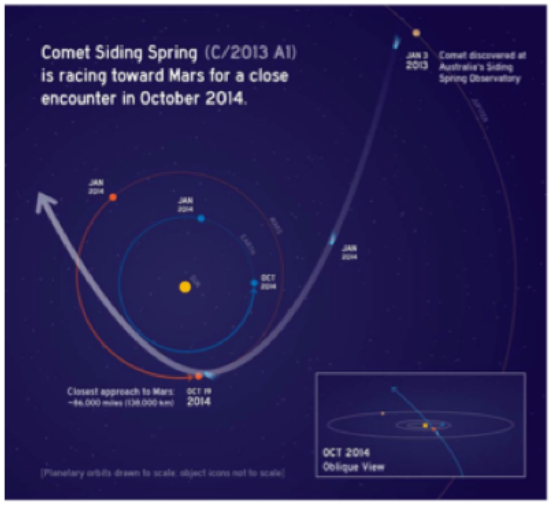
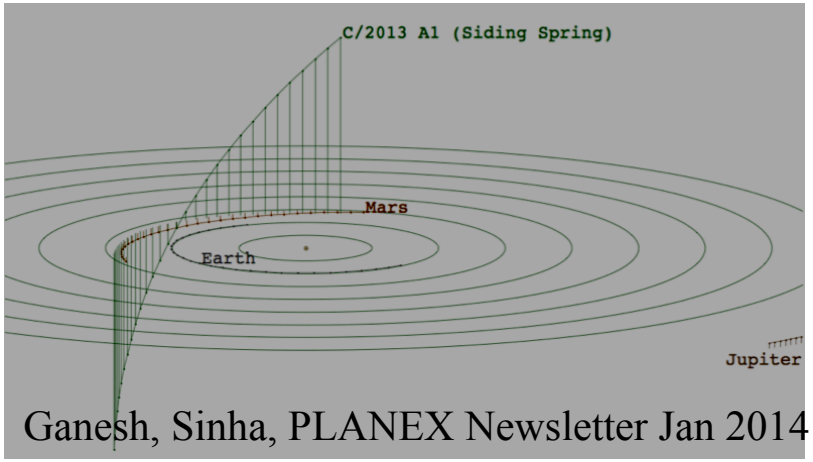
C/Siding Spring – Mars Encounter:





Ganesh, Sinha, PLANEX Newsletter Jan 2014

Padma A. Yanamandra-Fisher

Senior Research Scientist, Space Science Institute, USA

and

CIOC_SidingSpring FB Group

Two campaigns for the price of one

C/Siding Spring

- Dynamically new comet – Oort cloud
- At present, looks nominal, similar to C/ISON at similar AU
- Pro/Am observing networks; mostly southern hemisphere
- Dust activity (in – and out-bound)
- other features (tails, jets, etc.)

Mars

- influence of cometary dust on atmosphere: in- and outbound
- changing seasons on Mars: how does the cloud/species inventory change?
- long-term influences of cometary dust – high altitude clouds? On what timescales?

PACA:Pro-Am Collaborative Astronomy:

Role of Amateur Astronomers

Integration of social media

Observations

multispectral, calibrated images;
spectra:polarization

Standards

Data Format: aligned with pros

Embrace new methods

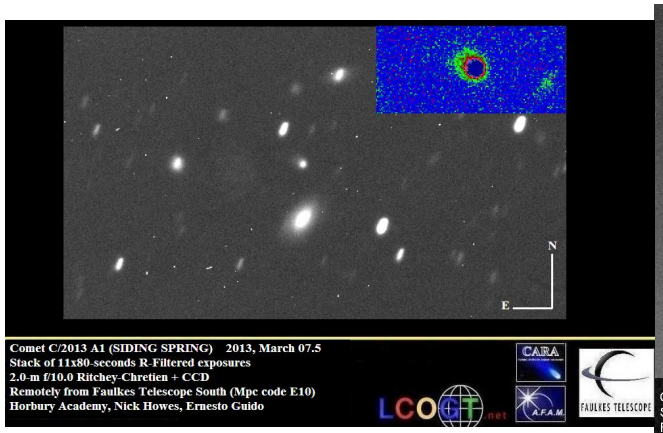
Increasing social media exposure (FB,websites, Flickr, Pinterest, Twitter, Google+ Hangouts)

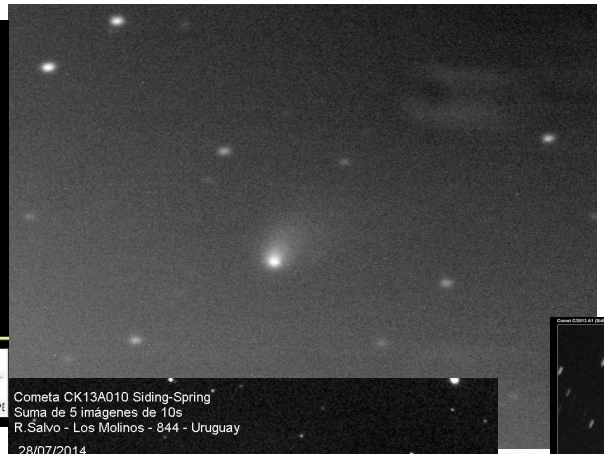
Share Results

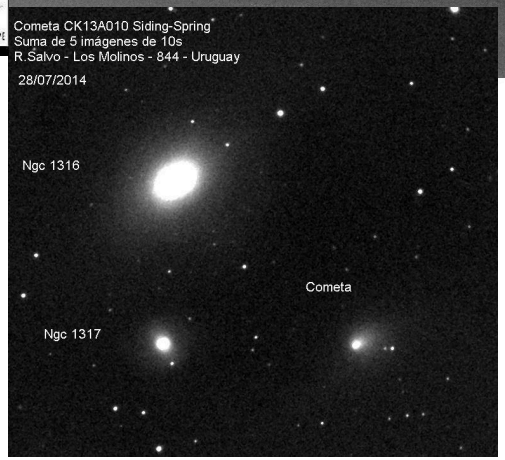
meetings; papers; workshops; etc.

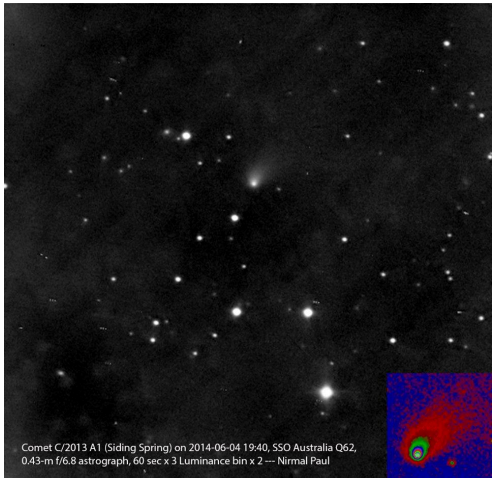
C/2013 A1 (Siding Spring) Gallery
Discovery and Characterization

2013 Mar 7









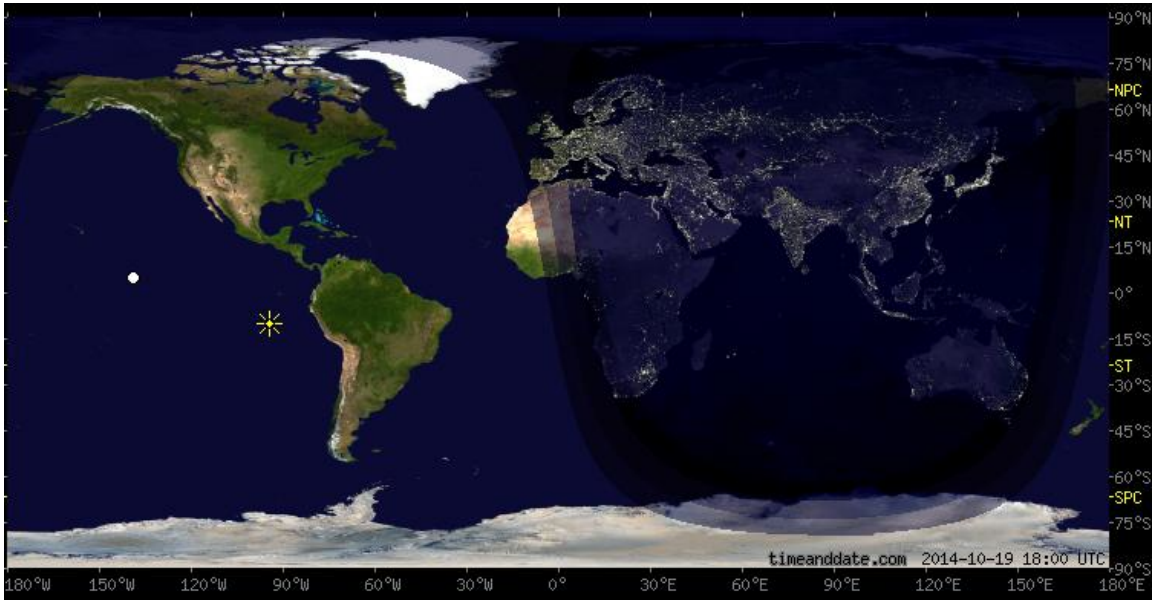
2014 Aug 5

Comet Campaign: Well Placed for Southern Hemisphere

- ✧ **Identified a minimum group of amateur astronomers**
- ✧ **Encouraging all types of observers: sketchers, visual observers, optical, nb comet filters; spectroscopy, (polarimetry) –**
- ✧ **Developed several social attributes :FB, Pinterest; Flickr, Twitter, Web Page/ Portal; Google+ Hangouts.**

- ❖ **working on providing observing guide/ephemeris/ etc. for consistent data for scientific use**
- ❖ **Providing temporary dropboxes for data collection and storage**
- ❖ **Addressing issues re: data format; data collation; filters; developing instructions/guides for data reduction, calibration**

Encounter Day, 19 October 2014 (UT): South Africa – best viewing option

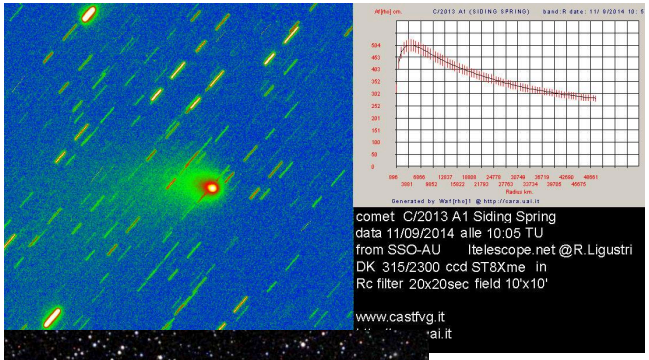


Information provided by Australian visual amateur observer, Chris Wyatt (Walcha, AU): taken the initiative to contact South African amateur groups; Work in Progress

FB Group: CIOC_SidingSpring

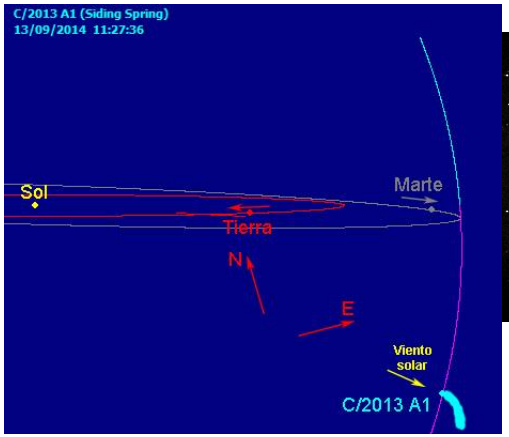
https://www.facebook.com/groups/cioc.sidingspring/

Australia

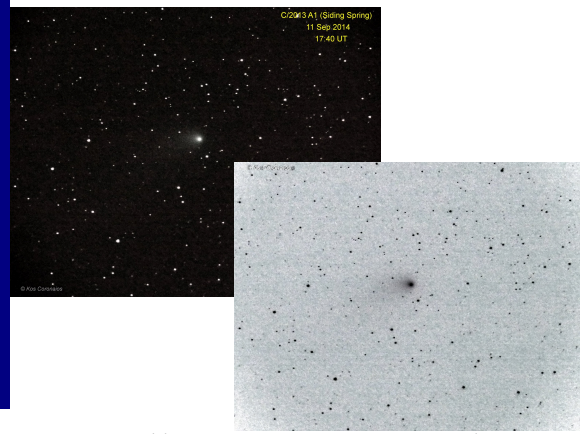


Credit:P.Lake, iTel

South Africa

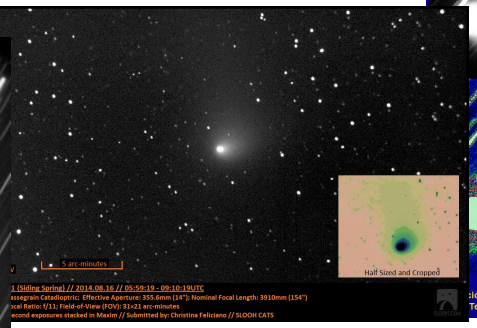


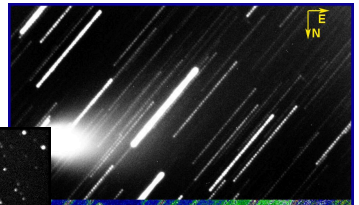
Credit: C. Colazo

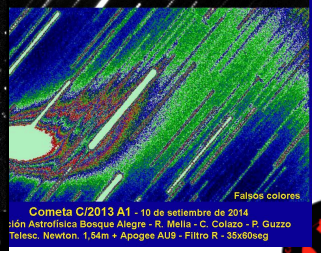


Credit: Kos Coronaios

South America

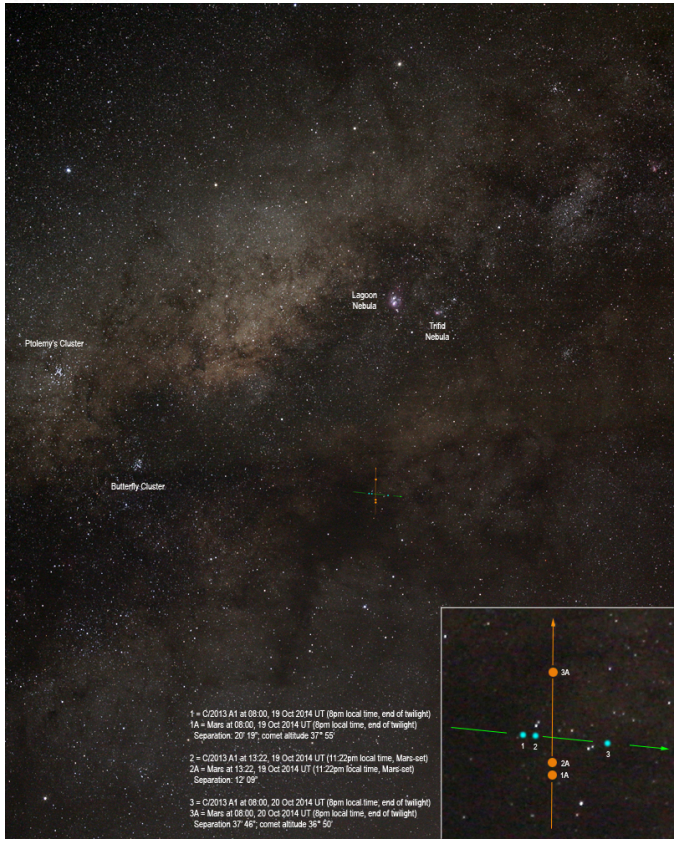






Yanamandra-Fisher et al.

The Southern Hemispheric Sky

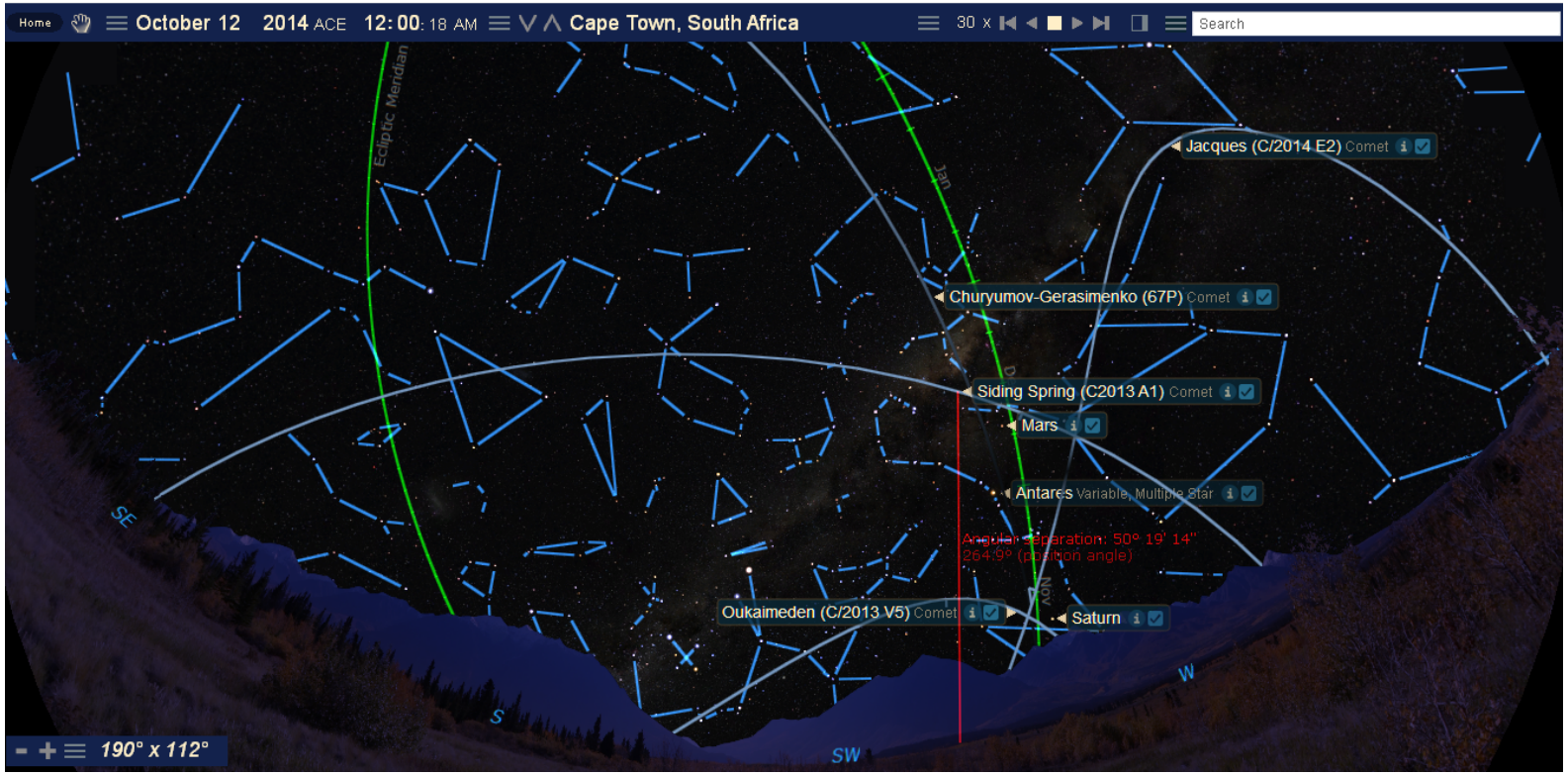


Courtesy: Rob Kaufman, Bright, Victoria, AU

- Fly-by will occur in a busy star field
- Observing strategy: observe from S, America, S, Africa and Australia – combination of individual observers and robotic telescope networks ; pre- – to post-encounter, as weather permits.
- Serendipty transits: NGC 362 on 29 Aug 2014

Credit: Damian Peach

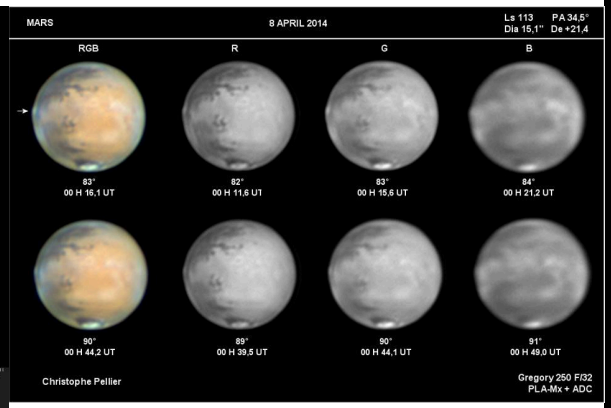
Star Chart for Cape Town, S. Africa 12 Oct 2014 (Midnight local time)

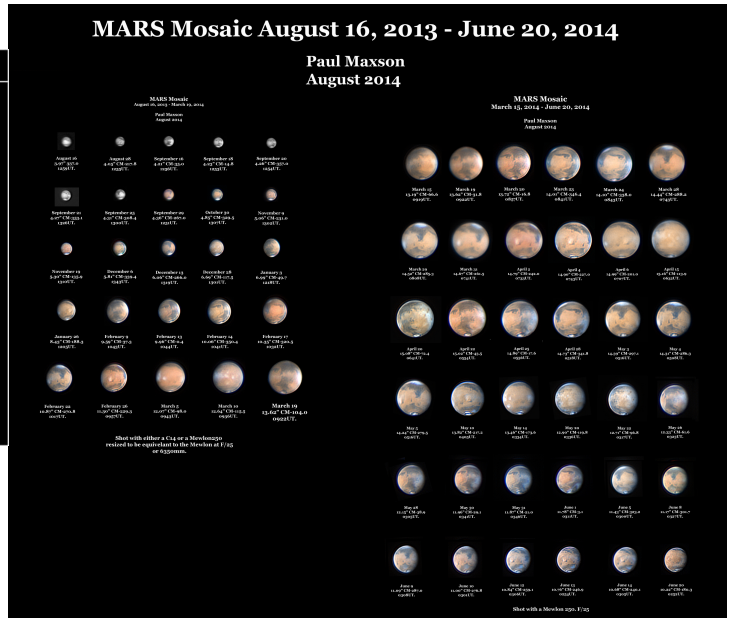


Courtesy: V. K. Agnihotri

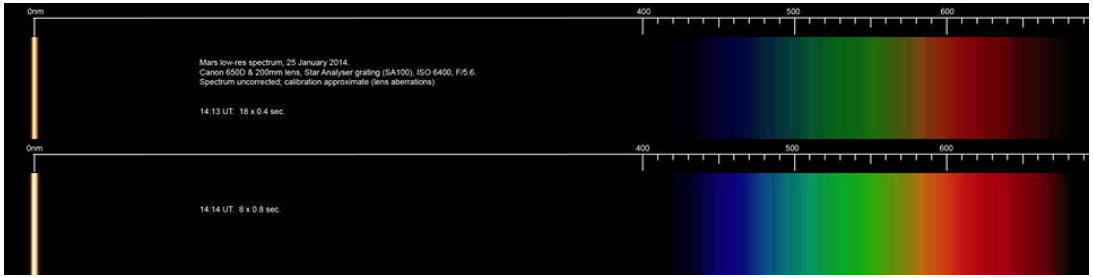
Positions of Comets Siding Spring, 67P, Jacques, Oukaimeden; and Mars, Saturn, Antares. C/SidingSpring is circumpolar. (seems like Oukaimeden had a dramatic decrease in brightness?_

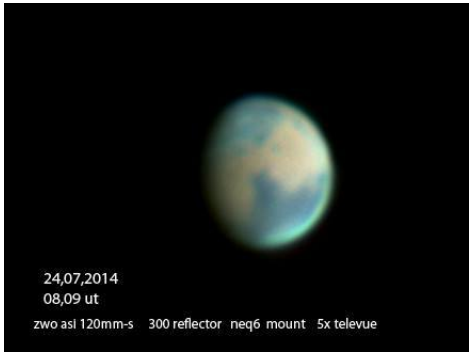
Mars Campaign





Credit: A. Wesley, (AU)14 Ap 2014; (center): C. Pellier (Fr) Apr 2014; (right) P. Maxson, (Az)

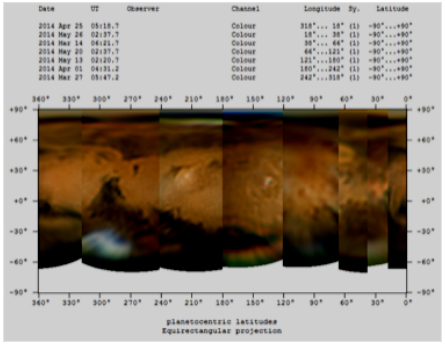


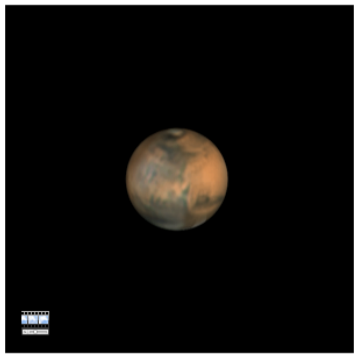


Credit: R. Kaufman (AU) J24 Jan 2014; (right): I. Adams (AU) 24 July 2014

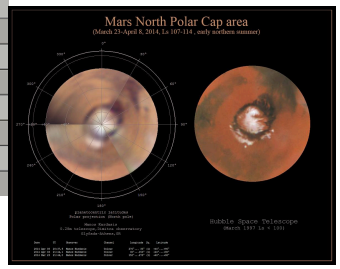
Mars Year 32: Change of Seasons
Southern Spring – Season for Dust Storms?

Martian years and start dates of northern hemisphere seasons				
Mars year	**Spring equinox (Ls = 0°)**	**Summer solstice (Ls = 90°)**	**Autumnal equinox (Ls = 180°)**	**Winter solstice (Ls = 270°)**
25	May 31 2000	Dec 16 2000	Jun 17 2001	Nov 11 2001
26	Apr 18 2002	Nov 03 2002	May 05 2003	Sep 29 2003
27	Mar 05 2004	Sep 20 2004	Mar 22 2005	Aug 16 2005
28	Jan 21 2006	Aug 08 2006	Feb 07 2007	Jul 04 2007
29	Dec 09 2007	Jun 25 2008	Dec 25 2008	May 21 2009
30	Oct 26 2009	May 13 2010	Nov 12 2010	Apr 08 2011
31	Sep 13 2011	Mar 30 2012	Sep 29 2012	Feb 23 2013
32	Jul 31 2013	Feb 15 2014	Aug 17 2014	Jan 11 2015
33	Jun 18 2015	Jan 03 2016	Jul 04 2016	Nov 28 2016
34	May 05 2017	Nov 20 2017	May 22 2018	Oct 16 2018
35	Mar 23 2019	Oct 08 2019	Apr 08 2020	Sep 02 2020
36	Feb 07 2021	Aug 25 2021	Feb 24 2022	Jul 21 2022
37	Dec 26 2022	Jul 12 2023	Jan 12 2024	Jun 07 2024
38	Nov 12 2024	May 29 2025	Nov 29 2025	Apr 25 2026
39	Sep 30 2026	Apr 16 2027	Oct 17 2027	Mar 12 2028
40	Aug 17 2028	Mar 03 2029	Sep 03 2029	Jan 28 2030





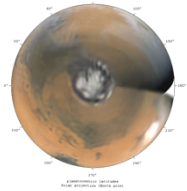
Credit: Mike Phillips

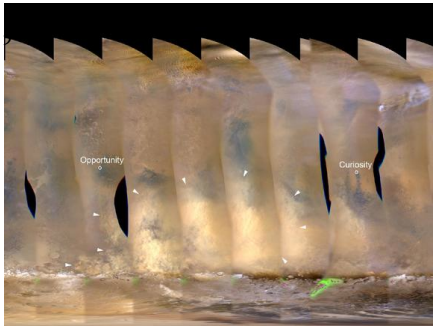


Animations:
See link on Summary Page

Credit: M. Kardasis: 2014
HST2007

Credit: Damian Peach
2014



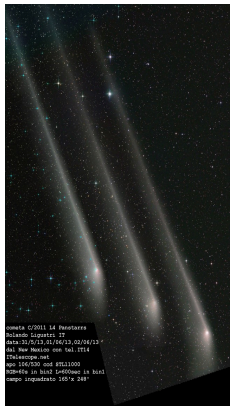


MRO: Nov 2012

Possible Features

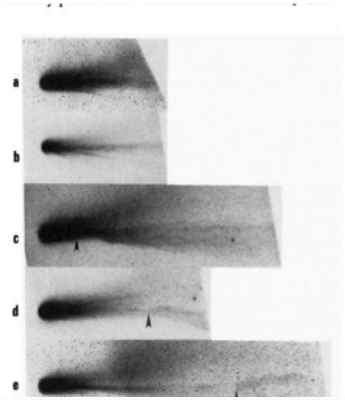
Anti-tails: Geometric effect of the dust behind the comet in its orbital path becomes visible during a short window when the comets's orbit lies in the same plane as the earth's orbit.

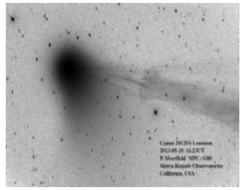
C/Arend-Roland, 1957 (A. McLure)



Courtesy: R. Ligustri: C/ PanSTARRS (2013).

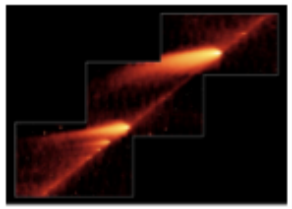
Disconnection events (DEs) occur when the interaction of the solar wind and induced magnetic filed of the comet's ion tail squeezes the magnetic field lines together to detach the ion tail.





C/Halley (1986) (left); C/Lemmon (2013) (top)

Fragments and Outbursts



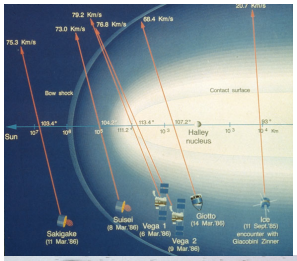
Reach et al. (2007) (L); Weaver et al. (1984) (R)

Summary

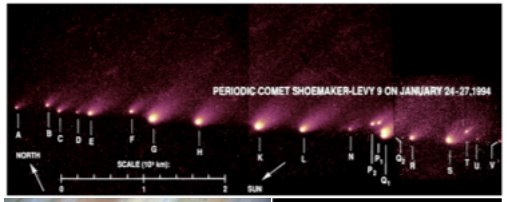
- **Dust studies** probe many aspects of cometary physics
  via tails, DEs, fragmentation, outbursts
- **Mars seasonal cycle**
  entering dust storm season
  Animations: Mike Phillips: http://i.imgur.com/rnyPEJW.gif
  Damian Peach: http://www.damianpeach.com/mars1314/mars2014_rotation.wmv
- **Pro-Am Astronomer Collaboration** :necessary
  provide long temporal context;
  responsive global network: always online
- **Inclusive of various fields**: observing, modeling, outreach, etc.
  magnitudes, Afrho, light curves, probe local solar winds, etc..

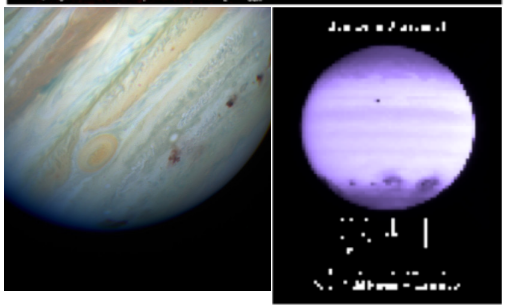
Some Recent Comet Campaigns: Amateur Contributions

IHW(1986): Comet 1P/Halley (Periodic)

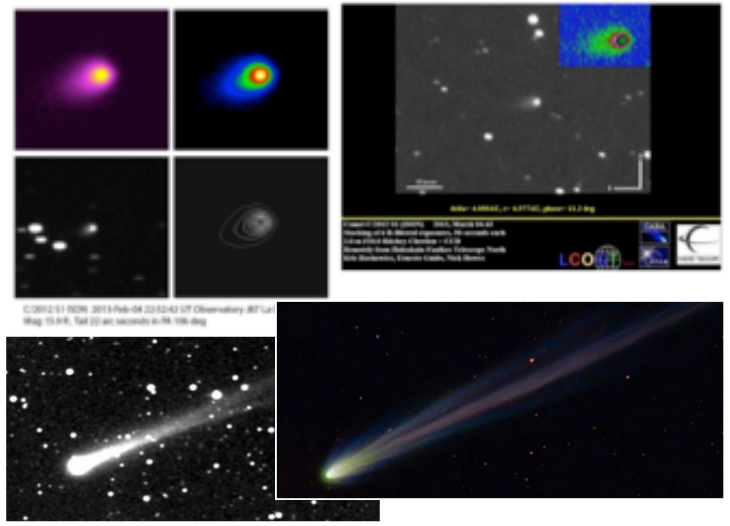


D/SL9-Jupiter (1994): Periodic, fragmented comet





CIOC_ISON (2013): Oort-cloud, sun grazing-comet

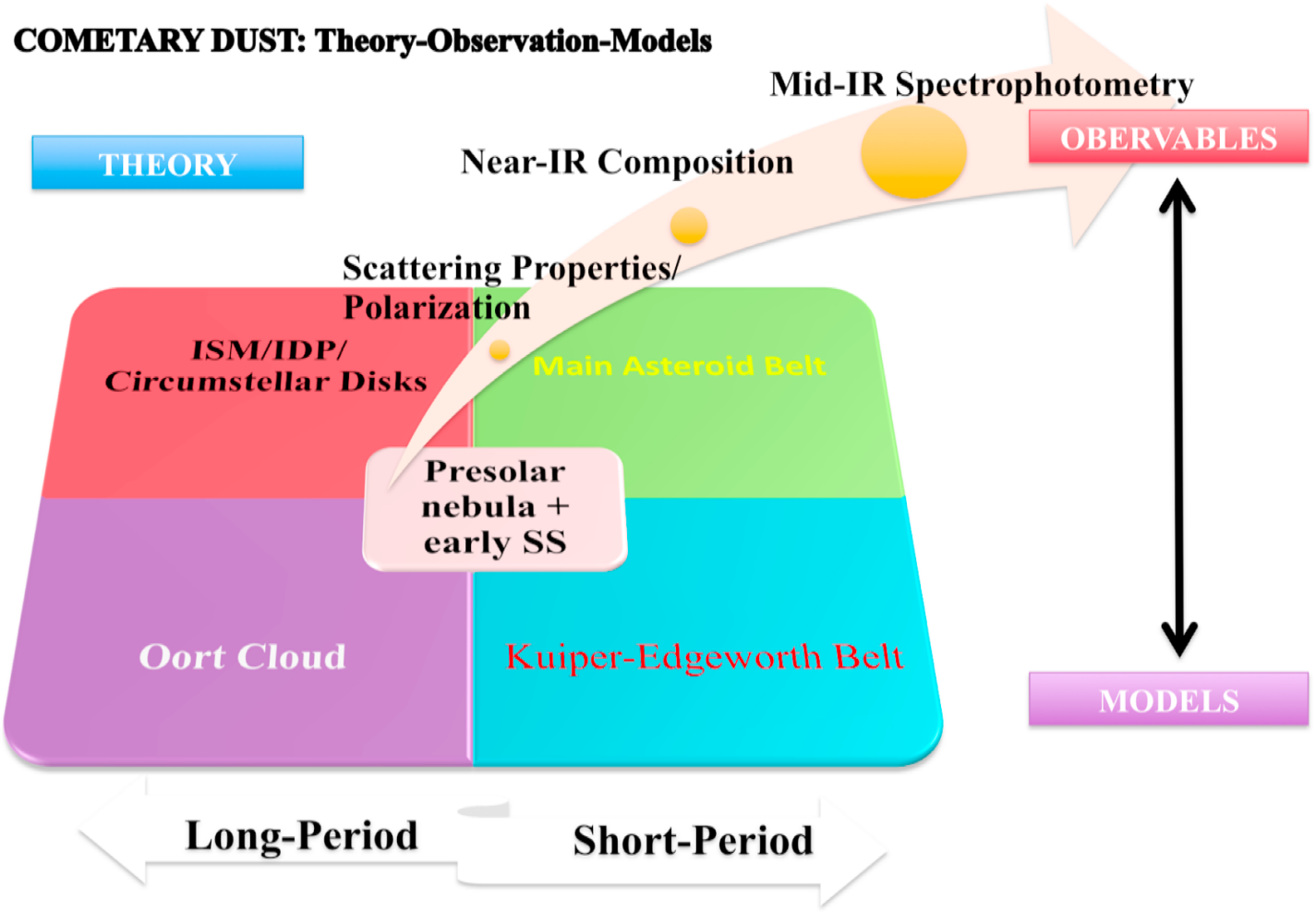


Outburst (left); Disintegration (right)

Amateur astronomer campaign DE's– probe local solar wind field

THANK YOU!

https://www.facebook.com/groups/cioc.sidingspring/

C/2013 A1 (Siding Spring)

Comet Connections