Shallow Sky Section

Annual Report 2016- 2017

Introduction

This report covers the period from August 2016-July 2017. This was the first year that the author has been responsible for the ASSA Shallow Sky Section. As a result there has been a lot to learn, but there have also been a number of highlights, most notably:

a) Building relationships within the South African Astronomical Community including the ASSA Council and members, SAAO, the Shallow Sky specialists, Boyden Observatory/UFS Physics dept, and various social media forums.
b) Representing ASSA in two live TV News interviews(SABC and eNCA)
c) Extensive ongoing international interaction, on a number of forums, on high resolution planetary and lunar imaging.
d) Submission of articles/images to MNASSA and Sky Guide, as well as BAA and ALPO journals internationally
e) Pro-Am collaboration supporting the NASA Juno mission at Jupiter and SAAO/NASA New Horizons mission(2014MU69 occultation)
f) Tim Coopers current and ongoing analysis of the widely observed Bolide/Fireball on 15 June.
g) Invitation for the author to present a paper on his Mars Observations (2015-2017 apparition) at the European Planetary Science Congress in Latvia in September 2017.

TV Interviews

SABC Newsroom interview October 24 2016

The author of this report was interviewed live on SABC News channel 404 on the subject of Mars. Two segments were broadcast. The first provided background to the planet itself and the second explored the implications of humans surviving on Mars. A short report on this event, with the associated youtube links was published in the October MNASSA.

Links:

https://www.youtube.com/watch?v=_vHgzbDfVos

https://www.youtube.com/watch?v=Xl1ko-GmSHU

eNCA News interview

At short notice the author was invited to, and attended a live eNCA News interview on 23 February, 2017. This was related to the announcement from NASA of the Trappist-7 exoplanet system.

Link:

https://www.enca.com/technology/seven-earth-sized-planets-discovered-around-a-single-star

Asteroids

The following communication was received from Jerome Jooste on 8 October, 2016:

Hello Clyde
As shallow sky director I believe it is important that you are made aware of the asteroid discovery made in May of this year(2016).
Using image sets from the PanSTARRS 1 telescope I identified a NEO which was given the preliminary designation P10udus. In follow up image sets the NEO was again detected and orbital elements calculated by the Minor Planet Centre. It was confirmed to be the same object and then given the provisional designation of 2016 GQ26. Once sufficient observations are made over a period of years and the orbital elements refined the IAU will approve the renaming of the asteroid by the discoverer.
This is only one of many preliminary discoveries I have made using data from PanSTARRS 1 and other telescopes engaged in NEO searches.
Regards
Jerome

Meteors/Meteorites

The most public and important event of the year was the Fireball/Bolide that was widely observed across the eastern, central and northern regions of the country on the morning of 15 June 2017. Tim Cooper (Shallow Sky Meteor specialist) has done extensive analysis and has estimated the point of entry was in the Eastern Cape, somewhere south of Dordrecht at an altitude of about 120km. It travelled NNE over the Drakensberg, passing overhead at Fouriesburg before disintegrating in the north eastern Free State, possibly in the location of Frankfort. Tim will complete his report on this event in due course. My appreciation to Tim and Kos Coronaios for their support in dealing with the numerous reports from the public.

Satellites

The past year satellite wise was relatively uneventful as far as South Africa was concerned - handled the usual odd enquiry about a satellite or lights seen - the bright flashing TELKOM 3 satellite - a failed communications satellite launch and left stranded in a useless orbit 266 by 5017 km - produced a fair number of reports as an unknown flasher. Then there was the usual Iridium flares and other bright satellites but nothing dramatic as far as re-entries etc . Daylight reports of satellite trails in the sky were all identified as aircraft contrails. Other reports of very bright objects turned out to be the landing lights of approaching aircraft etc.

Planetary work

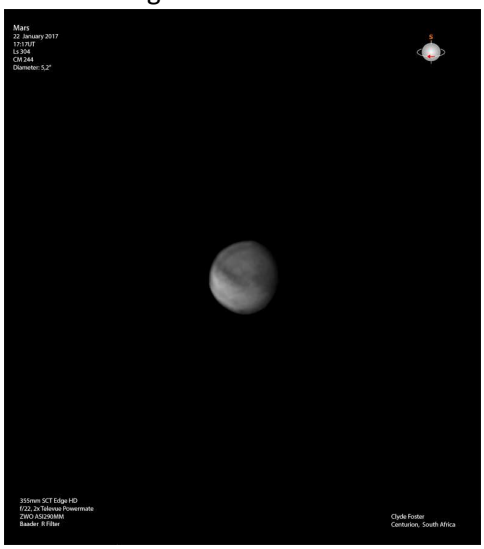
Mars

My Mars imaging programme for the 2015-2017 continued until February 2017. The apparition has been notable(notorious?) for its lack of significant dust storm activity. The planet will be exceptionally well placed from SA for the 2018 apparition with the major dust storm season being closer to opposition, providing an ideal opportunity to capture the initiation and development of any global scale storms. Submissions are made to:

a) BAA Mars section
b) ASSA Astrophotography section
c) Association of Lunar and Planetary Observers(ALPO), USA, Mars Yahoo group
d) ALPO-Japan, Mars section
e) Communication in Mars Observations(CMO)/The International Society of the Mars Observers(ISMO), Japan
f) PACA (Professional-Amateur collaboration in Astronomy) Mars group- by invitation only.
g) Des Etoiles plein les Yeaux- France
h) Planetary Virtual Observatory and Laboratory(PVOL), Europe

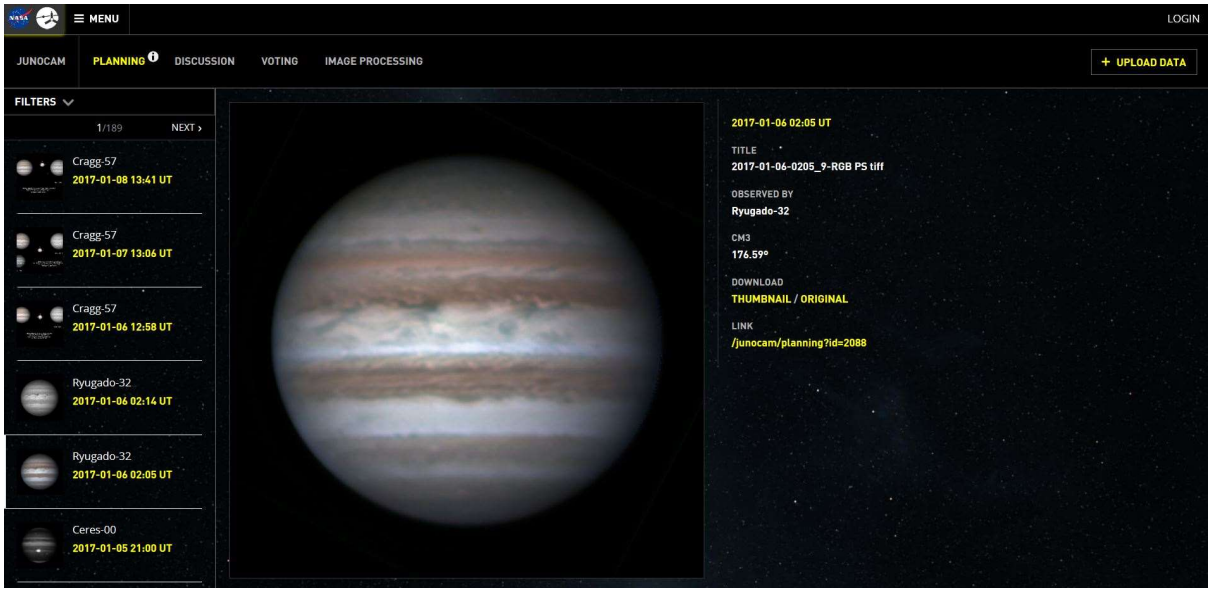
Mars was imaged on well over 200 days/nights during the apparition, a figure only rivalled by Paul Maxson in the USA and Efrain Morales in Puerto Rica, highlighting the fact that conditions in SA are very favourable, particularly if planets are in the southern skies.

The author has been invited to present a paper on his Mars observations at the European Planetary Science Congress which will be held 18-22 September 2017 in Riga, Latvia.

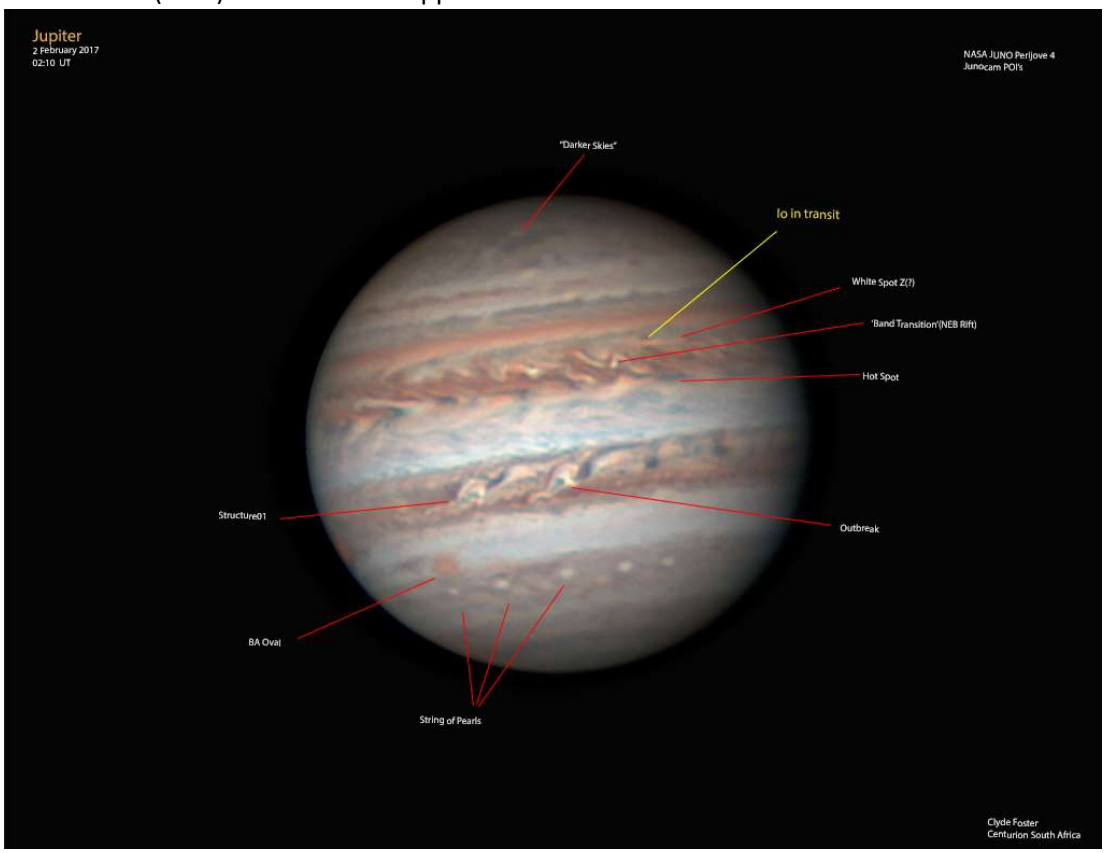


Jupiter

The author of this report has been extensively involved in submitting earth based images in support of the NASA Juno mission at Jupiter. An article on this Pro-Am work was published in the MNASSA May edition.



For Perijove(Juno closest approach in its orbit) 4 on 2 February, I was able to capture hi-res images of the target areas that the Juno spacecraft was scheduled to fly over, and the Junocam to image, one rotation(+-9h) before closest approach.



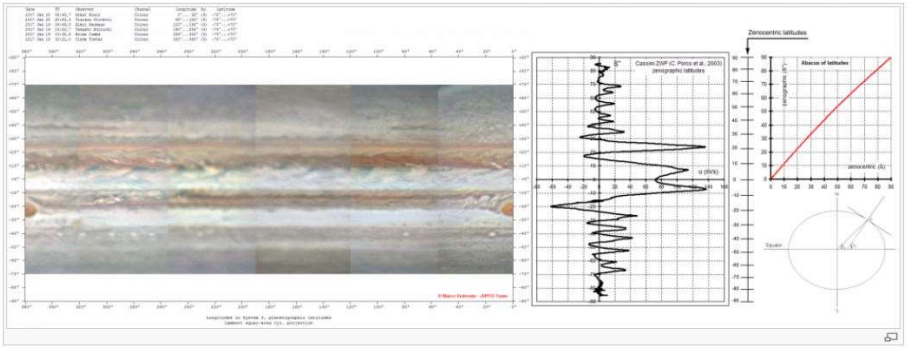
At the request of John Rogers, Director of the Jupiter section of the BAA, I have been added to the Jupos submission team. This team, primarily based in Europe, generates a comprehensive record of Jupiter's dynamic atmosphere, with global maps being generated on a roughly two weekly basis. The best amateur images worldwide are used to generate the maps.

Jupiter: maps, 2017 January 19-20

Jupiter planispheres composed with images taken between 2017 January, 19-20

Maps prepared by Marco Vedovato with the software WinJUPOS.

λ3 SYSTEM MAP (equirectangular projection, zenographic and zenocentric latitudes, North up)



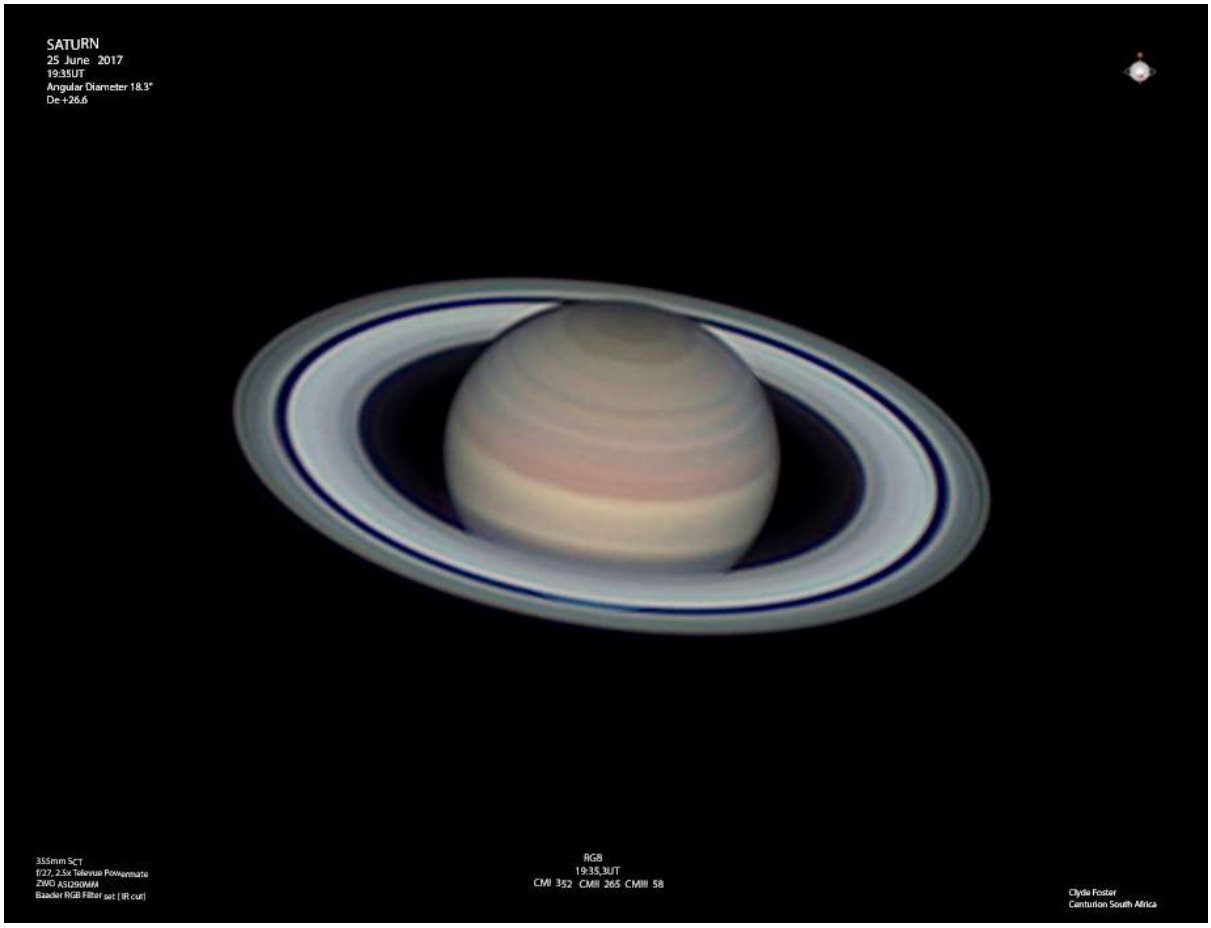
Link: http://pianeti.uai.it/index.php/Jupiter:_maps,_2017_January_19-20

Jupiter images are submitted to:

a) BAA Jupiter section
b) ASSA Astrophotography section
c) ALPO-Japan, Jupiter section
d) PACA (Professional-Amateur collaboration in Astronomy) Jupiter group- by invitation only.
e) Des Etoiles plein les Yeaux- France
f) NASA- Junocam mission
g) Jupos
h) Planetary Virtual Observatory and Laboratory(PVOL), Europe
i) HST Jupiter Collaboration group- by invitation

Saturn

Saturn has been followed through the latest apparition. With the NASA Cassini mission soon coming to a close, high quality amateur imaging of Saturn will again become a focus over the next few years.



Lunar

High resolution imaging is continuing and further images have been published in various international forums and journals. I am interacting with various individuals to assist them in developing lunar imaging skills. This is an area where developing amateurs can really get excited and produce rewarding results relatively quickly and easily, with guidance. This aspect will be included in the "Introduction to Planetary and Lunar imaging" presentation as mentioned below.

Solar Eclipse report

A report on the September partial solar eclipse was completed and published in the October MNASSA.

ASSA Shallow Sky Webpage

The webpage requires a further update, and this is on my priority list. It is anticipated that the Solar Eclipse report that was produced for MNASSA can also be utilised on the ASSA Solar Eclipse webpage. An area where the author needs to find some time.

Interaction with the Members/Centres

Positive interaction is continuing, most notably with Bloemfontein/UFS/Boyden and ASSA Johannesburg. Further communication with Cape and Durban Centres is planned. The writer is

currently preparing a presentation (or possibly webinar) on introducing observers to high resolution planetary and lunar imaging .

The author has been involved in a number of interactions with various individuals, mainly on FB forums, where I have provided specific input and advice on planetary and lunar imaging, and anticipate that this will continue.

British Astronomical Association-Burlington House visit -22 November 2016

In November I had a trip to the UK with my son, and whilst in London, arranged to meet up with a number of my BAA contacts. This was a second visit for the year as I had attended a normal meeting of the BAA back in January. I was privileged to have Dr Richard McKim (Director of Mars Section) sign a copy of his "Telescopic Martian Dust storm: A Narrative and Catalogue" (BAA Memoirs Vol 44 June 1999), which he left at Burlington House with Madeleine Davey for me to collect. In doing so I was able to have an informal meeting with Jeremy Shears, President of the BAA, where we were able to build on the interaction that we had during the previous meeting. In the evening, we met up with Dr John Rogers, Dr David Arditti and Martin Lewis for dinner at the Imperial China restaurant near Piccadilly. A very enjoyable, instructive and enlightening evening was held. It is often during these type of discussions and interactions that the finer details of processing techniques are discovered. A short report on the two BAA visits was submitted for publication in MNASSA.

SAAO/ 2014MU69

A request was received from SAAO (Anja Genade and Amanda Sickafoose) to assist with amateur support on observing the potential occultation of a 15 mag star by the Trans-Neptunian Object(TNO) 2014MU69. This faint object is the next target of the NASA New Horizons(Pluto) spacecraft, with the flyby anticipated for January 2019. This was a highly challenging (but exciting) opportunity for Pro-am collaboration. The author relocated his telescope and imaging systems to Boyden Observatory, Bloemfontein for five days and nights to cover the event. Data was successfully collected and is being analysed by SAAO. It is anticipated that the data will be submitted to the NASA New Horizons team for incorporation in their final report. My sincere appreciation to SAAO and especially David van Jaarsveld and Prof Matie Hoffman for their support and hospitality. Also to the ASSA Council for their enthusiastic support.

Conclusion

It has been an exciting, and busy, first year of involvement with ASSA. There is still plenty of work to do and it is hoped that further interest can be generated in the local Astronomical community in this exciting sector of Astronomy.

I would also like to take this opportunity to thank the Shallow Sky Specialists that have provided input throughout the year. Their contribution and support is greatly appreciated.

Clyde Foster

Director- Shallow Sky Section

ASSA

4 July 2017