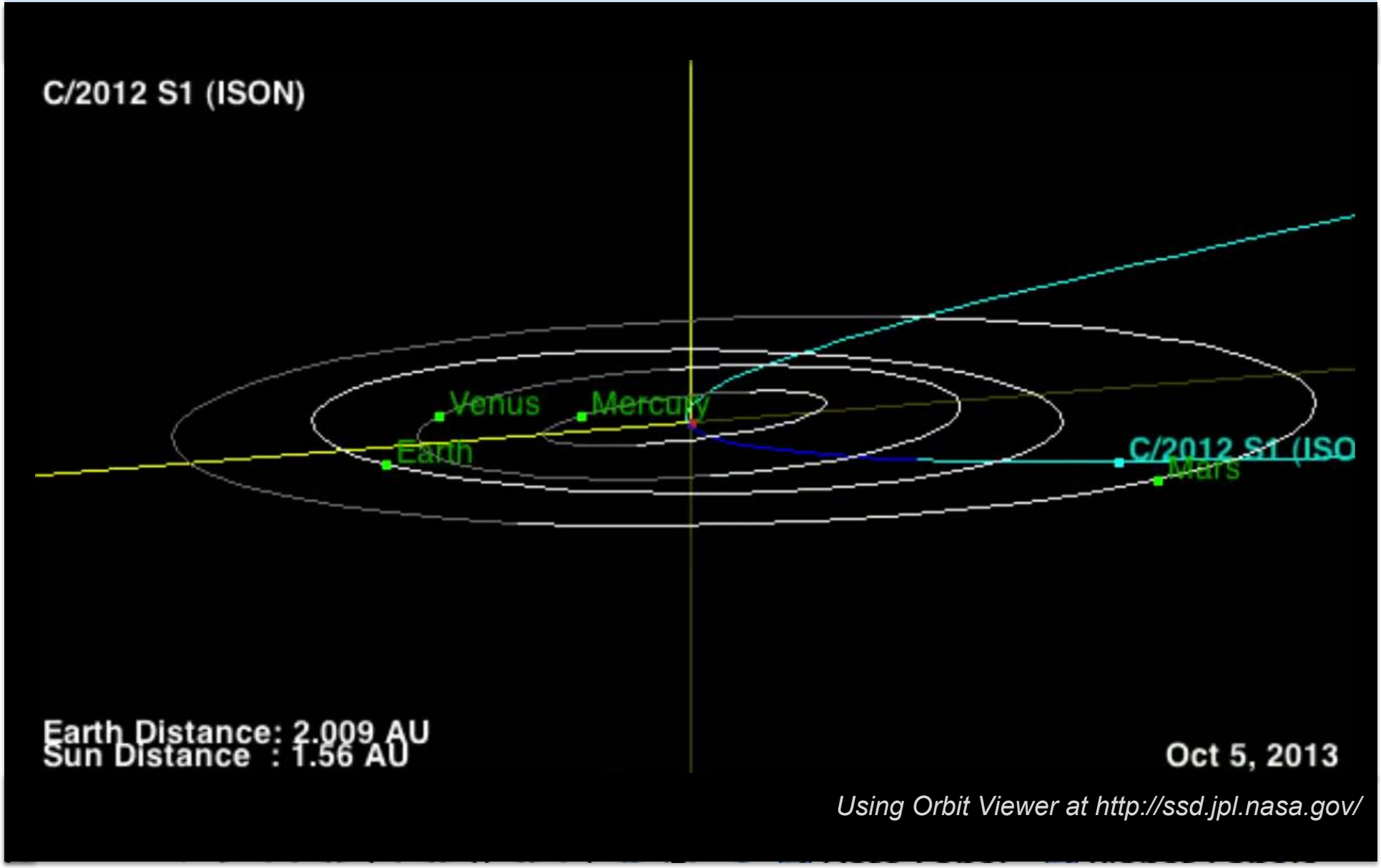
Many thanks to Neil Dello Russo and Mike Mumma

8th Meeting of the

NASA Small Bodies Assessment Group

January 15, 2012

Potentially bright comet (high signal) combined with Doppler shift (spectral features shifted from telluric counterparts) points to excellent target for ground-based comet science.



Possible Comet ISON Science Targets (near-IR)

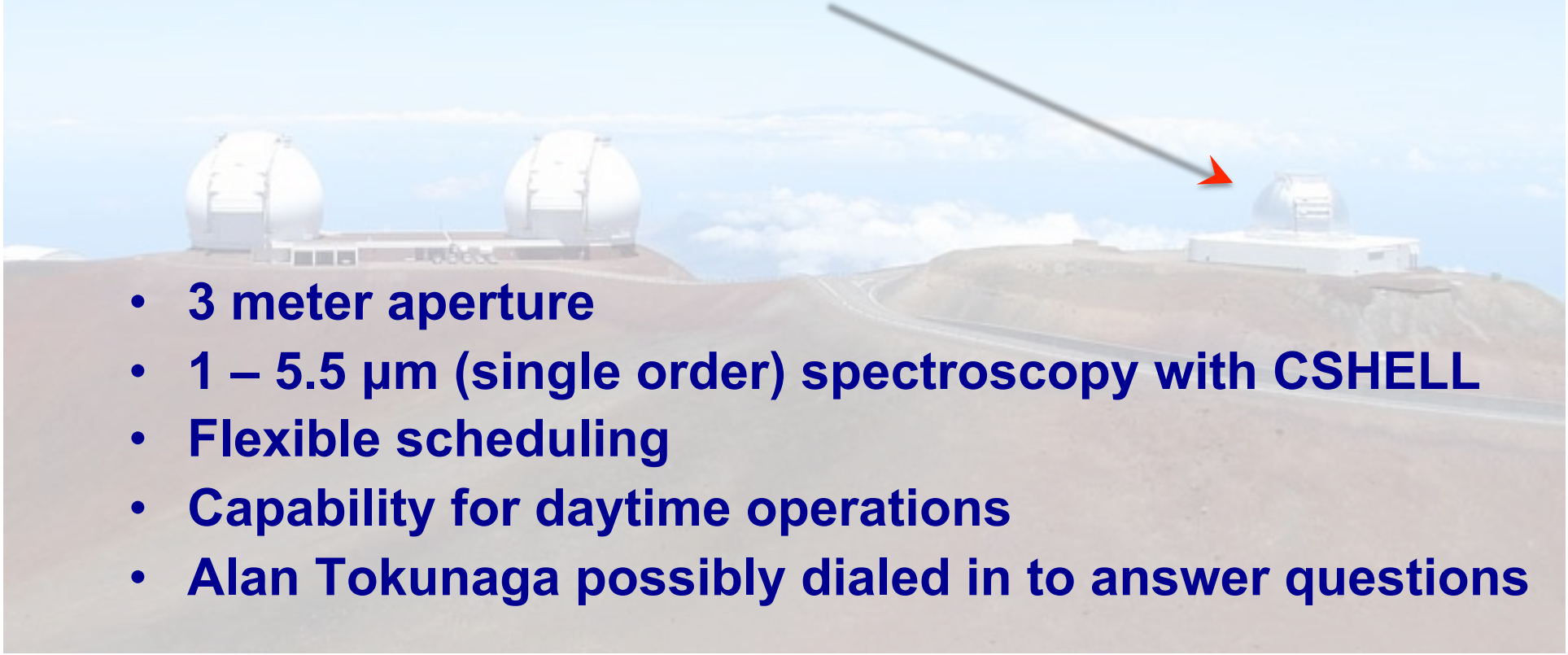
- Composition - changes over time
  - pre- and post- perihelion,
  - Stripping, splitting(!!!) exposing pristine material
- Composition - comparison to other comets
- Composition - distribution in coma as tracer of ice composition
- Rotational temperatures of gas species in coma

Possible Comet ISON Science Targets (near-IR)

- D/H from HDO/H_2O (and possibly from CH_4, C_2H_6, H_2CO, HCN)
- Abundance of CO and CH_4 volatiles as indicators of primordial versus evolutionary processes.
- Search for new cometary species such as C_2H_4 and C_4H_2. - clues to formation/evolution of early solar system ices

Near IR and NASA Ground-Based Assets

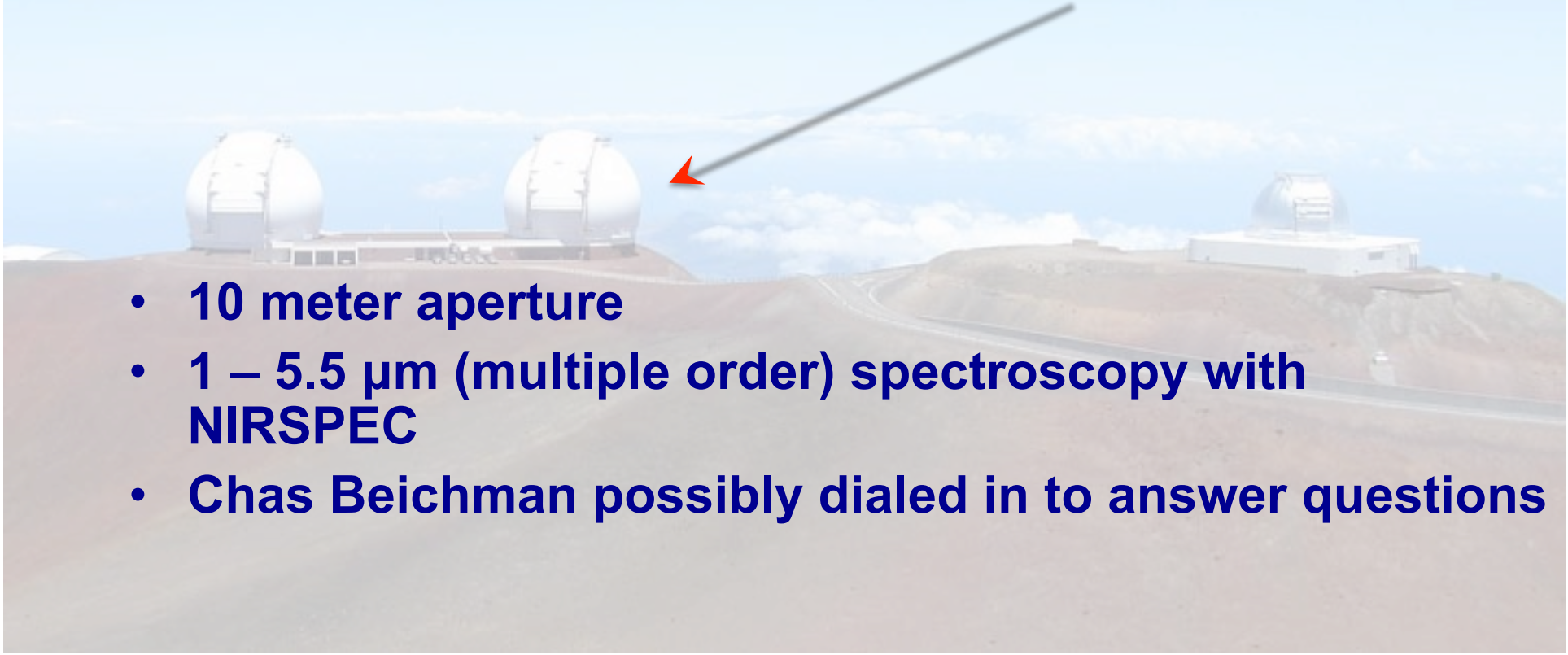
NASA Infrared Telescope Facility (IRTF)



- 3 meter aperture
- 1 – 5.5 μm (single order) spectroscopy with CSHELL
- Flexible scheduling
- Capability for daytime operations
- Alan Tokunaga possibly dialed in to answer questions

Near IR and NASA Ground-Based Assets

NASA time on the W.M. Keck Observatory



- 10 meter aperture
- 1 – 5.5 μm (multiple order) spectroscopy with NIRSPEC
- Chas Beichman possibly dialed in to answer questions

Comet ISON Optimal Accessibility
(perihelion 11/28)

From Keck:

Pre-perihelion: ~10/5–11/11 before sunrise

Post-perihelion: 12/24–1/1 before sunrise
(low Doppler shift)

Post-perihelion: 1/15–31 after sunset

From IRTF (within sun angle limitations):

Pre-perihelion: 11/5–22

Post-perihelion: 12/5–30

More from the ground…

Other wavelengths (radio, mid-IR, optical, etc)
targeting volatiles, dust…